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Do personal income taxes affect corporate tax-motivated profit shifting?

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ABSTRACT

This paper examines the role of personal income taxes on multinationals' corporate tax-induced profit shifting. As mandated in most OECD countries, firms need economic substance in low corporate-tax countries to justify profit shifting to these countries. Because high personal income taxes raise labor costs and thus the cost of providing economic substance, we predict that personal income taxes mute profit shifting. Using data from 26 European countries, we find that personal income taxes substantially reduce profit shifting to low corporate-tax jurisdictions, particularly when parent countries impose strict substance requirements. We also find that firms use employees to justify economic substance and that the effect of the personal income tax is related to its incidence falling partly on firms. Our results show important interactions between personal and corporate income taxes that reduce multinationals' profit-shifting activities when substance requirements are implemented as in the European Union or many OECD countries.

1. Introduction

In recent decades, corporate tax-induced profit shifting has gained the interest of academics[1] (e.g., Klassen et al., 1993, Klassen and Laplante, 2012, Beuselinck et al., 2015, Markle, 2016, Clausing, 2016, De Simone et al., 2017, De Simone et al., 2019, Janský and Palanský, 2019, Laffitte and Toubal, 2022, Wier and Zucman, 2022, Tørsløv et al., 2023), policymakers[2] (e.g., OECD, 2013a), the media,[3] and activist groups (e.g., Tax Justice Network, 2020). These stakeholders have expressed serious concerns about profit shifting to low-tax countries. In response to these concerns, the OECD, the European Union (EU), and many countries around the world have

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[1] For example, Clausing et al. (2021) "*propose ending this race-to-the-bottom in corporate taxation through a negotiated system of coordinated minimum taxation*" and state that "*it is not an exaggeration to say that minimum taxes could change the face of globalization.*"

[2] For example, U.S. President Joe Biden, stated in his remarks on the American Jobs Plan that "*91 Fortune 500 companies […], they used various loopholes so they'd pay not a single solitary penny in federal income tax. I don't want to punish them, but that's just wrong. I'm going to put an end to that, […]. We're establishing a global minimum tax for U.S. corporations of 21 percent*" (available at https://www.whitehouse.gov/briefing-room/speeches-remarks/2021/03/31/remarks-by-president-biden-on-the-american-jobs-plan/, last accessed 07/24).

[3] See, for example, the article by Zucman and Wezerek in *The New York Times* (available at https://www.nytimes.com/interactive/2021/07/07/opinion/minimum-corporate-tax.html, last accessed 07/24).

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taken action against profit shifting (e.g., the OECD's Base Erosion and Profit Shifting (BEPS) initiative and the Anti-Tax Avoidance Directive (ATAD) in the EU), and have proposed new policy tools, such as the global minimum tax. However, some scholars have cast doubt on the actual extent of profit shifting (Blouin and Robinson, 2023; Dyreng and Hanlon, 2021). This is because prior studies mainly focus on U.S. multinationals (MNEs), which are subject to less stringent anti-tax avoidance rules, or use data on non-U.S. firms from earlier years with less strict rules against profit shifting (e.g., Davies et al., 2018). Hence, these estimates may not be generalizable to many OECD countries that recently introduced strict anti-tax avoidance rules (e.g., Fuest et al., 2022). Consequently, prior literature cannot inform academics and policymakers whether the design of existing tax systems is already effective in limiting profit shifting.

In this paper, we argue and provide empirical evidence that existing corporate tax rules (tax rates and anti-tax avoidance measures) combined with personal income taxes reduce the incentives for firms to shift profits to low-tax countries. Put differently, the design of existing tax systems in the EU and many OECD countries is already effective in curbing profit shifting, even without additional rules such as the global minimum tax or tax disclosures such as public country-by-country reporting.

According to the existing anti-tax avoidance rules in the EU, transfer pricing — the key tool of profit shifting — must reflect the economic substance of intragroup transactions. Therefore, MNEs from the EU must prove economic substance in low corporate tax countries to justify profit shifting to these jurisdictions. Since employees carry out economic activities, employment in low-tax countries is critical to justifying economic substance and, thus, higher transfer prices to shift profits to these countries. This is where we argue that personal income taxes can matter for profit shifting. Specifically, personal income taxes can increase the cost of employment, as firms bear part of the employees' personal income tax burden in the form of higher wages (e.g., Blomquist and Selin, 2010; Gruber and Saez, 2002; Piketty et al., 2014). Hence, personal income taxes increase the cost of providing economic substance in subsidiaries. We thus posit that personal income taxes in low corporate tax countries reduce profit shifting to these countries. This effect should be pronounced when parent companies are exposed to strict substance requirements, for example, through controlled foreign company (CFC) rules, as implemented in many EU and most OECD countries.

Understanding the interaction between personal and corporate income taxes is important because countries set their tax policy along many dimensions. For example, to be an attractive country for MNEs locating subsidiaries and employees therein, a country may set low corporate taxes but may not have a low personal income tax. This policy choice stems from countries needing to provide sound economic conditions (e.g., secure financial system, relatively uncorrupt government), affordable public goods (e.g., education or the health system), and efficient infrastructure (e.g., roads, railways, or airports).[4] In most countries, the necessary revenues to finance these public goods predominantly stem from personal income taxes. If, at the same time, countries where the headquarters are located implement strict substance requirements to justify transfer prices, personal income taxes in subsidiary countries have the potential to reduce corporate profit shifting. While arguably other non-tax costs of profit shifting (e.g., general labor costs) also affect profit-shifting decisions, we are the first to focus on the interplay between corporate taxes and personal income taxes, as they are the policy tools directly set by tax regulators.

To examine this interplay between corporate and personal income taxes, we use a sample of 26 European countries with data on corporate and personal income taxes over the period 2006–2019. This sample has the advantage that other factors, such as tariffs and customs duties, are unlikely to affect the cost of providing economic substance, allowing us to isolate the role of personal income taxes in profit-shifting decisions. We identify 42 changes in personal income taxes and 122 changes in incentives to shift profits to low-tax countries (i.e., inbound profit shifting). The latter is computed as the difference in the statutory corporate tax rates between the subsidiary and the parent country. In 54 (68) cases, inbound profit-shifting incentives are created (cease to exist). Given the number of tax changes, we have meaningful variation in tax incentives to examine whether subsidiaries' profits respond to inbound profit-shifting incentives and whether personal income tax-induced labor costs affect the responsiveness to profit-shifting incentives. We approximate the personal income tax-induced cost of employment using the average personal income tax rate in the subsidiary country. Following Hines and Rice (1994), Beuselinck et al. (2015), and De Simone (2016), we account for several subsidiary- and country-level characteristics to ensure that economic and institutional conditions do not drive the results. Moreover, we include a rich set of fixed effects to 1) absorb subsidiary- or country-level time-invariant characteristics, 2) examine differences in profit-shifting within an MNE, and 3) absorb transitory industry shocks that could affect an MNE's profit-shifting behavior.

