ESTIMATION OF INTERNATIONAL TAX PLANNING IMPACT ON CORPORATE TAX GAP IN THE CZECH REPUBLIC

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Introduction

The issue of base erosion and profit shifting (BEPS) caused by multinational companies is a potential important impediment to tax collections. Because tax planning schemes utilized gaps and mismatches in tax rules to artificially shift profits to low or no-tax jurisdiction where there is insufficient of no economic activity (Hines, 2014; OECD, 2017). The Organization for Economic Co-operation and Development (OECD) has estimated the general annual revenue loss of USD 100 to 240 billion due to the BEPS OECD (2017).

Dharmapala and Riedel (2013) focused on tax motivated income shifting between parent companies and their affiliates. The parent companies have almost 60% affiliates established in low-tax jurisdictions. It resulted in profit shifting from the high-tax parent companies' jurisdictions to the low-tax affiliates' jurisdictions where the profit is taxed with the lower tax rate. Companies may also benefit from the difference between the statutory and the marginal tax rates that jurisdictions offer. This fact has important role in profit shifting across jurisdictional boundaries (Zodrow, 2010; Lennard, 2016; Baumann, Buchwald, Friehe, Hottenrott, & Weche, 2017). There are many authors who deal with the issue that multinational companies shift their profits thanks to tax differentials through the use of transfer pricing mechanism, royalties, inter-company transactions, etc. (Altshuler & Grubert, 2006; 2002; Hines, 1999; Desai, Foley, & Hines, 2004; 2006).This is not the only purpose of preferential tax jurisdiction. Companies also invest in tax havens because of the secrecy these jurisdictions offer (Braun & Weichenrieder, 2015). The number of Czech companies, whose owners are established in tax havens, have decreased approximately by 43% after conclusion of instruments for exchange of tax information with these jurisdictions. This indicates the importance of anonymity. On the other hand, companies that remain in the jurisdictions after conclusion of such instruments increase investments due to better tax conditions (Rohan & Moravec, 2017).

Currently, there are four studies made by international organizations that are focused on the estimation of the international corporate tax avoidance caused by base erosion and profit shifting: International Monetary Fund (IMF) (2014), OECD (2015), United Nations Conference on Trade and Development (UNCTAD) (2015), European Parliament Research Service (EPRS) (2015). There are also other authors who deal with the corporate income tax gap (e.g. Cobham & Jansky, 2017; Davies et al., 2015; Gumpert, Hines, & Schnitzer, 2016; Riedel, Zinn, & Hofmann, 2015; Crivelli, de Mooij & Keen, 2016). Jansky (2016) and Jansky and Kokes (2016) define the tax gap as the difference between the real amount of tax legally due and the amount that taxpayers actually pay.

This paper focuses on the calculation of corporate income tax efficiency indicator and its comparison with other EU member states. Furthermore, the paper is aimed at the estimative amount of corporate income tax revenue that the Czech Republic might have lost as a result of international corporate tax avoidance in 2013, 2014 and 2015 and subsequently this paper shows variety and differences among different studies as the presented estimation is made with official data obtained from General Financial Directorate instead from Eurostat and there the main reason for different results can be seen. The estimation combines the European Parliament Research Service's (2015) methodology and the IMF (2014) approach.

1. Materials and Methods

The corporate tax gap revenue estimation uses IMF (2014) and EPRS (2015) methodology. The methodology has been chosen for comparison's purposes. EPRS (2015) research uses Eurostat data compared to this paper, which uses official data from General Financial Directorate. Moreover the used methodology seems to be more precise in comparison with the methodology used for example by Glopolis (2016). This methodology estimates the tax gap's impact through indicators mentioned below. The other methodology calculates the impact from total amount of EU corporate tax gap through ration of particular member states' contributions to EU Gross Domestic Product. The methodology calculates the corporate income tax efficiency weighted average for all 28 European Union (EU) member states (MS) and net operating surplus adjusted for imputed compensation of self-employed as a theoretical corporate income tax base. These indicators are necessary for subsequent calculation of the revenue without profit shifting. Ebrill and others (2001) use a similar concept of tax efficiency to assess the performance of Value added tax. The analyzed data was obtained from the General Financial Directorate, AMECO, Eurostat and European Commission. The corporate tax revenue loss/gain is calculated for three periods: 2013, 2014 and 2015. EPRS (2015) study ends with the year 2013. One of the aims of this paper is to compare the results with EPRS (2015) study for 2013 and to continue with tax gap's estimation for upcoming years. Therefore, the year 2013 was set as a default time-period. The observation period ends in 2015 because there was no updated data during the research preparation. The first research question is – how the corporate income tax revenues of the Czech Republic are influenced by base erosion and profit shifting. The second research question is – how effective the corporate income tax system of the Czech Republic is and the third one – how the difference in datasource influences the corporate tax gap estimation.

