Declining Effective Tax Rates of Multinationals: The Hidden Role of Tax Base Reforms

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Abstract

While the statutory corporate income tax rate in the European Union fell by 9%, the effective tax rate of affiliates of multinational enterprises dropped by 14% between 2014 and 2022. In this paper, we argue that corporate tax policy making has shifted away from the 'cut rate - broaden base' approach. Building a novel database of tax reforms in the European Union, we document the growing trend of adopting tax base narrowing measures especially in the form of investment and R&D incentives, or tax relief for intellectual property income. Combining this with the financial accounts of more than 260,000 affiliates, we find indication that tax-base narrowing reforms have had a substantial negative impact on ETRs which was only to a small extend compensated by base-broadening reforms. Taken together, tax base reforms account for 36% of the reduction in effective tax rates, compared to 9% attributable to changes in statutory tax rates. Finally, we explore the political determinants of adopting tax reforms and find no significant differences between right-wing, center, and left-wing governments. This suggests that common trends shape corporate tax policies in the EU.

JEL Classification: F23, H25, H26, P11

Keywords: Effective Tax Rates, Multinational Corporations, Corporate Income Tax, Tax Reform, Political Orientation, European Union, Tax Competition

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1 Introduction

Profit shifting by multinational enterprises (MNEs) has attracted increased interest by the media, policy makers and researchers over the last decade. Recent estimates suggest that MNEs shift about 37% of their foreign profits to tax havens globally and that this share has more than doubled since the early 1990s (Wier and Zucman, 2023). This has motivated unprecedented international cooperation in the field of corporate taxation: the reforms implemented under the OECD's Anti-BEPS initiative, the global minimum tax or reforms enforced by the EU Code of Conduct group were built around the emerging consensus that opportunities for MNEs to shift profits to low-tax countries should be reduced. No consensus was reached, however, to generally limit international tax competition over real economic activity despite its likely detrimental impact on global corporate tax revenue collection. Research by García-Bernardo et al. (2022) suggests, for example, that only about 5% of the decline of effective tax rates paid by MNEs in the EU between 2005 and 2015 can be explained by profit shifting. 39%, in contrast, can be explained by EU member states cutting statutory tax rates and about 29% by adopting tax-base narrowing measures.

we argue that corporate tax policy making in the EU has shifted away from the 'cut rate - broaden base' approach. Instead tax-base narrowing measures have been the most frequently implemented type of reform with largely unknown consequences for corporate tax revenue collection. Building on a novel database of tax reforms adopted in the EU between 2014 and 2022, we find that while the average statutory tax rate declined only little, member states adopted more than 250 changes affecting the corporate tax base of which the majority had a base-narrowing impact. Based on a sample of more than 260,000 affiliates of MNEs in the EU, we document the continued decline of effective tax rates in the EU, starting from about 21% in 2012 and reaching 18% in 2022.As only part of this 14% decline can be explained by statutory tax rate cuts, we estimate the contribution of tax-base reforms.

We find that the net number of base-narrowing and base-broadening measures positively correlates with the change in the ETR, which implies that the ETR has declined more in countries adopting more base-narrowing than base-broadening measures between 2014 and 2022. Regressing the firm-level ETR on the cumulative numbers of base-broadening and base-narrowing reforms in each country, we find that the negative effect of base-narrowing reforms on the ETR was larger on average than the positive effect of base-broadening reforms. Simulations based on our preferred regression results suggest that all tax-base reforms taken together could explain as much as 36% of the overall decline of the EU ETR while statutory rate cuts would explain only 9%. However, the limited robustness of results to country-level clustering of standard errors and the relatively high share of unexplained variation in firm-level ETRs might point to a need for further refine the estimation strategy.

As not all countries seem to have followed the trend of cutting corporate taxes, we explore also the potential political or economic determinants of tax reforms using the Comparative Political Data Set by Armingeon et al. (2023). A pure reform count suggests that governments with left-wing political orientations have been less likely to adopt base-narrowing reforms than right-wing and center governments so that the numbers of base-narrowing and base-broadening reforms were more balanced on average. However, the probabilities of adopting base-broadening and base-narrowing reforms do not differ significantly by political orientation when estimating a formal logit model. Other macroeconomic control variables such as GDP growth or public debt do not seem to play a role either, except for the current account balance which correlates positively with the probability of adopting base-broadening measures.

Our research speaks to different strands of the economic literature around corporate taxation. First, we build on a growing literature on backward-looking corporate effective tax rates which complements analyses based on statutory corporate tax rates and forward-looking effective tax rates.

While the latter are model-based and incorporate some tax features that affect the corporate tax base, such as capital allowances or R&D incentives (Spengel et al., 2014; González Cabral et al., 2023), backward-looking effective tax rates simply calculate the ratio of taxes paid to financial profits. Despite limitations relating to the conceptual differences in financial and tax accounting (Hanlon and Maydew, 2009), ETRs based on financial accounting profits are more and more widely used as a proxy for the effective tax burden of companies (Bachas et al., 2023) and in particular of MNEs (García-Bernardo et al., 2023; Janský, 2023; Hugger et al., 2023). The general downward trend in effective corporate tax rates has been well established, e.g. by Dyreng et al. (2017) for the United States between 1988 and 2012, by Fuest et al. (2022) for the OECD between 1995–2016, and by García-Bernardo et al. (2022) for the EU between 2005 and 2015. In response to García-Bernardo et al. (2022), we show that this trend continues also between 2014 and 2022 even though the decline of statutory tax rates has slowed down in the EU and relate this development to the tax-base narrowing reforms implemented across countries. In contrast to García-Bernardo et al. (2022) who identify the effect of base-narrowing measures only as the unexplained residual, we explore the direct relationship of tax-base reforms and declining ETRs of affiliates of MNEs.

Second, our research also relates to the tax competition literature. The decline of corporate tax rates is frequently explained by international tax competition, where governments set tax rates in a non-cooperative way to attract mobile tax bases (Wilson and Wildasin, 2004). The continued decline of affiliates' ETRs in the EU and the high number of tax-base narrowing reforms adopted by member states over the last decade support the view of Hebous (2021) that international reforms aimed at reducing "harmful" tax competition have not decreased the general intensity of tax competition. Exploring the potential drivers of tax reforms, our finding that governments of all political orientations have cut corporate taxes would be in line with tax policies being shaped by international tax competition rather than political preferences. However, Leibrecht and Hochgatterer (2010) point out that empirical approaches often cannot effectively isolate the effect of tax competition from other general trends such as common intellectual trends promoted by an international public finance literature, or changes in the political climate such as the weakening of egalitarian values in Western societies. Indeed, our findings would also be consistent with common intellectual trends across political parties or the hypothesis that corporate tax policy is an issue of low political salience negotiated in the arena of "quiet politics" (Culpepper, 2010). This would imply that corporate taxation does not feature high in election debates but tends to be negotiated in the field of state-business interaction as described by Bohle and Regan (2021).[1]

Overall, our findings are still preliminary. They suggest that the contribution of foreign affiliates to EU-wide tax revenue collection has been weakened continuously over the last decade. While coordinated attempts to fix the international system of corporate taxation have focused on limiting the scope for profit shifting by MNEs, governments across the EU and across political parties have contributed to lowering the taxes effectively paid by affiliates of MNEs. More openness towards corporate tax harmonisation beyond the implementation of anti-avoidance measures might be needed to counteract this trend.

The rest of the paper proceeds as follows: In Section 2, we describe the datasets and the conceptual framework of our analysis. Section 3 presents evidence on declining effective tax rates of MNE affiliates in the EU and by country, and also documents the rise of tax base narrowing measures. We then analyze the effect of tax reforms on effective tax rates in Section 4 and explore whether different political orientations of governments might explain the divergent reform trends between countries in Section 5. Section 6 concludes. Additional tables and figures are available in Appendix.

[1] They develop this hypothesis for the cases of Ireland and Hungary which have pursued FDI-led growth regimes including on business-friendly corporate tax policies regardless of the political party in power.

2 Data Sources and Conceptual Framework

For each data source, we describe the construction process, define the key variables of interest, and discuss the representativeness of our sample and the limitations of our methodology. First, we build a novel database documenting tax base reforms along with their objectives. Then, we construct our sample of affiliates and compute their effective tax rates. Finally, we identify the political orientation of governments and collect additional variables of interest including macroeconomic indicators.

2.1 Corporate Income Tax Reforms

Collection of Tax Reforms We use the annual *Taxation Trends Reports* published by the European Commission to gather information on all corporate tax base reforms from 2014 to 2022. For each country, the reports include a list of the corporate income tax reforms that occurred during the previous year. They include brief descriptions of each measure, the enforcement date, and a classification indicating whether the reforms have a positive or negative impact on the tax rate or tax base of corporations. The reports are made publicly available by the European Commission and represent a valuable resource for researchers and policy-makers. However, they suffer from some short-comings. Notably, there are inconsistencies in classification over time, inclusion of reforms beyond corporate income taxation, and sometimes very short or inaccurate descriptions of the reforms so that in several cases additional investigation is required.

We build our tax reforms database as follows. First, we identify reforms that could impact the tax base of multinational affiliates, leaving aside those that are specific to certain sectors or regions or that we deem negligible[2]. Then, we define as "base broadening" reforms the reforms that broaden the tax base of corporations and should thus increase the effective tax rate, as opposed to "base narrowing" reforms that should narrow the tax base and decrease the effective tax rate. Finally, we classify the tax base reforms into nine distinct categories. Our categorization relies on the description of each measure provided by the *Taxation Trends Reports*, information from the websites of consulting firms such as PwC and Deloitte, publications in official journals, newspaper articles, and supplementary online research. Table 7 in Appendix presents our categorization, together with a short description and a concrete example for each category from our new database.

Discussion The new tax base reforms database is the first to provide a comprehensive overview of tax base reforms implemented in the European Union from 2014 to 2022. However, one caveat of this new database is its inability to differentiate reforms based on their potential impact on effective tax rates. Unlike statutory tax rate reforms, whose intensity can be directly measured as a percent change, the effects of tax base reforms are challenging to quantify using a common measure. For example, one reform may only add a few items to the list of deductible R&D expenses, while another may substantially increase the tax credit from 50% to 200% of deductible expenses. Despite their markedly different impacts on effective tax rates, both are recorded as one reform measure in our database. Consequently, in our regression analysis, these reforms are assigned equal weights, even though they are expected to have varying effects. This is a clear disadvantage compared to a detailed modelling of individual measures as done by Devereux et al. (2002) for capital allowances, by Evers et al. (2015) for intellectual property regimes or by González Cabral et al. (2023) for R&D incentives. The advantage of our very coarse approach is however, that we capture changes in all measures at the same time and that we can include also national peculiarities such as changes in the deductibility of municipal taxes in Italy or changes in tax bracket thresholds in the Netherlands.