Our main empirical results show significantly less profit shifting to low corporate tax subsidiary countries when the subsidiary country has a high personal income tax rate. Our estimates suggest an elasticity of profit shifting to personal income taxes of −1.42, which is reasonable given the elasticity estimates from −1.5 to −4.5 in prior literature (e.g., Grubert and Mutti, 1991, 2000; Hines and Rice, 1994). In economic terms, this means that a one percentage point increase in the average personal income tax rate is associated with an 8.6% decline in profit shifting or an aggregate decline in profit shifting to low-taxed subsidiaries in our sample from €2.4bn to €2.2bn (€2.04 million per MNE to €1.86 million per MNE).

This average estimate does not consider whether strict nexus and substance requirements apply. However, these requirements, as, for example, stipulated in CFC rules, are critical for personal income taxes to become a significant friction in profit shifting. Hence, we next explore differences in the applicability of CFC rules. These rules require economic activity in low corporate tax subsidiaries; otherwise, the profits of these subsidiaries are immediately taxed in the parent country. When splitting the effect of personal income taxes on inbound profit shifting into cases in which CFC rules apply and cases in which they do not, we find results consistent with our predictions: If CFC rules are binding and, thus, economic substance is required, personal income taxes have a stronger muting effect on inbound profit shifting. The economic magnitude suggests that, in this case, an increase in the personal income tax by one percentage

[4] One anecdote that personal income taxes are an important revenue source to fund public goods in low-tax countries can be found here: https://www.ft.com/content/3dd38136-9814-11de-8d3d-00144feabdc0, last accessed 07/24.

point reduces profit shifting to low-taxed subsidiaries by about 20%. However, we note that this large economic magnitude may be due to the caveats (e.g., the focus on EU MNEs), which we discuss at the end of the introduction. Considering these caveats, our results also show that if personal income taxes are more than one percentage point above the average European income tax rate *and* if CFC rules apply, MNEs in our sample no longer exhibit statistically significant profit-shifting activities. Hence, personal income taxes represent a major friction in cross-border profit shifting. Only if the cost of providing economic substance is sufficiently low (i.e., if there is no binding CFC rule or if the personal income tax is low in the case of a binding CFC rule) do European MNEs appear to shift profits to low-tax countries.

Next, we test two assumptions underlying our predictions. First, we show i) that firms locate more employees in countries with lower corporate tax rates and lower personal tax rates and ii) that firms locate more employees abroad when they face strict nexus and substance requirements due to anti-tax avoidance rules. Second, we provide indirect evidence consistent with tax incidence, that is, the notion that firms bear part of the employees' personal income tax burden. In cross-sectional tests, we explore 1) firm-level, 2) economic, and 3) locational characteristics related to the relative elasticities of labor demand versus supply, which determine who bears the personal income tax burden. The idea is that when firms are less elastic than employees, they bear more of the employees' tax burden. Across all tests, we find that when firms are more likely to bear the personal income tax burden, personal income taxes significantly mute profit shifting.

To further corroborate our main results, we run two additional tests. First, we examine the notion that profit shifting is a trade-off between costs and benefits. That is, firms respond to changes in tax incentives if the marginal benefits from tax savings outweigh marginal profit-shifting costs. In our setting, personal income taxes are thus expected to mute profit-shifting activities if other profit-shifting costs are sufficiently low. As a proxy for other profit-shifting costs, we exploit differences in 1) transfer pricing adjustment costs and 2) governance quality within the EU. Consistent with our prediction, personal income taxes have a stronger muting effect on profit shifting when other profit-shifting costs are sufficiently low. Second, we expand the scope of anti-tax avoidance rules beyond CFC rules to include transfer pricing documentation, exit taxes, country-by-country reporting, general anti-avoidance rules, and the strength of tax enforcement. Using these broader anti-tax avoidance measures, we continue to find that the effect of personal income taxes on profit shifting is more pronounced when the parent country applies and enforces strict anti-tax avoidance rules that require economic substance in low-taxed subsidiaries.

Our paper contributes to two related streams of the literature. First, we add to the literature on profit shifting (e.g., Hines and Rice, 1994; Huizinga and Laeven, 2008; Klassen et al., 1993), which focuses on identifying profit shifting (Dyreng and Lindsey, 2009, De Simone et al., 2019), examining the role of tax enforcement (Beuselinck et al., 2015) or losses (De Simone et al., 2017; Hopland et al., 2018), and assessing its aggregate extent (e.g., Tørsløv et al., 2023; Wier and Zucman, 2022). We are the first to show that the existing tax policy mix of personal income taxes, corporate taxes, and anti-tax avoidance rules increases the cost of profit shifting to such an extent that European MNEs often do not find it beneficial to provide the necessary economic substance in low corporate tax countries. As anti-tax avoidance rules are less strict in the U.S. than in the EU and as other countries had not implemented them back in the 1990s, prior studies using U.S. settings or non-U.S. data from earlier years (e.g., Clausing, 2016; Davies et al., 2018, or Laffitte and Toubal, 2022) may overestimate the extent of profit shifting by *non-U.S.* MNEs under the current anti-tax avoidance rules.[5] We show that when there are strict nexus and substance requirements, personal income taxes substantially reduce corporate tax-induced profit shifting. Hence, prior estimates do not generalize to the many OECD countries that have recently implemented such strict nexus requirements.

Second, we contribute to the debate on the role of corporate taxes in structuring the supply chain (Dyreng et al., 2015), in offshoring employment (Williams, 2018), and in the location of employment (Drake et al., 2022) by showing that personal and corporate income taxes interact in a meaningful way. We find that higher personal income taxes result in higher costs of providing economic substance, and thus lower labor input, undermining profit shifting to low corporate tax countries, but only if the headquarters country imposes nexus and substance requirements. Maybe for this reason, personal income taxes are not significant (e.g., Williams, 2018) and are not included as controls (e.g., Dyreng et al., 2015) in prior studies using U.S. MNEs, which are subject to less strict nexus and substance requirements than our sample firms from Europe. Overall, our results imply that due to the personal income tax-induced cost of providing economic substance, the current tax systems in the EU and most OECD countries already limit the artificial shifting of book income from high corporate tax parents to low corporate tax subsidiaries to a large extent.