Based on the research questions null hypotheses have been established as follow:

- *H_{01}: Base erosion and profit shifting do not cause a corporate income tax loss in the Czech Republic.*
- *H_{02}: The corporate income tax efficiency indicator of the Czech Republic is lower than EU average in the mentioned time period.*
- *H_{03}: Difference in data source does not influence final results of the corporate income tax gap estimation.*

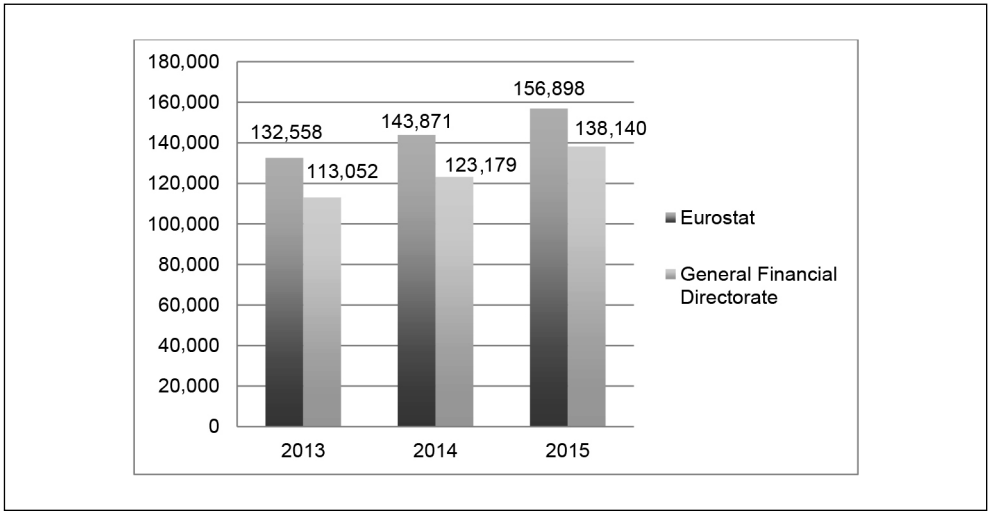
1.1 Corporate Income Tax Efficiency

To begin with, an indicator of corporate income tax efficiency has been constructed. The indicator comes from IMF's report on spillovers:

$$Eff_i = \frac{Rev_i}{(Rate_i \div 100) \times Base_1} \quad (1)$$

The corporate income tax efficiency for country *i* is denoted by Eff_i. This indicator is calculated for particular EU member states. This step is required for second equation. Rev_i represents actual corporate income tax revenue of country *i* in a local currency. The data of corporate income tax revenue for the Czech Republic comes from General Financial Directorate. For the rest of EU MSs, it comes from public finance and national accounts data from Eurostat. $Rate_i$ represents the statutory corporate income tax rate that is applied in the state *i*. The percentage tax rate is divided by 100. The data source of corporate income tax rate is used from European Commission's publications on taxation trends in the EU. $Base_i$ denotes the theoretical tax base of country *i*. There are available three types of operating surplus, which could be used as the theoretical tax base. Gross operating surplus, net operating surplus not adjusted for imputed compensation for self-employed workers, who are being treated for tax purposes as being external contractors and there are are not subject of income taxes from employment, pension etc. and the last one net operating surplus adjusted for imputed compensation for self-employed workers. The paper deals with the taxes on the corporate income excluding income of self-employed persons, whose surplus above their costs is taxed as personal income than corporate profit. Therefore the theoretical tax base is expressed by the net operating surplus adjusted for imputed compensation for self-employed workers. AMECO is used as the data source of the theoretical tax base. According to the EPRS's study, if the Eff_i takes the value further below one, the corporate income tax system is the less efficient in acquiring revenue. This may indicate tax competition (e.g. tax

Fig. 1: **The source difference of the corporate tax revenue of the Czech Republic denoted in mil. CZK**



Source: own processing in accordance with Eurostat, General Financial Directorate

incentives) but also the profit shifting. The difference between the corporate tax revenue data sources can be seen below. EPRS uses Eurostat database for its calculation. In this research the official data from Czech General Financial Directorate has been used.

Hereinafter the calculation of the corporate income tax efficiency for particular EU member states for time period 2013 is described. The efficiency is needed for the subsequent indicator of revenue without profit shifting estimation. Moreover the results confirm possible differences of research outputs due to the different data sets.

Tab. 2 contains the calculation of the corporate income tax efficiency for particular EU member states for time period 2014.

Tab. 3 below deals with the calculation of the corporate income tax efficiency for particular EU member states for time period 2015.

1.2 Indicator of Revenue without Profit Shifting

The second indicator gives an overview of how much the Czech Republic loses/gains from profit shifting. The indicator represents a hypothetical value of tax revenues that the jurisdiction could have received in case there is not any profit shifting applied:

$$\boldsymbol{RWS_i} = (\boldsymbol{Rate_i} \div \mathbf{100}) \times \boldsymbol{Base_i} \times \overline{\boldsymbol{Eff_i}} \qquad (2)$$

The tax revenue without profit shifting is denoted by $\boldsymbol{RWS_i}$. $\boldsymbol{Rate_i}$ represents the statutory corporate income tax rate that is applied in the state *i*. The percentage tax rate is divided by 100. The data source of corporate income tax rate is used from European Commission's publications on taxation trends in the EU. $\boldsymbol{Base_i}$ denotes the theoretical tax base of country *i*. The theoretical tax base is expressed by the net operating surplus adjusted for imputed compensation for self-employed workers. AMECO is used as the data source of the theoretical tax base. $\overline{\boldsymbol{Eff_i}}$ is the weighted average of corporate income tax efficiency rate for the entire EU. This variable enables to exclude base effects except profit shifting.