[2]For example, we have dropped changing rules for advance tax payments, tax incentives targeting very specific expenses, e.g. for the use of hybrid or electrical vehicles or for sports promotion and a limit on the deduction of corporate gifts for customers

2.2 Affiliates of Multinational Corporations and Effective Tax Rates

Financial Accounts of Affiliates We use the Orbis database to collect the financial accounts of affiliates located in the European Union over the period 2014-2022.[3] These financial accounts contain disaggregated information on affiliates' operating revenues, operating profits (EBIT), profits before taxes, tangible assets, number of employees, and corporate income taxes. We define each variable hereafter. Operating revenues are the sum of net sales, other operating revenues, and stock variations, net of VAT. Operating profits correspond to common definition of earnings before interest and taxes (EBIT), and are equal to the operating revenues minus the cost of goods sold and other operating expenses. Profits before taxes are the sum of operating profits and the financial profits that result from all financial activities of the affiliate. Tangible assets include all tangible assets such as buildings, land, machinery, furnishings, etc. The number of employees refers to the total number of employees included in the payroll of the company. Finally, corporate income taxes include all corporate taxes paid, accrued, or deferred, during the accounting period.

Selection Steps In Table 1, we present the selection steps to create the final sample of affiliates. We start from the universe of active affiliates in the European Union recorded in Orbis. Because we focus on private companies, we remove public authorities. In step 3, we select ultimate owners with at least two affiliates located in different Member States. This step ensures that we do not include purely domestic groups. We do however include domestic affiliates of domestic *multinational* groups. The next step is a key step in our analysis. In Orbis, MNEs report either consolidated accounts at the group level or unconsolidated accounts for each affiliate. The aim of this study is to investigate the impact of national tax base reforms on the effective tax rates of MNEs. Consequently, we opt to utilize unconsolidated accounts, as consolidated accounts encompass the dynamics of multiple countries, which would confound our investigation. In the final paragraph of this subsection, we discuss the representativeness concerns arising from this particular selection step.

Table 1: Selection of Affiliates

	Selection Steps	No. Affiliates
In Orbis		
1	Select active affiliates in the EU	14,267,810
2	Drop public authorities	13,441,624
3	Select ultimate owners with $\geq$ 2 affiliates in 2 $\neq$ EU countries	890,061
4	Select affiliates with unconsolidated accounts	438,923
Computing Effective Tax Rates		
5	Drop affiliates in non-relevant industries*	388,182
6	Select affiliates with $>$ 0 profits and $\geq$ 0 taxes	317,306
7	Select affiliates with ETR $\leq$ 100%	315,496
8	Select affiliates with $\geq$ 2 observations	264,819

[3] Orbis is a commercial product from the Bureau van Dijk company with information on more than 450 million companies.

Notes: This table presents the selection steps to create the final sample of affiliates. Affiliate definition: a company is identified as an affiliate if it has a shareholder with over 50% ownership, disregarding aggregated unnamed private shareholders and the public for listed companies. Ultimate owner definition: the ultimate owner is defined as the shareholder that ultimately owns over 50% of the affiliate, either directly or indirectly, and that is itself not majority owned by another shareholder. Non-relevant industries: financial and insurance companies, public administrations and defence, compulsory social security, household activities, extraterritorial organizations. Source: data downloaded on June 20, 2024 from the Bureau van Dijk website.

Computation of Effective Tax Rates Following the common practices in the literature, we apply additional selection steps to compute the effective tax rates. First, we exclude the financial sector, public administration and defence, compulsory social security, household activities, and extraterritorial organizations. Then, we keep observations of affiliates reporting null or positive corporate taxes, and strictly positive profits before taxes. This selection step allows us to include profit-making affiliates paying zero corporate taxes. Then, we compute the effective tax rate of an affiliate i in year t as the ratio between its corporate income taxes (CIT_{it}) and its profits before taxes (Π_{it}):

$$ETR_{it} = \frac{CIT_{it}}{\Pi_{it}} \tag{1}$$

With this measure of effective tax rate, we aim to capture taxes paid as a ratio of all profits booked in the affiliate. Consistent with the approach of Bachas et al. (2023) and Janský (2023), our aim is to compute an effective tax rate wherein the disparity with the statutory tax rate mirrors the impact of tax deductions and provisions that diminish the tax base of the affiliate. Second, we follow García-Bernardo et al. (2023) and we drop outlier observations with effective tax rates higher than 100%. We exclude affiliates that appear only once in our sample. For robustness, we also use a balanced sample of affiliates that appear every year from 2014 to 2022 in the regression analysis.

In the rest of the paper, we present our main country-level results using unweighted effective tax rates. Unweighted effective tax rates offer insight into the typical affiliate's tax payments relative to its profits, they measure the effective tax burden of the average affiliate in the country. We compute this unweighted effective tax rate at the country level (ETR_{ct}) as the simple average of the effective tax rates of affiliates i in year t in country c:

$$ETR_{ct} = \frac{1}{n}\sum_{i=1}^{n}\frac{CIT_{it}}{\Pi_{it}} \tag{2}$$

Similarly, our results at the EU level are calculated as a simple average of the effective tax rates in the 27 Member States. We assign equal weight to each country to ensure that the trends in effective tax rates of smaller economies are not overlooked. These smaller economies can be low-tax jurisdictions and significantly influence the tax competition dynamics within the European Union. In addition, we avoid assigning higher or lower weight to countries over or underrepresented in Orbis. For robustness, we provide three alternative measures of the trend in effective tax rates in the European Union in the Appendix (Figure 10). The first alternative measure is the average effective tax rate of all affiliates in the sample, which is also used for the regression analysis. In the second alternative measure, profits before taxes are replaced by earnings before interest and taxes (EBIT). Finally, in the third measure, countries are weighted by their GDP.

Summary Statistics Our final sample is an unbalanced panel of 264,819 affiliates, representing 1,457,781 observations over the period from 2014 to 2022. In Table 5 in the Appendix, we present the number of affiliates and observations by country, along with the average duration an affiliate remains in the sample. Notably, the number of affiliates per country exhibits considerable variation, ranging from 532 in Cyprus to 40,346 in France. On average, an affiliate remains in our sample

for 5.5 out of 8 years, though this duration fluctuates from 3.2 years in Cyprus to 6.5 years in Hungary.

In Table 6, we report summary statistics of the average affiliate by country for the year 2022. We observe large variations in the average revenues, profits, tangible assets, employees, and effective tax rates of affiliates across countries. Affiliates in the Netherlands, Luxembourg, and Ireland report the highest average revenues, with € 378 million, € 257 million, and € 246 million, respectively. Conversely, affiliates in Latvia and Slovakia report the lowest revenues at € 15 million both. The highest average profits are recorded in Ireland (€ 45 million), the Netherlands (€ 29 million), and Luxembourg (€ 19 million). Ireland is also by far the first country in terms of tangible assets (€ 480 million), followed by the Netherlands (€ 260 million), and Luxembourg (€ 232 million), suggesting that tangible assets tend to follow profits. In comparison, the first countries in terms of average employees are Germany (283), Austria (263), France (252), and Poland (242). 9 countries have an effective tax rate below 15%, led by Latvia (8.8%), Estonia (10.3%), Hungary (10.6%), and Bulgaria (10.8%). All countries but Italy and Belgium exhibit an effective tax rate below 25%.

Discussion With this sample, we do not claim to be able to reconstruct consolidated financial accounts at the group level. As presented in Tørsløv et al. (2023), a large part of the profits of multinational corporations are not recorded at the unconsolidated level in the Orbis database. However, we argue that the use of affiliate financial accounts is crucial to identify the role played by each country in the dynamics of international tax competition and to document how national tax reforms influence the taxes paid by MNEs through their effect on affiliate-level ETRs.

Conducting the analysis at the affiliate-level rather than at the macro-level also allows us to control for affiliate characteristics such as size or industry when estimating the correlation between effective tax rates and tax reforms.

2.3 Political Orientation and Additional Variables

Political Orientation In Section 5, we conduct a political analysis of tax reforms using the *Comparative Political Data Set* by Armingeon et al. (2023). This dataset provides political and institutional variables at the country level over time. Specifically, it includes a variable synthesizing the political orientation of governments. The variable is based on the share of cabinet posts held by left-wing parties, weighted by the number of days spend in office during a given year. The variable originally included five categories reflecting the hegemony, dominance, or balance of power among right-wing, center, and left-wing parties. However, to simplify the analysis, we streamline these categories into three broad classifications. The simplified categorization is as follows: a government is labeled right-wing if less than one-third of cabinet posts are occupied by left-wing parties, center if the share falls between one-third and two-thirds, and left-wing if more than two-thirds of cabinet posts are held by left-wing parties. This allocation rule is summarized as follows:

$$\text{Political orientation} = \begin{cases} \text{Right-wing}, & \text{if } S_{left} \leq 33.33\% \\ \text{Center}, & \text{if } 33.33 < S_{left} < 66.67\% \\ \text{Left-wing}, & \text{if } S_{left} \geq 66.67\% \end{cases} \tag{3}$$

Figure 9 in Appendix illustrates the evolution of governments' political orientation from 2014 to 2021. The overall trend in the European Union shows an increase in the number of right-wing governments, rising from 11 in 2014 to 17 in 2021. Meanwhile, center and left-wing parties have seen their presence decrease, with both dropping from 8 to 5 governments during the same period.

Macroeconomic Variables To complement our analysis, we incorporate various time-varying country variables. Specifically, we obtain the top statutory corporate income tax rates from *Eu-*

rostat. Using this variable, we identify a tax rate reform every time the statutory tax rate undergoes changes from one year to the next. Finally, we use several political and macroeconomic variables included in the *Comparative Political Data Set*. In particular, we select: a dummy equal to one if the government ideological composition changed from last to present year; trade openness, measured as the sum of imports and exports as a percentage of GDP; GDP growth, public debt, and public deficit.