However, our study is subject to several caveats and limitations. First, the economic magnitude of the muting effect of personal income taxes on profit shifting in the case of a binding CFC rule seems large and should, therefore, be interpreted with caution. This effect size might be explained by the fact that many of our EU sample countries have introduced and enforced strict anti-tax avoidance rules. Second, our measure of profit shifting does not capture all profit-shifting strategies. For example, we do not observe potential profit shifting to tax havens outside the EU. Hence, we cannot entirely rule out potential sample selection issues. However,

[5] For example, Laplante et al. (2024) show that the Base Erosion and Anti-Abuse Tax is not effective in curbing profit shifting because firms find strategies to avoid that tax, indicating that the U.S. substance requirements are not as tight as the rules in other OECD or EU countries. Accounting for personal income taxes would thus likely not reduce profit-shifting estimates for U.S. MNEs. However, our results have policy implications for the U.S., namely that the implementation of stricter nexus requirements could reduce profit shifting also because of personal income taxes.

supplemental tests suggest that our inferences appear not to be driven by the unobservable tax haven presence.[6] Finally, since we only consider a sample of European subsidiaries of EU MNEs, the generalizability to U.S. MNEs or multinationals from other countries is limited. For example, economic magnitudes may be smaller in other countries or settings with weaker levels of tax enforcement, less stringent anti-tax avoidance rules, or without country-by-country reporting.

2. Institutional background and hypothesis development

2.1. Profit shifting and economic substance requirements

MNEs have incentives to shift profits to low corporate tax countries to reduce their tax burden (e.g., Klassen et al., 1993; Klassen and Laplante, 2012; Markle, 2016, De Simone et al., 2019). However, over the last decade, many countries implemented or strengthened anti-tax avoidance rules following changes in business models (Brühne et al., 2024) and the initiatives of the OECD, the G20, and the European Commission. For example, some countries have introduced exit taxes to prevent MNEs from relocating assets, particularly intellectual property, to low-tax countries. Moreover, an increasing number of countries has enacted or tightened CFC rules mandating MNEs to conduct real economic activities in low-taxed subsidiaries (OECD, 2013b, BEPS action 3). In addition, the remuneration of transactions between related parties via transfer prices must be closely aligned with economic activities, and transfer pricing documentation requirements have been expanded (OECD, 2010; 2013b, BEPS action 13).

All these rules have in common that MNEs require economic substance in low-tax countries to justify profit shifting to these countries. The commonly accepted OECD guidelines (2010, 2013a, 2013b) specify that employees, particularly those with decision-making rights and high value-added activities, are critical to providing economic substance. Put differently, employees play a crucial role in justifying profit shifting to low-taxed subsidiaries in the presence of, for example, CFC rules.

To provide evidence of the recent increase in the relevance of economic substance rules, Fig. 1 shows the trends in anti-tax avoidance rules. To this end, we rely on Brühne et al. (2024), who created an index (denoted the *BJS Score*) that captures the strength of a broad range of anti-tax avoidance rules for OECD countries between 1996 and 2017. Panel A of Fig. 1 plots the trend in the *BJS Score* for our sample of EU countries (black line, GDP weighted) and the U.S. (gray line). We contrast our sample of EU countries with the U.S. because the U.S. are often used in studies estimating the extent of profit shifting (e.g., Clausing, 2016; Laffitte and Toubal, 2022) and because these estimates are frequently used for policymaking, both within and outside the U.S. Overall, Panel A of Fig. 1 shows that while providing nexus and economic substance may not have been an issue in the 1990s and early 2000s in the EU, the strictness in anti-tax avoidance rules has increased over the years, making it highly relevant in recent years. The increasing relevance of anti-tax avoidance rules, especially in the EU, is also demonstrated by the ATAD,[7] which forces all EU countries to implement strict rules similar to those in Germany, France, or Portugal by 2020 (not yet included in Fig. 1). In contrast, the strictness of the U.S. rules was constant at a low level until 2017.[8] Panel B of Fig. 1 shows the *BJS Score* for OECD countries in 2017, the last available year for the score. In line with the results from Panel A, larger EU countries (e.g., Germany and Spain) and larger non-EU countries (e.g., Canada and Australia) have strict anti-tax avoidance rules, whereas the U.S. score below the median of all OECD countries (even after the 2017 Tax Cuts and Jobs Act).

In sum, while anti-tax avoidance rules and thus the role of employees in providing economic substance to justify profit shifting might not be as important for U.S. MNEs, they are highly relevant for MNEs from Europe and other OECD countries. Hence, we acknowledge that our results do not generalize to U.S. MNEs and profit-shifting estimates for them. However, they are still informative for non-U.S. MNEs facing these rules, and they have implications for policymakers considering stricter nexus and substance requirements.

2.2. Hypotheses

Based on the institutional background in Section 2.1, we derive our hypotheses using a stylized example of an MNE with incentives to shift profits to a low-tax country. Panel A of Fig. 2 illustrates a hypothetical German MNE with an Irish subsidiary. Since the corporate income tax rate in the subsidiary country (Ireland, 12.5%) is lower than in the parent country (Germany, 30%), the MNE has

[6] We test this in two different ways. First, we show that, consistent with strict nexus and substance requirements curbing tax avoidance through tax havens, group-level effective tax rates (ETRs) are associated with tax haven use only if the parent country does not impose strict anti-tax avoidance rules. If a country implements strict anti-tax avoidance rules, the association between tax haven use and ETRs is no longer significant. Second, we show that the muting effect of personal income taxes on profit shifting is similar for firms with many versus few tax haven operations.

[7] See Council Directive (EU) 2016/1164 of July 12, 2016, which lays down rules against tax avoidance practices that directly affect the functioning of the internal market. Most provisions apply from January 1, 2019 or 2020.

[8] For example, Subpart F can be circumvented by creating hybrid mismatch arrangements (e.g., "Double Irish" tax structure with the check the box rules (Harris and O' Brien, 2018; Brothers, 2014)). Intellectual property can be transferred to low-tax countries without resulting in material taxation in the U.S. Although the U.S. apply the arm's length standard, the valuation of new patents is subjective under U.S. tax and accounting law (Harris and O' Brien, 2018; Blair-Stanek, 2015). Transfer pricing documentation is not required by law. Only in practice, taxpayers are advised to keep the documentation in a timely manner to avoid penalties (EY Worldwide Transfer Pricing Reference Guide, 2016-17). However, we note that anti-tax avoidance rules in the U.S. changed significantly after the implementation of the Tax Cuts and Jobs Act in 2018 that, in theory, should end strategies such as the "Double Irish."