The final effect is given by the difference between revenue without profit shifting ($\boldsymbol{RWS_i}$) and the actual corporate income tax revenue denoted by $\boldsymbol{Rev_i}$. The difference can be interpreted as the loss or gain from profit shifting. In the case the actual corporate income tax revenue takes a higher value than the revenue without profit shifting indicator then the jurisdiction profits from the profit shifting. The opposite situation results in tax revenue losses caused by profit shifting.

Tab. 1: **Calculation of the corporate income tax efficiency for particular EU member states for time period 2013 (Part 1)**

Country	Unit	Base (bn)	Tax rate (%)	Revenues (bn)	Eff calculation	Eff
Belgium	EURO	34.23612	33.99	12.2091	$\frac{12.2091}{0.3399 \times 34.23612}$	1.049175
Bulgaria	BGN	16.57857	10	1.6231	$\frac{1.6231}{0.1 \times 1.6231}$	0.979035
Czech Republic	CZK	807.735	19	113.052	$\frac{113.052}{0.19 \times 807.735}$	0.736641
Denmark	DKK	239.6818	25	54.066	$\frac{54.066}{0.25 \times 239.6818}$	0.902296
Germany	EURO	445.6341	29.55	50.5	$\frac{50.5}{0.2955 \times 445.6341}$	0.383491
Estonia	EURO	4.315953	21	0.0618	$\frac{0.0168}{0.21 \times 4.315953}$	0.068186
Ireland	EURO	49.1836	12.5	4.272	$\frac{4.272}{0.125 \times 4.272}$	0.694866
Greece	EURO	34.82386	26	2.071	$\frac{2.071}{0.26 \times 34.82386}$	0.228734
France	EURO	196.7501	33.33	58.736	$\frac{58.736}{0.3333 \times 196.7501}$	0.895683
Croatia	HRK	32.8425	20	6.7418	$\frac{6.7418}{0.20 \times 32.8425}$	1.026383
Italy	EURO	174.3434	31.4	40.3767	$\frac{40.3767}{0.314 \times 174.3434}$	0.737557
Cyprus	EURO	4.049885	12.5	1.1714	$\frac{1.1714}{0.125 \times 4.049885}$	2.313942
Latvia	EURO	4.20113	15	0.3697	$\frac{0.3697}{0.15 \times 4.20113}$	0.586668
Lithuania	EURO	11.32114	15	0.4767	$\frac{0.4767}{0.15 \times 11.32114}$	0.280714
Luxembourg	EURO	10.65323	29.22	2.2128	$\frac{2.2128}{0.2922 \times 10.65323}$	0.710854
Hungary	HUF	6,003.473	19	416.189	$\frac{416.189}{0.19 \times 6,003.473}$	0.364867
Malta	EURO	1.809474	35	0.4212	$\frac{0.4212}{0.35 \times 1.809474}$	0.665071
Netherlands	EURO	89.4848	25	14.255	$\frac{14.255}{0.25 \times 89.4848}$	0.637203
Austria	EURO	45.57368	25	7.2404	$\frac{7.2404}{0.25 \times 45.57368}$	0.635490
Poland	PLN	488.7057	19	29.351	$\frac{29.351}{0.19 \times 488.7057}$	0.316098
Portugal	EURO	28.37738	25	5.5446	$\frac{5.5446}{0.25 \times 28.37738}$	0.781552
Romania	RON	152.5669	16	12.826	$\frac{12.826}{0.16 \times 152.5669}$	0.525425

Tab. 1: **Calculation of the corporate income tax efficiency for particular EU member states for time period 2013 (Part 2)**

Country	Unit	Base (bn)	Tax rate (%)	Revenues (bn)	Eff calculation	Eff
Slovenia	EURO	0.816451	17	0.4332	$\frac{0.4332}{0.17 \times 0.816451}$	3.121112
Slovakia	EURO	19.6832	23	2.1178	$\frac{2.1178}{0.23 \times 19.6832}$	0.467801
Finland	EURO	23.51961	24.5	4.799	$\frac{4.799}{0.245 \times 23.51961}$	0.832827
Sweden	SEK	461.493	22	100.811	$\frac{100.811}{0.22 \times 461.493}$	0.992933
United Kingdom	GBP	297.2532	23	41.644	$\frac{41.644}{0.23 \times 297.2532}$	0.609113

Source: authors' own calculation, AMECO, General Financial Directorate, European Commission, Eurostat

Tab. 2: **Calculation of the corporate income tax efficiency for particular EU member states for time period 2014 (Part 1)**

