

CHARLES UNIVERSITY
FACULTY OF SOCIAL SCIENCES

Institute of Economic Studies



**Profit shifting of European banks:
Evidence from Global Reporting Initiative
data**

Bachelor's thesis

Author: Daniel Šůva

Study program: Ekonomické teorie (B6201)

Supervisor: doc. Petr Janský, M.Sc., Ph.D.

Year of defense: 2023

Declaration of Authorship

The author hereby declares that he or she compiled this thesis independently, using only the listed resources and literature, and the thesis has not been used to obtain any other academic title.

The author grants to Charles University permission to reproduce and to distribute copies of this thesis in whole or in part and agrees with the thesis being used for study and scientific purposes.

Prague, May 3, 2023

Daniel Šůva

Abstract

This thesis investigates the profit shifting practices of European banks using country-by-country reporting data. The main contribution is the first use of Global Reporting Initiative reports by hand-collecting a sample of six banks. The thesis estimates the banks' effective tax rates in two ways, highlighting the advantages and limitations of each method. Additionally, the study compares the economic activity, employees, and tangible assets in tax havens and estimates multiple models to estimate the amount of shifted profits into tax havens. The analysis finds no significant connection between the effective tax rate of jurisdiction and booked profits, which is in contrast to a large body of existing literature. It concludes that the sampled banks do not systematically use tax havens but confirms a positive relationship between a bank's size and its participation in profit shifting. The thesis also highlights the correlation between tax transparency and lower tax avoidance among the sampled banks, which is in line with the hypothesis that increased transparency can increase tax revenue.

JEL Classification	F21, F23, H25, H26, F32,
Keywords	Country-by-country Reporting, Profit Shifting, Tax Havens, CRD IV, GRI
Title	Profit shifting of European banks: Evidence from Global Reporting Initiative data
Author's e-mail	43932710@fsv.cuni.cz
Supervisor's e-mail	jansky@fsv.cuni.cz

Abstrakt

Tato práce zkoumá přesouvání zisků Evropských bank pomocí Country-by-country reporting dat. Hlavním přínosem je prvotní využití Global Reporting Initiative výkazů pomocí ručně sesbíraného datasetu šesti bank. Práce odhaduje efektivní daňové sazby bank dvěma způsoby, přičemž zdůrazňuje výhody a omezení každé metody. Studie porovnává úrovně ekonomické aktivity, personálu a hmotného majetku v daňových rájích a využívá několik modelů pro odhadnutí množství přesunutých zisků do daňových rájů. Analýza nenachází statisticky významný vztah mezi efektivními daňovými sazbami jurisdikcí a zaúčtovanými úroky, což je v rozporu s velkou částí současné literatury. Analýza dochází k závěru, že zkoumané banky systematicky nevyužívají daňové ráje, ale potvrzuje pozitivní vztah mezi velikostí banky a její účasti v přesouvání zisků. Práce také potvrzuje korelaci mezi daňovou transparentností a nižším vyhýbáním se daňovým povinnostem mezi zkoumanými bankami, což je v souladu s hypotézou, že zvýšení daňové transparentnosti zvýší daňové příjmy.

Klasifikace JEL	F21, F23, H25, H26, F32,
Klíčová slova	Country-by-country hlášení, Přesouvání zisků, Daňové ráje, CRD IV, GRI
Název práce	Přesun zisků evropskými bankami: Důkazy z údajů Global Reporting Initiative
E-mail autora	43932710@fsv.cuni.cz
E-mail vedoucího práce	jansky@fsv.cuni.cz

Acknowledgments

I would like to extend my sincere thanks to doc. Petr Janský, M.Sc., Ph.D., my thesis supervisor, for his valuable guidance, insightful comments, and patience throughout my thesis project. His expertise in the field of econometrics was instrumental in helping me better understand numerous subjects related to my research.

Furthermore, I would like to express my gratitude to my family and friends for their endless support during my studies, especially for their constant encouragement and helpful feedback.

Bibliographic Record

Sůva, Daniel: *Profit shifting of European banks: Evidence from Global Reporting Initiative data*. Bachelor's thesis. Charles University, Faculty of Social Sciences, Institute of Economic Studies, Prague. 2023, pages 46. Advisor: doc. Petr Janský, M.Sc., Ph.D.

Contents

List of Tables	vii
List of Figures	viii
Acronyms	ix
1 Introduction	1
2 Literature Review	4
2.1 Characteristics of Profit Shifting	4
2.1.1 Mechanics of Profit Shifting	5
2.2 Current Estimations of Profit Shifting	7
2.2.1 Magnitude of Profit Shifting	7
2.2.2 Elasticity of Profit Shifting	7
2.3 Exploitation of Country-by-country Data	9
3 Data	11
3.1 Capital Requirements Directive IV	11
3.2 Global Reporting Initiative	12
4 Methodology and Results	15
4.1 Effective Tax Rate	15
4.1.1 CRD IV approach	16
4.1.2 GRI approach	19
4.2 Share of Economic Activity in Tax Havens	21
4.3 Estimating Misaligned Profit	23
4.4 Semielasticity of Profits with Corporate Tax Rate	29
5 Conclusion	32
Bibliography	37

List of Tables

3.1	Key metrics of banks from the CRD IV dataset	12
3.2	List of banks that have published reports under GRI	13
3.3	Descriptive statistics of variables from the CRD IV and GRI datasets	13
4.1	Effective Tax Rate of Banks using the GRI and CRD IV data .	19
4.2	Share of Economic Activity of Banks in Tax Havens	21
4.3	Linear and Quadratic Regression Results of Profit Estimation .	25
4.4	Logarithmic Regression Results of Profit Estimation	26
4.5	Average Estimated Values of Shifted Profits into Tax Havens . .	28
4.6	Semielasticity using quadratic and logarithmic formula	30

List of Figures

4.1	ETRs by banks in the years 2016-2020	17
4.2	Three Approaches to Profits Shifted into Tax Havens	27

Acronyms

CbCR Country-by-country Reporting

MNE Multinational Enterprise

CRD IV Capital Requirements Directive IV

BEPS Base Erosion and Profit Shifting

IRS Internal Revenue Service

EU European Union

GRI Global Reporting Initiative

OECD Organisation for Economic Co-operation and Development

MiDi Micro database on direct investment

FDI Foreign direct investment

Chapter 1

Introduciton

Profit shifting of Multinational Enterprises (MNEs) has been a growing concern in combating tax avoidance. With the acceleration of globalisation and digitalization, MNEs can now shift their profits to low-tax jurisdictions more efficiently and with minimal costs, resulting in the erosion of the tax base in the countries of their business operations and subsequently decreasing the tax revenue. The current policy efforts are trying to minimize this behaviour are hindered by the lack of quality data and the general opaqueness of tax planning done by MNEs as evidenced by Joshi (2020)¹.

This thesis is focused on profit shifting done by European banks. The banking sector is an essential and stable player in the global economy and is also strictly regulated and scrutinized, including numerous tax-transparency enforcing policies. Notably, the European Union implemented the mandatory publishing of Country-by-country reporting by the European banks with the Capital Requirements Initiative IV as studied by Barake (2022), which has been in effect since 2014. Banks may still engage in predatory tax practices, but the scale and importance of the industry and the increased tax scrutiny are the reasons behind this thesis.

To combat the lack of quality data, I hand-collected a dataset of the CbCR data from reports published under the Global Reporting Initiative. GRI is an independent organisation promoting the responsible behaviour of companies on subjects such as corruption, civil rights, or climate change. GRI also provides widely used reporting standards for companies with a particular emphasis on sustainability. A component of the standards is publishing country-by-country

¹This thesis was written using ChatGPT by OpenAI to assist with L^AT_EXcode and Grammarly, an online writing assistant. However, all ideas and concepts presented in this thesis are the author's original work or have been appropriately cited to their respective sources.

reports of unprecedented quality and scope. However, publishing under GRI is purely voluntary. Since the abolition of the GRI database, there is no comprehensive source of companies publishing under GRI. Therefore the scope of this paper was reduced to European banks as the dataset can be supplemented by the less comprehensive CRD IV dataset, which was also used to work backward and check whether the banks reporting CRD IV also report under GRI.

I combined the CRD IV and the GRI CbCR datasets to provide as comprehensive insight as possible. The final dataset includes information, for instance, about profits earned, employees and assets present, and taxes paid in each jurisdiction an MNE operates in. The dataset was used to compare the tax behaviour of sampled banks, mainly their ETRs paid, presence in tax havens, and the scale of profit shifting. This approach is unique as any previous paper has not used the GRI data to any extent.