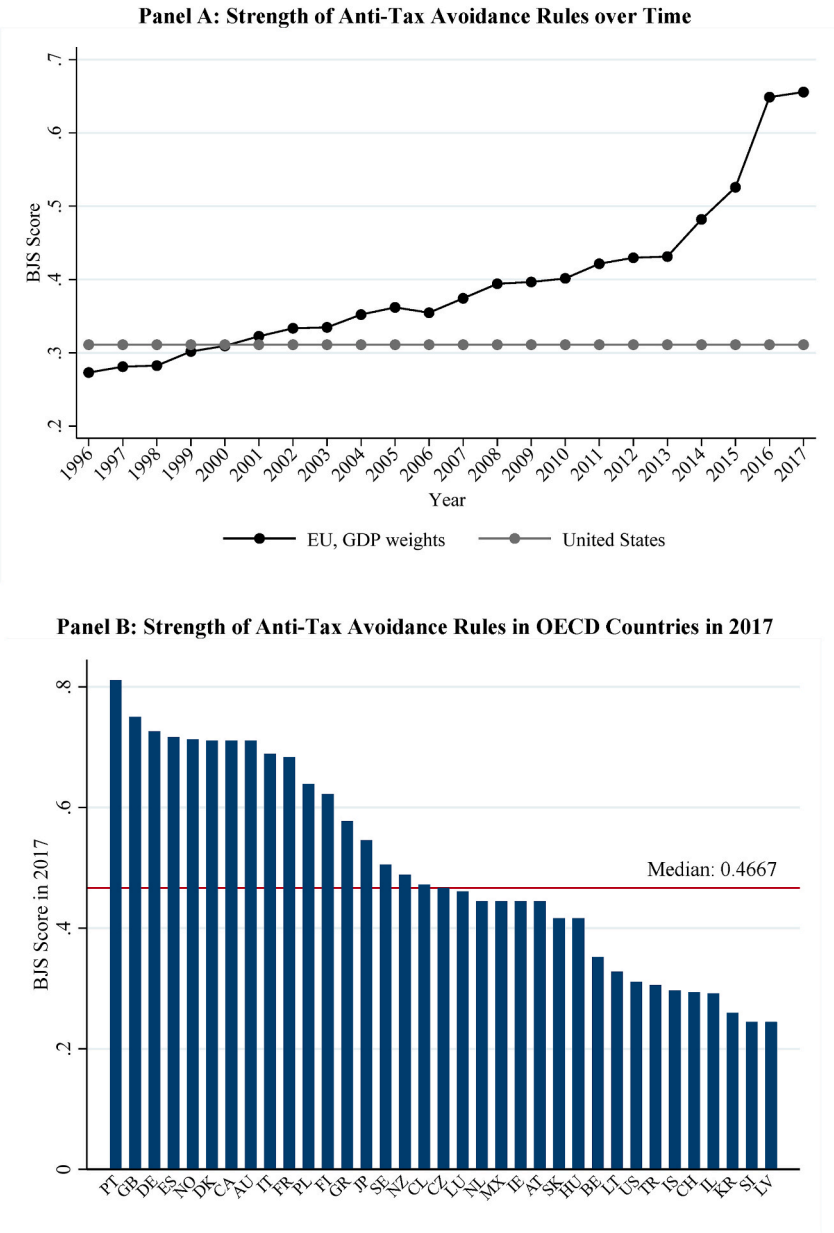

Fig. 1. Trends in Anti-Tax Avoidance Rules
This figure shows trends in anti-tax avoidance rules using the *BJS Score* provided by Brühne et al. (2024). Panel A plots the trends in the strength of anti-tax avoidance rules for the United States (gray line) and EU countries (black line, GDP weighted) from 1996 to 2017. Panel B shows the *BJS Score* in 2017 for OECD countries.

the incentive to shift profits from the parent company (Germany) to the subsidiary (Ireland). We refer to this as inbound profit shifting (see also Alexander et al., 2020, Elemes et al., 2021; Chow et al., 2023 for a similar definition). In the hypothetical case of no substance requirements for transactions with the subsidiary, profits could be shifted relatively easily from Germany to Ireland, where little or no economic activity is carried out. This can be achieved via transfer pricing or debt shifting (Clausing, 2003; Huizinga et al., 2008), of which profit shifting via transfer pricing seems to be the predominant channel (Heckemeyer and Overesch, 2017).

However, many countries have strict economic substance requirements, for example, due to CFC rules. Panel B of Fig. 2 illustrates this case, namely that the German parent company faces strict substance rules at home (Step 1). Because of these rules, the MNE needs economic substance in Ireland to engage in profit shifting (Step 2); otherwise, the profits of the subsidiary are taxed in the parent country. Employees, especially those with decision-making rights, are crucial for economic substance, and thus to justify higher transfer prices that allow for profit shifting (Step 3). This is where personal income taxes play a role, as employees are subject to personal income taxes in the country where they operate (Step 4). Because the personal income tax burden is borne not only by