Country	Unit	Base (bn)	Tax rate (%)	Revenues (bn)	Eff calculation	Eff
Belgium	EURO	38.17151	33.99	12.8901	$\frac{12.8901}{0.3399 \times 38.17151}$	0.993495
Bulgaria	BGN	14.64406	10	1.6582	$\frac{1.6582}{0.10 \times 14.64406}$	1.132336
Czech Republic	CZK	948.5900	19	123.179	$\frac{123.179}{0.19 \times 948.59}$	0.683447
Denmark	DKK	243.5001	24.5	55.784	$\frac{55.784}{0.245 \times 243.5001}$	0.935071
Germany	EURO	461.7875	29.58	51	$\frac{51.0}{0.2958 \times 29.58}$	0.373362
Estonia	EURO	4.29285	21	0.0689	$\frac{0.0689}{0.21 \times 4.29285}$	0.076428
Ireland	EURO	54.48542	12.5	4.6169	$\frac{4.6169}{0.125 \times 54.48542}$	0.677891
Greece	EURO	32.47029	26	3.349	$\frac{3.349}{0.26 \times 32.47029}$	0.396694
France	EURO	201.6106	33.33	57.063	$\frac{57.063}{0.3333 \times 201.6106}$	0.849192
Croatia	HRK	38.07952	20	5.8247	$\frac{5.8247}{0.20 \times 38.07952}$	0.764807
Italy	EURO	183.1952	31.4	35.0612	$\frac{35.0612}{0.314 \times 183.1952}$	0.609513
Cyprus	EURO	3.842498	12.5	1.1121	$\frac{1.1121}{0.125 \times 3.842498}$	2.315369
Latvia	EURO	3.856079	15	0.3637	$\frac{0.3637}{0.15 \times 3.856079}$	0.628791
Lithuania	EURO	11.40447	15	0.4998	$\frac{0.4998}{0.15 \times 11.40447}$	0.292166

Tab. 2: **Calculation of the corporate income tax efficiency for particular EU member states for time period 2014 (Part 2)**

Country	Unit	Base (bn)	Tax rate (%)	Revenues (bn)	Eff calculation	Eff
Luxembourg	EURO	12.05523	29.22	2.1398	$\frac{2.1398}{0.2922 \times 12.05523}$	0.607460
Hungary	HUF	6,845.882	19	534.652	$\frac{534.652}{0.19 \times 6,845.882}$	0.411040
Malta	EURO	1.871742	35	0.4475	$\frac{0.4475}{0.35 \times 1.871742}$	0.683092
Netherlands	EURO	89.1968	25	17.09	$\frac{17.09}{0.25 \times 89.1968}$	0.766395
Austria	EURO	45.71002	25	7.273	$\frac{7.273}{0.25 \times 45.71002}$	0.636447
Poland	PLN	505.1986	19	30.04	$\frac{30.04}{0.19 \times .194986n}$	0.312957
Portugal	EURO	29.76808	23	4.8967	$\frac{4.8967}{0.23 \times 29.76808}$	0.715196
Romania	RON	152.4887	16	14.1964	$\frac{14.1964}{0.16 \times 152.4887}$	0.581863
Slovenia	EURO	1.51095	17	0.5287	$\frac{0.5287}{0.17 \times 1.51095}$	2.058308
Slovakia	EURO	19.31105	22	2.5044	$\frac{2.5044}{0.22 \times .224405n}$	0.589488
Finland	EURO	24.4328	20	3.956	$\frac{3.956}{0.20 \times 24.4328}$	0.809567
Sweden	SEK	509.9859	22	103.237	$\frac{103.237}{0.22 \times 509.9859}$	0.920141
United Kingdom	GBP	331.8269	21	41.264	$\frac{41.264}{0.21 \times 331.8269}$	0.592162

Source: Authors' own calculation, AMECO, General Financial Directorate, European Commission, Eurostat

Tab. 3: **Calculation of the corporate income tax efficiency for particular EU member states for time period 2015 (Part 1)**

