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2017   **Anna Bartoňová**

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Country-by-Country Reporting Data and Profit Shifting of Banks

Bachelor thesis

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Abstract

Base erosion and profit shifting is a great concern of governments as well as the misalignment of the taxable income. With recently obtained country-by-country data we can address and measure the profit misalignment of financial institutions for $2014 - 2016$.

Using apportionment formula, we estimate the common consolidated corporate tax base (CCCTB) of each bank for every country specifically. The CCCTB then corresponds to profit created by real economic activity of a given bank in every country. We then observe the difference between CCCTB and actual taxable income, which determines the size of profit misalignment.

We determine that around 30 % of world's income before tax is shifted to jurisdictions without accompanied economic activity. We find out that there is no time trend among the years.

We conclude that large economies, such as United Kingdom, France, and Italy suffer more from profit misallocation, however, profit-havens Hong Kong, Ireland, or Luxembourg take advantage of the current system. We see that the Netherlands and Switzerland, which are usually considered to be tax havens, are with regard to bank industry, currently understating their income compared to the real economic activity in these countries.

Abstrakt

Eroze daňových základů a přesouvání zisků je velkou problematikou vlád stejně jako nesoulad mezi základem daně a ekonomickou aktivitou. S nově zveřejňovanými zprávami po jednotlivých zemích, dokážeme změřit nesoulad v základu daně s ekonomickou aktivitou finančních institucích za roky 2014 – 2015.

Pomocí přerozdělovacího vzorce odhadneme jednotný konsolidovaný korporátní základ daně (CCCTB) za každou banku pro každou zemi individuálně. CCCTB pak odpovídá zisku vytvořenému skutečnou ekonomickou aktivitou dané banky v konkrétní zemi. Poté sledujeme rozdíl mezi CCCTB a skutečným základem daně, což nám určí míru nesouladu.

Zjišťujeme, že kolem 30 % světového příjmu před zdaněním je přesunuto do jiných zemí bez odpovídající ekonomické aktivity. Ověřujeme, že mezi lety 2014 – 2015 nesledujeme žádný trend v datech.

Usuzujeme, že na velké ekonomiky jako je Velká Británie, Francie a Itálie, dopadá nesoulad v základu daně více, ale daňové ráje jako je Hong Kong, Irsko nebo Lucembursko na současném stavu profitují. Vidíme, že Nizozemsko a Švýcarsko, jež jsou obvykle považovány za daňové ráje, v této analýze týkající se pouze bankovního sektoru podhodnocují své příjmy ve srovnání se skutečnou ekonomickou aktivitou v těchto zemích.

Keywords

Klíčová slova

Acronyms

BEPS	Base Erosion and Profit Shifting
OECD	Organization for Economic Co-operation and Development
BEA	Bureau of Economic Analysis of the US Department of Commerce
CCCTB	Common Consolidated Corporate Tax Base
EU	European Union

Declaration of Authorship

1. The author hereby declares that he compiled this thesis independently, using only the listed resources and literature.

2. The author hereby declares that all the sources and literature used have been properly cited.

3. The author hereby declares that the thesis has not been used to obtain a different or the same degree.

Prague 31st July 2017   Anna Bartoňová

Institute of Economic Studies
Bachelor thesis proposal

In many countries may have emerged an issue of base erosion and profit shifting (BEPS). It refers to any tax avoidance strategies that are used to shift profit to low or no-tax locations. This issue is of concern of governments, because they are highly dependent on income from corporate taxes. Possible solutions to tackle BEPS are being proposed on international level. Even though it is impossible to measure BEPS accurately, we are provided with other indicators that can measure profit misalignment.

The aim of our thesis will be to study the profit misalignment using newly reported data about financial institutions located in Europe. We will use these data to estimate the actual economic activity in given countries. With that knowledge, we will be able to calculate the difference between declared profit and profit apportioned according to real economic activity. Thus, we will be able to approximately measure the profit misalignment.

Our major research questions will be:

What percentage of income is redistributed every year?

What countries suffer the most from profit redistribution?

Which countries would benefit the most from introduction of CCCTB in terms of increasing the tax base?

Are banks behaving the same as other international corporation in terms of profit misalignment?

Core literature follows.

ALEX COBHAM and PETR JANSKÝ, 2017. Measuring Misalignment: The Location of US Multinationals' Economic Activity versus the Location of their Profits. . 5 July 2017. DOI 10.1111/dpr.12315.

ALEX COBHAM and SIMON LORETZ, 2014. *International Distribution of the Corporate Tax Base: Implications of Different Apportionment Factors under Unitary Taxation*. Institute of Development Studies. ISBN 978-1-78118-178-2.

DHAMMIKA DHARMAPALA, 2014. *What Do We Know about Base Erosion and Profit Shifting? A Review of the Empirical Literature**. University of Chicago Law School.

ELIŠKA JELÍNKOVÁ, 2016. *Estimating the Misalignment between the Locations of Profits and Economic Activities of EU's Banks*. Bachelor Thesis. Prague: Charles University.

JAMES HINES and ERIC M. RICE, 1994. Fiscal Paradise: Foreign Tax Havens and American Business. *The Quarterly Journal of Economics*. 1994. Vol. 109, no. 1, p. 149–182.

MICHAEL P. DEVEREUX and SIMON LORETZ, 2008. The Effects of EU Formula Apportionment on Corporate Tax Revenues. *Fiscal Studies*. 18 March 2008. Vol. 29, no. 1, p. 1–33. DOI 10.1111/j.1475-5890.2008.00067.x.

RICHARD MURPHY, 2015. European Banks' Country--by--Country Reporting: A review of CRD IV data. . July 2015.

Content

Introduction

Base erosion and profit shifting (BEPS) is a term defining tax avoidance strategies of firms that misuse the differences in tax rates among countries to artificially shift profit to jurisdictions with low or no-tax where there is little or no economic activity. This challenges the fairness of tax systems and weakens the competitiveness of countries, because cross-border companies are abusing this option to lower their tax burden. Furthermore, it indirectly undermines the tax abidance of other taxpayers. Base erosion is a significant issue for all governments, since the corporate income tax is the important part their income.

Countries legitimately require the profits of multinational companies to be taxed, where the economic activities connected with earning the profits are held. As this issue could not be solved on a jurisdiction level, over 100 countries had joined the inclusive framework to tackle BEPS. This incentive comes from Organization for Economic Cooperation and Development (OECD), which in so called BEPS Project presented a package of 15 Actions that give countries instruments to prevent possible tax avoidance.

One part of the BEPS is the misalignment of profits. Profits of multinational companies are transferred to countries, where company does not create much of economic activity. To monitor this behavior, European Union enacted an action called country-by-country reporting as a part of Directive 2013/36/EU (The European Parliament and the Council 2013). On 26th June 2013 it was enacted that all financial institutions with establishments in more than one country must disclose following information for every country they have representation in. This comprise these information:

(a) name(s), nature of activities and geographical location;

(b) turnover;

(c) number of employees on a full time equivalent basis;

(d) profit or loss before tax;

(e) tax on profit or loss;

(f) public subsidies received.