The first part of my findings is calculating and analyzing effective tax rates using data from the CRD IV and GRI datasets. Garcia-Bernardo *et al.* (2021) used multiple approaches in calculating ETRs using CbCR and highlighted the heterogeneity of the results between the different methods. My analysis also uncovers the potential unreliability of ETRs. Mainly using tax paid, from the CRD IV dataset, as the tax value in the calculation proved inconsistent, as the ETR seems to be influenced by tax planning of the MNE or loss carryover from previous years. Tax accrued appears more reliable, as the definition is much more strict. Still, the data availability is limited, and investigating the trend over a more extended time would be superior.

Secondly, I examined the presence of European banks in tax havens. I calculated the shares of earnings, tax, employees, and tangible assets located in tax havens for each bank, which I also utilized in the third part to estimate the misaligned profit. The misaligned profit is estimated using three methods. Firstly, I employ the method used by Godar *et al.* (2022), which arbitrarily gives the share of employees and the share of tangible assets the same weight in calculating the share of economic activity in a country, which is then multiplied by the total earnings of a bank. Then I constructed a quadratic and a logarithmic OLS model to regress earnings on proxy variables to economic activity - full-time employees and tangible assets. Then I assumed the difference between the fitted values and real earnings to be misaligned profit.

The findings further support the idea that banks do not behave homogeneously. SEB Bank reports no economic activity in tax havens. On the contrary, Intesa Sanpaolo is estimated to have shifted over €900 million into

tax havens. Unicredit is comparable in size to Intesa Sanapolo and is also consistently estimated to shift profits into tax havens but on a smaller scale. It is impossible to conclusively confirm that SEB Bank or Banco Santander shift profits because their average net profit shifted into tax havens approaches zero. On the contrary, KBC Bank significantly shifts profits outside of tax havens, which is likely not a part of a curious tax planning strategy, but rather a consequence of KBC Bank being headquartered in a tax haven.

Lastly, the paper examines the effect of the tax rate as an incentive affecting profit shifting. I used the method pioneered by Hines & Rice (1994), adapted by Godar *et al.* (2022), because of the similar dataset used. ETR was statistically insignificant on all relevant levels, which goes against the consensus of the current literature. It potentially proves that the sampled banks, which have increased tax transparency as they are publishing under GRI, do not consistently shift their profits. Further explanations are provided in subsequent chapters.

This paper extends the current literature by introducing a new source of high-quality data. Arguably, the most critical determinant of future articles estimating tax avoidance will be the available data. The main limitation of the current literature is also data availability. CRD IV is a source of outstanding reliability and was used by Barake (2022), Murphy (2015) or Joshi (2020), but the directive only applies to banks operating in Europe and over a certain threshold and with a limited scope of mandatory variables. Similarly, all other current sources have their limitations, as further explained in the following chapter of the literature review. Therefore, introducing a new data source provides a unique point of view. This thesis offers a robust check of papers using solely the CRD IV data. Additionally, the collection of GRI data in the following years or the data collection of MNEs outside the banking sector is proved by this thesis to be of great benefit.

The thesis is structured as follows. Firstly, the following chapter of the literature review summarizes the current findings about profit shifting, mainly its mechanics, magnitude, and effects of tax rates. Then country-by-country reporting is introduced along with its role in the current research. The current sources of CbCR are presented along with their limitations and papers that utilize them. The Data chapter describes the strengths and weaknesses of CRD IV and GRI datasets. The Methodology and Results chapter is divided into four parts that analyze the effective tax rates of sampled banks, their presence in tax havens, the estimations of misaligned profit, and the relationship between ETRs and shifted profits. Finally, the conclusion summarizes the findings.

Chapter 2

Literature Review

2.1 Characteristics of Profit Shifting

Multinational corporations use profit shifting to artificially decrease their corporate tax base and, subsequently, their tax. This may radically reduce governments' tax revenue and arguably society's total welfare. Profit shifting may be described as a consequence of globalization amplifying its inequality. Profit shifting is challenging to observe, and there is no clear consensus on how it should be measured or estimated. Not every profit misaligned with the economic operations of the MNE is made with tax-avoidant intentions. Therefore it is difficult for lawmakers to set up clear and complete regulations. Despite the difficulties, new legislation and regulations are being introduced. Beer et al. (2020) point out that acquiring transfer pricing regulations or thin capitalization rules as examples of recent regulations of profit shifting done by MNEs, which are often passed in a larger framework like control foreign corporation rules (CRC) or general anti-avoidance rule (GAAR).

Profit shifting started developing throughout the 20th century as the newly globalized world enabled MNEs to expand internationally and shift their profits between tax jurisdictions. Concurrently, research responded to this new phenomenon. Hines & Rice (1994) is a crucial paper influencing research to this day. They observed a considerable expansion of profit shifting in the early 1980s. They also pioneered a new approach by estimating the pretax income on the labour and capital inputs in a tax jurisdiction, the present tax incentives, i.e., the differences in tax rates levied, and several control variables specific to their affiliates and countries. Their approach prevails even in modern literature. Modifications of their approach are used in Weichenrieder (2009),

Clausing (2016), Godar (2021), and Fuest *et al.* (2022). The volume of research continues to expand as we approach a period of even more focus on avoiding tax, particularly after the events of Luxleaks and Paradise Papers.

However, reaching a consensus about the future of profit-shifting regulations is challenging as there is no equilibrium suitable for everyone. Different tax jurisdictions have different profit-maximizing tax rate choices. Tiny tax jurisdictions may have a small local tax base; lowering the statutory tax rate would attract new foreign taxable profit and increase the tax revenue. This behavior harms the countries of origin because their tax base shrinks. This may be just one of many motivations for tax jurisdictions to become tax havens. Garcia-Bernardo & Janský (2022) identify The Cayman Islands, Luxembourg, the Netherlands, Switzerland, Singapore, Bermuda, and Puerto Rico as the destinations of most profit shifting. The lack of shared goals makes potential agreement on new consolidated and widely accepted regulations very difficult to achieve.

Consequently, many non-haven economies may decrease their corporate tax rates to become more competitive in the market of MNEs shopping for tax jurisdictions to combat the narrowing of their tax base. This practice is called Race to the Bottom and may have potential adverse effects without being long-term sustainable. We may start observing the beginnings of this phenomenon around the turn of the millennium. A clear example may be the decline of the corporate tax rate in the Czech Republic, which experienced a decrease from 45% in 1993 to 19% in 2010. Abbas & Klemm (2013) agree with this sentiment, as they documented a trend in decreasing statutory corporate tax rates, particularly in developing economies.

2.1.1 Mechanics of Profit Shifting

There is no consensus about correctly estimating and quantifying profit shifting. Tax laws expect MNEs to trade with their subsidiaries based on the arm's length principle. However, Godar (2021) argues that this principle is not always applicable as it does not account for economies of scale or specifics of certain industries and is not enforceable. MNEs often exploit their freedom by charging extremely low or high prices to their subsidiaries that do not reflect the market's equilibrium price. This allows subsidiaries in tax jurisdictions with high corporate tax to artificially inflate their profits and decrease their tax base. This is just one example of effective profit shifting.

There are various channels MNEs use to decrease their taxes paid. Both Ramboll & CORIT (2016) and ZEW (2016) agree in organizing them into three ways of aggressive tax planning. Firstly by exploiting different interest payments in different jurisdictions, secondly by royalty payments, and lastly by strategic transfer pricing of intra-group sales, violating the arm's length principle. Beer *et al.* (2020) expands by also including strategic location of management of intellectual property and asset sales to decrease taxes on associated income respectively to decrease capital gains taxation. The authors also mention avoiding PE status, exploiting tax treaty networks, and allocating high-risk operations in jurisdictions with higher tax rates.

2.2 Current Estimations of Profit Shifting

2.2.1 Magnitude of Profit Shifting

OECD considers 30% of the global gross profit to be generated by MNEs (Cadestin *et al.* 2018). Therefore estimation of the volume of profit shifting done by MNEs is of great importance. Since there is no consensus on the best practice for estimating profit shifting, partly because of the scarcity and low quality of available data, the estimates vary significantly. Several studies from the past three years, using macro-level data, propose a tax revenue loss caused by profit shifting to be \$200 to \$300 billion (Tørsløv *et al.* (2020), Garcia-Bernardo & Janský (2022) and Álvarez-Martínez *et al.* (2022)). Janský & Palanský (2019) estimate the tax revenue loss to be \$125 billion across their sample of 79 countries using the FDI approach first published in UNCTAD (2015). A larger loss is estimated by Clausing (2016), which estimates the corporate tax revenue loss to be \$125 billion. This paper only uses data from 25 countries, which makes the difference even more significant. To scale the estimate to the number of countries used in a dataset, we compare the average tax revenue loss as a percentage of GDP, which is 0.26% in Janský & Palanský (2019) and 0.48% in Clausing (2016).