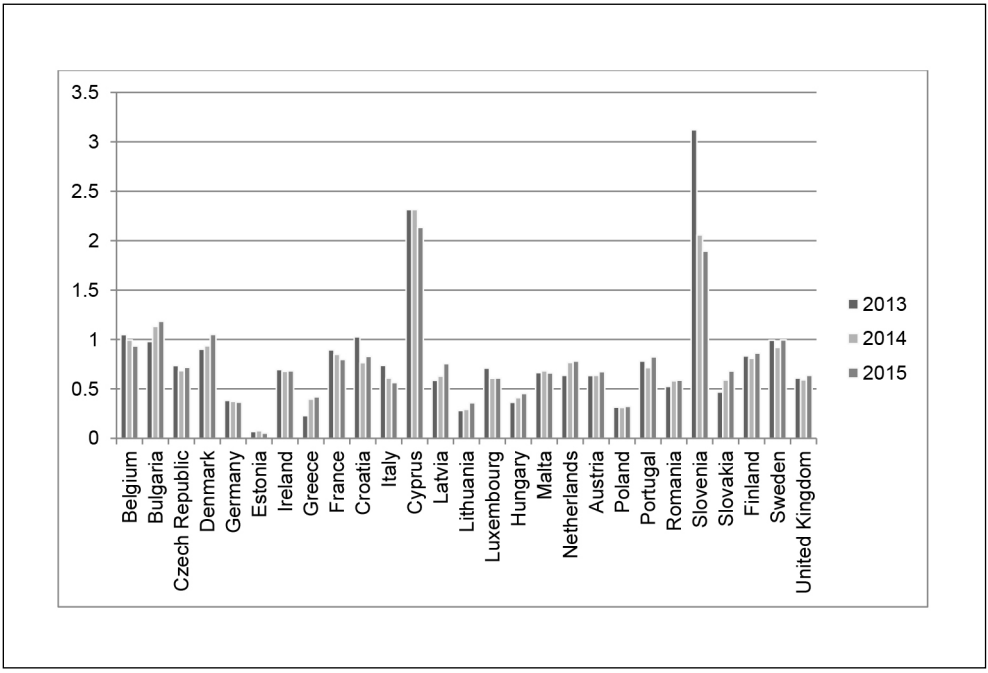
Country	Unit	Base (bn)	Tax rate (%)	Revenues (bn)	Eff calculation	Eff
Belgium	EURO	43.48916	33.99	13.8169	$\frac{13.8169}{0.3399 \times 43.48916}$	0.934713
Bulgaria	BGN	15.22104	10	1.8034	$\frac{1.8034}{0.10 \times 15.22104}$	1.184807
Czech Republic	CZK	1,013.1040	19	138.14	$\frac{138.14}{0.19 \times 1013.104}$	0.717649
Denmark	DKK	229.6731	22	53.08	$\frac{53.08}{0.22 \times 229.6731}$	1.050500
Germany	EURO	487.3359	29.72	52.9	$\frac{52.9}{0.2972 \times 487.3359}$	0.365240

Tab. 3: **Calculation of the corporate income tax efficiency for particular EU member states for time period 2015 (Part 2)**

Country	Unit	Base (bn)	Tax rate (%)	Revenues (bn)	Eff calculation	Eff
Estonia	EURO	3.59341	20	0.0381	$\frac{0.0381}{0.20 \times 3.59341}$	0.053014
Ireland	EURO	80.50267	12.5	6.8718	$\frac{6.8718}{0.125 \times 12.50267}$	0.682889
Greece	EURO	31.18964	29	3.8	$\frac{3.8}{0.29 \times 31.18964}$	0.420122
France	EURO	216.9506	33.33	57.699	$\frac{57.699}{0.3333 \times 216.9506}$	0.797943
Croatia	HRK	38.06926	20	6.3113	$\frac{6.3113}{0.20 \times 38.06926}$	0.828923
Italy	EURO	189.0033	31.4	33.4663	$\frac{33.4663}{0.314 \times 189.0033}$	0.563909
Cyprus	EURO	3.919699	12.5	1.0456	$\frac{1.0456}{0.125 \times 3.919699}$	2.134041
Latvia	EURO	3.43082	15	0.3886	$\frac{0.3886}{0.15 \times 3.43082}$	0.755116
Lithuania	EURO	10.67051	15	0.5739	$\frac{0.5739}{0.15 \times 10.67051}$	0.358558
Luxembourg	EURO	12.89701	29.22	2.2951	$\frac{2.2951}{0.2922 \times 12.89701}$	0.609021
Hungary	HUF	7,113.497	19	613.522	$\frac{613.522}{0.19 \times 7,113.497}$	0.453930
Malta	EURO	2.207586	35	0.5108	$\frac{0.5108}{0.35 \times 2.207586}$	0.661097
Netherlands	EURO	94.3608	25	18.43	$\frac{18.43}{0.25 \times 94.3608}$	0.781257
Austria	EURO	47.05711	25	7.9394	$\frac{7.9394}{0.25 \times 47.05711}$	0.674874
Poland	PLN	539.9078	19	33.104	$\frac{33.104}{0.19 \times 539.9078}$	0.322706
Portugal	EURO	32.48048	21	5.6136	$\frac{5.6136}{0.21 \times .21.48048}$	0.823000
Romania	RON	177.8497	16	16.7274	$\frac{16.7274}{0.16 \times 177.8497}$	0.587835
Slovenia	EURO	1.763751	17	0.568	$\frac{0.568}{0.17 \times 1.763751}$	1.894358
Slovakia	EURO	19.67942	22	2.9453	$\frac{2.9453}{0.22 \times 19.67942}$	0.680291
Finland	EURO	26.32965	20	4.547	$\frac{4.547}{0.20 \times 26.32965}$	0.863475
Sweden	SEK	566.7271	22	124.096	$\frac{124.096}{0.22 \times 566.7271}$	0.995316
United Kingdom	GBP	338.9224	20	43.215	$\frac{43.215}{0.20 \times 338.9224}$	0.637535

Source: Authors' own calculation, AMECO, General Financial Directorate, European Commission, Eurostat

Fig. 2: EU member states corporate income tax efficiency for periods 2013-2015



Source: own processing in accordance with AMECO, General Financial Directorate, European Commission, Eurostat

2. Results

The EU member states corporate income tax efficiency for the periods 2013-2015 calculated by the first equation can be seen in Fig. 2.