Clearly, we observe that this directive has several weak points. Firstly, this directive only applies for financial institutions, other corporate companies are not obligated to disclose these information, which diminishes the potential use of these data. Secondly, EU did not mention in what structure should financial institutions prepare the reports. This creates another obstacle for researches who would like to study these data. Also, the data are not available in any consolidated form, so whoever wants to access this

information must contact each financial institution separately. Some banks publish these data in annual reports, some are extending their sustainable reports, and some created separate reports only with this information. Some banks even do not report all information in one spot, reader has to go through multiple pages and created the arranged country-by-country view by herself.

Another disadvantage of current data form is that there is no specification in what currency financial institutions have to report. The exchange rate conversion is then left up to reader. In our analysis, we use the exchange rate as the average of the exchange rate of European Central Bank (European Central Bank 2017).

What is, however, the most fundamental problem, is that there is no instruction for the usage of units. Larger banks take advantage of this and they report all the numbers in largest possible unit, usually millions. Therefore, countries, which have smaller values of turnover, income before tax, or tax on profit or loss, are not mentioned in the report because their figures have been rounded to 0. This mostly regards small jurisdictions, possibly tax havens. Sometimes, banks sum figures of all these smaller countries and covers them as individual state called "Other". This treatment undermines the purpose with which the country-by-country report was created, researchers are then unable to determine, in what countries the bank is actually present. Later on, in our analysis, we comment on the group "Other" detailly.

Lastly, we cannot forget to mention that reporting these data is compulsory only for banks and other financial institutions which have establishments in EU. Even though there is some vagueness in the country-by-country report, it still is one of the first steps in fight against profit misalignment. Opening this data to the public, facilitates researchers and governments the access to analyzing which countries are affected by profit redistribution and to what extent is that a serious issue. The indirect effect is that financial institutions, knowing governments have access to these information, should be incentivize to stop avoiding taxes by shifting income abroad. Whether there is this secondary outcome we find out in longer period of time.

In this thesis, we want to focus on the analysis of profit misalignment to analyze, how many per cent of income is every year redistributed. By profit misalignment, we mean the amount of profit that is reported in one country by one company even though the economic activity does not correspond to that. As the indicator of economic activity, we use simplified apportionment formula. With that we can estimate the economic activity using information about number of employees and turnover of a firm in given

country. Apportionment formula then determines the common consolidated corporate tax base. Further information about the calculation are described in Section 2.2 Unitary Taxation and Common Consolidated Corporate Tax Base.

The estimate of the profit misalignment is based on the difference between taxable income of one country determined by real economic activity (CCCTB) and the actual reported income in that country. After creating these estimations, we can answer our first research question which is how many per cents of the overall taxable income is misaligned. Our second and third research question regards the performance of the countries. We point out, out of which countries is most of the taxable profit misaligned. In other words, we want to estimate which countries have understated their taxable profit the most in terms of economic activity. Likewise, we see to which countries was the profit misaligned to.

Similar analyses have been made, however, they used different dataset, Cobham and Janský (Alex Cobham, Petr Janský 2017) studied the misalignment using data of US-headquartered companies, Cobham and Loretz (Alex Cobham, Simon Loretz 2014) used Orbis database for companies located all around the world.

Although, Murphy (Richard Murphy 2015) and Jelínková (Eliška Jelínková 2016) both study misalignment using country-by-country reported data, they worked with much less observations then we did. Murphy only examines misalignment in 2014, Jelínková presents estimation for both 2014 and 2015. We include observations for the year 2016 in our analysis and we analyze more banks than Murphy and Jelínková have done. Thus, our study is in some sense more detailed and more precise.

The last research question we ask ourselves is, how do results of profit misalignment of financial institutions differ from analyses conducted on companies from different industries. To be more precise, we compare our findings with Cobham and Janský (Alex Cobham, Petr Janský 2017) and Cobham and Loretz (Alex Cobham, Simon Loretz 2014), who studied cross-border firms of all industries. We expect that we arrive to the same countries, which under- and overestimate their profit according to economic activity.

This paper is structured as follows. In Chapter 1 we review relevant literature regarding country-by-country reports and estimation of profit misalignment using unitary taxation approach and connect it with our study, then we discuss what other dataset are available for analyzing profit shifting. Chapter 2 we detailly describe our methodology, what data are we working with and what analytical tools we are using. Chapter 3 contains

the actual analysis, where at the end, we discuss our conclusions with existing literature. Lastly, reader can study the conclusion, where there is brief summarization of the analysis and the results.

1 Literature review

In this part of the thesis, we give reader a short overview of existing literature and indicate how is it connected with our analysis.

Firstly, we overview the literature regarding base erosion and profit shifting and what are the ways to analyze it. Then we go further in the topic of profit misalignment. We describe methods and findings of different researchers and we compare it with our analysis.

In the second part, we give a short summary of databases that are often used in analysis of profit misalignment.

1.1 BEPS literature overview

The issue of base erosion and profit shifting is not an issue of last decade, it is a long-standing problem. One of the first empirical estimation was created in 1994 by Hines and Rice (James Hines, Eric M. Rice 1994). Their research created conceptual framework which was used in many year later. Hines and Rice use data of cross-border companies from Bureau of Economic Analysis (BEA) of the US Department of Commerce, for the year 1982 consolidated to the country level. Their idea, which was then extended by other researchers, was that income before tax consists of so called "true income", which is created by economic activity, and shifted income. Economic activity that determines the true income is understood as capital and labor inputs. The variable responsible for inward or outward shift of the second part of income, is tax difference between foreign country and home country.

Hines and Rice's research is mentioned because they were one of the firsts who proposed capital and labor to be determinants of economic activity. Later, we see that analogous variables are often used to estimate the misalignment of profits, even in our analysis we use number of employees as indicator of economic activity, we do not, however, consider the information about assets in our analysis, but only due to the fact that this information was not included in the data we studied.

Special recognition goes to Dhammika Dharmapala (Dhammika Dharmapala 2014), who helped many researchers interested in the topic of BEPS by reviewing all relevant literature. Dharmapala's article serves mainly for summarazing facts. His work was based on Heckemeyer and Overesch's meta study (Jost H. Heckemeyer, Michael

Overesch [no date]). Due to Dharmapala's contribution anyone can easily understand, what approaches are usually used to estimate BEPS.

Other important article that was written about BEPS is a study by Huizinga and Laeven (Harry Huizinga, Luc Laeven 2008). They study incentives for BEPS that arise from tax differences between affiliates in different host countries. Their conclusion was that profit shifting of cross-border company depends on a weighted average of international tax rate differences between all countries, where the company is active.

Huizinga and Laeven proved that not only tax rate of host country to which the company wants to shift its profit matters. The similar approach we use in our analysis of profit misalignment, where we state that under unitary taxation, we have to calculate with information about company's performance in other countries.

Many other literatures about BEPS was written, however, as our thesis focuses on misalignment of the profit, we will further review the studies regarding that.

1.2 Profit misalignment literature overview

With the increased availability of private (e.g. Orbis), and public (e.g. Bureau of Economic Analysis (BEA) of the US Department of Commerce), more studies about profit misalignment were written, since data about multinational firms became easier accessible. One of the researches that must not be neglected, is working paper by Cobham and Janský (Alex Cobham, Petr Janský 2017). Their research question was, whether US multinational companies misalign their profit to jurisdictions where no economic activity is done. As well as Hines and Rice, Cobham and Janský use data from BEA. The data set they use covers information about US parents and majority owned foreign affiliates between 1983 and 2012. This enables them to study how the misalignment changes over time.