Incomplete or low-quality data hinder the estimates. The research is subordinate to the data availability. Particularly micro-level data are very scarce. Examples of micro-level data of limited scope are Godar (2021) and Fuest *et al.* (2022), who use data for MNEs in Germany. Godar (2021) uses confidential micro-level data for MNEs in Germany provided by Deutsche bank and estimates that German affiliates shift 7 to 29 percent of their profits outside of Germany. After adjusting for other foreign affiliates, it means a total loss between €1.5 billion and €5.8 billion. Fuest *et al.* (2022) present a lower estimate of MNEs shifting 4.3% of their profits resulting in a loss of €1.6 billion.

2.2.2 Elasticity of Profit Shifting

Current literature also estimates the effect of different rates on profit shifting as its arguably most important incentive. A significant difference in approaches is the usage of either the statutory or effective tax rates. Using statutory tax rates has several shortcomings. Collecting the data from different tax systems may be cumbersome, and it only partially encompasses the tax burden of a country as several other provisions may lower the effective tax rate MNEs pay in the

end. Effective tax rate considers the volume of profits booked in a country and the final tax paid in the same jurisdiction. Literature also calculates this value in two different ways. Forward-looking effective tax rate considers the statutory rate and other tax provisions that affect the tax base and the subsequent tax paid. Backward-looking effective tax rate uses only the actual data on profits booked and taxes paid in a country. This paper uses this tax rate because of the data availability. However, even using the actual micro-level data has its shortcomings. The tax rate may be downward biased because of various depreciation standards or the possibility of applying previous losses. Dowd *et al.* (2017) also highlight potential endogeneity concerns.

The effects of the size of the tax rate and its changes have become an essential topic of contemporary research. The recently growing number of empirical literature estimating the size of profit shifting was summarized in a meta-analysis conducted by Beer *et al.* (2020), which proposed that a reduction of 1 percentage point in the corporate tax rate leads to a 1% increase in before-tax earnings, which is a more significant effect than estimated in previous surveys. Moreover, this effect appears to be growing over time. However, there are still some gaps in our understanding of tax avoidance. For instance, most articles use a quadratic model, but Garcia-Bernardo & Janský (2022) propose a logarithmic function between the (mis)location of profits and tax rates levied. This extreme non-linearity is justified by the idea that countries with substantially lower ETRs tend to attract a larger share of profits than countries with slightly less competitive ETRs. Dwenger *et al.* (2013) also point out that an increase in tax rate will negatively affect the economic activity itself, as MNEs will decrease the wages paid in a country by 19-29 cents per every additional dollar of taxes paid, further eroding the tax base.

2.3 Exploitation of Country-by-country Data

Country-by-country reporting was proposed as a tool to increase the transparency of tax planning of multinational enterprises. CbCR as a concept was first introduced by Murphy (2003). However, because no appropriate data existed prior to this, his first analysis using CbCR was Murphy (2015) after the introduction of Capital Requirements Directive IV by the European Union, which detected profit shifting by European banks to low-tax jurisdictions exceeding €100 million. The notion of mandatory publishing of micro-level data to increase transparency and decrease profit shifting is supported by extensive literature. Joshi (2020) uses data from CRD IV to investigate the effect of private CbCR reporting on aggressive tax planning, finding that just the obligation to publish CbCR in the future decreased profit shifting and other tax-avoiding practices. Overesch & Wolff (2021) verify this sentiment by also using the CRD IV with the focus on multinational banks that are newly required to report activities in tax havens and find that exposed banks increased their tax expense relative to multinational banks with no activities in tax havens to disclose. Barake (2022) expands the usage of CRD IV data over a longer period of time to estimate the extent of profit shifting by top European banks, finding that profit shifting is around 3-4% of the total profits booked abroad, implying tax revenue losses of up to 2-3%.

Fuest *et al.* (2022) used CbCR data from German MNEs and found that 82% of them have subsidiaries in tax havens, which are also significantly more profitable than non-haven countries. However, only 9% of their global profits are located there, with EU tax havens being the most significant. Godar (2021) also uses data about German MNEs, by combining the MiDi and JANIS databases and estimates a slightly higher share of shifted global profits, ranging from 10 to 13 percent. Godar (2021) agrees with the higher importance of EU tax havens, with Luxembourg, Ireland, and the Netherlands being the most important for German MNEs.

Garcia-Bernardo *et al.* (2021) use CbCR data from IRS for US-headquartered MNCs. The paper finds strong evidence that American MNCs artificially use tax havens to lower taxes paid and identifies Ireland, Bermuda, and The Netherlands as the most important tax havens for US-headquartered MNCs. Another source of CbCR is the private database Orbis, which was used by Nerudová *et al.* (2020) to estimate the profit shifting of MNEs operating in Visegrad countries and found that, on average, a differential tax increase of one unit

results in less than a 1% loss in corporate income tax in Visegrad countries. Orbis was also later used by Garcia-Bernardo *et al.* (2020) to study the different methods of calculating effective tax rates and their significant differences from statutory tax rates. Godar *et al.* (2022) utilized a sample of MNEs with similar characteristics to the dataset used in this paper by utilizing a dataset of 10 MNEs, who published CbCR early, and they reveal a negative correlation between the high tax transparency of an MNE and its scale of aggressive tax planning. The paper also highlights the high variance across their sample of MNEs.

Country-by-country reporting provides a unique insight into the tax planning of MNEs. This micro-level data enables more thorough research and to detect profit misalignment more sensitively than previous efforts. However, the availability of CbCR is scarce at best, and completeness and consistency need to be improved as no source provides consolidated data on a wide range of affected MNEs that publicly publishes all relevant metrics. All current sources have several downsides and imperfections. OECD only publishes data aggregated at the country level. CRD IV by the EU only affects the banking sector and only includes four relevant variables. However, current policy efforts would include MNEs from all sectors in the CRD IV in the future. IRS requires CbCR from all US-based MNEs but publishes only data aggregated at the country level. MiDi data overseen by the Deutsche Bundesbank is detailed, but access to them is severely limited as the dataset is primarily confidential.

The utilization of Global Reporting Initiative CbCR data in this paper stems from several reasons. A thorough search of the relevant literature yielded no articles using Global Reporting Initiative CbCR data, which may feel like a blind spot of the current literature. GRI reports are published voluntarily and independently of any institution. The disclosures formulated by GRI are rather exhaustive and extensive. Therefore an MNE publishing under GRI provides never-before-seen data, like intra-group transactions, third-party revenues, or tax accrued. Therefore even a modest dataset may deliver a unique contribution to the research on profit shifting and tax avoidance.

Chapter 3

Data

This section provides an overview of the data used in this paper, their sources, and a brief description of each variable used. A unique contribution of this paper is the utilization of previously unexploited data, particularly the hand-collected country-by-country dataset published under the Global Reporting Initiative. GRI data allow us to expand on previously examined CbCR data published under the CRD IV initiative, which provides a robust and broad dataset encompassing the whole banking sector but is relatively lenient with the mandatory variables. Several control geographic variables further expand the dataset.

3.1 Capital Requirements Directive IV

In 2014, the European Union initiated the implementation of CbCR reporting after the enactment of Article 89 in the CRD IV Directive 2013/36/EU. This directive mandated banks operating in the EU to reveal specific information, such as net banking income, number of full-time employees, profit or loss before tax, tax on profit or loss, and public subsidies received for each country where they have a business presence. This obligation falls on all banks operating in the EU with revenues over €750 million. This paper uses CRD IV data from the dataset published by the EU Tax Observatory hand-collected by Barake (2022) and only for the banks with available GRI data. This paper utilizes all variables, except public subsidies received, because all subsidies reported are negligible in scope.

When analyzing a relatively small sample of banks, one may encounter significant differences, compromising the robustness of any conclusions drawn

Table 3.1: Key metrics of banks from the CRD IV dataset

	Employees	Net banking income	Earnings before tax	Corporate tax
Swedbank	16,213	4483	1601	365
Intesa Sanpaolo	86,540	24356	9069	1619
Banco Santander	189,392	46404	14547	4012
KBC Bank	28,838	6134	1188	407
SEB Bank	16,007	6917	1893	391
Unicredit	77,068	16742	-2438	340

All variables are in millions of EUR except employees.

from the data. For example, Unicredit is unique in that it has negative earnings before tax reported due to substantial reported losses in Italy, where its headquarters and plurality of its economic activity are located.

Another factor that contributes to the heterogeneity of sampled banks is their size. Banco Santander, for instance, is almost twelve times larger than Swedbank in terms of the number of employees. Additionally, the tax paid by different banks can vary significantly, and the size of a multinational enterprise may impact its tax planning strategy. Therefore, it is crucial to consider these variations in size and other factors when conducting any comparative analysis of banks.