The Czech Republic's corporate income tax efficiency rate is approximately 70%, which is a very good result in comparison with Germany and Poland that have between 2013-2015, approximately 35%. This low number for Germany and Poland could be caused by base erosion and profit shifting.

The corporate income tax efficiency of the particular EU member state is used for the calculation of the weighted average of corporate income tax efficiency rate.

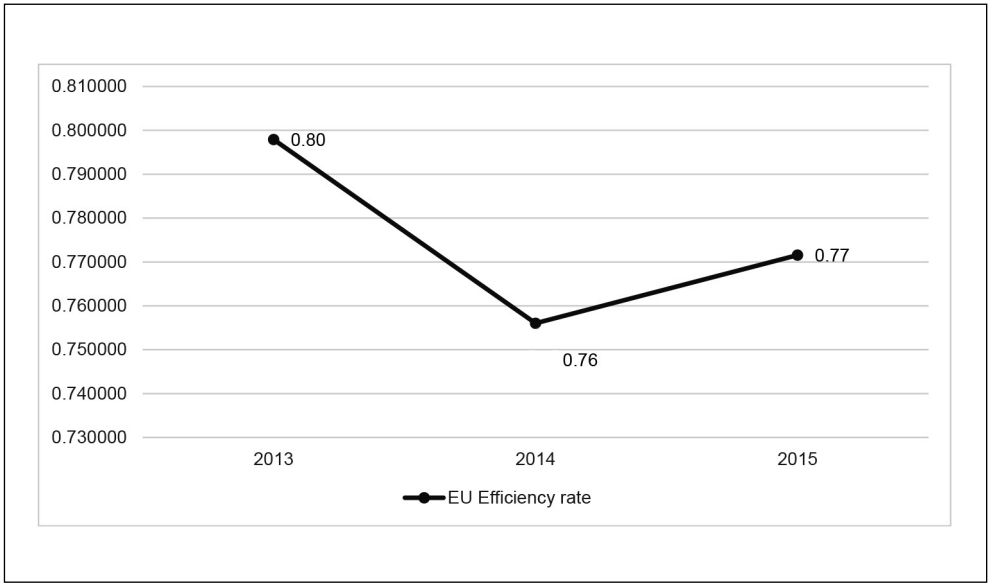
In 2013 the Czech Republic's income tax efficiency rate is approximately 74%, in 2014 it is approximately 68% and in 2015 it is approximately 72%. The Czech Republic is approaching the EU averagein mentioned period, but does not reach it. Therefore, the null hypothesis H_{02} is accepted.

With the EU average efficiency, the RWS calculation can be made. Based on the second equation the following results have been calculated (see Tab. 4).

If there was not be a base erosion and profit shifting among the EU member states, the Czech Republic could have the amounts mentioned above as a corporate tax revenue. This hypothetical indicator is compared to the actual amount of corporate tax revenue. The difference can be interpreted as the loss or gain from profit shifting. For a better overview of the results, see Tab. 5.

As shown in Tab. 5 it is evident that the theoretical corporate tax revenue, which represents revenue without profit shifting (RWS), takes higher value than the actual corporate tax revenue (Rev). It resulted in loss of corporate tax revenue caused by profit shifting. In 2013, the Czech Republic lost CZK 9,404 mil. due to the base erosion and profit shifting. In 2014 the Czech Republic had its

Fig. 3: **Weighted average of corporate income tax efficiency rate in EU between 2013-2015**



Source: Authors' own calculation, AMECO, General Financial Directorate, European Commission, Eurostat

Tab. 4: **Calculation of the indicator of revenue without profit shifting for the Czech Republic for the time periods 2013, 2014, 2015**

Year	Tax rate (%)	Base (mil. CZK)	$\overline{Eff}_i$	RWS calculation	RWS (mil. CZK)
2013	19	807,735	0.797915	0.19 × 807.735 × 0.797915	122,456
2014	19	948,590	0.756025	0.19 × 948.590 × 0.756025	136,260
2015	19	1,013,104	0.771560	0.19 × 1,013.104 × 0.771560	148,517

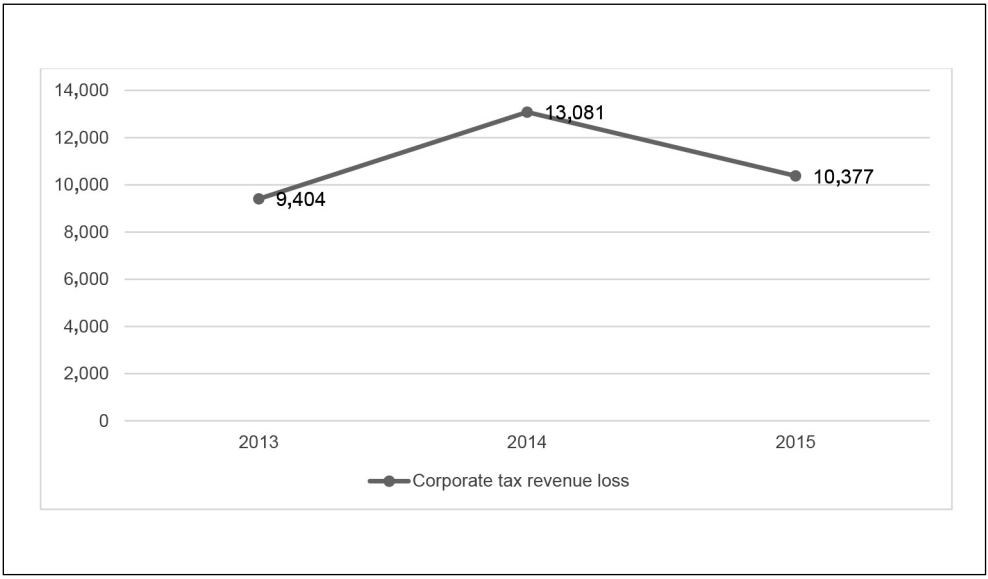
Source: Authors' own calculation, AMECO, European Commission