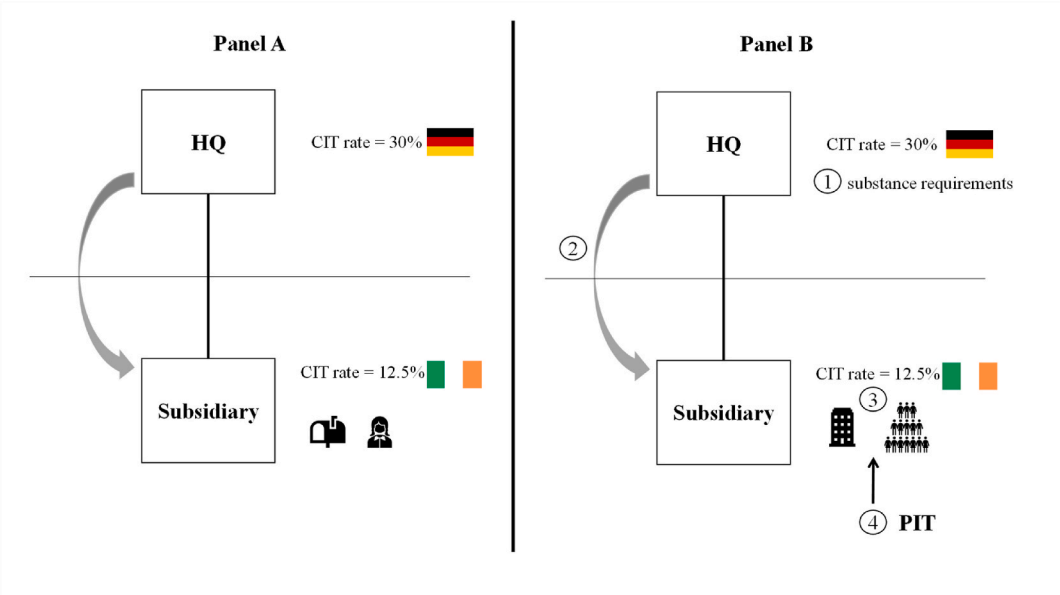

Fig. 2. Inbound Profit-Shifting Incentives and Economic Substance Requirements
This figure illustrates the inbound profit-shifting incentive. Panel A displays the case in which there are no economic substance requirements, and thus the multinational firm finds it beneficial to shift profits from the parent country (*HQ*) to the low-taxed foreign subsidiary. In Panel B, the multinational firm faces economic substance requirements for intragroup transactions carried out with its low-taxed foreign subsidiary (Step 1). To engage in further inbound profit shifting (Step 2), the multinational firm therefore must provide economic substance, that is, employees, in the low-taxed foreign subsidiary (Step 3). However, personal income taxes increase the cost of providing substance (Step 4) and thus reduce the incentive for the multinational firm to shift profits to the low-taxed foreign subsidiary. In both panels, the acronym CIT stands for the statutory corporate income tax rate of the parent or subsidiary country, and PIT stands for the personal income tax rate in the subsidiary country.

employees but also partly by firms through higher wages (Blomquist and Selin, 2010; Gruber and Saez, 2002), personal income taxes increase the cost of employees needed to justify economic substance in subsidiary countries.

In sum, we argue that personal income taxes can increase the cost of employment and thus the cost of providing economic substance in a subsidiary. In our example, this implies that the personal income tax in Ireland increases the cost of economic substance, that is, the cost of employment. Put differently, a high personal income tax in a low corporate tax country can mitigate inbound profit shifting because firms may find it too costly to provide the required economic substance that justifies profit shifting to that country. This effect should materialize when the parent country imposes strict economic substance requirements, for example, through CFC rules. In contrast, personal income taxes should not affect profit shifting if the parent country does not impose strict economic substance requirements for low-taxed subsidiaries, for example, because the statutory corporate tax rate of the subsidiary country is above the threshold tax rate defined by the parent country's CFC rule (e.g., 25% tax rate for German MNEs during our sample period and 15% as of January 2024). Taken together, these arguments lead us to formulate our two hypotheses as follows.

H1. *Personal income taxes in the subsidiary country reduce profit shifting to this country.*

H2. *The muting effect of personal income taxes on profit shifting to the subsidiary country is stronger if the parent country imposes strict economic substance requirements.*

However, we note that these hypotheses depend on two main assumptions. First, labor is required and used to justify inbound shifting. Second, firms bear a part of their employees' personal income tax burden because personal income taxes can reduce profit shifting only to the extent that they are costly for MNEs. We validate and provide corroborating evidence on these assumptions in Sections 6.1 and 6.2.

3. Institutional setting: personal and corporate taxes in Europe

Before we describe the empirical research design, it is important to first discuss the construction and assumptions of our tax variables, which serve as the institutional setting in our sample. In this section, we thus give an overview of the personal income tax information (Section 3.1), the corporate tax and CFC regime information (Section 3.2), and the variation in personal and corporate tax rates (Section 3.3).

3.1. Personal income taxes: background, country data sources, and assumptions

Personal income taxes are levied on income earned by employees. These taxes are one of the most important revenue sources of European countries, contributing 25% to total tax revenues (OECD, 2020). We use the dataset of Jacob and Vossebürger (2022), who collected data on the personal income tax rates of the EU countries plus Norway, Serbia, and the United Kingdom. We extend their data until 2019. As discussed in more detail in Appendix A, we consider an unmarried, non-government employee without children.[9] We consider standard deductions and account for regional income taxes. In cases of regional income taxes, we use the population-weighted average regional tax rate (e.g., Denmark and Italy) or the capital city's regional rate if a population-weighted average does not exist (e.g., Spain and Croatia). Finally, we include mandatory surcharges (e.g., in Portugal, Spain, and Greece) but neglect voluntary taxes (e.g., the German church tax).

We use the average personal income tax rate for each country-year for the 25th, 50th, 75th, and 90th income percentiles. The income percentiles are obtained from the EU Statistics on Income and Living Conditions and the European Community Household Panel. We use the country-specific wage at different income percentiles to account for wage differences across Europe. This approach enables us to differentiate between high- and low-income levels in a given country because economic substance is typically tied to decision-making rights that are more likely to be delegated to higher-income individuals. We focus on average personal income taxes because, in contrast to marginal taxes, they represent the overall tax burden on an employee's annual income. Additionally, we use and expand data on employers' and employees' social security contributions from Jacob and Vossebürger (2022).

3.2. Corporate income tax data and other tax data

To measure profit-shifting incentives, we exploit changes in parent and subsidiary countries' corporate income tax rates. We obtain information on corporate tax rates from 2006 to 2019 from EY, KPMG, the OECD, and Eurostat. We include federal and regional corporate income taxes in the top bracket. If there are local differences in tax rates (e.g., in Germany or Italy), we use the sum of the federal top corporate tax rate and the average regional corporate tax rate. Information on CFC regimes is from Brühne et al. (2024) and is extended to our sample period and countries. We use the information on a CFC rule and the parent country-specific threshold that qualifies a foreign subsidiary as a low corporate tax subsidiary. A CFC rule in the parent country does not imply that it applies to a specific subsidiary. For the CFC rule to be binding, the subsidiary country's tax rate must be below the critical parent country-specific threshold (e.g., 25% in Germany until 2023, 18.75% in Spain, or 11.8% in Sweden). We use country pair (i.e., subsidiary-parent) information to create the indicator *CFC-Relevant*, which equals one if the CFC rule applies to that country pair. We also define the variable *Not CFC-Relevant* as 1 – *CFC-Relevant*. This variable captures cases where the CFC rule does not apply, or the parent country does not have a CFC rule.