3.2 Global Reporting Initiative

The Global Reporting Initiative develops and promotes sustainability reporting standards for businesses and organizations. These standards help organizations understand and communicate their impacts on issues like climate change and human rights. However, publishing reports under this standard is purely voluntary. Therefore many MNEs do not publish complete reports under GRI. This paper aims to exploit disclosure 207-4 of the Tax section by expanding the current CRD IV dataset with the variables tangible assets, third-party sales, intra-group transactions, and tax accrued. The voluntary basis of publishing GRI data reduces the scope of our data, which is already limited by the CRD IV regulation. Several banks do not publish under GRI, or they do not publish this particular disclosure in full. The total dataset contains 145 observations from 6 banks.

There are several issues with the hand-collected data. GRI dictates publishing values of tax accrued in each jurisdiction. On the contrary, both Unicredit

Table 3.2: List of banks that have published reports under GRI

Bank	Year	Headquarter	Notes
Swedbank	2020	Sweden	
Intesa Sanpaolo	2019	Italy	
Banco Santander	2021	Spain	
KBC Bank	2020	Belgium	
SEB Bank	2020	Sweden	Missing tax accrued
Unicredit	2020	Italy	Missing intra-group trans., tax accrued

and SEB Bank reported tax paid instead. Swedbank and Intesa Sanpaolo report both. While the variables are connected, there is a distinction, which makes the dataset less robust. Unicredit does not publish all GRI data for all countries it operates in but aggregates some of them into a single observation of *Other countries*, which will be treated as one country in some of the following calculations. Unicredit also does not publish values for intra-group transactions or any satisfactory proxy variable. Those shortcomings demand certain adjustments in each estimation or usage of the dataset, which will be further explained in the following chapter.

Table 3.3: Descriptive statistics of variables from the CRD IV and GRI datasets

Statistic	N	Mean	St. Dev.	Min	Max
employees	126	3,286.175	8,629.138	0	62,228
net_banking_income	126	833.623	2,360.598	-37.000	19,442.1
earnings_before_tax	126	205.243	893.820	-3,636.480	6,424.1
corporate_tax	126	56.619	181.703	-229.868	1,385
tangible_assets	126	470.785	1,928.294	0	14,732
third_party_revenues	126	804.952	2,867.331	-1,263.04	27,599.4
intra_group_transactions	112	72.702	544.396	-158	5,643.8
tax_expense_accrued	95	63.564	333.602	-1,397.156	2,185

All variables are in millions of EUR. The first four variables were collected from the CRD IV dataset, and the latter is from the GRI dataset. Unicredit and SEB Bank did not report tax expense accrued, and Intra Group Transactions were not reported by Unicredit, resulting in fewer observations.

The breakdown of utilized variables may present further heterogeneity in the dataset, like a relatively high standard deviation and skewness to the right, which is undesirable in such a small dataset. However, the GRI dataset allows us to use otherwise unobtainable variables. The quality of aggregate CbCR

data is often hindered by possible double-counting of dividends in the dataset, creating a biased sample. A more reliable way to determine an organization's activity level in a tax jurisdiction is to consider tangible assets, revenues from third-party sales, and intra-group transactions with other jurisdictions rather than relying solely on aggregated revenues, which is a unique contribution of this paper.

Chapter 4

Methodology and Results

4.1 Effective Tax Rate

Differences in corporate income tax rates across countries serve as both the motivation and outcome of tax avoidance. MNEs may use the discrepancies and loopholes in different tax codes to decrease their tax burdens, resulting in tax base erosion and reduced tax revenue for some governments. Therefore, analyzing corporate income tax rates is crucial to the research of profit shifting and tax avoidance, the identification of tax jurisdictions that facilitate such practices, and the estimation of the scale and determinants of profit shifting. The statutory tax rate, which represents the baseline amount of income that should be paid, is a starting point for determining corporate income tax rates. However, tax codes are more complex than just the statutory rate, and various provisions in different tax codes can adjust the portion of profit collected through taxes. As a result, more than just the statutory tax rate is required to determine differences in the tax environments of different countries.

The effective tax rate may be considered a baseline metric because it should represent the actual portion of earnings paid as a tax. Therefore ETR is a more informative value than a pure statutory tax rate. There are multiple schools of thought on calculating ETR. They all require more data than the statutory-rate method, making them more nuanced and valuable. However, the approaches differ in the data used and, subsequently, in their strengths and weaknesses. The forward-looking approach is more abstract, as it analyses the tax code as a whole and is less oriented on the micro-level specificities of different MNEs. It makes the forward-looking ETR better to study and estimate the effects of policy reforms and decision-making of firms, but the process is also cumber-

some. Understanding and calculating all possible allowances, deductibles, and other features of different tax codes is time-demanding and complex. Tax codes also keep getting amendments and reforms, making the relevance of different analyses time-sensitive.

Therefore, this analysis uses backward-looking ETR, arguably more empirical and with higher data requirements. This is solved by the strength and uniqueness of the CRD IV and GRI datasets, which enable the calculation of backward-looking ETRs for different tax jurisdictions and MNEs. In concept, ETR is calculated by dividing the total tax paid by an MNE in a tax jurisdiction and the total profits booked in a jurisdiction. However, many methodologies attempt to approximate this fraction by the available data. Every methodology and data used has its shortcomings, possibly compromising the estimates' robustness. Public and non-aggregated CbCR data are the best sources for this calculation because they enable the calculation of the above-mentioned explicit relationship between tax paid and profits booked, as analysed in Garcia-Bernardo *et al.* (2021).

4.1.1 CRD IV approach

One of the key decisions in calculating backward-looking ETR is the choice of the tax variable, which is also the case in this paper. CRD IV requires the reporting and publication of corporate tax paid by an MNE in a tax jurisdiction. However, the directive does not explicitly define the variable and maybe be understood differently. The tax paid may be related to the fiscal year of the profit booked for which the tax is paid or purely to the time the tax is paid without considering the time of the origin of the profit booked. This ambiguity may create problems for the robustness of the analysis as each MNE will report differently. Particularly, loss carryover may severely distort the data. The present tax may be influenced by a reported loss from a previous year, which may harm the accuracy, as raised in Godar *et al.* (2022).

ETR of bank i was calculated by dividing the sum of corporate tax paid across all jurisdictions j by the sum of earnings before tax across all jurisdictions j . Similarly, the Bank Average in the following figure was calculated using the sums of tax paid and earnings by all banks available in the CRD IV dataset:

$$ETR_i = \frac{\sum_{j=1}^n \text{corporate_tax}}{\sum_{j=1}^n \text{earnings_before_tax}}$$

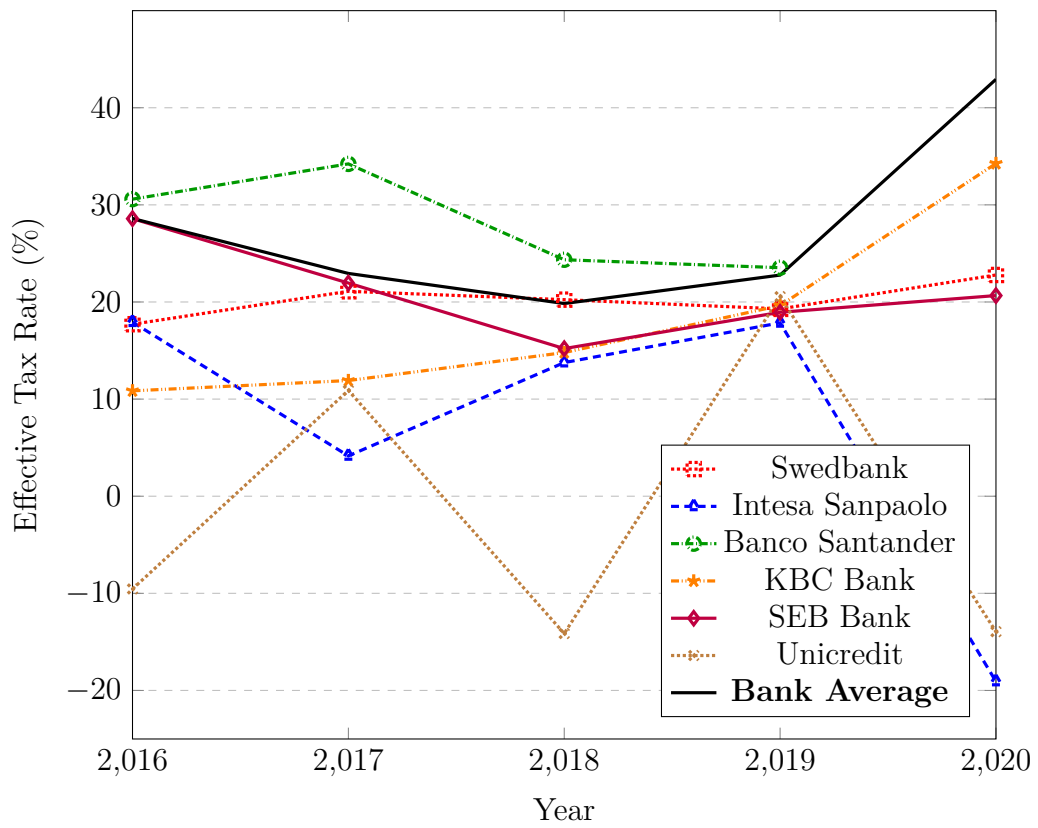


Figure 4.1: ETRs by banks in the years 2016-2020

Before 2020, the ETR of banks was converging around the value of 20%, which would be appropriate regarding the statutory rates. Based on the data available, it is impossible to differentiate ETRs by banks that voluntarily publish CbCR under GRI from the average of other European banks, which goes against the hypothesis that higher transparency would result in higher effective tax rates because the ability to shift profits would be limited.