Tab. 5: **Calculation of the profit shifting effect (denoted in mil. CZK)**

Year	RWS	Rev	RWS–Rev
2013	122,456	113,052	9,404
2014	136,260	123,179	13,081
2015	148,517	138,140	10,377

Source: Authors' own calculation, General Financial Directorate

Fig. 4: **Corporate tax revenue loss of the Czech Republic between 2013-2015 (denoted in mil. CZK)**



Source: Authors' own calculation

highest tax revenue loss, reaching up CZK 13,081 mil.

The main difference in comparison with the EPRS (2015) research, can be seen from Fig. 1. There is approximately 20 billion CZK difference between Eurostat data and official General Financial Directorate data. In the case of the Czech Republic, ERPS (2015) study resulted in 0.484 billion EURO (approximately 12.5 billion CZK) tax gain in 2013 from based erosion and profit shifting within EU. On the other hand, this paper re-estimated the tax loss with the same methodology except used data. The paper resulted in approximately 9.404 billion CZK tax loss. The null hypotheses H_{01} and H_{03} are rejected. And alternative hypotheses are accepted. In Tab. 5 and Fig. 4 it was confirmed that the base erosion and profit shifting cause corporate tax revenue loss in the Czech Republic in the observed period. Also it was confirmed that different data sources may influence final results significantly.

3. Discussion

At the very beginning, it is very important to focus on the corporate income tax efficiency rate which is depicted by Figs. 2 and 3. Between 2013 and 2015 the Czech Republic is approaching the EU average. Germany and Poland have one of the lowest efficiency rate, which may be caused by base erosion and profit shifting. Corporate tax gap estimation studies concerning the Czech Republic have a very broad range related to the estimated amount. The estimated amount is located between CZK 57 billion loss and CZK 12.5 billion gain. Author shave observed that the corporate tax revenue loss is approximately CZK 9.404 billion in 2013. These findings are close to UNCTAD (2015) extrapolation for the Czech Republic whose estimation is also CZK 12 billion. IMF (2014) extrapolation estimates the corporate tax gap of 8 billion CZK. Jansky and Cobham (2017) estimate on the IMF (2015) basis, approximately CZK 7 billion. It is the similar methodology that has been used in this paper. The result depends on the input database. For instance, the difference that is shown in the Fig. 1. EPRS (2015) uses for its estimation Eurostat as a database of actual corporate tax revenue. EPRS (2015) study resulted in CZK 12.5 billion gain of corporate tax revenue for the Czech Republic in 2013 due to the profit shifting. On the other hand, authors have changed the Eurostat database to the

official data of General Financial Directorate on this study. Subsequently, CZK 9.404 billion loss of corporate tax revenue in 2013 for the Czech Republic has been calculated.

Glopolis (2016) brings another point of view. According to its estimation, the Czech Republic can lose up to CZK 57 billion corporate tax revenue caused by base erosion and profit shifting. This figure is obtained from the EPRS (2015) estimation for entire sample i.e. EU 28. The tax loss for entire EU is estimated in amount of EUR 160-190 billion. The amount of CZK 57 billion is calculated from the ration of the Czech Republic's contributions to EU Gross Domestic Product. The authors consider that this is a relatively high number and very rough estimation. From the authors' point of view, the amount of corporate tax revenue that Czech Republic loses is generally between 0 and 20 billion CZK.

There can be another approach. Rohan and Moravec (2017) dealt with the tax information exchange impact on the number of companies relocated and on the amount of foreign direct investments shifted. The profit shifting or the tax avoidance is being widely influenced by agreed instruments on exchange of information. There can be two kinds of taxpayers' reactions.

The first reaction confirms that some companies are interested in anonymity. Rohan and Moravec's (2017) study indicates taxpayers' companies relocation from jurisdictions that are covered by measures of information exchange to the jurisdictions that are not covered by the mechanism of information exchange. These shifted taxpayers may prefer anonymity to tax benefits as they do carry out direct investments into the non-contractual jurisdictions to keep the anonymity and they decided to bear the vindicatory 35% withholding tax, applied in the Czech Republic for example (see Section 36 subsection 1 letter c) of the Act No. 586/1992 Coll., as amended).

