Tax Incentives: An Effective Mechanism to Achieve EU Harmonization?

Elisabeth Bustos-Contell *, Salvador Climent-Serrano, Gregorio Labatut-Serer

University of Valencia

* Corresponding author: salvador.climent@uv.es

Submitted: 27 August 2019, accepted: 13 February 2020, published: 19 February 2020

Abstract: For decades, European Union (EU) wide corporate tax harmonization has been sought to eradicate business relocation for tax reasons. It is hoped that this harmonization will ensure that companies pay taxes in the countries where they operate. One mechanism that countries use to achieve this harmonization is tax incentives. Yet each country establishes its own incentive structure, according to its statutory tax rate. This study analyzes the effective tax burden in the initial 15 EU member states between 2006 and 2014 to identify significant differences that prevent tax harmonization across these countries. The statutory and effective tax rates are used to evaluate the tax burden. The net tax incentives and disincentives are also considered. The analysis shows that between 2006 and 2014, these 15 member states used tax incentives to close the gaps among these countries’ tax burdens. Countries with above-average effective tax rates offered greater tax incentives than countries with below-average effective tax rates. However, though these tax policies reduced the gap in the tax burden, harmonization of the effective tax rate was not achieved during the study period.

Keywords: effective tax rate; incentives; tax burden; tax harmonization

JEL Classification: H26; H71

How to cite: Elisabeth Bustos-Contell, Salvador Climent-Serrano, Gregorio Labatut-Serer. Tax Incentives: An Effective Mechanism to Achieve EU Harmonization?. J. Bus. Account. Financ. Perspect., 2020, 2(2): 12; doi:10.35995/jbafp2020012.

© 2020 Copyright by the authors. Licensed as an open access article using a CC BY 4.0 license.

1. Introduction

In recent times, the harmonization of the corporate tax rate has troubled governments of economically developed countries. A lack of tax convergence means that companies flock to regions with favorable tax policies. This offshoring and the attendant tax avoidance harm the affected economies.
Repeated attempts to harmonize the tax burden have often proved unsuccessful. This situation has been reflected in numerous studies that provide evidence of the significant differences among the tax burdens in different countries. Studies have examined the tax burden in the US (Dyreng et al., 2017; Kim et al., 2011), Australia (Richardson and Lanis, 2007), and Asia (Suzuki, 2014). Scholars have also compared European and non-European countries (Chennells and Griffith, 1997; Jacobs and Spengel, 2000), and have conducted comparisons of 50 and 83 countries (Abbas and Klemm, 2013; Chen and Mintz, 2011, respectively). Studies of the tax burden in Europe include studies by Buijink et al. (2002), Cuenca-García et al. (2013), Devereux et al. (2008), Marques and Pinho (2014), and Overesch and Rincke (2011).

The desire of European Union member states to reduce tax avoidance has intensified in recent years. Council Directive (EU) 2016/1164 of 12 July 2016, which formalizes rules against tax avoidance practices that directly affect the functioning of the internal market, was recently approved.¹ This directive is based on the BEPS (Base Erosion and Profit Shifting Project) report, which was published by the Organization for Economic Co-operation and Development (OECD).² The BEPS report presents recommendations to eradicate tax avoidance and ensure that companies meet their tax obligations in the countries where they operate.

This novel perspective justifies the relevance of our study. We sought evidence of whether significant differences persist in effective taxation across EU member states or whether EU-wide harmonization has been achieved. To do so, we analyzed the effective tax rate (ETR) of the initial 15 EU member states (EU-15). The ETR is the most widely used indicator of tax burden (Armstrong et al., 2012; Fairfield and Jorratt De Luis, 2016; Kaplan, 1975). The primary goal of this study was to measure the intrinsic nature of the difference between the ETR and the statutory tax rate (STR). This difference arises through the tax incentives and disincentives that are implemented under the tax policy of each EU member state.

This study contributes to the literature in several ways. First, it offers a current analysis of the EU-wide convergence or divergence of the tax burden that derives from the tax policies that are applied by different EU member states. Second, it provides evidence of the non-STR tax mechanisms that might lead to this divergence. Third, the number of countries that are covered by this study (i.e., 15) is notably higher than the number of countries that are covered by the majority of prior studies that have compared the tax systems of EU member states. Therefore, this study offers a notably broader perspective of the issue.

The choice of ETR and the difference between ETR and STR in the empirical analysis is based on a meticulous review of the pertinent literature. From a methodological perspective, the choice of sample is justified to avoid biases, which might lead to errors in estimates, and to validate our findings.

Our primary findings are as follows: Countries with above-average STRs offered greater incentives than countries with below-average STRs. Certain countries with below-average STRs even imposed net disincentives. The goal was to reduce the gaps among ETRs and achieve tax harmonization.

This paper is organized as follows: Section 2 presents the theoretical framework, provides a literature review, and states the hypotheses; Section 3 details the empirical method, sample characteristics, and study variables; Section 4 discusses the results; and Section 5 presents the primary conclusions of the study.