For their analysis, they use following variables. As indicators of the profit they use net income and profit-type return[1], and gross profit. As a factor determining economic activity, they use sales and thereafter similar factors as proposed by Hines and Rice: total assets (which equals tangible plus intangible assets), and for the employment indicator, they take number of employees and respective compensation cost.

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[1] Profit-type return is an economic accounting measure of profits from current production. Unlike net income, it is gross of U.S. income taxes, excluding capital gains and losses and income from equity investments, and reflects certain other adjustments needed to convert profits from a financial accounting basis to an economic accounting basis. (Bureau of Economic Analysis 2014)

Having separated data for tangible and intangible assets allows them to identify the economic activity of companies in these countries more accurately; intangible assets are often used as a mean to shift the profit from one jurisdiction to another.

They use these indicators to apportion the profits of individual firms among countries where the real economic activity takes place. As an indicator of such activity, they used common consolidated corporate tax base (CCCTB, further information in Section 2.2 Unitary Taxation and Common Consolidated Corporate Tax Base). In our analytical part, we will use the same approach, however, our CCCTB formula will be simplified.

Janský and Cobham observe that total assets are not a proper indicator of economic activity, therefore they create the second estimate of CCCTB using only tangible assets. Conclusion coming from Cobham and Janský analysis is that countries of all income levels are affected by profit outflow towards profit-havens. They also identified that majority of the profit flows to only several jurisdictions with effective tax rate close to zero. They identified that those countries are the Netherlands, Ireland, Bermuda and Luxembourg as the most important, followed by Singapore and Switzerland.

Here, we have to point out the contradiction between Cobham and Janský research and our findings. Unlike Cobham and Janský, we identify the Netherlands and Switzerland as countries which taxable income would increase if it was for CCCTB. The explanation can be seen in the Section 3.3 Discussion.

Another important study is a paper presented by Cobham and Loretz (Alex Cobham, Simon Loretz 2014). Unlike previous studies, they estimate the misalignment of profit of multinational firms located all over the world using the Orbis database provided by Bureau van Dijk. Cobham and Loretz focus on analysing, whether multinational companies actually shift profit in low-tax countries. As apportionment factors, they use profit or loss before taxes, turnover, tangible assets, total assets, number of employees, compensation costs, and corporate taxes paid.

Cobham and Loretz prove that for studied years 2003-2011 declared profit does not correspond to actual economic activity. They also study, how each of apportionment factors is responsible for redistribution of the profit. Total assets make, according to their study, least changes, however using only number of employees as an indicator of the economic activity, changes the distribution of profit the most. This affirms the

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observation of Janský and Cobham, who claimed that intangible assets are used as a mean to transfer profits and therefore total assets cannot be the best economic activity indicator.

This conclusion is also important for our thesis. Since we base our analysis only on data from country-by-country reports, we are not equipped with enough variables and we have to simplify the formula for calculation of CCCTB. The variables that we can use to apportion the taxable income are number of employees and turnover. In classical CCCTB formula, number of employees would be weighted by $\frac{1}{6}$, however, in our simplified case the weight is $\frac{1}{2}$. Since Cobham and Loretz estimated that number of employees is responsible the most for the misalignment, we can easily increase the weight and the analysis is still meaningful.

Among other things, Cobham and Loretz discuss the issue of international loss consolidation. They mention that in the separate accounting systems, the loss can be carried forward to be offset against future profit, or loss can be used against profit in other subsidiary in the same country. Under the unitary taxation, losses can be even carried forward to be offset against profit of a subsidiary of another country. Cobham and Loretz also pointed out that redistribution of income would lower the corporate tax base by 12 per cent due to international consolidation of losses. The international consolidation of losses is also further discussed in our analysis in the commentary of performance of USA between 2014 and 2015.

However, the fact that in analysis of Cobham and Loretz there were a lot of missing data of developing countries and countries with lower incomes must be emphasized.

Richard Murphy creates the first analysis of country-by-country reported data (Richard Murphy 2015). He uses the dataset of 26 banks, upon which only 17 published all required data for the year 2014 which Murphy studies. His research question is how much of the profit of banks with establishments in EU was misalign in 2014. He uses the difference between CCCTB and actual income of a country as an indicator of profit misalignment. As the apportionment factors, he uses equally weighted number of employees in the particular country and turnover in the particular country.

Even with limited dataset, he manages to confirm the hypothesis that banks are overstating their profits in low-tax and offshore jurisdictions. Murphy estimates that in over 130 countries he studies over 100 million euro was redistributed unaccompanied with economic activity.

Murphy's research is for our thesis crucial. He uses the same methodology and estimates the misalignment of income using the same, simplified, CCCTB on country-by-country reported data for financial institutions.

Another person who analysed country-by-country data to find a proof of misalignment of profits of banks, was Eliška Jelínková in her thesis (Eliška Jelínková 2016). She focuses on impact of unitary taxation on countries's tax base using simplified CCCTB.

Murphy's and Jelínková's studies are closely connected. Jelínková, however, presents data for 2014 and 2015, too, and she also has broader dataset available. Jelínková shows that there are no significant differences between those 2 years.

Important thing that has to be mentioned is that in both studies the authors confirm that unlike analysis provided by Cobham and Janský, they consider the Netherlands and Switzerland as countries which taxable income would, with the introduction of CCCTB, increase. This is the same results we arrive too. The explanation of this issue reader can find in the Section 3.3 Discussion.

The added value of our thesis is that we collect information about turnover, profit before tax, corporate tax paid and number of employees for EU financial institutions for year 2016. Unlike Jelínková or Murphy, we can estimate the misalignment of the profit for 3 consecutive years for more than 44 financial group from 146 countries or jurisdictions. None of them was equipped with such broad database. Having observation for 3 years allows us to see whether the estimates of profit misalignment change over the years. This applies, for instance, to our discussion about USA's taxable income between 2014 and 2015, which is broadly described in Section 4.1.

1.3 Review of existing databases

In this section, we would like to describe datasets that are available for propose of possible future papers.

The data we use in this thesis are country-by-country data reveal by individual financial institutions situated in Europe. In the introduction section, there is detailed overview of what data has to be published, by whom and we also listed several drawbacks connected with quality of country-by-country data.

Publishing these data became mandatory in 2014, however, some banks presented even the numbers for 2013. Currently, there is no aggregated online database of all required data for all financial institutions.

In their paper, Cobham, Gray, and Murphy suggest creating an online database which would comprise all available data from country-by-country reports and other existing sources (Alex Cobham, Jonathan Gray, Richard Murphy 2017). In their study, they detailly describe all possible uses of this database.

Database containing information about banks for years 2013, 2014, and 2015 that my supervisor provided me with, might make a flying start.

As we mentioned before, country-by-country data are mandatory to publish since 2014, therefore this dataset does not tell us much about trends in time. Luckily, there is one commercial database available. Orbis database issued by Bureau van Dijk is the largest database, which contains information about more than 220 million private companies. It contains consolidated information from balance sheets, profit and loss accounts, and the ownership structure of companies located all over the world. The disadvantage of this data is that it is not accessible for everyone, the access to the datatbase is subjected to a charge.

This dataset was used by (Alex Cobham, Simon Loretz 2014), who estimated apportionment factors that were used in calculation of unitary tax base.