A notable change in the time trends of ETRs happened in 2020. Diverging from the previous values is noticeable. It is reasonable to expect this to be the consequence of the COVID-19 pandemic, which suddenly affected the world economy. It is feasible that it also influenced European banks' tax and business planning. However, the influence of the pandemic on the banking sector is beyond the scope of this paper.

Despite not studying the COVID-19 consequences, they help us identify the problematic nature of this dataset and approach adopted by several papers solely relying on this variable, e.g., Barake (2022). The figure depicting ETRs presents several outliers, particularly the negative values. Unicredit regularly reports net losses before tax, mainly caused by reporting losses in its most important countries - Italy and Austria. Despite negative profits in some jurisdictions, the bank still pays taxes in other countries, which results in aggregate negative ETR. Similarly, Banco Santander reported massive losses of over €10 billion in Spain, resulting in an uncharacteristically high negative ETR of -141%, which is not visible in the figure, as it would distort the scale of the y-axis. Intesa Sanpaolo also has a negative ETR of -19%, which is caused by reporting negative corporate tax paid of €688 million in Italy, where it is headquartered, likely caused by the policies of the government in response to the COVID-19 pandemic.

The previous paragraph highlights several instances when the usage of CRD IV data for calculating the ETR falls short. However, those reasons are not isolated but only highlighted because of their obviousness. This supports the notion of the ETR not being a perfect indicator, particularly with the usage of the tax variable from the CRD IV dataset, which is not able to accurately depict the tax burden on an MNE since it does not comprehend the isolated events, such as the time-related tax planning or governmental policies, such as the one-off tax reductions. This and the timing issue raised earlier in the chapter indicate the problematic nature of ETR using CbCR data. However, it is possibly still the best indicator available.

4.1.2 GRI approach

An advantage of the GRI dataset is the more robust definition of variables and a broader scope of collected data. GSSB (2021) regularly issues requirements for GRI disclosures. Disclosure 207-4, country-by-country reporting, dictates the publishing of both tax paid on a cash basis and tax accrued on profit/loss in a particular tax period, which mitigates some timing issues, as mentioned in the previous CRD IV part. A tax accrual creates a tax obligation stemming from a realized taxable economic activity. The definition does not include the timing of the tax being paid. It is, therefore, more rigid and less likely to be influenced by other unrelated factors, particularly the tax planning of MNEs. The GRI standards directly state, "for Disclosure 207-4-b-ix, [...] exclude deferred corporate income tax and provisions for uncertain tax positions" (GRI 207, 2019, p. 10). Arguably, a more strict definition of the tax variable is better suited for calculating ETR, as fewer outside influences are present.

The fundamental of calculating the ETR is the same way as in the previous CRD IV approach. The tax paid is substituted with tax accrued from the GRI dataset, and the earnings before tax remain from the CRD IV dataset:

$$ETR_i = \frac{\sum_{j=1}^n tax_accrued}{\sum_{j=1}^n earnings_before_tax}$$

The following table displays the ETRs calculated for banks that published tax-accrued data in their GRI disclosures. Since Unicredit and SEB Bank failed to publish said variable, the data is only available for four banks. The table also contains the ETR calculated using the CRD IV for the same year of the GRI data for comparison.

Table 4.1: Effective Tax Rate of Banks using the GRI and CRD IV data

Bank	Effective Tax Rate	
	GRI	CRD IV
Swedbank	23.65%	22.78%
Intesa Sanpaolo	20.19%	17.85%
Banco Santander	26.16%	27.6%
KBC Bank	47.14%	34.26%

The comparison highlights the discrepancies between the two sources used. Both Swedbank and Banco Santander exhibit a difference lower than one per-

centage point. However, Intesa Sanpaolo displays a difference of almost three percentage points and KBC Bank of almost thirteen percentage points. KBC Bank reports the tax accrued to be almost €100 million lower in Belgium than the tax paid, making for most of the considerable difference between ETRs. This further shows the unreliability of ETRs as a single-sourced ETR fails to register such discrepancies that affect the calculations.

As previously hinted, the GRI approach to reporting tax is arguably more robust as the definitions are more strict, and the directive dictates reporting both tax accrued and tax paid. However, the issue that GRI suffers from is the voluntary nature of publishing their disclosure, and even when banks decide to publish under GRI reports, they still skip parts of the report. A significant benefit of CRD IV as a source for research is the availability of the data. Currently, data is available for all European banks with a turnover of over €750 million since 2014. So the CRD IV data may be less reliable on their face value, but the number of banks sampled over multiple years may result in more robust results because the differences in timings of taxes being paid and various policy changes may average over time or be supplemented by data from other banks or other years.

4.2 Share of Economic Activity in Tax Havens

Recent literature examines the misalignment of reported profits and true economic activities, proxied by a combination of variables, e.g., number of employees, tangible assets, or third-party sales. This approach was used by Garcia-Bernardo *et al.* (2021) or Godar *et al.* (2022). The irregular economic activity of banks in tax havens may uncover potential profit-shifting activities. This paper adapts the list of tax havens previously used in Godar *et al.* (2022), which expanded the list originally by Gravelle (2015) by adding Belgium, Hungary, and the Netherlands, as they were characterized as facilitators of aggressive tax planning.¹

The values in the following table were calculated using the CbCR data by dividing the sum of a *variable* located in a tax haven by its the total sum for each bank separately. Data for earnings and tax were used from the CRD IV dataset. Data for tangible assets and employees were used from the GRI dataset. However, as both CRD IV and GRI require the publication of the employee data, this particular source is not relevant, as the data is identical.

Table 4.2: Share of Economic Activity of Banks in Tax Havens

Bank	Earnings	Tax	Share of Employees	Tangible Assets
Swedbank	0%	0%	0%	0%
Intesa Sanpaolo	14.67%	11.68%	3.33%	1.06%
Banco Santander	3.74%	5.48%	5.05%	4.63%
KBC Bank*	54.55%	65.6%	50.69%	72.86%
SEB Bank	4.44%	3.95%	2.5%	1.48%
Unicredit	39%**	11.38%	3.07%	3.56%

* KBC Bank is headquartered in a tax haven - Belgium

** Only for this computation, value for Italy (HQ) was excluded, as Unicredit reports a massive loss of over €3.5 billion there, which would heavily distort the result. If the methodology was not changed, the result would be -16.7%. Unicredit reports positive profits everywhere else.

¹The full list consists of Belgium, Hungary, Netherlands, Andorra, Anguilla, Antigua and Barbuda, Aruba, Bahamas, Bahrain, Barbados, Belize, Bermuda, Cayman Islands, Cook Islands, Costa Rica, Cyprus, Dominica, Gibraltar, Grenada, Guernsey, Hong Kong, Ireland, Isle of Man, Jersey, Jordan, Lebanon, Liberia, Liechtenstein, Luxembourg, Macao, Maldives, Malta, Marshall Islands, Mauritius, Monaco, Montserrat, Nauru, Netherlands Antilles, Niue, Panama, Saint Lucia, Saint Vincent and the Grenadines, Samoa, San Marino, Seychelles, Singapore, St. Kitts and Nevis, Switzerland, Tonga, Turks and Caicos Islands, Vanuatu, British Virgin Islands, and U.S. Virgin Islands.

The table discovers two outliers. Firstly, KBC Bank has significantly higher shares of economic activity in tax havens, which is justified by being headquartered in Belgium, which is considered a tax haven. Therefore, the high share of earnings booked in tax havens is likely not primarily caused by lower tax rates, which is supported by the fact, that it pays higher tax on profits booked in tax havens than other profits. It is difficult to extrapolate some conclusions from the case of KBC Bank as the taxes paid in the country of its headquarters will differ in nature from other taxes paid. Also, the characterization of Belgium as a tax haven is controversial, as the statutory corporate tax rate is not extraordinarily low, but Belgium participates in other aggressive tax practices.