3.3. Changes in personal income taxes and corporate income taxes

We observe 42 changes in personal income taxes at the 75th income percentile and 52 changes in corporate income taxes of at least one percentage point across the 26 subsidiary countries and years in our sample (see Fig. 3).[10] Panel A (Panel B) of Fig. 3 plots increases and decreases in the personal income tax rate (corporate tax rate) over the sample period. We observe increases and decreases in personal income tax rates in almost all sample years. In contrast, corporate tax rates mainly decrease in our sample.[11] In the Online Appendix, Section OA.1, we show that changes in personal tax rates and corporate tax rates are not statistically significantly related to each other in our sample.

Since we examine inbound profit shifting, we focus on the incentives to shift income from the parent country to the foreign subsidiary country (as illustrated in our example in Fig. 2). For this purpose, as explained in more detail below, we define the indicator variable *Inbound*, which equals one if the corporate tax rate in the parent country is more than two percentage points higher than in the subsidiary country. Because of profit-shifting costs (Dharmapala, 2014), we impose this requirement to examine sufficiently large marginal benefits for an MNE to engage in profit shifting. Panel C of Fig. 3 displays the changes in the variable *Inbound* from zero to one (an inbound profit-shifting incentive is created) or from one to zero (there is no longer an inbound profit-shifting incentive) for all the sample subsidiary-parent country pairs. We observe 122 changes in *Inbound*, with 54 (68) country pairs creating (no longer having any) inbound profit-shifting incentives. These changes arise because of changes in the corporate tax rate in the subsidiary country and/or in the parent country. Panel C of Fig. 3 shows that changes are reasonably scattered over time, with the creation of inbound profit-shifting incentives peaking in 2014. In sum, our sample shows significant variation in profit-shifting incentives *and* personal income tax rates.

Finally, we provide simple descriptive evidence on the interaction of profit-shifting incentives (proxied by *Inbound*) and the cost of providing economic substance (proxied by the personal income tax rate) at the subsidiary-year level. Fig. 4 plots the average personal

[9] In Table A.1 of Appendix A, we also provide an example of the income tax calculation in Ireland in 2019.

[10] There are 49 changes at the 25th percentile, 43 changes at the 50th percentile, and 53 changes at the 90th percentile. Because higher-income employees plausibly have the decision rights necessary to provide economic substance, we mainly interpret the economic magnitudes for the 75th income percentile in our analyses.

[11] In Figure A.1 of the Online Appendix, we show that there are 55 changes in corporate income taxes of at least one percentage point across the 30 parent countries and years in our sample. Again, most of the changes are decreases.

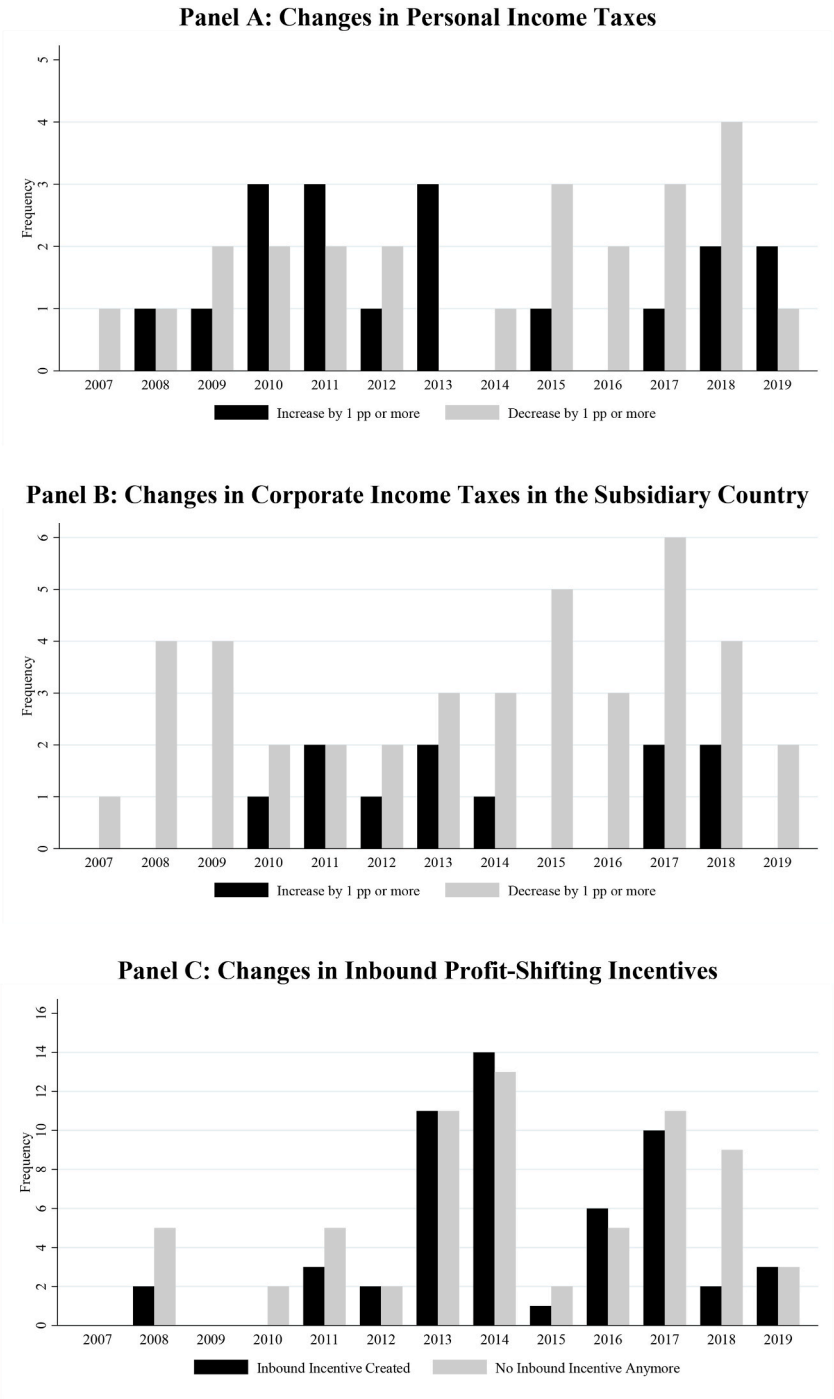

Fig. 3. Changes in Personal Taxes, Corporate Taxes, and Profit-Shifting Incentives
This figure plots the number of increases and decreases of at least one percentage point in personal income taxes measured at the 75th income percentile (Panel A) and the number of increases and decreases of at least one percentage point in corporate income taxes (Panel B). In Panel C, we count the number of changes in inbound profit-shifting incentives.

income tax rate when inbound profit-shifting incentives do not exist (*Inbound* = 0) and when inbound profit-shifting incentives exist (*Inbound* = 1). As these statistics are based on our regression sample, they represent the actual location decisions of the MNEs. The univariate results show that personal income tax rates are lower in subsidiaries with an inbound profit-shifting incentive. This is consistent with H1, as the results suggest that higher personal income taxes increase the cost of providing economic substance in low corporate tax countries to the extent that MNEs base fewer activities in these countries.