2. Literature Review

The fundamental goal of the literature that compares the tax burden in different contexts is to determine whether different countries or regions impose varying tax burdens that may affect a company’s decision to relocate. Eminent studies include those by Buijink et al. (2002), Devereux et al. (2002), Chennells and Griffith (1997), Jacobs and Spengel (2000), and Overesch and Rincke (2011).

Chennells and Griffith (1997) compared the ETRs and STRs of 10 countries (Australia, Canada, France, Germany, Ireland, Italy, Japan, Spain, the UK, and the US) between 1985 and 1994. Their study shows that the

¹Available at: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32016L1164.
²Available at: http://www.oecd-ilibrary.org/taxation/oecd-g20-base-erosion-and-profit-shifting-project_23132612.
countries with the biggest spreads between the ETR and STR are Germany, Italy, and Spain. Jacobs and Spengel (2000) compared data on ETRs over 10 years for firms in Germany, France, Netherlands, the UK, and the US. Their findings imply that the tax burden differs by sector within the same country and by country within the same sector. The authors conclude that for the study period, UK firms faced the smallest tax burden, followed by firms in the US and the Netherlands. Firms in Germany and France faced the highest ETRs.

Devereux et al. (2002) analyzed a sample of EU and G7 firms, using data for the 1980s and 1990s. They found that STRs remained stable over this period. However, the STRs of the most profitable investments fell. This finding implies the existence of tax competition to attract profitable investment projects, particularly multinational projects. In a European setting, Overesch and Rincke (2011) studied the ETRs of 32 European countries from 1983 to 2006. They concluded that for these countries, tax competition leads to a decrease in tax rates.

Finally, Buijink et al. (2002) analyzed the tax policies of 15 EU member states from 1990 to 1996. The goal of their study was to determine the existence of significant differences in the tax burden (i.e., the ETR). The work of Buijink et al. (2002) shows that tax incentives differ significantly across countries and lead to greater variation among ETRs than among STRs.

3. Research Design

3.1. Variable Specification and Development of Hypotheses

To gather evidence of tax burden harmonization or divergence across the EU-15 member states between 2004 and 2014, we used the variables country and year. We based our analysis on the ETR and STR. We analyzed the difference in absolute terms between the ETR and the STR (DISAB). Table 1 shows the variables that we employed in this study.

| Variable name                        | Label | Description                                                                 |
|--------------------------------------|-------|-----------------------------------------------------------------------------|
| Effective tax rate                   | ETR   | Total income tax expense                                                   |
|                                      |       | Financial accounting income before tax                                     |
| Statutory tax rate                   | STR   | Percentage value of the nominal rate                                        |
|                                      |       | (provided by the European Commission)                                      |
| Absolute difference between ETR and STR | DISAB | ETR – STR                                                                  |
| Country                              | COUNTRY | European Union -15 member states                                      |
| Year                                 | YEAR  | (2006–2014)                                                                |

Table 1 Description of variables.

We used the ETR because numerous pertinent studies have employed this indicator to analyze the tax burden (Armstrong et al., 2012; Buijink et al., 2002; Chang et al., 2017; Fullerton, 1984; Kaplan, 1975; Langli and Saudagaran, 2004; Wang, 1991). The ETR is defined as total income tax expense divided by before-tax financial accounting income (Jansen and Buijink, 2000). Like numerous scholars before us (Chen et al., 2016; Gupta and Newberry, 1997), we compared the ETR with the STR. This combination of variables aligns with the recommendation of Omer et al. (1991) to use more than one measure of tax rates in empirical studies.

The variable DISAB was especially useful to calibrate non-STR tax mechanisms (Buijink et al., 2002), namely to measure the tax deductions and permanent differences between accounting income and taxable income. Table 2 shows the components of the non-STR tax mechanisms.
Incentives | Disincentives
---|---
Deductions | Positive permanent differences
Negative permanent differences

Table 2 Components of non-STR tax mechanisms.

Interpreting the sign of the ETR less the STR (DISAB) is important. A negative value of the DISAB indicates that the ETR is lower than the STR because of an incentive (i.e., deductions or negative permanent differences). A positive value of the DISAB indicates that the ETR is higher than the STR because of a disincentive (i.e., positive permanent differences). These possible values for DISAB are summarized in Table 3.

| Sign DISAB | Interpretation | Cause |
|---|---|---|
| DISAB (−) | Tax mechanisms that offer net incentives | Permanent differences (+) < Deductions + Permanent differences (−) |
| DISAB (+) | Tax mechanisms that offer net disincentives | Permanent differences (+) > Deductions + Permanent differences (−) |

Table 3 Interpretation of the sign of the DISAB.