3 Effective Tax Rates and Base Erosion by Governments

3.1 Trends in Effective Tax Rates

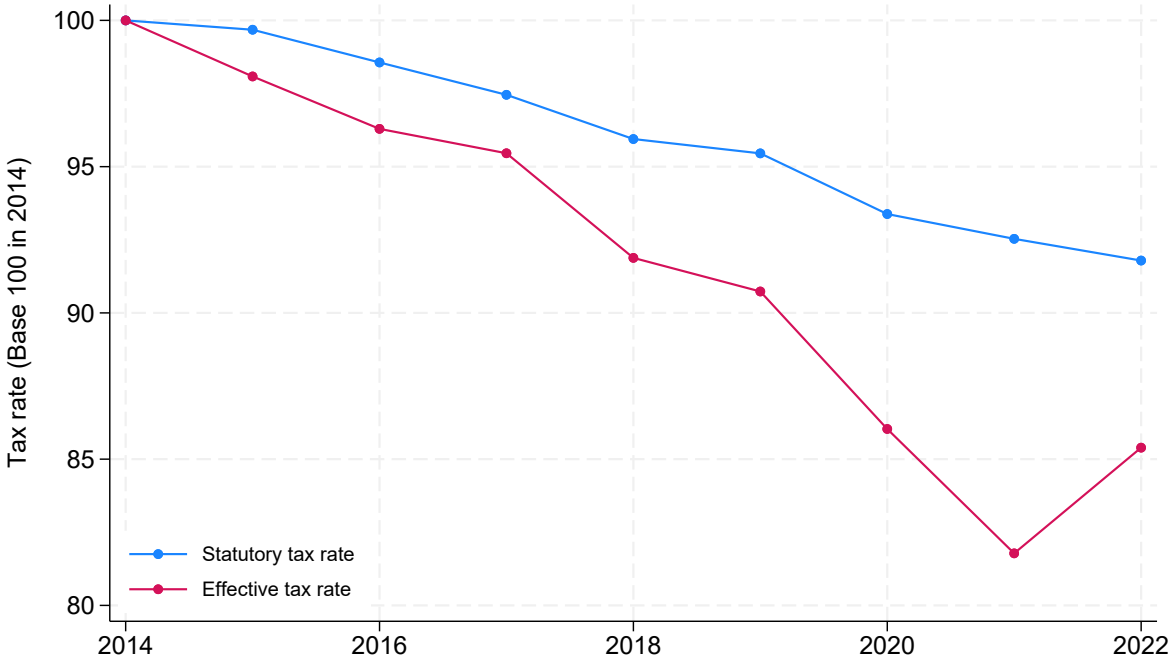
Declining Tax Rates The first stylized fact revealed by our analysis is that the effective tax rate paid by affiliates of MNEs in the European Union is on a significant downward trend. Figure 1 depicts the trend in tax rates of affiliates in the European Union. Between 2014 and 2022, the effective tax rate dropped by 14%. In absolute terms, it went from 21% in 2014 to 18% in 2022, marking a 3 percentage point reduction over eight years, which is equivalent to a 0.33 percentage point decline annually.[4]

Figure 1 also reveals that the average statutory tax rate across Member States follows a similar, though less pronounced, downward trend as the effective tax rate. During the same period, the statutory tax rate fell by 9%. It went from 23% in 2014 to 21% in 2022, representing a 0.25 percentage point reduction every year. The average statutory corporate tax rate in the EU has reached its lowest level since the signature of the Maastricht treaty in 1992.

The effective tax rate on profits booked by multinational corporations in the European Union has fallen at a faster rate than the average statutory tax rate. Therefore, the fall in statutory tax rate is not sufficient to explain the fall of the effective tax rate. Instead, the gap between the two measures has widened, from 2 percentage points in 2014 to 3 in 2022, with a maximum recorded at 3.6 in 2021. The fact that the effective tax rate fell more than the statutory tax rate suggests that countries have adopted narrower definitions of corporate tax bases.

[4]For robustness, we compute three alternative measures of effective tax rates in the European Union. The trends for these alternative measures are depicted in Figure 10 in Appendix.

Figure 1: Trends in Tax Rates of Affiliates in the European Union



Notes: This figure presents the evolution of corporate income tax rates in the European Union from 2014 to 2022. The blue curve is the average statutory tax rate, while the red curve is the average effective tax rate. Both are normalized to 100 in 2014. More information on the computation of effective tax rates in Section 2.

The Rate Gap is Widening in most Member States An analysis at the country level reveals that almost all Member States contribute to the downward trend in effective tax rates. Figure 2 shows the percentage change in effective and statutory tax rates by country between 2014 and 2022. 22 countries experienced a drop in the effective tax rate, out of which 13 have seen their effective tax rate declining by more than 10%, 7 by more than 15%. Among the five countries that experienced an increase, Bulgaria had the largest increase with 19.6%, while the effective tax rate in the other four declined by less than 3%.

Regarding statutory tax rates, 11 countries reduced their rates, 8 of them by more than 10%. The largest drop was in Hungary, which halved its rate over the period (20.6% to 10.8%), followed by France, which cut its statutory rate from 38% to 25.8%, a 32% decline. Interestingly, 12 countries did not change their statutory rates between 2014 and 2022. Among the four countries that increased their rates, Germany made a minor adjustment (0.3%), the Netherlands increased it by 3.2%, Slovenia raised it by 11.8%, and Latvia saw the highest increase by 33%.[5]

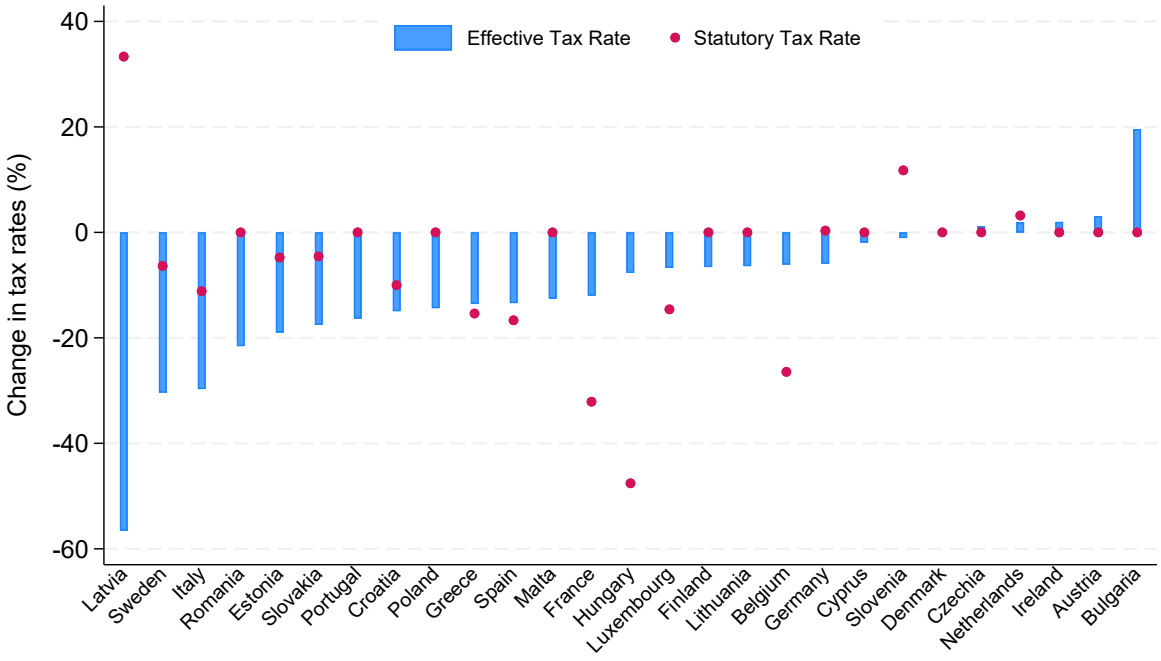
Figure 2 shows that affiliates of multinational corporations experienced a decrease in both effective and statutory rates in most Member States. However, it also discloses that these two measures do not always move in the same direction within a country. Fourteen countries have seen their effective tax rate decrease more than their statutory rate, widening the rate gap.[6] It is thus likely that these countries have narrowed their tax base definitions through base-narrowing reforms during the period.

[5]Latvia is a special case to the extent that it adopted a dual tax system in 2018, deciding to tax undistributed profits at 0%, while taxing distributed profits at 20%. Since *Eurostat* reports only the top statutory tax rate, the statutory rate appears to have increased. However, in practice, a significant portion of profits are no longer taxed, explaining the significant drop in the effective tax rate.

[6]This group includes Latvia and Slovenia, where the effective tax rate decreased despite an increase in the statutory rate.

This group is driving the diverging trend of ETR ans statutory rate at the European Union presented in Figure 1. The second group consists of seven countries where the decrease in the statutory rate was larger than that in the effective rate.[7] Finally, a third group of six countries, including the low-tax jurisdictions of Ireland, the Netherlands, and Cyprus, did not exhibit significant changes in either effective or statutory rates.[8]

Figure 2: Change in Tax Rates of Affiliates between 2014 and 2022



Notes: This figure presents the percent change in statutory and effective tax rates between 2014 and 2022. Due to data limitation, the period considered for Denmark is 2017-2022. More information on the computation of effective tax rates in Section 2

3.2 The rise of tax-base narrowing measures

Since 2014, EU member states have adopted a number of corporate tax reforms which can be categorized into base-broadening and base-narrowing measures. For the period 2014-2022, we observe 113 base-broadening and 140 base-narrowing reform measures (Table 2). Anti-avoidance measures were the most frequently adopted type of reform, followed by introductions or modifications of cost-based investment incentives, loss carry regimes and R&D incentives. We describe them in more detail in 6.

[7] This group includes Bulgaria, where the effective tax rate increased despite no change in the statutory rate.

[8] This does not necessarily mean they did not implement any base reforms. Several explanations are possible: these countries may be passive and not actively engage in international tax competition; they may have inconsistent tax policies over time with both base broadening and base narrowing measures; or they may already have favorable tax systems for multinational corporations as low-tax jurisdictions.

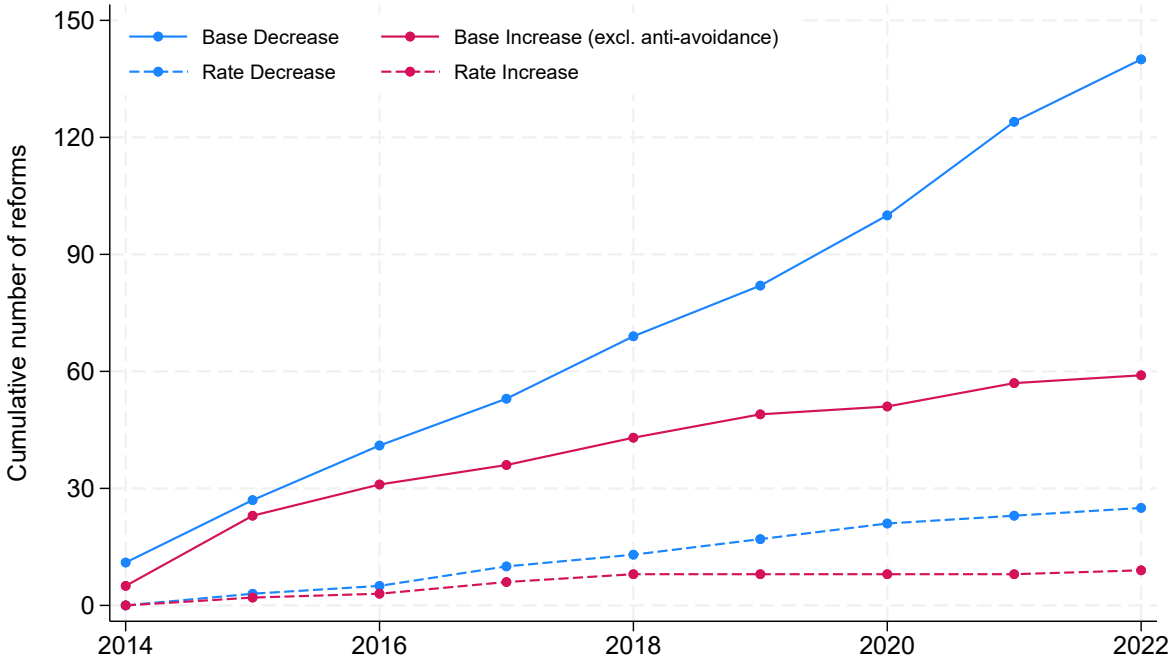
Table 2: Corporate Tax Reforms in the European Union, 2014-2022