Conversely, SEB Bank reports no economic activity in tax havens, which is also unusual, but it can be justified by its headquarter in Sweden and relatively smaller size compared to the other banks. SEB Bank was ranked by Janský *et al.* (2020) as the 35th largest by tangible assets. So the current expansion to other countries is limited. The other sampled banks report significantly smaller shares of employees and tangible assets in tax havens than earnings and tax. This is consistent with the idea of MNEs using tax havens to book profits, but the economic activity happening elsewhere. But it would be necessary to obtain a larger sample to confirm this trend.

The heterogeneous behaviour of banks in tax havens and their diverging trends in their changes of presence in tax havens were highlighted by Aliprandi *et al.* (2021), who sampled 36 European banks and discovered that 16 of them decreased their share of activities over the years between 2014 and 2020, but 8 of them increased the economic activities in tax havens. Seven sampled banks have a stable presence, and the remaining five never reported substantial activities in tax havens. This supports the contracting trends detected in the first two sections of the results, specifically, the irregular trends of ETRs over time and the uneven presence of banks in tax havens.

4.3 Estimating Misaligned Profit

Both misaligned profits and shifted profits refer to a situation when profits are not distributed in a way that accurately represents the share of an economic activity carried out in a tax jurisdiction. Still, the reasons and motivations for the discrepancies are not identical. Profit shifting occurs when profits are intentionally shifted into another country to exploit the differences in tax environments. However, not all differences are consequences of tax avoidance, as MNEs continuously shift their economic activities because of business planning and other factors outside of tax planning. Therefore equaling misaligned and shifted profits will likely overestimate the scale of profit shifting. However, without an available alternative, estimating misaligned profits is often the best option, even when it serves only as an upper bound and otherwise may be considered a weakness of a paper. However, more sophisticated approaches provide similar results to the misalignment approach, as noted by Godar (2021). Therefore estimating misaligned profits is still a relevant and valuable analysis.

Godar *et al.* (2022) observe that early publishers of CbCR report a smaller share of profits in tax havens than the world average. They also measure their economic activities to be more profitable in tax havens than in non-haven countries. Higher profitability in havens can also be observed in the sample of GRI publishers despite their lower use of tax havens. Average earnings before tax per employee in tax havens are €0.1 million, compared to €0.06 million in non-haven countries. Despite the relatively small share of economic activity in tax havens, the increased profitability may still present a significant enough role to make profit shifting into tax havens a substantial part of the tax planning of banks.

Garcia-Bernardo & Janský (2022) arbitrarily set an equal weight to employees and tangible assets when calculating misaligned profits, where employees and tangible assets are used to calculate the share of economic activity. Garcia-Bernardo & Janský (2022) also argue that the precision of the formula does not have a high impact on the estimation, as a large proportion of profits are redirected to only a small set of tax havens. This analysis will utilize said formula as one of the approaches and potentially verify the claim's validity. The original formula also uses unrelated party revenues, but that was not proved

fruitful for this analysis. So the following formula is adopted:

$$misaligned_i = earnings_i - \left(0.5 \frac{employees_i}{\sum_i employees_i} + 0.5 \frac{tangible_assets_i}{\sum_i tangible_assets_i} \right) \sum_i earnings_i$$

Another approach used to estimate the misaligned profit is the use of OLS regression to try to explain part of the variance of earnings, with the assumption that the difference between the fitted values of the model and the real values is misaligned profit. The two following models are estimated. One with simple linear regression and one with added quadratic variables to capture the potential non-linearity of the relationship. The regression results are presented in the subsequent table:

$$earnings_i = \beta_0 + \beta_1 employees_i + \beta_2 tangible_assets_i + u_i$$

$$earnings_i = \beta_0 + \beta_1 employees_i + \beta_2 employees_i^2 + \beta_3 tangible_assets_i + \beta_4 tangible_assets_i^2 + u_i$$

Both models curiously estimate tangible assets to have a negative marginal effect in most cases, as it becomes positive only around the value of €8.8 billion, which is reached only by Banco Santander in Spain and the USA. However, the model will likely be biased because of the high correlation (0.66) between employees and tangible assets and incorrectly assigning their joint influence on earnings solely to employees. Both models have a solid value of R^2 , but the quadratic model proves to be superior in this metric. The fitted values were used as the non-shifted profit. After subtracting them from the real values, the result was used as misaligned profit in further analysis. The following logarithmic model was also regressed but, after a comparatively poor performance, was omitted from further analysis:

$$earnings_i = \beta_0 + \beta_1 \log(employees)_i + \beta_2 \log(tangible_assets)_i + u_i$$

Table 4.3: Linear and Quadratic Regression Results of Profit Estimation

	Dependent variable: earnings	
	earnings	
	linear (1)	quadratic (2)
employees	0.061*** (0.010)	0.042* (0.023)
employees ²		0.00000*** (0.00000)
tangible_assets	-0.025 (0.046)	-0.878*** (0.184)
tangible_assets ²		0.0001*** (0.00001)
Constant	17.806 (71.703)	120.428* (67.250)
Observations	126	126
R ²	0.304	0.476
Adjusted R ²	0.293	0.459
Residual Std. Error	751.767 (df = 123)	657.657 (df = 121)
F Statistic	26.851*** (df = 2; 123)	27.473*** (df = 4; 121)

Note:

*p<0.1; **p<0.05; ***p<0.01

Table 4.4: Logarithmic Regression Results of Profit Estimation

	Dependent variable: earnings
	earnings logarithmic
log_employees	60.382 (40.949)
log_tangible	63.989* (37.678)
Constant	-292.668 (195.410)
Observations	126
R ²	0.118
Adjusted R ²	0.104
Residual Std. Error	846.271 (df = 123)
F Statistic	8.221*** (df = 2; 123)

Note: *p<0.1; **p<0.05; ***p<0.01

Swedbank was omitted from this part of the analysis as it does not meaningfully operate in tax havens, as mentioned previously. The following figure presents the sums of misaligned profit in countries previously labeled as tax havens for each bank and each calculation method. An arithmetic mean was also added. The figure demonstrates the heterogeneity of results for different banks and the high correlation between the methods used. The correlation coefficient for combinations of the three methods ranges between 0.65 and 0.87. This arguably confirms the validity of the methods as they arrive at similar results via different tools.

For the purposes of the following parts of the thesis, the difference between the estimated profits and the reported profits is assumed to be shifted profits, but the previously mentioned differences between misaligned and shifted profits apply. KBC Bank is shifting profits out of tax havens, which is also influenced by being headquartered in a tax haven. Therefore it is difficult to include KBC Bank in the analysis with other banks, as it would be more desirable to have a larger sample of banks with headquarters in a tax haven. Both SEB Bank and Banco Santander have net profits shifting close to zero. The three methods do not even agree on the direction of the profit shifting.