After defining the variables and the goals of our study, we propose the following hypotheses:

**Hypothesis 1 (H1).** *The mean and median ETR is equal across all EU-15 member states.*

**Hypothesis 2 (H2).** *The mean and median of the absolute difference between ETR and STR (DISAB) is equal across all EU-15 member states.*

### 3.1.1. Sample

We drew a sample of firms that are located in the EU-15 member states. These countries have relatively similar economic characteristics. Thus, we excluded the following 13 EU member states that gained accession to the EU after 2003: Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovak Republic, and Slovenia.

After suitable filters had been applied, the number of sampled firms was 777. All firms were publicly traded companies. The firms belonged to different sectors. Like other scholars (Crabbe and Vandenbussche, 2009; Lisowsky, 2010), we excluded the financial sector from this study because of its specific characteristics.

The study period was 2006 to 2014. This was an interesting time because it spanned the period from immediately prior to the 2008 financial crisis to the start of the economic recovery.

Table 4 presents details of the sample by country and year, showing the number of observations and the percentage of the sample covered by these observations.

The sample consisted of 6249 ETR observations. These observations were gathered from the Orbis database, which is managed by Bureau van Dijk Electronic Publishing (BvD). The STRs of the EU-15 member states were gathered from the Taxation Trends Report, which was published by the European Commission.³

³http://ec.europa.eu/taxation_customs/business/economic-analysis-taxation/data-taxation_en.
| EU member state | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | Total obs. | % |
|----------------|------|------|------|------|------|------|------|------|------|------------|---|
| Germany        | 158  | 156  | 150  | 145  | 158  | 150  | 148  | 144  | 145  | 1354       | 21.7% |
| Austria        | 28   | 27   | 25   | 25   | 27   | 27   | 27   | 27   | 27   | 239        | 3.8%  |
| Belgium        | 21   | 22   | 21   | 21   | 20   | 22   | 22   | 22   | 20   | 191        | 3.1%  |
| Denmark        | 34   | 33   | 29   | 30   | 35   | 34   | 35   | 34   | 30   | 294        | 4.7%  |
| Spain          | 26   | 26   | 25   | 27   | 26   | 24   | 22   | 19   | 25   | 220        | 3.5%  |
| Finland        | 41   | 41   | 40   | 35   | 38   | 38   | 36   | 32   | 37   | 338        | 5.4%  |
| France         | 87   | 91   | 87   | 90   | 87   | 88   | 84   | 87   | 783  | 12.5%      |
| Greece         | 22   | 23   | 20   | 18   | 17   | 20   | 17   | 10   | 21   | 168        | 2.7%  |
| Netherlands    | 28   | 28   | 24   | 25   | 28   | 27   | 24   | 27   | 24   | 235        | 3.8%  |
| Ireland        | 18   | 20   | 20   | 18   | 20   | 19   | 20   | 19   | 18   | 172        | 2.8%  |
| Italy          | 18   | 18   | 17   | 14   | 19   | 16   | 14   | 14   | 14   | 146        | 2.3%  |
| Luxembourg     | 6    | 8    | 8    | 8    | 6    | 8    | 8    | 8    | 8    | 68         | 1.1%  |
| Portugal       | 3    | 3    | 3    | 3    | 3    | 3    | 2    | 2    | 3    | 26         | 0.4%  |
| UK             | 161  | 163  | 147  | 146  | 152  | 159  | 155  | 153  | 154  | 1390       | 22.2% |
| Sweden         | 70   | 70   | 66   | 66   | 72   | 64   | 70   | 75   | 625  | 10.0%      |
| Total obs.     | 721  | 729  | 685  | 663  | 710  | 704  | 685  | 664  | 688  | 6249       | 100.0%|
| %              | 11.5%| 11.7%| 11.0%| 10.6%| 11.4%| 11.3%| 11.0%| 10.6%| 11.0%| 100.0%     |

Note: Total obs.—Total number of observations.

Table 4  Number of observations by country and year.

3.1.2. Method

We first performed a descriptive analysis of the primary statistics for each variable. Next, we focused on the variables ETR and DISAB. For each of these variables, we applied parametric ANOVA to test for differences among the n means. We then applied the nonparametric Kruskal–Wallis test to test for differences among the n medians. Both tests were conducted in SPSS. If the results did not support the proposed hypotheses, to evaluate possible divergence, we conducted a robust test of differences among means of the variables for each country with respect to Germany, which we took as the reference country. The aforementioned analyses were designed to provide evidence of harmonization or divergence of the ETR and the characteristics of the divergence in terms of tax incentives or disincentives.

4. Results

4.1. Country Statutory Tax Rates

Table 5 shows the primary descriptive statistics for the country STRs between 2006 and 2014. The countries in bold had STRs that were greater than the mean for the EU-15 over this period.