The second detected reaction of taxpayers shows, on the other side, an increase of foreign direct investments at the same moment, the agreements on exchange of information are concluded (or similar measures) with the preferential tax jurisdiction. As when such instruments are concluded the taxation of transactions is targeted by a specific provision and the tax is withheld at the level of 15% only. The Rohan and Moravec's study (2017) results show that Czech multinational companies, remaining in preferential tax jurisdictions since the anonymity was cancelled, increased the amount of their foreign direct investments, i.e. the remaining companies' owners prefer favorable tax regime instead of anonymity and use the new tax benefit while increasing the amount of direct investments.

The amount of estimated losses due to the tax haven might be considered politically motivated as well (Široký, 2005). The understanding of the offshore issue importance is highly individual from different points of view of different states (Kristofik, Istok, & Nedelova, 2017). For Germany and Poland the base erosion and profit shifting is a huge problem (e.g. Meyering & Groene, 2017; Maurer, Port, Roth, & Walker, 2017; Stolicna & Cernicka, 2017). However, the Czech Republic is one of the countries being relatively successful in corporate tax collection compared to most countries based on the current study results. Nevertheless, the Czech Republic must follow the OECD and EU and meet the requirements relating to the offshore industry elimination and apply the instruments increasing the intensity of tax information exchange to prevent the base erosion and profit shifting among states, even though the Czech Republic is particularly as a state facing the relatively high VAT gap (CASE, 2015) the issue which influenced the state budget income and seems to be an issue of higher importance from the point of view of the Czech Republic tax administration. The countries with higher political power are more or less the states facing the higher amount of losses due to the base erosion and profit shifting comparing to the countries keeping lower political power as the Czech Republic, which faces the problem of VAT gap particularly, as the studies showed. Such situation results in implementation of huge amount of instruments fighting the tax competition with relatively questionable benefits for some states as the Czech Republic.

Conclusion

This paper identifies the significant effect of base erosion and profit shifting. The research estimates the corporate tax revenue loss in 2013, 2014 and 2015. In 2013, the corporate tax revenue loss was CZK 9,404 mil. In 2014, the corporate tax revenue loss was CZK 13,081 mil., which was the highest amount in the examined period. Therefore, the null hypothesis H_{01} was rejected. Studies dealing with a similar issue have different results. For instace, EPRS

(2015) study resulted in CZK 12.5 billion gain of corporate tax revenue for the Czech Republic in 2013 due to the profit shifting. There is approximately CZK 22 billion difference. According to Glopolis (2016) study, the Czech Republic can lose up to CZK 57 billion corporate tax revenue caused by profit shifting. Glopolis used different methodology, which uses ration of the Czech Republic's contributions to EU Gross Domestic Product, compared to this paper. The results' difference could have been caused by the used methodology or different data source.

The authors are convinced that if official data of a particular EU member state instead of the Eurostat database (see the difference in Fig. 1) was used, there would be totally different results. Thus the null hypothesis H_{03} was rejected.

From Figs. 2 and 3 there could be seen that the Czech Republic is approaching EU corporate income tax efficiency average but the EU average is still slightly higher than the Czech Republic's income tax efficiency rate. Therefore the null hypothesis H_{02} was accepted. In comparison with neighboring countries, such as Poland and Germany, which have the lowest corporate income tax efficiency average within EU, the Czech Republic still has sufficient results.

From this research results it is noticeable that corporate tax revenue loss is not such a big issue as the VAT tax gap problem.

This article has been supported by the Internal Granting Agency (IGA) of the FEM CULS Prague, the project No. 20171032 – International Corporate Tax Gap Size Estimation and Profit Shifting Relevant Factors Identification.

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Abstract

ESTIMATION OF INTERNATIONAL TAX PLANNING IMPACT ON CORPORATE TAX GAP IN THE CZECH REPUBLIC

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There are many studies focusing on VAT (value added tax) tax gap but very few relevant studies that deal with the corporate income tax loss. The studies vary particularly in their methodology, databases and interpretation. In the case of the Czech Republic the studies resulted in a range between CZK 57 billion tax gap and CZK 12.5 billion corporate tax revenue gain caused by the tax planning. The main aim of the paper is to calculate the corporate income tax efficiency rate for the Czech Republic and compare it with other member states. The indicator of corporate income tax efficiency is important for the calculation of the tax revenue without profit shifting (RWS) indicator and then the subsequent corporate income tax gap estimation for 2013-2015, which is the second goal of the paper. The RWS indicator gives an overview of the Czech Republic´s amount of loses/ gains relating to the corporate tax base erosion and corporate profit shifting. In the case when the actual corporate income tax revenue takes a higher value than the revenue without profit shifting indicator the jurisdiction benefits from the profit shifting operations. The opposite situation results in tax revenue losses caused by profit shifting to other "more attractive" tax jurisdictions. Authors' study re-estimation results in approximately CZK 9.404 billion tax gap caused by base erosion and profit shifting instead of 12.5 billion CZK that shows EPRS's study for period 2013. The third aim of the paper is to deal with the difference between input data from Eurostat database and official data from General Financial Directorate.

Key Words: *Avoidance, base erosion, profit shifting, revenue, tax, tax loss.*

JEL Classification: *H21, H26, L51, K34, P52.*

DOI: *10.15240/tul/001/2019-1-011*