	Increasing	Decreasing
Base Reforms	113	140
Anti-tax avoidance regulations	54	0
Cost-based investment regimes	9	37
Research and Development regimes	3	20
Intellectual Property regimes	4	11
Allowances for Corporate Equity regimes	2	6
Loss carry regimes	17	7
Taxation of capital gains and dividends	5	5
Withholding taxes on dividends, interests, and royalties	2	3
Other reforms	17	51
Statutory Rate Reforms	9	25
Total Number of Reforms	122	165

Notes: This table presents the tax reforms implemented in the European Union from 2014 to 2022 by category. The total number of reforms refer to the sum of statutory tax rate and tax base reforms. More information on the collection of tax reforms in Section 2

A pure reform count might serve as a proxy for reform activity even though it disregards the intensity of reforms. Statutory tax rate cuts have been more frequent than rate increases over the 9 sample years. For the number of tax base reforms, the picture looks more balanced at first sight. However, as nearly half of the base-broadening reforms were anti-avoidance measures which should in principle only target very tax aggressive firms, their overall effect on the effective tax rate of the average affiliate might be limited. Disregarding anti-avoidance measures, we observe an increasing gap between the cumulative number of base-broadening and base-narrowing measures implemented (Figure 3).

Figure 3: Cumulative Tax Reforms, 2014-2022



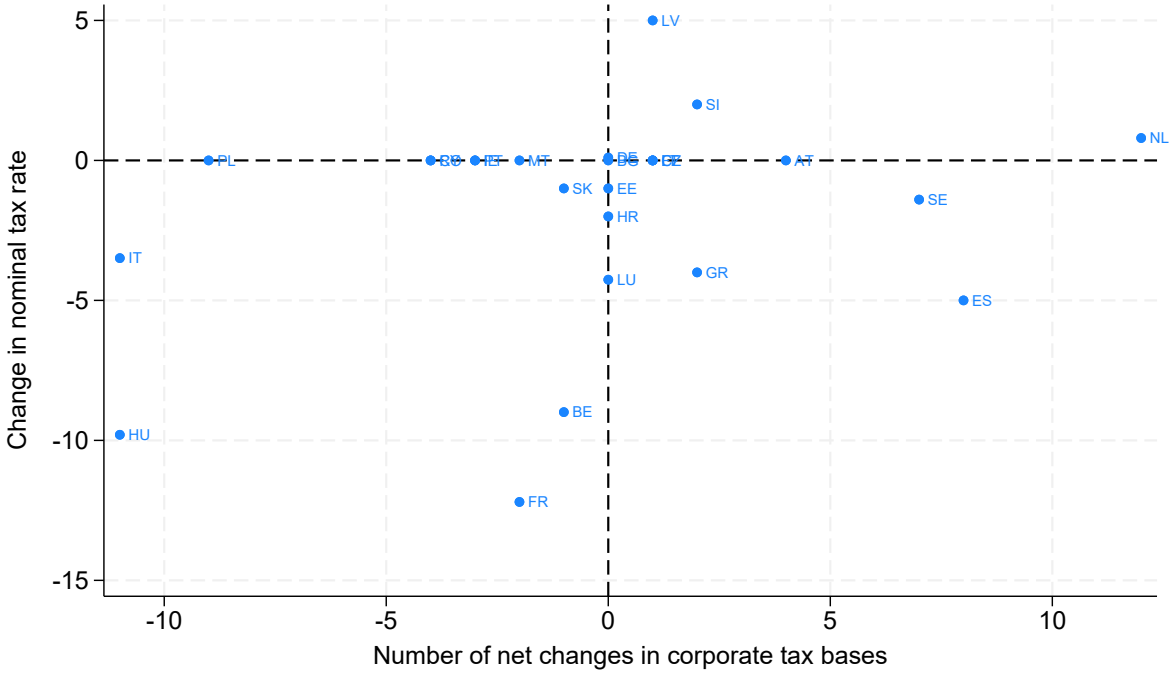
Notes: This figure presents the cumulative number of tax reforms over the period 2014-2022. The blue (red) lines represent increasing (decreasing) tax reforms. The solid lines refer to base reforms, while the dashed lines refer to rate reforms. We count a tax rate reform every time the statutory tax rate in a given year is different from the previous year. More information on the definition of tax base reforms in the Data Sources and Conceptual Framework Section

We use the net count of base-broadening and base-narrowing reforms (including anti-avoidance measures), as in Kawano and Slemrod (2016) and the direction of statutory tax rate changes to assess the general direction of tax reforms implemented in different countries (Figure 4). For the period 1980 to 2004, the authors observed that declining statutory tax rates in OECD countries had frequently been accompanied by base-broadening measures. This was in line with a typical policy recommendation of international institutions in the neoliberal era that promoted tax rate cuts in combination with tax base widening measures as efficiency-enhancing and thus growth-friendly (OECD, 2010).

Our results suggest that the 'rate cuts and base broadening' approach was rather the exception than the rule in the EU in recent years: 11 countries have cut the statutory corporate tax rate but only 3 of them adopted more base-broadening than base-narrowing measures. Instead, 5 countries combined statutory tax rate cuts with more base-narrowing than base-broadening measures. 8 countries have left their statutory rate unchanged but implemented more base-narrowing than base-broadening reforms.

Five countries have combined a stable statutory rate with a balanced number of base-broadening and narrowing reforms, or even adopted more base-broadening than base-narrowing reforms. Only 3 countries have both slightly increased the statutory rate and adopted more base-broadening reforms. However, among those, the pure reform count is probably misleading at least for Latvia as it completely exempted undistributed profit from corporate tax.

Figure 4: Change in statutory corporate tax rates and tax bases by country, 2014-2022



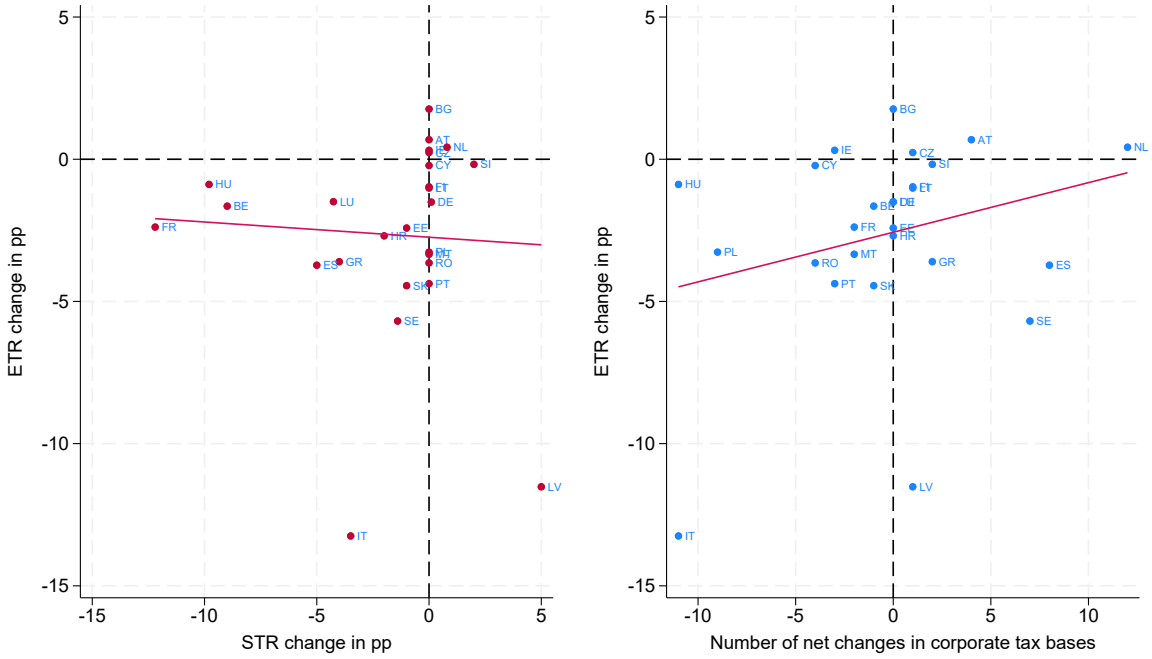
Notes: This figure plots the change in the statutory tax rate against the number of net changes in corporate tax bases. A negative number of net changes implies that the country adopted more base-narrowing than base-broadening reforms.

4 The Contribution of Reforms to the Declining Effective Tax Rate

What is the contribution of the described tax reforms to the decline of the average ETR of affiliates in the EU? While it seems clear that the declining average statutory tax rate has lowered the corporate tax burden, a relationship between the tax base reforms and the ETR is much harder to establish as we know little about the relative intensity of reforms.

Descriptive evidence suggests that all countries which have cut their statutory rate have seen the ETR of multinational affiliates decline. However, the correlation is blurred by a number of countries without tax rate changes but declining ETRs (Figure 5, Panel A). The number of net changes in corporate tax bases also seems to correlate positively with the ETR, implying that implementing more base-narrowing than base-broadening reforms more often coincides with declining ETRs (Panel B). However, also countries implementing more base-broadening than base-narrowing reforms have declining ETRs which might indicate that the base-narrowing reforms were more intensive or that other factors are at play.

Figure 5: Tax reforms and change of ETR, 2014-2022



Notes:. This figure plots the effective tax rate change in percentage points against (i) the statutory tax rate change in percentage points in Panel A; and (ii) the net number of changes in corporate tax bases in Panel B.