The data in Table 5 reveal differences among the EU-15 member states in terms of the STR. The mean STR for the EU-15 over the period of 2006 to 2014 was 28.70%. The member states with mean STRs higher than this rate were (in descending order) France, Belgium, Italy, Germany, Spain, Luxembourg, and Portugal. The countries with mean STRs lower than the EU-15 mean were (in descending order) the UK, Sweden, Netherlands, Denmark, Finland, Austria, Greece, and Ireland, which had the lowest STR (12.5%). France had the highest STR (35.17%).
4.2. Effective Tax Rate

Table 6 shows the primary descriptive statistics for the ETR between 2006 and 2014. The countries in bold had ETRs that were greater than the mean for the EU-15 over this period.

| EU member state | Obs. | Mean   | Median | SD    | Max   | Min   |
|-----------------|------|--------|--------|-------|-------|-------|
| Austria         | 239  | 0.2338 | 0.2375 | 0.1001| 0.5914| 0.0054|
| Belgium         | 191  | 0.2306 | 0.2437 | 0.1079| 0.5543| 0.0000|
| Denmark         | 294  | 0.2860 | 0.2572 | 0.0970| 0.5848| 0.0000|
| Finland         | 338  | 0.2507 | 0.2440 | 0.0886| 0.5664| 0.0000|
| France          | 783  | 0.3039 | 0.3068 | 0.1135| 0.5850| 0.0036|
| Germany         | 1354 | 0.2865 | 0.2954 | 0.1007| 0.5906| 0.0000|
| Greece          | 168  | 0.1903 | 0.1770 | 0.0954| 0.5989| 0.0058|
| Ireland         | 172  | 0.2533 | 0.2533 | 0.1214| 0.5745| 0.0000|
| Italy           | 146  | 0.3398 | 0.3491 | 0.1135| 0.5850| 0.0379|
| Luxembourg      | 68   | 0.2596 | 0.2631 | 0.0996| 0.5966| 0.0014|
| Netherlands     | 235  | 0.2172 | 0.2294 | 0.0986| 0.5975| 0.0027|
| Portugal        | 26   | 0.2311 | 0.1248 | 0.1043| 0.4359| 0.0080|
| Spain           | 220  | 0.2385 | 0.2488 | 0.1054| 0.5469| 0.0036|
| Sweden          | 625  | 0.2556 | 0.2658 | 0.0863| 0.5855| 0.0000|
| UK              | 1390 | 0.2530 | 0.2627 | 0.0000| 0.5842| 0.0000|
| Mean (EU-15)    | 6249 | 0.2870 | 0.3000 | 0.0523| 0.3870| 0.1250|

Note: Obs.—Number of observations. * In bold the countries that are above the EU average.

The data in Table 6 show that the ETR also differed among EU-15 member states. The mean for the EU-15 over the study period was 26.31%, which was lower than the mean STR (28.70%) over the same period. This difference between the means of the STR and ETR indicates the existence of net tax incentives. Only three countries had ETRs that were greater than the mean. Italy had the highest mean ETR over the study period (33.98%), followed by France (30.39%) and Germany (26.85%). Ireland had the lowest tax burden (ETR = 19.03%).
4.2.1. ANOVA of the ETR

Table 7 presents the results of the ANOVA of the ETR.

| Method            | Degrees of freedom | Value  | Probability |
|-------------------|--------------------|--------|-------------|
| ANOVA F-test      | (14, 6315)         | 55.23249 | 0.0000      |
| Welch F-test      | (14, 846.977)      | 54.04536 | 0.0000      |
| Source of variation | D.f.             | Sum of squares | Mean of squares |
| Between           | 14                 | 9.570324  | 0.683595    |
| Within            | 6315               | 78.15871  | 0.012377    |
| Total             | 6329               | 87.72903  | 0.013861    |

Table 7 ANOVA of the ETR by country (2006–2014).

The ANOVA supports the findings of the descriptive analysis. The ANOVA yielded a value of 55.23, with a significance of 0% or, equivalently, a degree of confidence of 100%. Thus, the mean ETRs differed significantly among EU-15 member states between 2004 and 2014. Therefore, we reject the first hypothesis (H1).

4.2.2. Kruskal–Wallis Test for ETR

The results of the Kruskal–Wallis test for the ETR appear in Table 8.

| Method          | D.f. | Value  | Probability |
|-----------------|------|--------|-------------|
| Chi-square      | 14   | 617.7386 | 0.0000      |
| Kruskal–Wallis  | 14   | 768.1853 | 0.0000      |
| Van der Waerden | 14   | 741.3179 | 0.0000      |

Table 8 Kruskal–Wallis test for ETR (2006–2014).

The Kruskal–Wallis test corroborates the results of the ANOVA and descriptive analysis, with a value of 668.18 and a significance level of 0%. These results support the rejection of the first hypothesis (H1), thereby confirming the significant difference among the mean ETRs of the EU-15 member states.

4.2.3. Robust Test of Differences among Means of the ETR

The results of the ANOVA and the Kruskal–Wallis test led to the rejection of the hypothesis of equal ETRs. However, these analyses failed to identify which countries caused this divergence. Therefore, we conducted a robust test of differences for each country with respect to Germany. The aim was to determine which countries’ ETRs differed significantly.