Third database that is often used in study of BEPS, is the database of Bureau of Economic Analysis of U.S. Department of Commerce. This is a database of all US headquartered companies, where can, of course, be found multinational companies. Data from this source were used in (James Hines, Eric M. Rice 1994) study of BEPS. Study of Cobham and Janský (Alex Cobham, Petr Janský 2017) used these data, too.

2 Methodology

In the analytical part of this thesis, we want to estimate the misalignment of the profit of financial institutions located in Europe. By the misalignment of the profit we understand the inconsistency between reported profit in a country and the real economic activity that takes place in that country.

Our estimates are built on country-by-country data, which have been compulsory to publish since 2014. Our dataset contains observations for 3 consecutive years which allows us to study possible trends of misalignment. Further information about the data collection and their quality are mention in the Section 2.1.

The tax base of a country corresponding to real economic activity is computed using apportionment formula, which means that the tax base of a whole bank group, which has an establishment in that country, is multiplied by a coefficient which represents what fraction of economic activity takes place in that country. The overall tax base in this country is then the sum of apportioned tax bases of all banks. Detailed description of computation methods we mention in the Section 2.2.

With the apportioned tax base, we can estimate the misalignment itself. We do so in 2 different ways. Firstly, we say that the misalignment is defined by the difference between apportioned tax base and actual reported tax base. When the difference is positive, we see that the apportioned tax base is larger, thus currently reported profit is understated. In case of negative difference, the real economic activity does not correspond much to reported pre-tax income.

Secondly, we calculate what portion of apportioned tax base the actual reported tax base is, we simply divide the reported income before tax by apportioned tax base. To make the results clearer, we denoted the portion in percentage. The interpretation of the percentage is following: the closer it is to 100 %, the better is the taxable income aligned. In other words, countries which percentage is close to 100 % are currently reporting income with accordance to real economic activity.

When the percentage approaches to 0, it indicates that country understates its current taxable income. Countries with percentages above 100 % are reporting much more profit than should be reported if we observe the real economic activity.

We left out the cases, where the portion would be negative because either apportioned tax base or reported profit before tax was negative. This percentage would not have any meaning.

Our main research question is to estimate how many per cent of world's taxable income is redistributed every year due to profit misalignment. To estimate this, we sum the computed positive differences between apportioned tax base and divide it by sum of world's taxable income. Our approach differs from Jelínková and Murphy (Eliška Jelínková 2016; Richard Murphy 2015). They take into the account the absolute value of difference; therefore, their figures are twice as large than ours. In our thesis, we believe that it is enough to work with the positive difference, because it indicates the amount of profit that flows out of the economies to different jurisdiction. The negative difference stands for the amount of profit that is flowed in to jurisdiction with no corresponding economic activity.

Further on, we can focus on values of the differences between apportioned tax base and actual taxable income. It helps us to find the answer to our next research question; what countries report the biggest profit misalignment? We claim that the larger the difference is, the more the countries understate their profits, analogously, the smaller (has to be negative) difference we observe, the more of taxable profit is unaccompanied by actual economic activity.

As we mentioned above, we base our estimates on reported data of financial institutions. The last question we are seeking answer to is, if there are any significant differences between our results for banking sector and results estimated by using data of companies from all industries (Alex Cobham, Petr Janský 2017; Alex Cobham, Simon Loretz 2014).

2.1 Method of Data Collection

As we mentioned above, we build our approximations of misalignment on recently published country-by-country data. The data set we are working with was created in a joint effort of many contributors. Parts of it were prepared by Jelínková (Eliška Jelínková 2016), other parts were added by other Chares University students, and with some other parts outside researchers contributed. At the time, we started working with the data set, it was lacking any information for financial year 2016. Our contribution here was, that we gathered all country-by-country information for 2016 and added it to the data set.

The database we analyze, consists now of 44 financial groups from 146 countries with observations for at least one of the years 2014, 2015, and/or 2016. Banks, we covered in our research are chosen from the Relbanks ranking of 2016, which covered the biggest banks and financial groups in the world in terms of total assets. We dared to assume that

the larger the number of assets is, the more probable it is that the bank has establishment in other countries and at the end in Europe and thereby the country-by-country data will be available.

Even though the publishing of country-by-country data was made compulsory in 2014, our dataset is not complete and we still lack several observations. To successfully conduct our analysis we only use banks which revealed all compulsory information. Therefore, we were forced to leave out some observation from our sample because we were not able to find all needed figures. We excluded Dexia and DNB ASA from our dataset for all the years, because they were missing information about annual turnover. Then we deleted observation for the year 2014 for Landesbank Baden-Württemberg, Banco Populare, and Nationwide Building Society, as well as Handelsbanken for the year 2016, because they did not provide information about income before taxes. Number of employees is missing at Standard Chartered for years 2014 and 2016, therefore we excluded these entries, too.

Country-by-country reporting became mandatory in 2014, however, some banks presented data far back as 2013. Unfortunately, there were only 2 banks that revealed all information turnover, income before tax, corporate income tax and number of employees; those banks were Standard Chartered and Barclays. Even though they have published data altogether for 64 countries, any estimation of CCCTB made would be biased.

In the introduction section, we describe in depth the drawbacks accompanying the country-by-country data. The issue that has to be emphasized is lacking of summarized overview prepared by the EU. This could increase the data quality and availability. Each bank chooses own way of reporting, in some cases, data are available in annual or sustainable reports, in others, they are presented individually. One thing is uniform for all 41 banks we studied – all figures are published as numbers in PDF files. This results in 2 things, firstly we risk that we make a typo as we are copying every single number. Secondly, we have to round the figures. Banks, mostly, present the data in millions of EUR or USD. That results in the fact that figures for turnover, profit or loss before tax and tax paid are published in decimal form. It is then only up to each bank to choose the decimal order of rounding. Then it is clear that the number we copied cannot be precise. On the other hand, we have to commend the report provided by Dekabank in year 2016. They presented country-by-country data in a separate document, where the figures were counted up to units of Euros. Having this detailed data by every financial group is every

researchers' dream. The only downside of this report was that it was only provided in German.

Rounding, however, is responsible for second issue and that is not including of all influenced countries. Let us take financial results of BNP Paribas of 2016 as an example. BNP Paribas in their country-by-country report published that the members of the group were presented in 66 countries around the world. All figures except numbers of employees were in the report presented in millions of EUR. Cayman Islands were listed as a country where BNP Paribas had in 2016 establishment, but it reported the number of employees, turnover, profit before taxes and taxes as 0, probably because of rounding. Therefore, we did not consider the BNP Paribas establishment in Cayman Islands in our analysis.

Important thing that has to be mentioned is that figures in country-by-country reports differ not only about units but also about reported currencies. Most of the financial institutions are using euros, however, banks from northern Europe present numbers in Swedish or Norwegian kr, Handelsbanken or DNB ASA, respectively. US located banks use USD, for instance Standard Chartered and HSBC. Barclays reports in GBP.

To maintain the same method that used Jelínková and Murphy (Eliška Jelínková 2016; Richard Murphy 2015) we convert all these figures to EUR. We use the average exchange rate for the period from 1st January 2016 to 31st January 2016 published by European Central Bank (European Central Bank 2017).