4.1 Regression analysis

To estimate the average contribution of tax reforms to the decline of the EU-wide average effective tax rate of affiliates of MNEs, we regress ETRs at firm-level on the statutory tax rate, the cumulative number of reforms adapted in each country and some affiliate-level and country-level control variables. In the first specification we follow Kawano and Slemrod (2016) who use the cumulative sum of net tax base changes as explanatory variable (equation 4). In our preferred specification, we use two different variables for tax-base broadening and tax-base narrowing measures to allow for a different average intensity of reforms (equation 5).

$$etr_{ict} = \beta_1 \mathbf{str}_{ct} + \beta_2 \mathbf{B}_{ct} + \Gamma \mathrm{Z}_{ct} + \Upsilon \mathrm{X}_{it} + \alpha_i + \mu_t + \epsilon_{ict} \tag{4}$$

$$etr_{ict} = \beta_1 \mathbf{str}_{ct} + \beta_2 \mathbf{B}^B_{ct} + \beta_3 \mathbf{B}^N_{ct} + \Gamma \mathrm{Z}_{ct} + \Upsilon \mathrm{X}_{it} + \alpha_i + \mu_t + \epsilon_{ict} \tag{5}$$

At the country level we include the annual GDP growth rate and the unemployment rate as control variables to account for cyclical variation in ETRs. At the affiliate-level we include log tangible assets, the number of employees, turnover and the share of the financial result in total profit before tax. We also include affiliate fixed effects to account for unobserved heterogeneity between firms and year fixed effects. In regressions (1), (2), and (4) we use heteroskedasticity robust standard errors clustered at industry level. We also apply the wild bootstrap as standard errors might be correlated at country-level and report the corresponding p-values in brackets for regression (2). In regression (3), we cluster standard errors at country-level although this does not seem ideal with only 27 clusters.

Regression (1) would suggest that an increase in the statutory tax rate by 1 percentage point is associated with an increase in the ETR by 0.1 percentage points. The positive coefficient of the net base change would suggest that if the difference between base-broadening and base-narrowing reform is positive, this correlates positively with the change in the ETR, i.e. the ETR increased by

0.35 percentage points on average when one more base-broadening than base-narrowing measure was implemented. An increase in the GDP growth rate seems to be positively associated which is consistent with the automatic stabilizer function of the corporate tax: In economic upswings, corporate profits increase while the mitigating effect of capital allowances or loss-carryovers diminishes relatively, so the relative tax burden increases. At the affiliate level, we have a limited set of control variables of which only real assets seem to play a relevant role. The negative coefficient might indicate that an increase of real assets has a dampening effect on the ETR through the increased use of capital allowances.

Regression (2) suggest that the base-narrowing reforms have on average had a more negative impact on the effective rates than the base-broadening measures contributed to increasing the effective tax rates. On average, an additional base-broadening reform is associated with a decrease of the ETR by 0.2 percentage points. Base-narrowing reforms, in contrast, are associated with a decline of the ETR by 0.4 percentage points on average. The estimated coefficients of the relevant explanatory variables do not change much if we use a balanced panel of firms (regression 4).

As pointed out by Moulton (1990), standard errors can be seriously downward biased if we estimate the effect of aggregate variables on micro units and the regression model does not account for the grouped structure of the data and thus wrongly assumes that the error terms of individual observations are independent although they might be correlated at group level. If we cluster standard errors at country level, i.e. with 27 clusters instead of 76 industry clusters, the only country-level explanatory variable which still seems to have a significant effect on the ETR are the base-narrowing measures. As it is not realistic that the statutory rate would not have any effect on the ETR, this requires further investigation.

Table 3: Effective Tax Rate Responses to Tax Base Reforms

	(1)	(2)	(3)	(4)
Statutory rate	0.097***	0.081***	0.081	0.087**
	(0.028)	(0.029)	(0.151)	(0.038)
		[0.008]		
Net base change	0.346***			
	(0.023)			
Base-broadening		0.178***	0.178	0.158***
		(0.024)	(0.193)	(0.032)
		[0.000]		
Base-narrowing		-0.425***	-0.425**	-0.435***
		(0.027)	(0.203)	(0.029)
		[0.000]		
GDP growth	0.038***	0.039***	0.039	0.046***
	(0.009)	(0.009)	(0.051)	(0.010)
		[0.000]		
Unemployment	0.030	-0.031	-0.031	-0.027
	(0.030)	(0.031)	(0.222)	(0.035)
		[0.335]		
Log Assets	-0.213*	-0.211*	-0.211	-0.788***
	(0.118)	(0.120)	(0.167)	(0.161)
		[0.080]		
Employees	0.000**	0.000**	0.000***	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
		[0.016]		
Log Revenues	0.087	0.088	0.088	0.235
	(0.107)	(0.108)	(0.178)	(0.167)
		[0.417]		
Share Fin Profits	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
		[0.389]		
Clusters	76 industries	76 industries	27 countries	76 industries
Observations	960,898	960,898	960,898	173,590
R-squared	.61	.61	.61	0.57

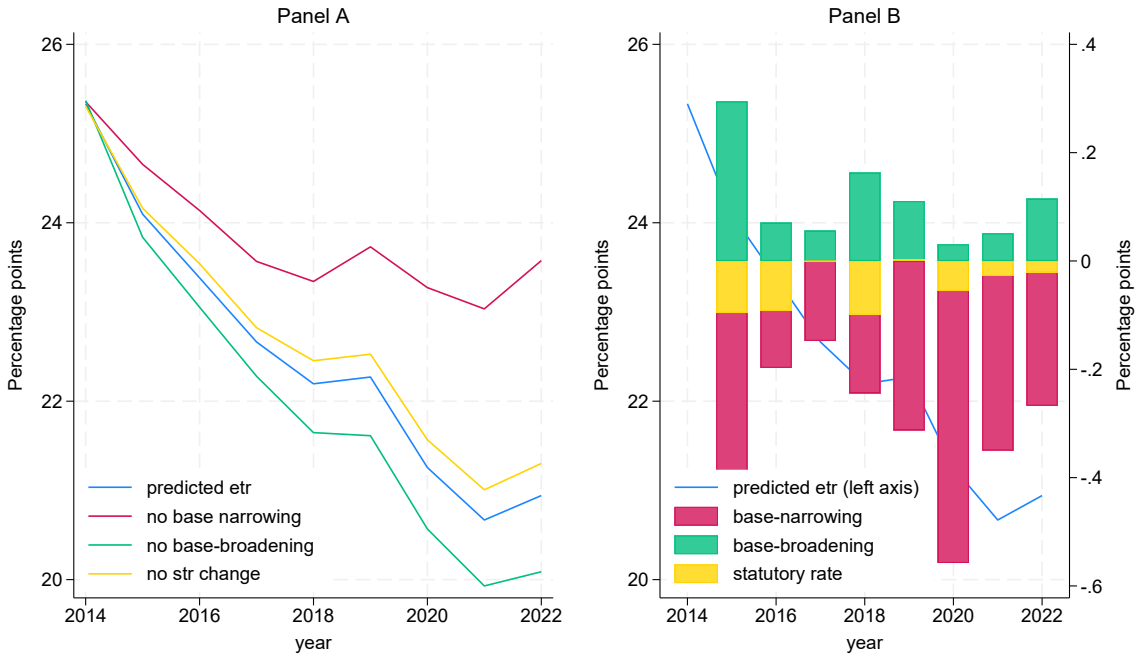
Notes: The table presents the results of OLS regressions with affiliate and year fixed effects. Heteroskedasticity robust standard errors in parentheses. The dependent variable is the effective tax rate of affiliates. Net base change is the cumulative difference of base-broadening minus base-narrowing measures. Base broadening (narrowing) is the cumulative sum of base-broadening (base-narrowing) measures. As the number of countries is below 50, we have added p-values from the wild bootstrap with bootstrap clustering by country in square brackets below the standard errors of regression (2) as an alternative to clustering standard errors at country-level. Regression (4) is based on a balanced sample for robustness.

4.2 Decomposing the Decline of ETRs

Despite the limited robustness of our regression results, we illustrate the implications of our preferred specification, by calculating the average contribution of tax rate and base changes to the overall decline of affiliates' ETRs. We use the estimated coefficients of refression (2) to predict the average change of affiliates' ETRs over the sample period. We then predict alternative ETRs keeping either the statutory rate, the base-broadening or base-narrowing measures constant at their 2014 value (Figure 6, Panel A). In this way we can simulate how the ETR would have developed if the statutory tax rate had remained constant in all countries (yellow line) and compare it to how the ETR would have developed if no additional base-broadening or base-narrowing measures had been adopted after 2014 (green and red lines).

In addition we plot the annual contribution of each factor to the decline of ETRs. As the effects are averages over the sample period the annual variation derives from the number of reform measures implemented. For example, the largest number of base-narrowing measures were implemented in 2015, 2019 and in 2020 and 2021, as part of the covid-19 packages, so the total contribution is highest in these years.

Figure 6: Contribution of rate and base reforms to the decline of EU ETR, 2014-2022



Notes:. The two figures illustrate the estimated contribution of tax reforms to the development of average ETR in the EU. Panel A plots hypothetical ETRs predicted by our regression model each time keeping one tax reform factor constant. Panel B plots the estimated annual contribution of each reform factor to the development of the average ETR. Note that the rate and base reform bars do not add up to the predicted ETR changes because of the other explanatory variables in the regression. Especially the year fixed effects seem to absorb a considerable share of the downward trend in the ETR.

Altogether, statutory tax rate cuts would explain only 9% of the average decline of affiliates' ETRs while the base-narrowing and base-broadening measures taken together would explain 36%. Our results would suggests that base-narrowing measures have reduced the effective tax burden of multinational affiliates much more than base-broadening measures have counteracted this effect. A considerable part of the ETR decline cannot be explained by our tax reform variables which might be related to the fact that we group very heterogeneous tax base reforms into cumulative reform

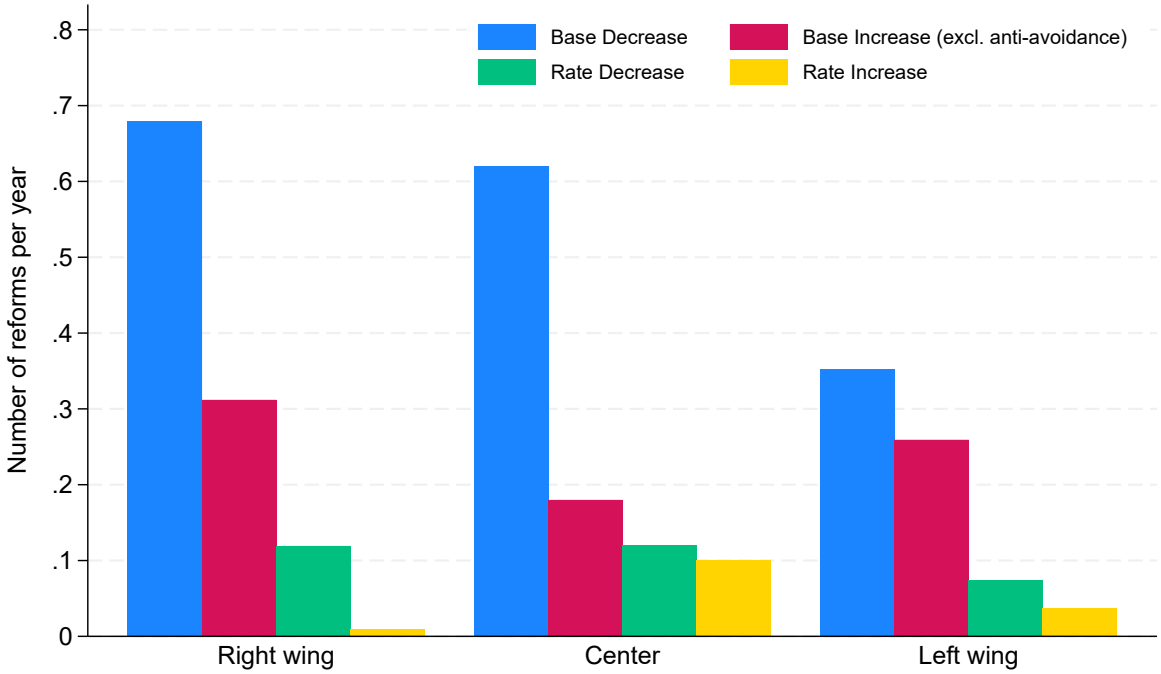
counts which are arguably a very blunt measures. Our analysis can still shed light on the role of tax base reforms which are easily overlooked in international comparisons especially when they do not have a standardized design across countries and can thus not easily be covered by model-based comparisons.