The data in Table 9 show that all countries’ mean ETRs differed significantly from Germany’s mean ETR. The differences were highly significant. Significance was less than 1% for all countries except Luxembourg, for which significance was less than 5%. These results corroborate and complement the results that we obtained in the other analyses.
EU member state | Mean | Difference (with respect to Germany)
--- | --- | ---
Germany | 28.65% | -
Austria | 23.38% | *** −5.27%
Belgium | 23.06% | *** −5.60%
Denmark | 26.03% | *** −2.62%
Finland | 23.07% | *** −5.58%
France | 30.39% | *** 1.74%
Greece | 25.33% | *** −3.32%
Ireland | 19.03% | *** −9.62%
Italy | 33.98% | *** 5.33%
Luxembourg | 25.96% | ** −2.69%
Netherlands | 21.72% | *** −6.94%
Portugal | 23.11% | *** −5.54%
Spain | 23.85% | *** −4.80%
Sweden | 25.56% | *** −3.09%
UK | 25.30% | *** −3.35%

Note: Significance at 1%, 5%, and 10% denoted by ***, **, and *, respectively.

Table 9 Robust country pairwise comparison (with respect to Germany) of mean ETR (2004–2014).

4.3. Absolute Difference between ETR and STR (DISAB)

Table 10 shows the primary descriptive statistics for DISAB (2006–2014) by country. Countries with net tax disincentives appear in italics. Countries with net tax incentives that were above the mean for the EU-15 appear in bold. The remaining countries had net tax incentives that were below the mean for the EU-15.

EU member state | Obs. | Mean | Median | SD | Max | Min
--- | --- | --- | --- | --- | --- | ---
Austria | 239 | −0.0162 | −0.0125 | 0.1001 | 0.3414 | −0.2446
Belgium | 191 | **0.1094** | −0.0963 | 0.1079 | 0.2143 | −0.3400
Denmark | 294 | **0.0073** | 0.0022 | 0.0970 | 0.3348 | −0.2500
Finland | 338 | −0.0197 | −0.0059 | 0.0893 | 0.2214 | −0.2503
France | 783 | **0.0478** | −0.0438 | 0.0881 | 0.2508 | −0.3438
Germany | 1354 | **0.0352** | −0.0194 | 0.1036 | 0.2886 | −0.3836
Greece | 168 | **0.0083** | 0.0082 | 0.1239 | −0.2500 | −0.2500
Ireland | 172 | **0.0653** | 0.0520 | 0.0954 | 0.4739 | −0.1192
Italy | 146 | **0.0113** | 0.0234 | 0.1127 | 0.2456 | −0.2761
Luxembourg | 68 | **0.0314** | −0.0240 | 0.0992 | 0.3086 | −0.2779
Netherlands | 235 | **0.0403** | −0.0273 | 0.0988 | 0.3425 | −0.2671
Portugal | 26 | **0.0562** | −0.1702 | 0.1046 | 0.1709 | −0.2706
Spain | 220 | **0.0703** | −0.0594 | 0.1073 | 0.2469 | −0.3196
Sweden | 625 | −0.0031 | 0.0029 | 0.0874 | 0.3408 | −0.2800
UK | 1390 | −0.0138 | −0.0079 | −0.3000 | 0.3639 | −0.3000
Mean (EU-15) | 6249 | −0.0239 | −0.0137 | 0.1024 | 0.4739 | −0.3836

Note: Obs.—Number of observations. * In bold the countries that are above the EU average.

Table 10 Descriptive statistics for DISAB by country (2006–2014).

The mean DISAB was negative for 11 countries. The mean DISAB for the EU-15 was also negative. When we considered all EU-15 countries together, the mean ETR was 2.39% lower than the mean STR.
The DISAB reflects the difference between the ETR and STR. A negative DISAB value indicates that the ETR is lower than the STR and therefore denotes that the incentives are greater than the disincentives. Thus, the descriptive analysis shows that most EU-15 member states offered net tax incentives. Belgium offered the greatest incentives, with an ETR that was 11% lower than the STR. Sweden had the smallest net tax incentives, with an ETR that was only 0.31% lower than the STR.

Four countries had net disincentives. Ireland had a mean DISAB of 6.53%. Ireland, which had the lowest STR in the EU-15 (12.5%), applied tax policies that were designed to compensate for this low STR. Thus, the net disincentives meant that the ETR was 6.53% greater than the STR. Ireland’s positive DISAB was caused by permanent differences that were greater than the sum of deductible differences and deductions. Nevertheless, Ireland’s ETR (19%) was the lowest in the EU-15.