2.2 Unitary Taxation and Common Consolidated Corporate Tax Base

Financial institutions and other companies which have establishments in more than one country often deal with the problem of taxation. Each country even on European level has separate tax system. The determinant of tax base is in most of the cases simply the profit. However, taxable profit does not have to correspond to actual economic activity. This is mainly a problem of tax havens, where profits are artificially shifted but no real activity takes place there.

Many countries identified the problem of income outflow due to tax avoidance of multinational companies. They can diminish the amount of these tactics by lowering the statutory income tax. A possible question for future research could be what is the perfect statutory tax that gives companies enough incentives to stop shifting profit abroad.

Not even changes in the tax base can increase the governments' incomes. Several multinational organization proposed that abandoning separate tax systems and

establishing of unitary taxation system could be the solution to fair distribution of income and at the end the taxes. Under the term unitary taxation system, one can understand that in case of cross-border company, profit is aligned to the countries where it was economically active. The tax rate at that particular country is left up to the jurisdiction.

As Cobham and Janský (Alex Cobham, Petr Janský 2017) state, several approaches that can determine the fair portion of taxable income were introduced. There is a range of formulae in the USA, Canadian provinces introduce also one, and the EU proposed the method to rightful profit allocation, too. The estimation of the misalignment in our thesis is based upon the latter approach.

In Canada, they redistribute the profit according to the sales and wages. The formula to calculate the tax base in a given province is then given by

$$CCCTB_j = \sum_c (CTB_{jc}) \cdot \frac{1}{2} \sum_c \left(\frac{sales_{jc}}{\sum_c sales_{jc}} + \frac{wages_{jc}}{\sum_c wages_{jc}} \right),$$

where j is the index for jurisdiction, in case of Canada it is a province, and c stands for the specific company. $CCCTB_j$ stands for new tax base in jurisdiction j and NTB_{jc} is abbreviation for current tax base of company c in the jurisdiction j.

Canadian approach is very intuitive, but unfortunately cannot be used among more countries. They use wages as the determinant of economic activity, which is supposed to be on very similar level all over Canada, but in other countries it can attain very distinct values.

Our thesis is focused on European hypothetical approach to redistribution of taxation. European Union came with the proposal for Common Consolidated Corporate Tax Base (CCCTB) in 2011. It should provide fair and competitive taxation on the EU level and most importantly it should diminish the misalignment of the profit. Of course, the impact could be much higher if even countries outside Europe would follow this. The proposal was put aside in 2011 as it was considered too ambiguous, but due to strong demand for tools to tackle BEPS it was re-launched in late 2016 (European Commission 2017).

The apportionment formula for computation of CCCTB is very intuitive. CCCTB is computed as a share of consolidated tax base according to factors defining economic activity. Currently, the tax base in each country is denoted by the share of profit in that particular country, by way of contrast, in the CCCTB the tax base is specified more precisely.

What fraction should be taxed in which jurisdiction is defined by equally weighted indicators of economic activity in a given jurisdiction. Those indicators of economic activity are sales in the jurisdiction compared to sale in whole cross-border company, assets in the jurisdiction compared to assets of the whole group, and employees' factor is included, too. The employees factor is defined by equally weighted number of employees in the jurisdiction compared to number of employees in whole group, and the amount of money spent on compensation costs in the jurisdiction and in the whole group (The European Council 2016).

Exact formula is show below. Index j stands for jurisdiction or country, c is an abbreviation for company. $CCCTB_c$ stands for new tax base in company c, CTB_{jc} is current tax base in jurisdiction j of company c. $empfact_{jc}$ defines the employment factor and the computation formula is below. $\#employees$ is the number of full time employees in the jurisdiction j of company c.

$$CCCTB_j = \sum_c (CTB_{jc}) \cdot \frac{1}{3} \cdot \sum_c \left(\frac{sales_{jc}}{\sum_c sales_{jc}} + empfact_{jc} + \frac{assets_{jc}}{\sum_c assets_{jc}} \right)$$

$$empfact_{jc} = \frac{1}{2} \cdot \left(\frac{wages_{jc}}{\sum_c wages_{jc}} + \frac{\#employees_{jc}}{\sum_c \#employees_{jc}} \right)$$

BEA database comprises all information that is needed to calculate CCCTB using this proposed formula. Cobham and Janský (Alex Cobham, Petr Janský 2017) use this approach to estimate the CCCTB, but they mention that even this formula does not define taxable profit precisely enough. They suggest using intangible assets instead of the variable total assets.

However, in our study, we are limited to data revealed by country-by-country reports. They are not that broad; therefore, we have to simplify the formula. We miss out the variables sales and assets, and we use turnover instead. Also, we do not have the information about payroll, so we miss out that too. It is necessary to remark the analysis of Cobham and Loretz (Alex Cobham, Simon Loretz 2014). They analyze, to what extent individual factors identify the misalignment of the profit and they claim that the factor responsible for the most of the profit misalignment is number of employees, which supports our simplification.

The simplified formula can be seen below.

$$simCCCTB_j = \sum_c (CTB_{jc}) \cdot \frac{1}{2} \cdot \sum_c \left(\frac{\#employees_{jc}}{\sum_c \#employees_{jc}} + \frac{turnover_{jc}}{\sum_c turnover_{jc}} \right)$$

To emphasize that formula we are using is only related to CCCTB proposed by EU, we denote it by $simCCCTB$, which stands for an estimate of simplified CCCTB.

In the analysis, we calculated the $simCCCTB$ for every country separately and then we use it to answer the research questions by methods mentioned in the introduction section of this Chapter.

3 Analysis

The aim of this analysis is to provide answer to our research questions and we do so using methods described in Chapter 2, Methodology to study misalignment of the profit of financial institutions with establishments in at least one European country.

Core of our analysis lies under the question: What would happen if all countries in the world adapted to unitary taxation model? We have to put a strong emphasis on the word "all". If we considered only one profit-haven country not to join the unitary taxation union, companies would still have incentive to shift profit there. Devereux and Loretz (Michael P. Devereux, Simon Loretz 2008) have shown that if only high tax countries participated in our model the tax revenue consequences would be much less profound.

3.1 Our Findings

First question we are finding answer to is, what percentage of pre-tax income is misaligned every year. As we describe in Chapter 2, Methodology, we are interested in estimating only the percentage of profit that has flowed out of the countries. If we wanted to estimate the percentage of profit that has been redistributed totally, we would need to multiply our result by 2. This approach is used by Jelínková and Murphy (Eliška Jelínková 2016; Richard Murphy 2015) and thus our findings do not match.

To estimate the percentage of misaligned income we use country-by-country data, simplified CCCTB and difference between simplified CCCTB and current taxable income. Calculation of simplified CCCTB is discussed in Chapter 2, Section 2.2. Calculation of differences between simplified CCCTB and current taxable income, as well as the estimation of percentage of misaligned profit can be found in the introduction of Chapter 2.