5 Corporate Tax Reforms and Political Orientation of Governments

In Section 3 we have documented the use of tax base reforms by countries, and in Section 4 we have presented some evidence that base-narrowing reforms might explain an important share of the decline of ETRs rates in the European Union. However, we also observe different reform patterns across countries. In some countries, neither statutory rates nor ETRs have declined (Figure 2 in Section 3) and a few countries have combined broadly stable or increasing statutory rates with more base-broadening than base-narrowing reforms. In this section, we would thus like to explore what political or economic factors might explain the diverging reform patterns. In particular, we examine whether right-wing, center, or left-wing governments have more frequently implemented either base-broadening or base-narrowing reforms and whether macroeconomic factors such as GDP growth, public debt or unemployment might play a role in the adoption of reform.

Stylized Fact 1: Left-wing Governments are less likely to adopt Base-Narrowing Reforms Figure 7 depicts the average number of reforms per year by right-wing, center, and left-wing governments in the European Union from 2014 to 2021. On average, right-wing and center parties have enacted 0.6 to 0.7 base-narrowing reforms annually while in office. In contrast, left-wing parties have a lower average of 0.35. Although left-wing parties implement base-narrowing reforms less frequently, they still enact more base-narrowing reforms than any other type of reform. Excluding anti-avoidance directives from the European Union and the OECD, the average number of base-broadening reforms by left-wing and right-wing parties is quite similar, at 0.26 and 0.31, respectively. Finally, rate-increasing reforms are the least common type of reforms across all political orientations, with right-wing parties implementing on average 0.009 rate increasing reforms per year in office.

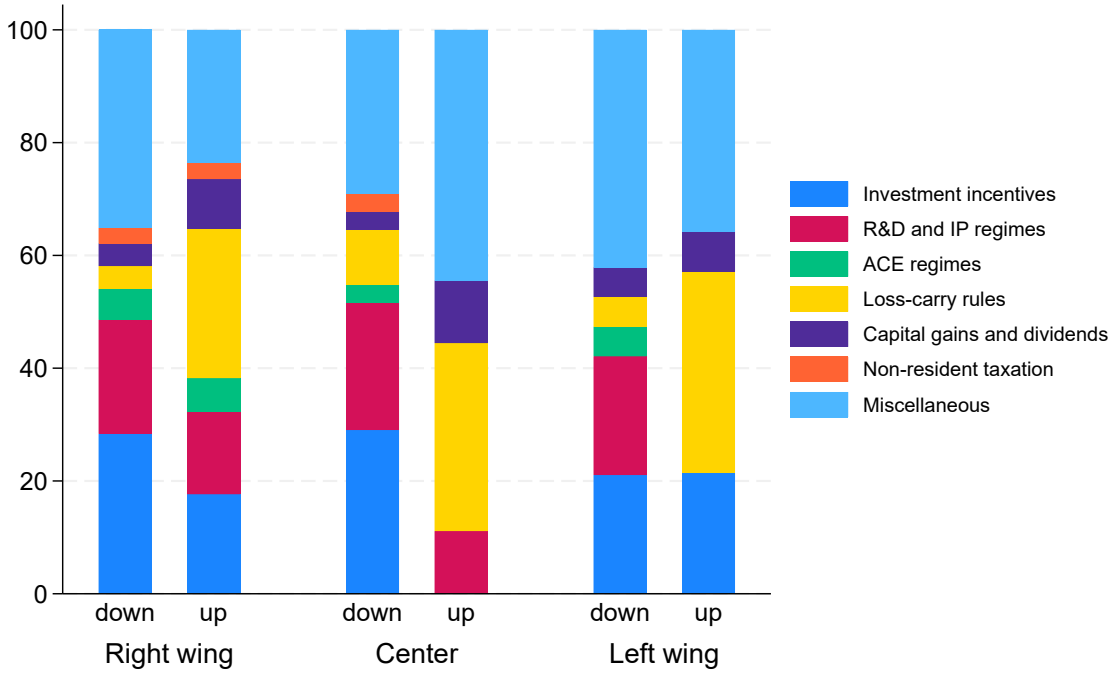
Figure 7: Tax Reforms and Political Orientation in the European Union



Notes: This figure presents the number of reforms by political orientation, divided by the number of years the respective government is in office. The reforms are split into four groups: base narrowing, base broadening, rate decreasing, and rate increasing. Base broadening reforms exclude anti-avoidance regulations enacted by the European Union and the OECD.

Stylized Fact 2: Governments of Different Political Orientations Implement Similar Types of Reforms Looking at the categories of tax base reforms implemented reveals that right-wing, center, and left-wing governments have enacted relatively similar reforms while in office. As shown in Figure 8, the distribution of reform categories among these political orientations is fairly consistent. All three political orientations have made loss-carry regimes more restrictive and thereby broadened the corporate tax base. Also, the share of miscellaneous reforms is relatively high, ranging from 25% to 45% of the total for all three political orientations. A few notable differences exist: the center has made investment incentives more generous without adopting any balancing restrictive measures in this reform category. The left has made R&D and Intellectual Property regimes more generous without any balancing base-broadening measures in this category.

Figure 8: Tax Reforms Categories and Political Orientation



Notes: This figure breaks down the categories of reforms implemented by right-wing, center, and left-wing governments in % of total. It can be read as follows: investment incentives represent 18% of the base broadening reforms implemented by right-wing governments.

Stylized Fact 3: Political and Economic Factors Have Little Explanatory Power We use a logit estimator with country fixed effects to regress the probabilities of adopting narrowing or broadening tax reforms on the political orientation of governments and a set of macroeconomic factors that could influence the corporate taxation policy, including GDP growth, public debt, public deficit, the national current account, and the unemployment rate.[9] We also include the statutory corporate income tax rate, and a dummy equal to one when a new government is in office. The results are reported in Table 4. Regressions (1) to (3) report the results for the probability of adopting base-broadening reforms, while regressions (4) to (6) refer to base-narrowing reforms. In regressions (1) and (4), the only explanatory variable is the government orientation. We add the dummy for new governments in regressions (2) and (5), and we further add the statutory tax rate and the macroeconomic variables in regressions (3) and (6). The estimated coefficients are in log odds.

In all specifications, the results suggest that there are no significant differences across political orientations in the probability of adopting tax cuts or tax increases. The estimated log odds of tax cuts are always lower when left-wing governments are in office. Transforming in odd ratios the coefficients in regression (6), the odds of tax cuts are estimated to be about 2.4 times lower under left-wing governments compared to right-wing governments. However, we cannot reject the null hypothesis that the coefficient is zero. Interestingly, regression (3) shows that new governments are 2.6 times less likely to implement tax increases, with the estimated coefficients being significant at the 5% level. Most of the estimated coefficients associated with macroeconomic variables, including those for the public deficit, are not significant. This suggests that corporate tax policy is independent of the governments' need to raise revenue. The only exception is the current account, with a positive coefficient significant at the 5% level. This would imply that a one percent increase in the current

[9] Because very few statutory rate reforms have been implemented from 2014 to 2021, we cannot run a separated analysis for statutory rate and base reforms.

account increases the odds of broadening tax reforms by almost one half (0.46%). Net exporters are more likely to implement national tax increases compared to net importers, which might worry that tax increases could further deteriorate their competitiveness.

Table 4: Political Orientation and Tax Reforms

	(1) Increase	(2) Increase	(3) Increase	(4) Decrease	(5) Decrease	(6) Decrease
Center	-0.161	-0.231	-0.293	0.589	0.553	0.609
	(0.656)	(0.691)	(0.723)	(0.626)	(0.586)	(0.674)
Left wing	0.296	0.017	-0.149	-0.842	-1.043	-0.894
	(0.589)	(0.626)	(0.773)	(0.613)	(0.644)	(0.672)
New government		-1.021**	-0.952**		-0.518	-0.538
		(0.490)	(0.478)		(0.333)	(0.386)
Statutory tax rate			-0.013			-0.264**
			(0.139)			(0.106)
GDP growth			0.014			0.038
			(0.086)			(0.042)
Public debt			-0.010			0.015
			(0.058)			(0.023)
Public deficit			0.165			-0.007
			(0.164)			(0.088)
Current Account			0.381**			0.005
			(0.160)			(0.059)
Unemployment rate			0.179			0.096
			(0.115)			(0.068)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	168	168	168	200	200	200

Notes: The table presents the estimated regression coefficients using a fixed-effects logit model. Heteroskedasticity robust standard errors are in parentheses. In regressions (1) to (3), the dependent variable is a dummy equal to one if a tax increasing reform has been implemented, while in regressions (4) to (6), it is a dummy set to one if a tax decreasing reform has been implemented. The estimated coefficients are reported in log odds.

Discussion Overall, we do not find indication that macroeconomic factors such as public finances, growth, and unemployment drive diverging reform patterns of EU countries. If anything, left-wing governments are less likely to implement tax cuts than the right and the center, but still contribute to the downward trend in statutory and effective tax rates by implementing more tax cuts than tax increases. The lack of statistical significance might be due to the relatively small panel size with only 27 countries and 8 years. Alternatively, common macro trends might have more explanatory power than country-specific factors. For example, international tax competition might influence policy makers across political parties. The shift from tax rate cuts to base-narrowing measures might also be a sign of generally changing policy trends in the post-neoliberal era, where tax incentives related to certain industrial policy objectives might become more popular (Wade, 2012). The fact that governments of different political orientations have adopted similar types of reforms might also point to the political economy literature around "quiet politics" which tries to explain the continuity in business-friendly tax policies despite changing political circumstances (Morgan and Ibsen, 2012).