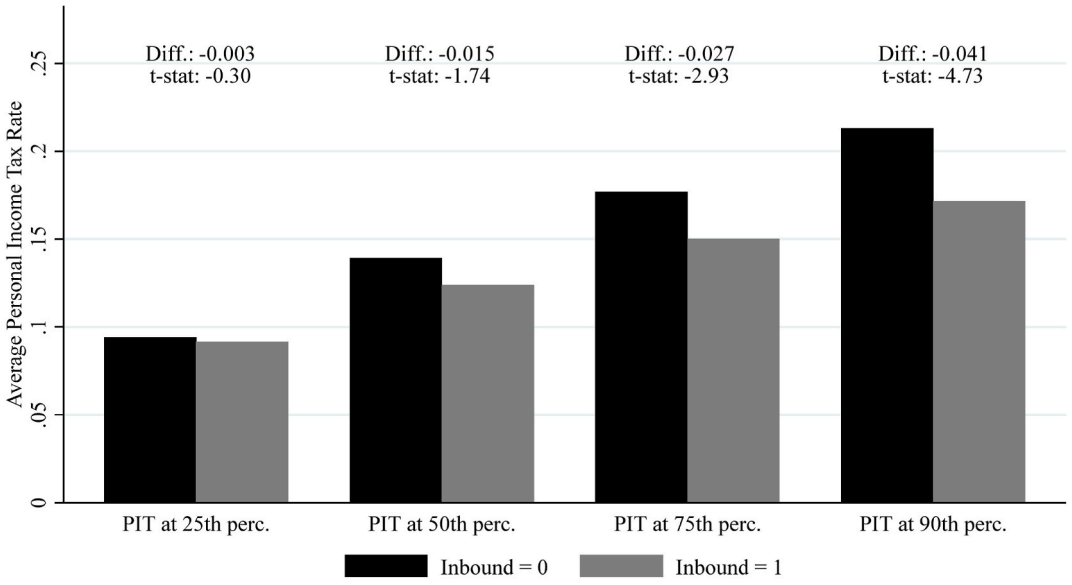

Fig. 4. Personal Income Taxes and Profit-Shifting Incentives
This figure displays the average personal income tax rate at different income percentiles for inbound profit-shifting incentives (*Inbound* = 1) and for no, or only limited, inbound profit-shifting incentives (*Inbound* = 0). We test for the statistical differences using subsidiary-level data and standard errors clustered at the country pair level.

4. Empirical specification and data

4.1. Empirical identification for H1

To empirically test the effect of personal income taxes on the incentive to shift profits from the parent firm to the subsidiary, we employ the following specification, building on prior literature (Beuselinck et al., 2015; De Simone, 2016; Hines and Rice, 1994; Markle, 2016):

$$\ln(EBIT_{i,s,j,p,t}) = \beta_0 + \beta_1 Inbound_{s,p,t} + \beta_2 PIT_{s,t} + \beta_3 Inbound_{s,p,t} \times PIT_{s,t} + X_{i,t} + \Pi_{s,t} + \partial_i + \gamma_{j,t} + \omega_{l,t} + \varepsilon_{i,t} \quad (1)$$

The dependent variable, ln(*EBIT*), is measured for subsidiary *i* located in country *s* owned by a parent *j* in country *p* in year *t*. It is defined as the natural logarithm of the subsidiary's earnings before interest and taxes (EBIT; see Beuselinck et al., 2015; Alexander et al., 2020). The variable *Inbound* measures the inbound profit-shifting incentive.[12] Theoretically, there is an incentive for inbound profit shifting if the difference between the corporate tax rates of the subsidiary country *s* (CIT_s) and the parent country *p* (CIT_p) is negative. However, since profit shifting is costly, we set *Inbound* to one if the difference in corporate tax rates between the subsidiary and the parent country (*CIT-Differential*) is less than −2 percentage points (i.e., the median *CIT-Differential*).[13] As inbound shifting should increase a subsidiary's profits, we expect β_1 to be positive.

Next, we include the average personal income tax rate in the subsidiary country *s* (*PIT*). We estimate Equation (1) separately for personal income tax rates based on different income percentiles. The advantage of this approach is that we can assess the role of *PIT* across different income levels, thus considering the progressive nature of the personal income tax. Moreover, estimating the regressions separately per income percentile avoids multicollinearity. We center *PIT* at the mean and multiply the tax rate by 100.[14] This way, the coefficient on *PIT* represents a one percentage point change from the average personal income tax rate. We are mainly interested in *Inbound* × *PIT*, which captures the effect of personal income taxes on corporate tax-motivated inbound profit shifting. One

[12] We focus our identification on the profit-shifting incentives between the parent company and the subsidiary because our study examines the effect of personal income taxes on inbound shifting incentives that should be relevant if substance requirements are imposed (see Section 2.2). As substance requirements, such as CFC rules, are imposed in the country of the parent company, it is necessary to consider the profit-shifting incentives between the parent company and the subsidiary. In addition, Dischinger et al. (2014) show that profits and resources are managed by the parent company, which is ultimately responsible for setting the MNE's tax strategy. For these reasons, we do not use the measure proposed by Huizinga and Laeven (2008) in our main analyses. However, in Table A.2, Online Appendix, we use the "C" measure proposed by Huizinga and Laeven (2008) to reconcile our results with prior literature. The results are in line with our main findings, though statistically somewhat weaker. See Section OA.1 for more details.

[13] In Section OA.1, Online Appendix, we use alternative cutoffs for *Inbound* to show the robustness of our results.