We arrive to the estimate of 35 %, 24 %, and 32 % of misaligned profit for year 2014, 2015, and 2016, respectively. Graph 3.1 shows the percentage of misaligned profit for all years. We observe that the values are alike every year, thus we do not see any trend for reduction of misaligned profit of financial institutions. Longer time series can aswer this question accuratelly.
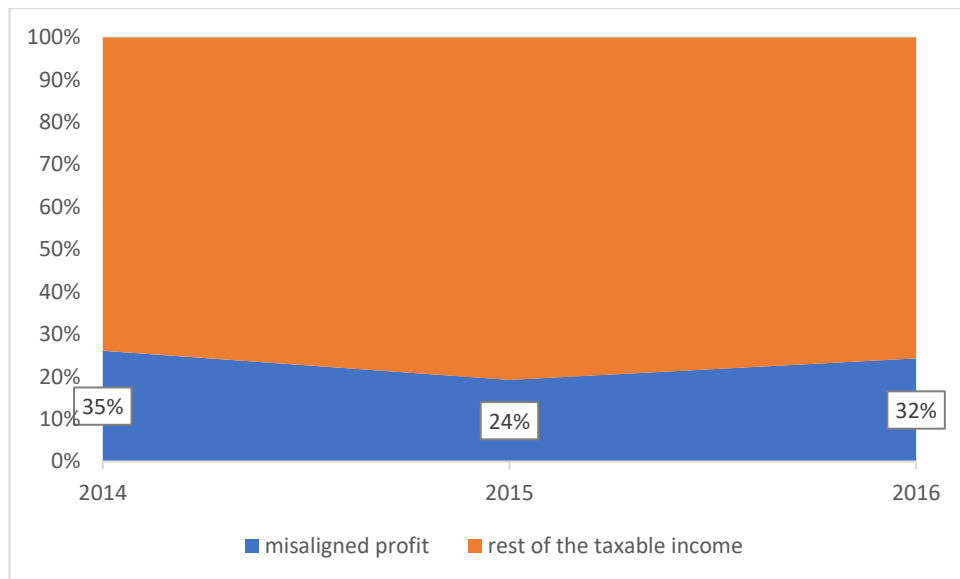
Graph 3.1: Misaligned profit as a percentage of taxable income during 3 consecutive years.Source: The author

Our next research question regards the analysis of profit misalignment on the countries' level. Our question to be answered is, which countries suffer the most from profit misalignment and whether there are changes in the ranking among years. Methods we used to analyze that are stated in the first part of Chapter 2, Methodology.

To present our results, we prepared one table for every year. Table 3.1 stands for results from 2014, Table 3.2 summarizes year 2015, and Table 3.3 shows year 2016.

Every table comprises this information: name of the country with calculated corresponding value of simplified CCCTB. In Chapter 2, Section 2.2 reader can see the detailed overview, why we are using this apportionment factor and how the estimation was made. The values of simplified CCCTB are presented in millions of EUR. Next column in the table is the sum of taxable income of banks for each individual country. Again, results are presented in millions of EUR. Further on, we see income before tax presented as a percentage of simplified CCCTB. The last column we study is the nominal difference between simplified CCCTB and pre-tax income. Methodology of these two indicators is contained in introduction to Chapter 2.

To make the table easy to read, we only include 10 countries with largest (top of the table) and 10 countries with smallest (bottom of the table) differences between simplified CCCTB and actual income before tax. We also include the countries which current taxable income corresponds the most with our estimated CCCTB (these can be seen in the middle of each table).

The top of each table represents countries that would benefit the most from introduction of CCCTB in terms of increase of the tax base. However, there is little

exception from this rule in the Table 1. The first position is taken by countries listed as Other. This term comprises rather smaller countries that banks chose specifically not to mention in their country-by-country reports (see Introduction). Most of the banks did not state which countries they covered up in this category. However, we strongly assume that most of them are tax havens; as we collected the data manually, we noticed that if the item Other was present in the report, none of the well know tax havens was reported separately.

Countries listed as Other showed negative Income before Tax and therefore computed negative CCCTB. Assuming countries listed as Other are tax havens, this only indicates that banks shift their losses to the tax havens. After introduction of CCCTB the reported tax base should be still negative, however, the reported loss should be 3.5 times smaller. This might be misinterpreted as increase of the tax base. However, the correct interpretation is that for the minus sign is responsible the reported loss before tax. The indicator of economic activity only tells us that no businesses takes place in countries labeled as other, thus when we multiply the actual (negative) tax base, by low percentage and we obtain still a negative number.

As an answer to our question we find that top positions in terms of understating the profit in all years are represented by large economies: United Kingdom, France, Spain, Italy, and surprisingly the Netherlands and Switzerland. All of these have reported both tax base and CCCTB positive. The difference between CCCTB and current tax base is also nonnegative, which indicates that after launching CCCTB, their taxable income would increase. Currently, their taxable income is lower than it should be. One can simple deduce that this means that financial institutions in these countries did not tax income where the economic activity took place, therefore they were shifting profit towards tax havens.

It could be surprising for us to see Switzerland and the Netherlands in the top ranks. As these countries are considered to be tax havens, we should expect them to be located in the bottom positions. The reason why the estimations driven them up is that we only study the data about financial institutions and this market behaves differently in Switzerland and the Netherlands.

On the bottom of the table, there are countries with negative difference between simplified CCCBT and income tax base. This indicates that these countries had higher income tax base than it would have been if it was for CCCBT. Reader should not be surprised that there are many countries considered as tax havens, such as Hong Kong,

Luxembourg, and Ireland. Surprisingly, we see that even Czech Republic is considered to be a country which would lose if it was for CCCTB.

The answer to our research question is that countries which benefit the most from profit misalignment are mostly tax havens.

Further on, we study countries which income tax base as a percentage of CCCTB is close to 100 %. We see that most of these are smaller developing economies. However, we have to point out that we do not have enough observations to claim that every bank that is located in countries with percentage close to 100 is distributing income fairly. This could be sample selection biased because we have only few information about banks located in these countries, for instance, we only have information about 1 bank, BFCM, that was present in St. Martin, thus we cannot claim that every bank in smaller developing countries distributes income with accordance to economic activity.

Other interesting result we get if we study the table according to taxable profit as a percentage of CCCTB. The higher the percentage is the more the income is misaligned with the economic activity. If the percentage approaches 0, it means that current income before tax is underestimated and with CCCTB the tax base would be much higher in relative numbers.

Even though the absolute difference between CCCTB and current tax base is not that large, we see that the highest portion of income before tax that is misaligned is reported in tax havens, such as Isle of Man, Mauritius, Marshall Islands, and Maldives. The ranking of these countries differs every year but even that we can claim that for all 3 years at least 400 % of their income comes from other jurisdictions.

Final question regards the comparison of our result estimated for banking sector with studies that estimated profit misalignment among companies from all industries, answer to that is included in the discussion section.