6 Conclusion

In this paper, we argue that corporate tax policy making in the EU has shifted away from the 'cut rate - broaden base' approach. Instead tax-base narrowing measures have been the most frequently implemented type of reform with largely unknown consequences for corporate tax revenue collection. Building on a novel database of tax reforms adopted in the EU between 2014 and 2022, we find that while the average statutory tax rate declined declined by only 8 percent, member states adopted more than 250 changes affecting the corporate tax base of which the majority had a base-narrowing impact. Based on a sample of more than 260,000 affiliates of MNEs in the EU, we document the continued decline of effective tax rates which declined from 21% in 2014 to 18% in 2021 or by 14% on average.

We find indication that, on average, tax-base narrowing reforms were not only more frequent but also more intensive than base-broadening reforms. Simulations based on regression results suggest that tax-base reforms could explain up to 36% of the decline of ETRs while statutory tax rate changes explain about 9%. This suggests that corporate tax cuts have contributed significantly to lowering the tax burden of MNEs in the EU even if an important share of the decline of ETRs remains unexplained.

As we observe some diverging reform trends across countries, we explore also the potential political and economic determinants of tax reforms. Preliminary results suggest that governments with right-wing, center or left-wing political orientations were equally likely to implement tax-base narrowing reforms and that the probability of adopting tax cuts seems broadly unrelated to country-specific macroeconomic factors.

Our findings suggest that the contribution of affiliates of MNEs to EU-wide tax revenue collection has been weakened continuously over the last decade. While coordinated attempts to fix the international system of corporate taxation have focused on limiting the scope for profit shifting by MNEs, governments across the EU and across political parties have contributed to lowering the taxes effectively paid by foreign affiliates. More openness towards corporate tax harmonisation beyond the implementation of anti-avoidance measures might be needed to counteract this trend.

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Appendix

Table 5: Orbis Sample of Affiliates

	Affiliates	Aff (%)	Observations	Obs (%)	Av Years in Sample
Austria	4,054	1.53	23,092	1.58	5.70
Belgium	12,726	4.81	78,827	5.41	6.19
Bulgaria	6,343	2.40	31,614	2.17	4.98
Croatia	2,559	0.97	15,062	1.03	5.89
Cyprus	532	0.20	1,692	0.12	3.18
Czechia	14,859	5.61	75,539	5.18	5.08
Denmark	11,339	4.28	49,146	3.37	4.33
Estonia	1,494	0.56	8,000	0.55	5.35
Finland	6,208	2.34	38,114	2.61	6.14
France	40,346	15.24	216,737	14.87	5.37
Germany	14,683	5.54	78,879	5.41	5.37
Greece	1,190	0.45	7,340	0.50	6.17
Hungary	3,353	1.27	21,689	1.49	6.47
Ireland	4,283	1.62	20,413	1.40	4.77
Italy	32,016	12.09	188,485	12.93	5.89
Latvia	3,190	1.20	14,940	1.02	4.68
Lithuania	2,621	0.99	13,342	0.92	5.09
Luxembourg	1,663	0.63	6,976	0.48	4.19
Malta	2,437	0.92	9,302	0.64	3.82
Netherlands	4,292	1.62	22,072	1.51	5.14
Poland	14,622	5.52	80,300	5.51	5.49
Portugal	8,339	3.15	49,266	3.38	5.91
Romania	11,122	4.20	64,607	4.43	5.81
Slovakia	15,797	5.97	82,997	5.69	5.25
Slovenia	1,861	0.70	11,211	0.77	6.02
Spain	21,810	8.24	126,428	8.67	5.80
Sweden	21,080	7.96	121,711	8.35	5.77
Total	264,819	100.00	1,457,781	100.00	5.50

Notes: This table presents the unbalanced sample of affiliates from the Orbis database. The total number of affiliates and observations per country is reported, together with the average number of years an affiliates remains in the sample, the maximum possible being 8 years.

Table 6: Summary Statistics in 2022

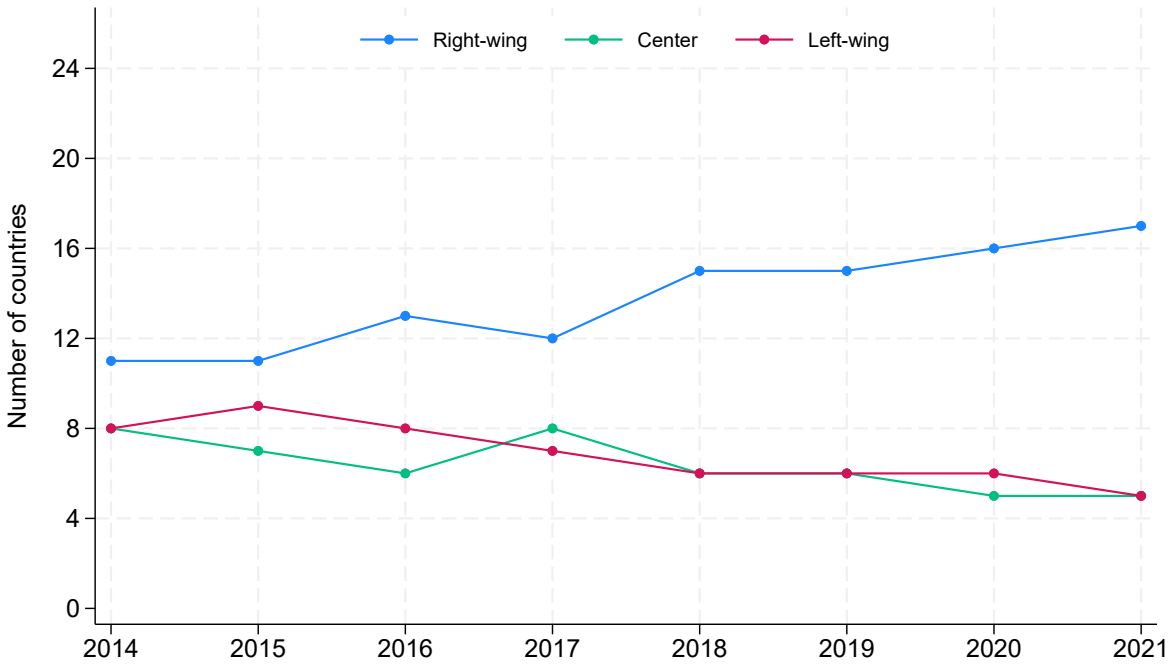
	Revenues	Profits	EBIT	Taxes	Assets	Employees	ETR	STR	N
Austria	163,161	12,033	9,106	2,587	108,384	262.5	23.1	25.0	2,915
Belgium	109,564	5,138	3,994	781	74,466	105.1	25.4	25.0	9,434
Bulgaria	71,782	5,851	5,820	613	46,424	283.0	10.8	10.0	878
Croatia	16,139	1,375	1,355	215	15,049	92.0	15.3	18.0	1,974
Cyprus	170,178	14,778	15,948	1,610	69,218	182.8	11.3	12.5	59
Czechia	45,874	3,140	2,771	580	36,810	95.9	20.4	19.0	8,485
Denmark	196,077	9,040	7,336	1,114	51,257	66.0	20.3	22.0	8,828
Estonia	19,096	1,848	1,592	139	15,679	55.5	10.3	20.0	1,028
Finland	45,521	4,804	3,831	566	47,790	98.1	13.8	20.0	4,496
France	72,902	8,318	6,801	1,139	85,577	252.4	17.5	25.8	23,889
Germany	216,415	15,991	10,861	2,728	167,915	282.7	23.8	29.8	7,844
Greece	80,079	6,855	7,539	1,734	75,875	165.1	22.9	22.0	898
Hungary	57,813	3,555	2,832	283	45,472	185.4	10.6	10.8	2,602
Ireland	246,303	45,843	36,578	4,297	480,082	249.5	16.0	12.5	2,587
Italy	56,744	4,707	3,869	1,214	65,572	112.7	31.3	27.8	23,129
Latvia	14,848	1,190	1,197	70	8,754	73.0	8.8	20.0	1,715
Lithuania	24,814	2,254	2,018	249	17,584	104.7	14.8	15.0	2,043
Luxembourg	256,897	19,378	13,836	2,935	232,447	164.3	20.6	24.9	743
Malta	34,558	8,095	4,561	1,627	113,874	.	23.2	35.0	104
Netherlands	377,992	28,547	20,388	6,636	259,590	168.0	22.1	25.8	2,185
Poland	53,368	3,814	3,750	657	45,522	242.0	19.4	19.0	10,512
Portugal	26,716	2,717	2,690	579	28,042	116.9	22.4	31.5	6,142
Romania	23,775	1,977	1,927	261	16,488	103.9	13.2	16.0	8,261
Slovakia	15,238	1,077	1,063	260	12,581	74.5	20.9	21.0	9,662
Slovenia	25,885	1,582	1,488	227	18,582	82.9	16.3	19.0	1,557
Spain	67,267	6,044	5,929	1,355	68,167	193.1	24.0	25.0	14,643
Sweden	29,511	4,774	3,075	411	39,409	83.6	13.0	20.6	15,635
EU27 Av.	93,278	8,323	6,747	1,291	83,208	149.8	18.2	21.2	6,380

Notes: This table presents country level summary statistics on affiliates in our sample in 2022. Revenues, profits, EBIT, taxes and assets are in thousand euros. Employees are in thousand. The effective and statutory tax rates are in percent. The last column is the number of observations in 2022. The last row is a simple average across the 27 Member States.