Table 11 shows the mean STR and ETR in ascending order and the mean DISAB in descending order.

| STR | DISAB | ETR | Explanations of notable observations in the ranking by STR |
|-----|-------|-----|----------------------------------------------------------|
| IE  | 0.125 | IE  | 0.065 | Ireland: Minimum ETR explained by lowest STR in the EU-15 (despite having the greatest disincentives in the EU-15) |
| EL  | 0.245 | IT  | 0.011 | Netherlands: Low ETR explained by a below-average STR coupled with above-average incentives (divergent behavior) |
| AT  | 0.250 | EL  | 0.008 | Belgium: Low ETR explained by the highest incentives in the EU-15 despite having the second highest STR in the EU-15 |
| FI  | 0.250 | DK  | 0.007 | Finland: Median DISAB |
| DK  | 0.253 | SE  | −0.003 | Portugal: Below-average ETR explained by the third highest incentives in the EU-15 despite having an above-average STR |
| NL  | 0.257 | UK  | −0.014 | AT  | 0.234 |
| SE  | 0.259 | AT  | −0.016 | Spain: Below-average ETR explained by the second highest incentives in the EU-15 despite having an above-average STR |
| UK  | 0.267 | FI  | −0.020 | UK  | 0.253 |
| PT  | 0.287 | LU  | −0.051 | EL  | 0.253 |
| LU  | 0.291 | DE  | −0.055 | SE  | 0.256 |
| ES  | 0.309 | NL  | −0.040 | LU  | 0.260 |
| DE  | 0.322 | FR  | −0.048 | DK  | 0.260 |
| IT  | 0.329 | PT  | −0.056 | DE  | 0.287 |
| BE  | 0.340 | ES  | −0.070 | FR  | 0.304 |
| FR  | 0.352 | BE  | −0.109 | IT  | 0.340 |

Note: EU-15 mean denoted by black bar; countries with ETRs below the EU-15 mean denoted by blue; countries with ETRs above the EU-15 mean denoted by purple; Austria (AT), Belgium (BE), Denmark (DK), Finland (FI), France (FR), Germany (DE), Greece (EL), Ireland (IE), Italy (IT), Luxembourg (LU), Netherlands (NL), Portugal (PT), Spain (ES), Sweden (SE), United Kingdom (UK).

According to the data in Table 11, the most common situation was the correction of STRs through tax mechanisms. Accordingly, an above-average STR was combined with above-average tax incentives. Conversely, a below-average STR was combined with scarce or below-average incentives or with disincentives. The circled figures correspond to two countries—Netherlands and Italy—that had divergent behavior that did not fit this pattern.

4.3.1. ANOVA of the DISAB

The results of the ANOVA of the country DISAB are shown in Table 12.

The ANOVA corroborates the results of the descriptive analysis of the DISAB, with a value of 34.62 and a significance of 0%. Thus, the second hypothesis (H2) of an equal mean DISAB across all EU-15 member states is rejected.
Table 12  ANOVA of DISAB by country (2006–2014).

4.3.2. Kruskal–Wallis Test of the DISAB

Table 13 presents the results of the Kruskal–Wallis test of the differences among median DISABs over the study period. The Kruskal–Wallis test corroborates the earlier results, with a value of 492.66 and a significance of 0%. Consequently, the second hypothesis (H2) of an equal median DISAB across all EU-15 member states is rejected.

Table 13  Kruskal–Wallis test for DISAB by country (2006–2014).

4.3.3. Robust Test of Differences among Means

Finally, Table 14 presents the results of the robust test of differences between each country’s mean DISAB and Germany’s mean DISAB. Countries that appear in bold had mean DISAB values that differed significantly from Germany’s mean DISAB.

| EU member state | Mean | Difference (with respect to Germany) |
|----------------|------|-------------------------------------|
| Germany        | −3.52% | - |
| Austria        | −1.62% | *** 1.90% |
| Belgium        | −10.94% | *** −7.43% |
| Denmark        | 0.73% | *** 4.25% |
| Finland        | −1.97% | *** 1.55% |
| France         | −4.78% | *** −1.26% |
| Greece         | 0.83% | *** 4.34% |
| Ireland        | 6.53% | *** 10.05% |
| Italy          | −1.13% | ** 2.39% |
| Luxembourg     | −3.14% | 0.37% |
| Netherlands    | −4.03% | -0.51% |
| Portugal       | −5.62% | −2.10% |
| Spain          | −7.03% | *** −3.51% |
| Sweden         | −0.31% | *** 3.21% |
| UK             | −1.38% | ** 2.14% |

Note: Significance at 1%, 5%, and 10% denoted by ***, **, and *, respectively.

Table 14  Robust country pairwise comparison (with respect to Germany) of mean DISAB (2006–2014).
The data in Table 14 corroborate the conclusions of the descriptive analysis. The results imply that Germany’s mean DISAB over the study period differed significantly from most countries’ mean DISAB. Significant differences were identified for 11 countries. Nine of these differences were significant at the 1% level, and two were significant at the 5% level. Only three countries had mean DISAB values that did not differ significantly from Germany’s mean DISAB. These countries were the Netherlands, Luxembourg, and Portugal.