Table 3.1 Estimation of simplified CCCTB of financial institution in 2014. Source: The author

2014				
country	simplified CCCTB	income before tax	income before tax as percentage of CCCTB	difference between CCCTB and income before tax
	millions EUR	millions EUR	%	millions EUR
Other	-2074.44	-7421.62	358%	5347.18
United Kingdom	13933.59	9659.89	69%	4273.70
France	18987.01	14758.49	78%	4228.52
Netherlands	3806.62	443.27	12%	3363.35
Switzerland	522.60	-2610.88	-	3133.48
Spain	5088.93	2002.03	39%	3086.90
Brazil	4053.54	1656.36	41%	2397.18
Hungary	389.62	-1528.87	-	1918.49
Italy	-718	-2582	360%	1865
Romania	314	-1182	-	1496
Armenia	14	16	110%	-1
Sweden	4135	4552	110%	-417
Bosnia and Herzegovina	60	64	108%	-5
Montenegro	6	6	98%	0
Indonesia	264	258	98%	6
South Africa	1171	1129	96%	42
Germany	10650	9785	92%	865
Vanuatu	4	4	90%	0
Singapore	883	1809	205%	-926
Chile	950	1994	210%	-1044
Czech Republic	695	2265	326%	-1570
Mexico	3099	4698	152%	-1599
China,P.R.: Mainland	968	2939	304%	-1972
Belgium	2656	4724	178%	-2068
Ireland	1425	4042	284%	-2617
Luxembourg	1211	4750	392%	-3539
Hong Kong S.A.R. of China	2788	7029	252%	-4241
United States	5769	11635	202%	-5866

Table 3.2 Estimation of simplified CCCTB of financial institution in 2015. Source: The author

2015				
country	simplified CCCTB	income before tax	income before tax as percentage of CCCTB	difference between CCCTB and income before tax
	millions EUR	*millions EUR*	*%*	*millions EUR*
United States	5449	672	12%	4777
Spain	5194	426	8%	4768
United Kingdom	9713	5986	62%	3726
Germany	9799	6977	71%	2821
France	23671	20972	89%	2699
Italy	9197	6910	75%	2287
Ukraine	481	-550	-	1032
Brazil	3764	2779	74%	985
Netherlands	6385	5431	85%	954
Switzerland	522	-267	-	789
Madagascar	42	46	110%	-4
Sweden	4222	4502	107%	-280
Ivory Coast	62	65	104%	-2
Chad	8	8	104%	0
Other	-574	-556	97%	-18
United Arab Emirates	314	300	95%	14
Romania	752	714	95%	38
Vanuatu	5	5	94%	0
Denmark	2879	2688	93%	190
Finland	1510	1402	93%	108
Mali	4	4	92%	0
Armenia	17	15	91%	1
Poland	2646	2369	90%	278
Japan	191	821	429%	-630
Saudi Arabia	-19	624	-	-643
Belgium	3902	4554	117%	-652
Australia	394	1118	284%	-724
Mexico	2974	3929	132%	-955
Czech Republic	1309	2405	184%	-1096
China,P.R.: Mainland	1119	3192	285%	-2073
Ireland	1916	4444	232%	-2528
Luxembourg	1490	5809	390%	-4320
Hong Kong S.A.R. of China	3401	10486	308%	-7085

Table 3.3 Estimation of simplified CCCTB of financial institution in 2016. Source: The author

2016				
country	simplified CCCTB	income before tax	income before tax as percentage of CCCTB	difference between CCCTB and income before tax
	millions EUR	*millions EUR*	*%*	*millions EUR*
Italy	-2443.3	-11353.8	465%	8910
Spain	354.4	-4542.0	-	4896
France	19257.9	14873.7	77%	4384
United Kingdom	7982.3	4827.4	60%	3155
United States	7214.4	4179.4	58%	3035
Netherlands	6289.6	5347.3	85%	942
Ukraine	450.2	-469.2	-	919
Switzerland	462.0	-370.1	-	832
India	2001.6	1533.7	77%	468
South Africa	1595.1	1147.0	72%	448
Indonesia	277.0	304.3	110%	-27
Belgium	4359.4	4781.4	110%	-422
Finland	1409.1	1538.9	109%	-130
Oman	50.6	54.2	107%	-4
Denmark	3604.8	3780.0	105%	-175
Sweden	3684.9	3793.1	103%	-108
Algeria	150.7	153.5	102%	-3
Guinea	25.6	26.0	102%	0
Malaysia	382.1	380.6	100%	2
St. Martin (French part)	1.0	1.0	98%	0
Morocco	344.2	326.0	95%	18
Madagascar	44.6	42.0	94%	3
French Polynesia	30.8	29.0	94%	2
Estonia	179.2	163.9	91%	15
Croatia	93.1	735.6	790%	-643
Poland	1623.1	2310.0	142%	-687
Portugal	252.3	992.4	393%	-740
Japan	333.0	1106.2	332%	-773
Czech Republic	1320.9	2606.4	197%	-1285
Ireland	247.8	1644.7	664%	-1397
Germany	6075.4	8626.2	142%	-2551
China,P.R.: Mainland	1121.2	4351.5	388%	-3230
Luxembourg	1291.2	5491.3	425%	-4200
Hong Kong S.A.R. of China	3126.1	7812.8	250%	-4687

In the next section, we point out to the existing discrepancies of analyzed data.

3.2 Inconsistency in reported income before tax of the USA

In year 2014, United States were found to be the very last out of all 132 countries in terms of magnitude of difference between CCCTB and taxable income. However, in 2015 and 2016, the USA climbed up to position 1 and 5, respectively. Table 3.4 summarizes the results. We see that in 2014 we would classify the USA as a country where profits are shifted even though no economic activity takes place there. We derived that from the fact that simplified CCCTB is more than twice lower than actual taxable income.

Year	CCCTB	Income before Tax	Income Before Tax as Percentage of CCCTB	Difference between CCCTB and Income before Tax
	millions EUR	millions EUR	%	millions EUR
2014	5769	11635	202%	-5866
2015	5449	672	12%	4777
2016	7214	4179	58%	3035

The origin of this discrepancy has simple multiple reasons. Firstly, reader can easily notice that estimated CCCTB in 2014 and 2015 is always around 5.5 million EUR, which suggest that there did not change much in terms of economic activity defined by number of employees and annual turnover between these years. We have to seek for the reason, why reported taxable income was in 2014 11.5 billion Euro and the next year only 0.6 billion Euro. In year 2016, we see that the value stabilized on 4.1 billion EUR, thus we focus on examining only 2014 and 2015 data. The explanation lies in the fact that several banks have given diverse performance between 2014 and 2015. For instance, Santander reported excellent profit of 3.7 billion EUR in the USA in 2014. The next year, however, the profit fell down by more than half to 1.5 billion EUR and at the same time, turnover and number of employees rose in 2015. The same is the situation with Deutschebank. In 2014 with the profit of 1 billion EUR it was one of the important contributors to USA's overall income before tax based on available data. In 2015 a drastic fall came and instead Deutschebank reported loss of 2.9 billion EUR keeping the number of employees and turnover almost constant. Deutschebank did not recover from this shock, in 2016 there was still loss reported. To show the magnitude of the drop-downs in income, we present a Graph 3.2, which contains data about loss of Royal Bank of Scotland, too.