Table 7: Description of Tax Reform Categories

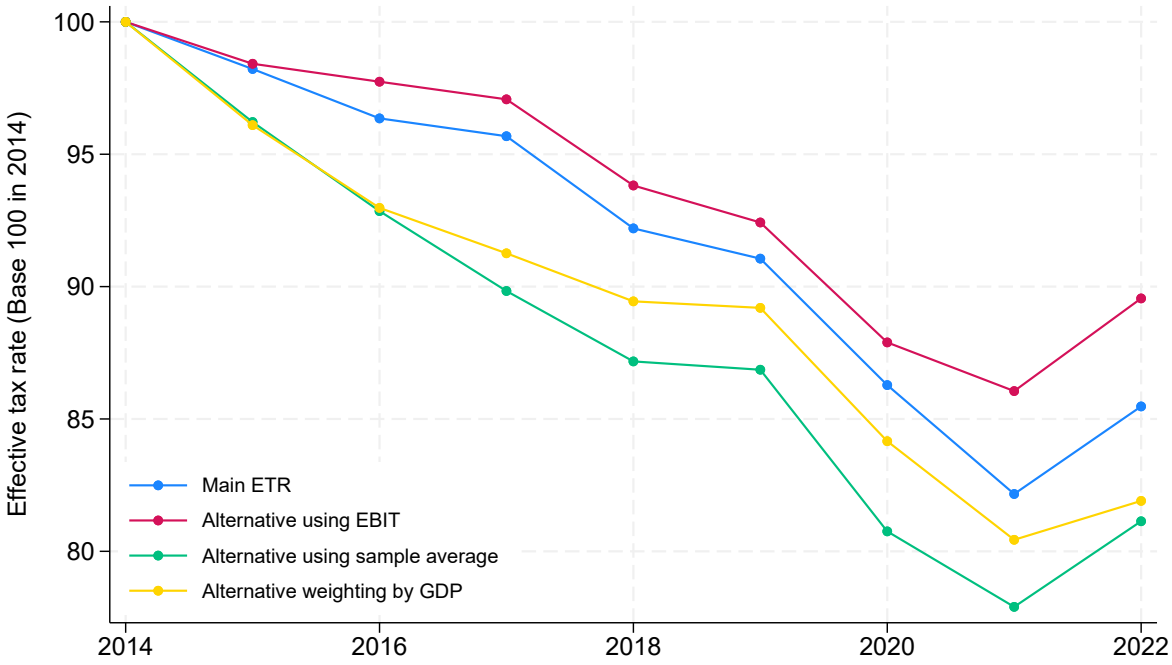
	Category	Short Description	Example
1	Anti-tax avoidance reforms	Regulations to prevent profit-shifting such as: controlled foreign company rules, exit taxes, interest deduction limitations,thin-capitalization rules.	France 2014: Limitation of the deductibility of interest to 75%.
2	Cost-based investment regimes	Investment deductions, capital allowances for investment, depreciation schemes.	Ireland 2015: Removal of restriction on capital allowances on intangibles.
3	Research and Development regimes	Incentives and tax credits for research and development expenses.	Finland 2021: Additional 50% deduction for R&D costs of cooperation with research organizations in 2021-2025.
4	Intellectual property regimes	Reduced rate and favorable taxation of income from intellectual property regimes.	Poland 2019: Preferential taxation with the reduced 5% corporate income tax rate with reference to income derived from the qualified intellectual property rights.
5	Allowances for corporate equity regimes	Allowances on the cost of equity to correct for the bias that favors debt finance over equity.	Cyprus 2015: Notional Interest Deduction on equity capital up to 80% of taxable income on new equity capital introduced on or after 1 January 2015.
6	Loss carry regimes	Provisions allowing businesses to offset current profits with losses incurred in previous years.	Spain 2017: New limits to offset losses: 70% of tax base with a minimum of EUR 1 million.
7	Taxation of capital gains and dividends	Rules on the taxation of profits derived from the sale of assets (capital gains) and income distributed to shareholders as dividends.	Belgium 2018: Raising the dividend exemptions to 100% and abolishing the minimum rate for capital gains of large companies.
8	Withholding taxes on dividends, interests and royalties	Regulations specifying the withholding tax rates applicable to payments such as dividends, interests, and royalties made to non-resident entities.	Bulgaria 2015: Exemption from withholding tax on the interest and royalty payments made from a Bulgarian economic operator to associated companies of another Member State.
9	Other reforms	Reforms that do not fall into the other classifications such as deductions of specific business expenses (cars, restaurant, etc) and tax credits related to employment and social security contributions (staff training, health, employment promotion, etc).	Austria 2014: Salaries above EUR 500.000 are no longer deductible from the Corporate Income Tax.

Figure 9: Political Orientation of Governments in the European Union



Notes: This figure plots the political orientation of governments in the European Union from 2014 to 2021.

Figure 10: Alternative Measures of Effective Tax Rates



Notes: This figure plots alternative measures of effective tax rates in the European Union from 2014 to 2022.

6.1 The most frequent reform areas

Anti-tax avoidance reforms A significant part of the base-broadening reforms are anti-avoidance measures (54/113). These measures were enacted at the level of the OECD or the European Union, which led especially Poland (7), the Netherlands (6), Slovenia (4), and Finland (4), to introduce several anti-avoidance measures missing in their national legislation. In particular, one key regulation is the Council Directive 2016/1164, also referred to as the Anti Tax Avoidance Directive (ATAD), which contains a series of measures against tax avoidance including interest limitation rule, exit taxation rule, general anti-abuse rule and controlled foreign company rule. From 2016 to 2022, most of the anti tax avoidance reforms implemented are related to it.[10] We would assume that the impact of anti-avoidance measures on the average ETR is limited because they should in principle target only the most aggressive firms.

Cost-based Investment Incentives Most of the tax base narrowing reforms implemented between 2014 and 2022 were cost-based investment incentives: Capital allowances or depreciation rules became more generous in Belgium, Czechia, Finland, Germany, and Poland. Also Luxembourg increased the tax credit for investments and Portugal relaxed the conditions for tax relief on reinvested earnings twice. In addition, several countries adopted incentives targeting more specific investment projects: Hungary introduced a tax incentive allowing companies to deduct the triple amount of investment into start-ups, made tax credits and tax-free provision for certain investment projects more generous, and relaxed depreciation rules for lump-sum depreciation. Poland introduced an additional write-off of robotization costs including tangible and intangible assets and training. Slovenia introduced a new tax allowance for investment into the green and digital transition. Slovakia introduced tax incentives for investment in industry 4.0 in 2022 (but tightened general depreciation rules in 2015). Since 2018, Lithuania allows companies investing in technological renewal to decrease their taxable profits by up to 100% of the investment amount instead of previously 50%. Additional temporary cost-based investment incentives were put in place in Cyprus in 2017 and during the pandemic in Belgium, Czechia, Finland, Germany, Italy, and Lithuania.

Some countries changed their capital allowances for intangible assets: Ireland removed the of restriction on the capital allowance on intangibles (2015) and reintroduced a limitation of 80% of the trading income later on. The cap of 80% on the amount of relief that may be claimed, indicates that the tax relief might be substantial in individual cases. Cyprus relaxed the rules for tax amortization of intellectual property. Spain made depreciation rules for intangible assets more generous in 2016, and tightened depreciation rules for tangible fixed assets.

R&D and Intellectual Property Regimes Between 2014 and 2022, 10 member states have implemented or extended R&D tax incentives, sometimes several times. This is in line with a general upward trend in public support for private R&D over the last two decades, where direct government financing of R&D has remained broadly constant in % of GDP, but the indirect support in the form of tax incentives has increased (OECD, 2024).[11]

Existing tax credits for R&D became more generous in Austria, Ireland, Spain and Italy which implemented additional temporary tax credits in 2020 and 2021. Finland introduced an additional 50% deduction for R&D costs of cooperation with research organizations and extended it to 150% in 2022. Poland introduced a new tax relief to incentivize employment in R&D activities and to support product development costs. In addition, existing R&D tax relief was made more generous so that companies can deduct up to 200% of R&D staff costs and other qualified costs. Slovakia

[10] This finding gives credit to the idea that the EU institutions can limit to some extent the proliferation of harmful tax practices and limit the degree of tax competition in the European Union.

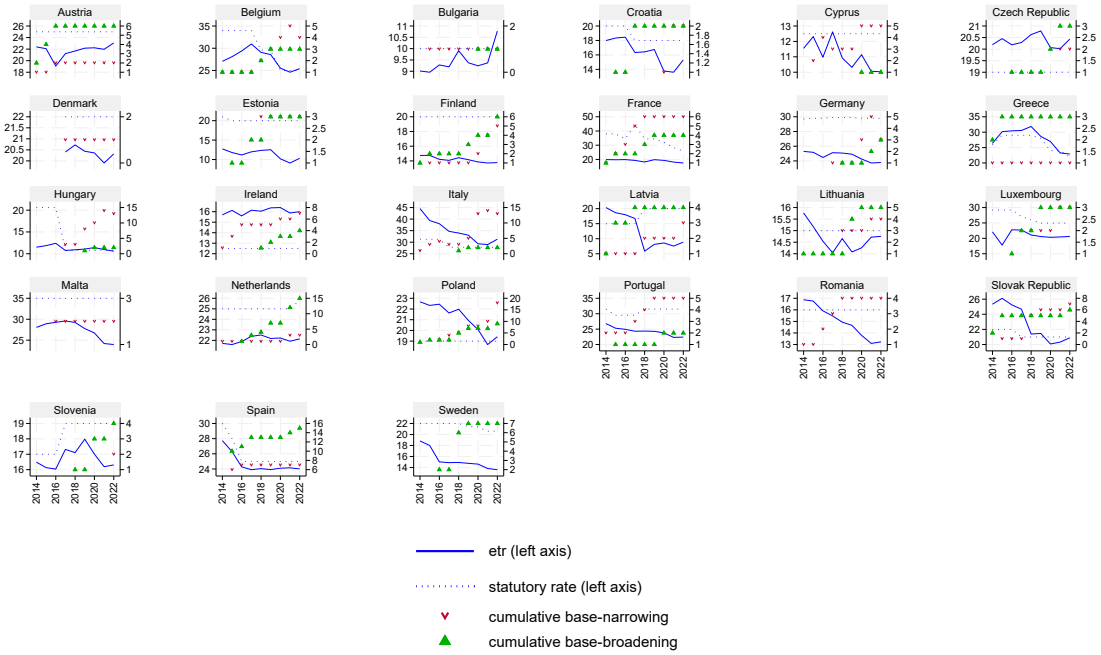
[11] Direct government funding of business R&D has remained at 0.08% of GDP since 2000 and R&D tax expenditure has increased from 0.01% in 2000 or 0.07 in 2014 to 0.1% in 2021 (OECD, 2024).

introduced a R&D tax credit in 2015 and increased the deduction limit of 25% to 100% later on. Italy replaced the previous patent box regime with a cost-based incentive: Since 2021/22, 110% of the costs for R&D activities related to intellectual property such as software, patents, technical industrial know how, industrial designs and models can be recognized for tax purposes (PWC 2023).

A number of countries provide preferential tax treatment of income from intangible assets such as patents, software, and utility models with varying generosity. A total of 14 intellectual property regimes currently exist in the EU which tax eligible incomes at rates of 15% or less (Flamant et al., 2021). Since 2022, Poland allows for a simultaneous use of R&D and IP Box relief which implies that companies can deduct R&D costs from taxable profits and pay lower tax on IP income.

Other reforms The second most frequent base-broadening measures concerned loss carry regimes. Greece, Latvia, Lithuania, Luxembourg, Slovakia, and Spain introduced general limitations for loss carryover, other countries adopted restrictions for more specific cases, e.g. impairment losses, group taxation or joint use with other tax incentives. Our category "other reforms" groups together reform measures that do not fit into the typical categories. These range from substantial reforms such as the introduction of a 0% statutory tax rate for reinvested profits in Latvia to likely less important deductions concerning staff training, marketing costs, the use of company cars or a threshold for the deductibility of top salaries.

Figure 11: ETR and Key Explanatory Variables by Country Rates



Notes: This figure plots effective and statutory rate, and the cumulative count of base-narrowing and base-broadening measures by country.