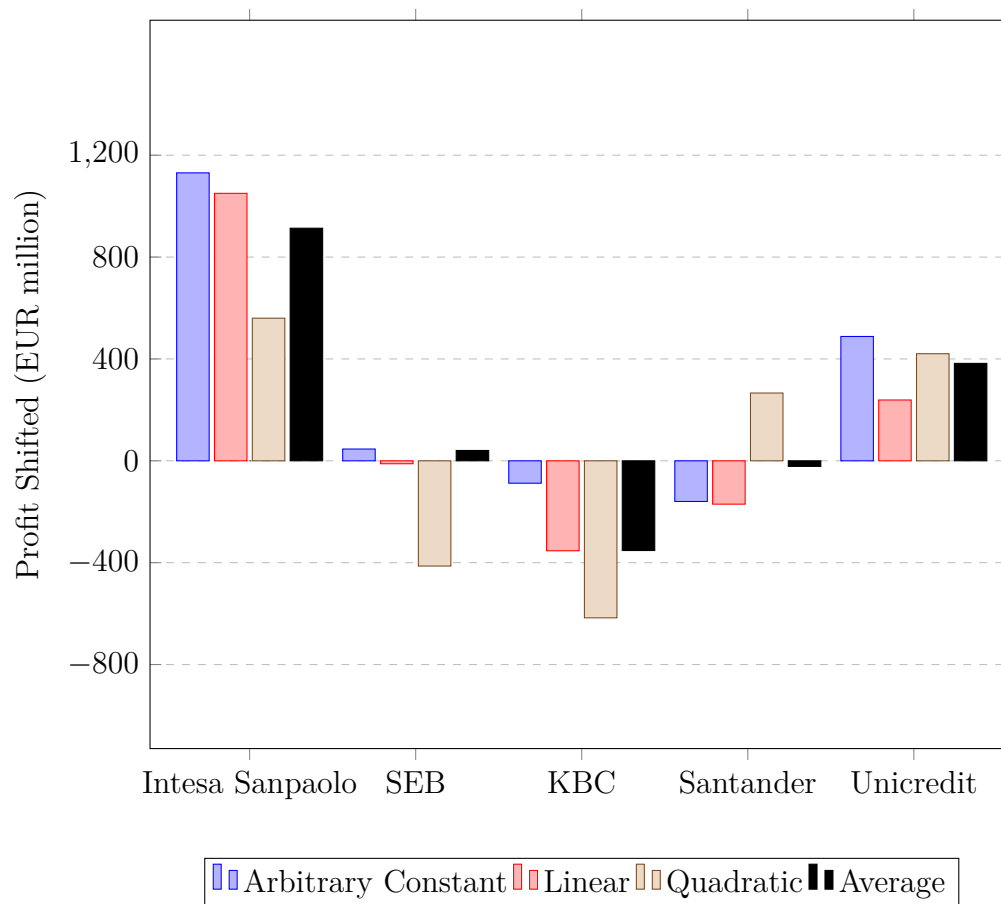


Figure 4.2: Three Approaches to Profits Shifted into Tax Havens

Both Unicredit and Intesa Sanpaolo consistently show profit shifted significantly into tax havens. Particularly, Intesa Sanpaolo reaches over €900 million in shifted profits to tax havens. Unicredit and Intesa Sanpaolo are comparable in size, as Intesa Sanpaolo holds fewer tangible assets but employs fewer full-time employees. Therefore it is not unfounded to acknowledge that Intesa Sanpaolo participates in profit shifting at higher rates. This would be supported by Barake (2022), who attests, that larger European banks tend to engage more in tax planning. Curiously, both banks comparably pay between 11% and 12% of their tax in tax havens. The breakdown of the economic activities of both banks based on the particular countries they operate in might be a significant factor, but that is beyond the scope of this thesis.

Table 4.5: Average Estimated Values of Shifted Profits into Tax Havens

Bank	Average
Intesa Sanpaolo	913.33
Banco Santander	-21.94
KBC Bank	-352.32
SEB Bank	40.63
Unicredit	382.55

All variables are in millions of EUR.

Papers with large-scale datasets overwhelmingly estimate profit shifted by MNEs to be in the billions of dollars as stated in Tørsløv *et al.* (2020), Álvarez-Martínez *et al.* (2022), or Garcia-Bernardo & Janský (2022). Cobham & Janský (2019) uses aggregate CbCR data from IRS to estimate profit shifting of US-based MNEs to be \$670 billion in 2012, which would be in contrast to the irregular values estimated in this section. However, when Godar *et al.* (2022) used firm-level data of early publishers of CbCR, the results are comparable. Godar *et al.* (2022) sampled ten MNEs, and four of those are estimated to either shift profits outside of tax havens or the profits shifted approach zero. Firm-level data are capable of uncovering outliers from the sample that do not shift their profits as a tool of tax avoidance and infer additional conclusions that could get lost in larger or aggregated datasets.

4.4 Semielasticity of Profits with Corporate Tax Rate

A known indicator of tax avoidance is the estimator of semielasticities of affiliates' profits regarding the ETRs present in different jurisdictions. The analysis originated in Hines & Rice (1994) but has been modified and built upon by later research. This thesis will adopt the version used by Godar *et al.* (2022) because of the similar data from early publishers of CbCR. A similar model was also used by Beer *et al.* (2020).

Because of the limited data availability over multiple years, the model will be a simple cross-sectional regression. Earnings before tax in a single jurisdiction by a single bank will be used as the response variable. ETR calculated using the CRD IV data will be used as a proxy variable of the tax incentive MNEs face. Because of the previously-mentioned non-linearity of profit shifting, the first model will also include a quadratic variable of ETR as a regressor. Garcia-Bernardo & Janský (2022) argue that a logarithmic² function is superior because of the extreme non-linearity between profits and tax rates, which will be used as an alternative control model. The tax jurisdiction's population and GDP per capita in their logarithmic forms will be used as country-level control variables. Similarly, employees and tangible assets in logarithms will be used as proxies for the economic activity of a bank in a country. Five dummy variables for each bank will be used, leaving out Unicredit as the control case.

$$\begin{aligned} earnings_i = & \beta_0 + \beta_1 ETR_i + \beta_2 ETR_i^2 + \beta_3 \log(employees)_i + \beta_4 \log(tangible_assets)_i \\ & + \beta_5 \log(population)_i + \beta_6 \log(GDP_per_capita)_i + \sum_i^5 \gamma_i D_i + u_i \end{aligned}$$

Given that there is only a small number of observations from six banks, the model is bound to be inaccurate. Its primary purpose is to establish significant connections across variables to further build upon the descriptive analysis and to introduce more factors that could further explain and detect profit shifting.

²All logarithms used in this thesis are natural logarithms.

Table 4.6: Semielasticity using quadratic and logarithmic formula

	Dependent variable: earnings	
	earnings	
	quadratic (1)	logarithmic (2)
ETR	11.459 (10.958)	-3.850 (7.700)
I(ETR ²)	-0.118 (0.136)	
logETR		112.630 (104.365)
log_employees	71.872 (46.731)	63.969 (48.092)
log_tangible	88.519** (44.073)	92.051** (44.007)
log(population)	63.465 (40.592)	67.023 (40.608)
log(GDP_per_capita)	83.533 (98.558)	72.711 (98.667)
Observations	126	126
R ²	0.238	0.241
Adjusted R ²	0.164	0.167
Residual Std. Error (df = 114)	817.049	815.585
F Statistic (df = 11; 114)	3.236***	3.285***

Note: *p<0.1; **p<0.05; ***p<0.01

Dummy variables were statistically significant at least at 90% significance level but were omitted for conciseness as they only affect the intercept, which is not the focus of the analysis.

Expectedly, higher tangible assets and employees signal higher economic activity, resulting in higher profits booked. There are possibly the same issues as in the previous chapter with the high correlation between employees and assets because the model determines employees to be statistically insignificant. The positive impact and low statistical significance of the country-level variables are also to be expected.

The models curiously provide statistically insignificant results suggesting a positive correlation of ETR with booked profits. The intuition and current literature suggest an opposite relationship because higher tax rates would suggest profit shifting out of a country and lowering the profits. A negative effect of ETR on profits using the semielasticity approach was declared by Godar *et al.* (2022), Barake (2022), or Garcia-Bernardo & Janský (2022). Possible explanations for the discrepancy include an imperfect sampling of the banks and an insufficient sample, which would decrease the quality of the model, which is supported by the low R^2 of both models.

On the contrary, the models could support the notion that the European banks left tax havens after the increased mandatory tax transparency after the mandated publishing of CRD IV in 2014. Similarly, the absence of the negative correlation could signal the heterogeneity of the European banks because the sampled banks with higher tax transparency use tax havens to only a limited extent, and banks refusing to publish expanded CbCR under GRI use tax havens on a more significant level. This would be in line with the findings of Joshi (2020), who argues, that just the obligation of higher tax transparency decreases tax avoidance.

Chapter 5

Conclusion

Despite a rapidly increasing number of published papers on profit shifting and tax avoidance in the last decade, as Beer *et al.* (2020) observed, the policy response has been relatively weak and not satisfying the requirements for successful and comprehensive research. Mainly the policymakers are behind in implementing mandatory reporting of MNEs, with the clear goal of mandatory detailed country-by-country reporting. Implementing CbCR would significantly increase the precision of the estimations and diagnosis of the tax base erosion experienced by governments and the subsequent decrease in tax revenue.

The implementation of CRD IV by the European Union, targeting the banking sector, may be considered a breakthrough. Still, the successive implementation to the entire economy of MNEs has been problematic but is said to commence in 2026. However, CRD IV will never be fully a satisfactory source because of the limited number of asked variables. OECD also requires CbCR data, which are only published as aggregates at the country level. This severely limits the usefulness of the data. As this thesis showcases, only firm-level data are able to fully comprehend the specifications of different MNEs, which are lost in the aggregation. Similarly, all other potential sources, such as the IRS CbCR or MiDi databases, have their accuracy or accessibility shortcomings.

The GRI disclosures provide a unique source of CbCR data as it mandates a wider variety of data to be published. A clear disadvantage is the voluntary nature of publishing under GRI. Similarly, no control mechanisms are in place to verify the authenticity of reported data. However, the GRI disclosures potentially apply to MNEs worldwide in all industries without limited accessibility. The practical downfall of GRI is the absence of a consolidated database

of the data or at least the list of MNEs that publish CbCR under GRI, severely limiting the data collection's efficiency. A related issue is the naturally smaller sample sizes compared to mandatory reporting standards.