5. Conclusions

5.1. Conclusions Regarding the ETR

The EU member states’ desire to fight tax avoidance is exemplified by the recent approval of Council Directive (EU) 2016/1164 of 12 July 2016. This directive formalizes rules against tax avoidance practices that directly affect the functioning of the internal market.

Building on prior studies, this study addressed EU-wide interest in the harmonization of the tax burden across EU member states. Our primary goal was to provide evidence regarding whether the tax policies that were applied between 2006 and 2014 focused on tax convergence to prevent companies from paying taxes in other regions. Therefore, we compared the ETR for 6249 firms from the 15 EU member states that have similar economic characteristics.

ANOVA and Kruskal–Wallis tests, together with a robust test of differences of means, revealed that each country’s mean ETR differed significantly from the ETR of the reference country, Germany, which had a mean ETR of 26.85%. Italy had the greatest tax burden, with a mean ETR of 33.98%. Ireland had the lowest tax burden, with a mean ETR of 19.03%. Consistent with studies by Abbas and Klemm (2013), Buijink et al. (2002), and Marques and Pinho (2014), our findings show a lack of tax harmonization across the EU-15 member states between 2006 and 2014.

5.2. Conclusions Regarding the Difference between the ERT and STR

We analyzed the nature of the ETR divergence that prevents EU-wide harmonization. To do so, we defined DISAB as the absolute difference between the ETR and STR. A nonzero value of DISAB is due to net incentives, namely deductions and positive or negative permanent differences. This analysis is of great interest because the structure of a country’s tax incentives depends on the tax policy. In the EU, these policies should target harmonization to avoid offshoring and tax avoidance.

We studied the DISAB by following the same procedure as that used for the study of the ETR. The results show that, with the exception of Italy, countries with an STR that was above the mean for the EU-15 (28.70%) offered higher tax incentives to compensate for high taxation.

With the exception of the Netherlands, countries with STRs that were below the EU-15 mean offered lower incentives (or, in some cases, disincentives) to compensate for low taxation. Despite having an STR of 25.75%, which was below the mean for the EU-15, the Netherlands had an ETR of 21.72% and therefore a DISAB of \(-4.03\%\). The Netherlands had the closest tax burden to that of Ireland, whose ETR was 19.03%.

Table 15 shows the mean ETR for each country with respect to the mean for the EU-15. Table 15 also indicates the size of each country’s net tax incentives.

This study provides evidence of a relationship between the size of the STR and the size of incentives over the period of 2006 to 2014. This finding reflects the efforts of the EU-15 member states to close the gap in effective tax burdens. This conclusion differs from the conclusions reached by Buijink et al. (2002), who reported that for the period of 1990 to 1996, the relationship between the STR and incentives was erratic and did not reduce the gap in the tax burden across EU member states.
| Tax policy | EU member state | Mean STR | Mean DISAB | Exception |
|------------|----------------|----------|-----------|-----------|
| Highest net incentives | France | 0.3517 | −0.0478 | |
| | Belgium | 0.3400 | −0.1094 | |
| | Italy | 0.3285 | 0.0113 | |
| | Germany | 0.3217 | −0.0352 | |
| | Spain | 0.3089 | −0.0703 | |
| | Luxembourg | 0.2911 | −0.0314 | |
| | Portugal | 0.2873 | −0.0562 | |
| Mean (EU-15) | | 0.2870 | | |
| Lowest net incentives/disincentives | UK | 0.2668 | −0.0138 | |
| | Sweden | 0.2587 | −0.0031 | |
| | Netherlands | 0.2575 | −0.0403 | |
| | Denmark | 0.2530 | 0.0073 | |
| | Finland | 0.2504 | −0.0197 | |
| | Austria | 0.2500 | −0.0162 | |
| | Greece | 0.2451 | 0.0083 | |
| | Ireland | 0.1250 | 0.0653 | |

**Table 15** Incentives and country ETR with respect to EU mean (2006–2014).

Despite our findings, we are aware than the use of incentives and disincentives as mechanisms to achieve tax harmonization is insufficient if the EU member states do not agree to align the incentives that are offered under their tax policies. If each country sets its own incentives, firms will continue to flock to countries that offer the most favorable incentives for their specific activity or investment. Therefore, in our opinion, the EU member states should consider closing the gap in the tax burden by harmonizing their STRs and their incentives. Failing this harmonization of STRs, they should align their STRs with the incentives that they offer in order to achieve a common ETR.

Accordingly, we believe that this study will be of interest for the governments of the EU member states. Our findings provide governments with additional insight to help design tax policies that contribute to harmonization and the elimination of tax havens and tax avoidance.