As was mentioned earlier, the figures for turnover and number of employees did not change over the years, which let us assume that reported losses might be only carried forward from the previous years to be offset against future profits. We also observe that between years 2014 and 2015 corporate income before tax has risen in some countries, for instance Canada, United Kingdom, Luxembourg, the Netherlands and Switzerland. (Alex Cobham, Simon Loretz 2014) mention the advantage of unitary taxation system and that is that even that some companies create major losses, it can be offset against profits of other companies in the same year and the resulting tax base should be appropriate. This is clearly proved by this example, where we see that with constant economic activity indicator factors, the simplified CCCTB does not change as much as taxable profit under current system does.
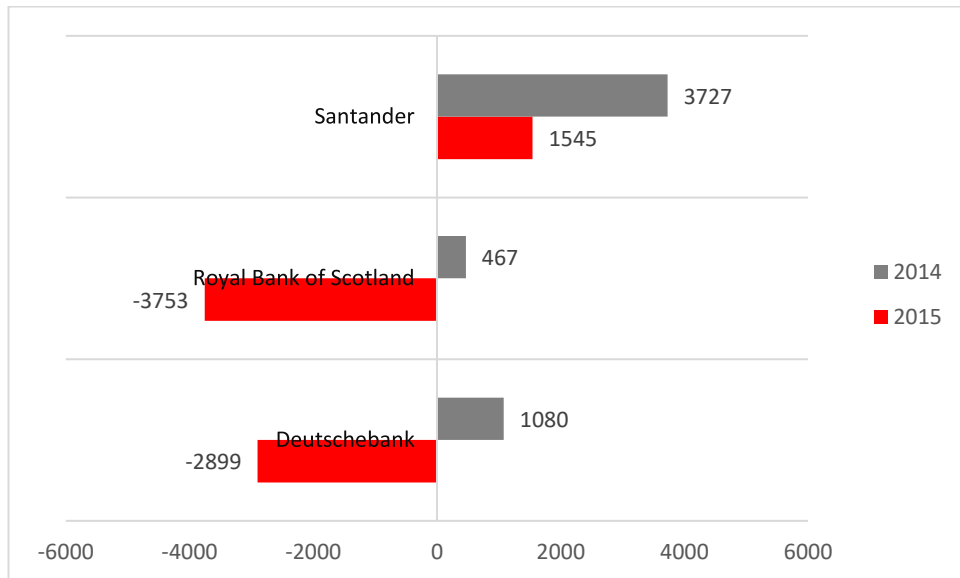
Graph 3.2Most important drop-downs in taxable income in the USA between 2014 and 2015

Secondly, there is mismatch in available data for 2014 and 2015. Our estimation for the year 2014 comes from the data set consisting of 31 banks located in the USA, in 2015 our dataset increased by 4 more banks according to our available data. From the country-by-country data we see that in 2014 Credit Suisse had establishment in the USA, however, it created loss of 7.54 million EUR, which probably was the reason why Credit Suisse decided not to operate in the USA in 2015. On the other hand, Raiffeisen Bank opened a new branch in the USA in 2015 which increased the turnover in 2015 compared to 2014 value. However, the banks that are mostly responsible for this data inconsistency are Banco de Sabadell SA and Standard Chartered plc. They did not report correct data for 2014 so we left them out of our dataset, but they provided valid number for the years 2015 and 2016. Their summed turnover in the USA exceed 800 million EUR and they

employed 1705 people which indicates large economic activity in the USA. Therefore, if we assume their performance in the previous year to be approximately similar, we could expect the simplified CCCTB in the USA to grow and at the end the difference between CCCTB and Income before tax would decrease.

If we compare our findings with results provided by Jelínková (Eliška Jelínková 2016), we find that she estimates the difference between simplified CCCTB and income before tax for 2014 as 248.5 million EUR and -26.4 million EUR for 2015, respectively. This major difference is caused by the fact that her dataset was very limited and she did not cover all the banks we study now. In her thesis information about Credit Suisse, Lloyds Bank., and most importantly Santander Bank, was not included. All these financial institutions have significant share on USA's taxable income and that explains the discrepancies between Jelínková's and our paper.

3.3 Discussion

Our thesis follows the same method which uses Murphy in his research (Richard Murphy 2015). Murphy computes the simplified CCCTB based on country-by-country data. After studying 17 banks located in 131 countries, he arrives to the similar findings as we do. He mentions the USA as the country that overstates its declared profit in 2014 the most, followed by Belgium, Luxembourg, Ireland, Singapore, and Hong Kong.

As the countries that would benefit the most from launching of unitary taxation system using BEPS, he considers Spain, UK, Switzerland, the Netherlands, and Brazil. He finds that among these countries with understated profit before tax, we can count item "Other". Thus, our results correspond highly with Murphy's study.

Jelínková bases her thesis (Eliška Jelínková 2016) on extending Murphy's research by data for 2015. She estimates the simplified CCCTB and using that she examines the possible misalignment of profit of financial institutions. Her dataset is still limited compared to observations that we have studied.

She finds out that countries which difference between CCCTB and current taxable income are large economies such as United Kingdom, France, Italy and Germany. She also states that to no expectation, the Netherlands and Switzerland even though they are considered to be tax havens they are supposed to benefit from introduction of CCCTB.

Unlike we do, she does not point out in her thesis the large difference between performance of the USA, however she only averages the estimates of differences between

CCCTB and taxable income for year 2014 and 2015. With this figure, she then claims that the taxable income of the USA would increase with introduction of CCCTB.

Last thing that needs to be mentioned, is Jelínková's conclusions about percentage of the profit that is misaligned in the world every year. She arrived to the percentage of 67.5 and 57.7 for 2014 and 2015, respectively, which is twice as much than we estimated. The rub lies in the methodology. She has taken the absolute value of the differences between CCCTB and taxable income and divided it by the sum of income before tax in every country. Hower, we considered only positive differences between CCCTB and income before taxes and therefore we arrived to the number of 35 % and 24 % for year 2014 and 2015 respectively.

Cobham and Janský (Alex Cobham, Petr Janský 2017) using BEA data estimate that most of the profit of companies over the world flows to the few so called profit havens: Netherlands, Ireland, Bermuda, Luxembourg, Singapore and Switzerland. We have to point out, that this is only partially in accordance with our conclusions. In our sample, we identified the Netherlands and Switzerland not as a country where profit would be shifted, but as a country suffering from profit outflow. This discrepancy is caused by our selection of data. BEA database provides information about companies from all industries, however, we dealt only with information about EU based banks.

Study of Cobham and Loretz (Alex Cobham, Simon Loretz 2014) uses Orbis data and CCCTB the way EU proposed it. In their paper, they also discussed the international loss consolidation under unitary taxation. They mentioned that under this system, it would be possible to offset losses of one company in country number one against profits of the same company located in country number two. This application we demonstrated in the example of USA. Even though in 2014 the consolidated taxable profit of US based bank was much larger than in 2015, the calculated simplified CCCTB was almost the same.

Conclusion

This thesis concerned the problematics of base erosion and profit shifting of financial institutions. This term defines tax avoidance strategies of multinational corporations which serve for lowering the tax burden. To estimate the magnitude of BEPS, we chose the unitary tax system approach. The new tax bases were estimated according to common consolidated corporate tax base (CCCTB) formula presented by European Union in 2011. CCCTB was calculated as a share of actual income before tax. The share is defined by indicators of economic activity, such as employment and turnover.

We built our estimates on figures from country-by-country reports presented by financial institutions located in Europe. We had observations for 3 years: 2014, 2015, and 2016.

We provided review of available literature which studies misalignment of profits.

Our analysis resulted in finding, that the around 30 % of world's profit is every year reallocated to different jurisdictions. Those jurisdictions are usually countries with low or no tax rate.

We found that countries which would benefit the most from the launch of CCCTB are large economies, such as: United Kingdom, France, Spain, or Italy. Since we studied only financial institution, therefore only one sector of the economy, we also found out that profits of banks flowed out of Switzerland and the Netherlands, which are in any other study mentioned among profit-haven countries. We identified countries that benefit the most in absolute terms on differential in tax rates. These were Hong Kong, Luxembourg, and Ireland.

At the end, we compered our conclusion with other studies concerning misalignment of profit and we assured that similar results were reached even with using different data.

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