This unique approach to the analysis of profit shifting using CbCR data provides a new point of view. The study reveals that estimating European banks as a homogeneous industry is incorrect. Even the small sample shows vast differences between banks that might go unnoticed in larger datasets that do not consider the implied subdivisions of the sample. A similar approach was utilized by Godar *et al.* (2022), who studied a sample of 10 MNEs, who published their firm-level CbCR early and arrived at similar findings of high variation between companies with only a weak connection between shifted profits and ETRs across jurisdictions.

The above-mentioned heterogeneity amongst banks occurred in their effective tax rates, presence in tax havens, and profit shifting practices. ETRs varied across times as they proved prone to one-off events, like the bank's tax planning, outside-world black swan events, or loss carryover from previous periods. The mean ETR also varied across banks. Some banks reported no business presence in tax havens, while others operate primarily in tax havens. Profit shifting, estimated using three methods, varied across banks in size and even the direction of the profits being shifted. Additionally, no statistically significant connection between ETRs in a tax jurisdiction and profits booked there was established, which goes against the majority of the current literature, but supports the findings of Godar *et al.* (2022), which attests to the notion of MNEs with higher tax transparency participate in profit shifting to a lesser extent. It is unclear to what extent the findings can be extrapolated to all European banks, and caution must be taken.

Country-by-country reporting from reports published under the Global Reporting Initiative proved to be a valid and valuable data source for research on profit shifting and tax avoidance. In the context of data scarcity in this field, every additional potential origin of data and information should be utilized to its fullest extent, which was not happening with the GRI CbCR prior to this thesis. This thesis only scratches the surface of the usefulness of this source. The potential expansion of the scope of interest outside the European banking sector could include MNEs and industries previously not studied in this context. Potentially, the highest disadvantage of GRI CbCR compared to other sources is the lack of a longer time when the data is published by some MNEs, which does not enable the utilization of more complex models. Potentially very

beneficial future research using GRI CbCR is treating the data as panel data for studying consequences policies or world events, which is currently impossible. Currently, there is no publicly available extensive source of firm-level CbCR. Therefore future policy changes, either mandating the publishing of reports of MNEs under GRI or a similar, separately created standard, could satisfy the need of current research to minimize tax avoidance of multinational enterprises.

Bibliography

ABBAS, S. M. A. & A. KLEMM (2013): “A partial race to the bottom: corporate tax developments in emerging and developing economies.” *International Tax and Public Finance* **20(4)**: pp. 596–617.

ALIPRANDI, G., M. BARAKÉ, & P.-E. CHOUC (2021): *Have European Banks left tax haven? Evidence from country-by-country data*. Ph.D. thesis, Eu-Tax.

ÁLVAREZ-MARTÍNEZ, M. T., SALVADOR BARRIOS, DIEGO D’ANDRIA, MARIA GESUALDO, GAETAN NICODEME, & JONATHAN PYCROFT (2022): “How large is the corporate tax base erosion and profit shifting? A general equilibrium approach.” *Economic Systems Research* **34(2)**: pp. 167–198.

BARAKE, M. (2022): “Tax Planning by European Banks.” *Technical report*, EU Tax Observatory Working Paper No. 9.

BEER, S., R. DE MOOIJ, & L. LIU (2020): “INTERNATIONAL CORPORATE TAX AVOIDANCE: A REVIEW OF THE CHANNELS, MAGNITUDES, AND BLIND SPOTS.” *Journal of Economic Surveys* **34(3)**: pp. 660–688.

CADESTIN, C., SÉBASTIEN MIROUDOT, ISABELLE DESNOYERS-JAMES, DAVIDE RIGO, YE MING, & KOEN DE BACKER (2018): “Multinational enterprises and global value chains: new insights on the trade-investment nexus.” *Technical report*, OECD Science, Technology and Industry Working Papers, Paris.

CLAUSING, K. A. (2016): “THE EFFECT OF PROFIT SHIFTING ON THE CORPORATE TAX BASE IN THE UNITED STATES AND BEYOND.” *National Tax Journal* **69(4)**: pp. 905–934.

COBHAM, A. & P. JANSKY (2019): “Measuring misalignment: The location of us multinationals’ economic activity versus the location of their profits.” *Development Policy Review* **37(1)**: pp. 91–110.

- DOWD, T., P. LANDEFELD, & A. MOORE (2017): “Profit shifting of U.S. multinationals.” *Journal of Public Economics* **148**: pp. 1–13.
- DWENGER, N., D. KÜBLER, & G. WEIZSÄCKER (2013): “Preference for randomization: Empirical and experimental evidence.” *Technical report*, SFB 649 Discussion Paper.
- FUEST, C., F. HUGGER, & F. NEUMEIER (2022): “Corporate profit shifting and the role of tax havens: Evidence from German country-by-country reporting data.” *Journal of Economic Behavior & Organization* **194**: pp. 454–477.
- GARCIA-BERNARDO, J. & P. JANSKÝ (2022): “Profit Shifting of Multinational Corporations Worldwide.” .
- GARCIA-BERNARDO, J., P. JANSKY, & T. TØRSLØV (2020): “Multinational corporations’s effective tax rates: Evidence from orbis.” *Garcia-Bernardo J., Jansky P. and Tørsløv T.(2020):" Multinational Corporations’s Effective Tax Rates: Evidence from Orbis" IES Working Papers* **20**.
- GARCIA-BERNARDO, J., P. JANSKÝ, & T. TØRSLØV (2021): “Multinational corporations and tax havens: evidence from country-by-country reporting.” *International Tax and Public Finance* **28(6)**: pp. 1519–1561.
- GODAR, S. (2021): “Tax-Haven Investors and Corporate Profitability – Evidence of Profit Shifting by German Affiliates of Multinational Firms.” *FinanzArchiv* **77(4)**: p. 345.
- GODAR, S., G. ALIPRANDI, T. FACCIO, & P. JANSKÝ (2022): “The long way to tax transparency: lessons from the early publishers of country-by-country reports.” .
- GRAVELLE, J. G. (2015): “Tax havens: international tax avoidance and evasion. Congressional Research Service.” *Technical report*, Library of Congress.
- GSSB, G. S. S. B. G. (2021): “Consolidated Set of the GRI Standards 2021.” *Technical report*.
- HINES, J. R. & E. M. RICE (1994): “Fiscal Paradise: Foreign Tax Havens and American Business.” *The Quarterly Journal of Economics* **109(1)**: pp. 149–182.

- JANSKÝ, P., J. GARCÍA-BERNARDO, & T. TØRSLØV (2020): “Multinational Corporations’ Effective Tax Rates: Evidence from Orbis.” *IES Working Papers* **20/2020**.
- JANSKÝ, P. & M. PALANSKÝ (2019): “Estimating the scale of profit shifting and tax revenue losses related to foreign direct investment.” *International Tax and Public Finance* **26(5)**: pp. 1048–1103.
- JOSHI, P. (2020): “Does Private Country-by-Country Reporting Deter Tax Avoidance and Income Shifting? Evidence from BEPS Action Item 13.” *Journal of Accounting Research* **58(2)**: pp. 333–381.
- MURPHY, R. (2003): “A proposed international accounting standard: reporting turnover and tax by location.” *Technical report*, Association for Accountancy and Business Affairs.
- MURPHY, R. (2015): “European Banks’ Country-by-Country Reporting.” *Technical report*, Norfolk: Tax Research LLP.
- NERUDOVÁ, D., M. DOBRANSCHI, V. SOLILOVÁ, & M. LITZMAN (2020): “Profit shifting to onshore and offshore tax havens: the case of visegrad countries.” *Post-Communist Economies* **32(7)**: pp. 904–946.
- OVERESCH, M. & H. WOLFF (2021): “Financial Transparency to the Rescue: Effects of Public Country-by-Country Reporting in the European Union Banking Sector on Tax Avoidance*.” *Contemporary Accounting Research* **38(3)**: pp. 1616–1642.
- RAMBOLL, M. C. & A. CORIT (2016): “Study on structures of aggressive tax planning and indicators final report.” .
- TØRSLØV, T., L. WIER, & G. ZUCMAN (2020): “Externalities in International Tax Enforcement: Theory and Evidence.” *Technical report*, National Bureau of Economic Research, Cambridge, MA.
- UNCTAD (2015): “World Investment Report 2015” “Reforming International Investment Governance.” *Technical report*, United Nations, Geneva.
- WEICHENRIEDER, A. J. (2009): “Profit shifting in the EU: evidence from Germany.” *International Tax and Public Finance* **16(3)**: pp. 281–297.
- ZEW, Z. f. E. W. (2016): “The impact of tax planning on forward-looking effective tax rates.” .