**References**

Abbas, A., & Klemm, A. (2013). A partial race to the bottom: Corporate tax developments in emerging and developing economies. *International Tax and Public Finance, 20*, 596–617. [CrossRef]

Armstrong, C. S., Blouin, J. L., & Larcker, D. F. (2012). The incentives for tax planning. *Journal of Accounting and Economics, 53*(1), 391–411. [CrossRef]

Buijink, W., Janssen, B., & Schols, Y. (2002). Evidence of the effect of domicile on corporate average effective tax rates in the European Union. *Journal of International Accounting, Auditing & Taxation, 11*, 115–130. [CrossRef]

Chang, C.-W., Chen, M.-C., & Chen, V. Y. S. (2017). Are corporate tax reductions real benefits under imputation systems? *European Accounting Review, 26*, 215–237. [CrossRef]

Chen, Y., Cuestas, J. C., & Regis, P. (2016). Convergence in corporate statutory tax rates in the Asian and pacific economies. *International Journal of Finance & Economics, 21*(3), 266–278. [CrossRef]

Chen, D., & Mintz, J. (2011). *New estimates of effective corporate tax rates on business investment* (Cato Institute Tax & Budget Bulletin No. 64). Retrieved June 16, 2016 from [http://ssrn.com/abstract=2231640](http://ssrn.com/abstract=2231640).
Chennells, L., & Griffith, R. (1997). *Taxing profits in a changing world*. London: Institute for Fiscal Studies.

Crabbe, K., & Vandenbussche, H. (2009). *Are your firm’s taxes set in Warsaw? Spatial tax competition in Europe* (CEPR Discussion Paper, 7159). Retrieved June 16, 2016 from https://ssrn.com/abstract=1345685.

Cuenca-García, E., Navarro-Pabsdorf, M., & Mihi-Ramírez, A. (2013). Fiscal harmonization and economic integration in the European Union. *Inzinerine Ekonomika-Engineering Economics, 24*(1), 44–51.

Devereux, M., Griffith, R., & Klemm, A. (2002). Corporate income tax reforms and international tax competition. *Economic Policy, 17*(35), 451–495. [CrossRef]

Devereux, M., Lockwood, B., & Redoano, M. (2008). Do countries compete over corporate tax rates? *Journal of Public Economics, 92*, 1210–1235. [CrossRef]

Dyreng, S., Hanlon, M., Maydew, E. L. and Thornock, J. R. (2017). Changes in corporate effective tax rates over the past twenty-five years in corporate. *Journal of Financial Economics, 124*, 441–463. [CrossRef]

Fairfield, T., & Jorratt De Luis, M. (2016). Top income shares, business profits, and effective tax rates in contemporary Chile. *Review of Income and Wealth, 62*(S1), S120–S144. [CrossRef]

Fullerton, D. (1984). Which effective tax rate? *National Tax Journal, 37*(1), 23–41.

Gupta, S., & Newberry, K. (1997). Determinants of the variability in corporate effective tax rates: Evidence from longitudinal data. *Journal of Accounting and Public Policy, 16*, 1–34. [CrossRef]

Jacobs, O. H., & Spengel, C. (2000). Measurement and development of the effective tax burden of companies. An overview and international comparison. *Intertax, 28*(10), 334–351. [CrossRef]

Kaplan, R. L. (1975). Effective corporate tax rates. *Journal of Corporate Taxation, 2*(2), 187–198.

Kim, J. B., Li, Y., & Zhang, L. (2011). Corporate tax avoidance and stock price crash risk: Firm-level analysis. *Journal of Financial Economics, 100*(3), 639–662. [CrossRef]

Langli, J. C., & Saudagaran, S. M. (2004). Taxable income differences between foreign and domestic controlled corporations in Norway. *European Accounting Review, 13*(4), 713–741. [CrossRef]

Lisowsky, P. (2010). Seeking shelter: Empirically modeling tax shelters using financial statement information. *Accounting Review, 85*(5), 1693–1720. [CrossRef]

Marques, M., & Pinho, C. (2014). Tax-Treaty Effects on Foreign Investment: Evidence from European Multinationals. *FinanzArchiv: Public Finance Analysis, 70*(4), 527–555. [CrossRef]

Omer, T. C., Molloy, K. H., & Ziebart, D. A. (1991). Measurement of effective corporate tax rates using Financial Statement Information. *Journal of American Taxation Association, 13*, 57–72.

Overesch, M., & Rincke, J. (2011). What drives corporate tax rates down? A reassessment of globalization, tax competition, and dynamic adjustment to shocks. *The Scandinavian Journal of Economics, 113*(3), 579–602. [CrossRef]

Richardson, G., & Lanis, R. (2007). Determinants of the variability in corporate effective tax rates and tax reform: Evidence from Australia. *Journal of Accounting and Public Policy, 26*(6), 689–704. [CrossRef]

Suzuki, M. (2014). Corporate effective tax rates in Asian countries. *Japan and the World Economy, 29*, 1–17. [CrossRef]

Wang, S. (1991). The relation between firm size and effective tax rates: a test of firms’ political success. *The Accounting Review, 66*(1), 158–169.