[14] Because sample sizes differ in some specifications, we recenter *PIT* for each sample size to obtain precise coefficient estimates that can be interpreted as a one percentage point change from the sample average.

advantage of using the dummy variable *Inbound* to capture profit-shifting incentives is that it simplifies the interpretation of the results on the role of personal income taxes. Consistent with H1, we expect personal income taxes to reduce inbound profit-shifting incentives because they increase the cost of employment, and thus the cost of providing substance ($\beta_3 < 0$).

The coefficient on *PIT*, β_2, captures the effect of personal income taxes when *Inbound* takes the value of zero (i.e., the difference between the corporate tax rate of the subsidiary and the parent is equal to or above −2 percentage points). We refer to this case as outbound profit shifting. In this case, the headquarters no longer have an incentive to shift profits to the subsidiary. Instead, there may be reverse profit-shifting incentives, i.e., from the subsidiary to the parent country (e.g., Dischinger et al., 2014).[15] Hence, personal income taxes should not affect corporate tax-induced outbound profit shifting ($\beta_2 = 0$) because MNEs have no additional incentives to provide economic substance in the subsidiary. In our analysis, outbound shifting thus serves as a placebo test to address concerns that factors other than the cost of employment and economic substance requirements are responsible for the potential mitigating effect of personal income taxes on corporate tax-induced inbound profit shifting. Note that with this setup, the coefficients β_1 and β_3 compare the EBIT of subsidiaries with an inbound shifting incentive (*Inbound* = 1) and their sensitivity to personal income taxes to the case of subsidiaries with an outbound shifting incentive (*Inbound* = 0).[16]

As the basic setup of the inbound profit-shifting regression is to explain output (*EBIT*) with input factors, we include a vector $X_{i,t}$ with several subsidiary-level controls. Following Hines and Rice (1994) and De Simone (2016), we include the natural logarithm of *Tangible Fixed Assets* and *Staff Expenses* to control for capital and labor in the subsidiary. We also include the natural logarithm of *Intangible Fixed Assets* (e.g., Beer and Loeprick, 2015) and *Leverage* (e.g., Huizinga and Laeven, 2008) to control for other drivers of profit shifting.[17] Moreover, in line with Alexander et al. (2020), we control for country-level characteristics of the subsidiary's host country ($\Pi_{s,t}$) to ensure that neither economic nor institutional conditions drive our results. Specifically, we add the natural logarithm of the *GDP* per capita, *GDP growth*, *Control of Corruption*, the annual *Inflation* rate, and the *Unemployment* rate. In addition, we include social security contributions (*SSC*) for the same income percentiles as *PIT*. *SSC* are mandatory payments to institutions that entitle the employee to receive social benefits (e.g., payments for retirement, healthcare, and/or unemployment). As these contributions are levied on the employee's gross salary, they are directly related to the firm's cost of employment, similar to personal income taxes. To control for this component of gross wages in the same vein as *PIT*, we interact *Inbound* with *SSC*.[18]

In all specifications, we use a comprehensive fixed-effects structure. First, we include subsidiary fixed effects (∂_i) to ensure that the identification of our coefficients of interest stems from *within*-subsidiary variations in personal income taxes and inbound profit-shifting incentives.[19] In addition, these fixed effects absorb any firm- or country-level time-invariant characteristics correlated with the profit-shifting strategy of a subsidiary. Second, we include parent-year fixed effects ($\gamma_{j,t}$) to absorb any time-variant MNE characteristics, for example, arising from MNE-specific profit-shifting opportunities or country-specific characteristics of the parent country. Importantly, with these fixed effects, we compare subsidiaries from the same parent company. Finally, we include industry-year fixed effects defined at the two-digit NACE code level ($\omega_{l,t}$). We cluster standard errors at the subsidiary-parent country pair level.

4.2. Empirical identification for H2

To test the effect of substance requirements imposed by CFC rules on the association between personal income taxes and inbound profit-shifting incentives, we modify our regression model from Equation (1). Specifically, we split up *Inbound* and *Inbound* × *PIT* into the mutually exclusive cases of whether the CFC rule applies (*CFC-Relevant* = 1) or not (*Not CFC-Relevant* = 1). In this specification, *CFC-Relevant* is a proxy for binding substance requirements at the country pair level. It is defined as a dummy variable equal to one if the parent country *p* imposes a CFC rule that applies to the subsidiary located in the host country *s*. Panel B of Fig. 2 provides an example to illustrate this. During our sample period, the parent company's country, Germany, has a CFC rule that applies to a subsidiary in a country with a corporate tax rate of less than 25%. As the corporate tax rate of Ireland (12.5%) is lower than the CFC threshold of 25%, the dummy *CFC-Relevant* is equal to one in our example. We also include the interaction of *Inbound* and *Inbound* × *PIT* with the variable *Not CFC-Relevant*. The latter variable captures all cases of inbound profit shifting where the parent country's CFC rule does not apply to the specific country pair. As *Not CFC-Relevant* is defined as 1 – *CFC-Relevant*, these two groups are mutually exclusive. In our German parent country example, this approach would capture subsidiaries in a country with a tax rate of, for example, 26% (e.g., Sweden in 2012). With the German tax rate of approximately 30%, there is an inbound profit-shifting incentive, but the

[15] We note that, due to our definition of *Inbound*, outbound shifting also contains cases where marginal inbound shifting incentives (*CIT-Differential* > −2) or no profit-shifting incentives exist (*CIT-Differential* = 0).

[16] When interpreting the results, we refrain from explicitly stating that our findings for the *Inbound* = 1 cases are *relative* to the case of subsidiaries with no inbound or with an outbound profit-shifting incentive. To keep the language simple, we refer to "inbound shifting," although the results are always relative to the outbound case.

[17] Our results are robust to excluding *Staff Expenses* and *Tangible Fixed Assets* (see Table A.3, Online Appendix). Moreover, as *Intangible Fixed Assets* may absorb some of the profit-shifting effect that would otherwise be captured by *Inbound*; we show that results are similar when excluding intangibles (see Table A.4, Online Appendix).

[18] Our results are robust to excluding the interaction of *Inbound* with *SSC* (see Table A.5, Online Appendix). Note that one conceptual difference between *PIT* and *SSC* is that the latter derive direct benefits for employees.

[19] As our identification stems from multiple tax changes, there is not one pre- and one post-reform observation as in a canonical difference-in-differences approach. To illustrate the extent of variation in our sample, for the income tax rate at the 75th income percentile, more than 96% of the sample subsidiaries experience a change in income taxes at some point. If we require a large change in the income tax rate at the 75th income percentile of at least one percentage point, about 35% of the sample subsidiaries experience a larger change in the income tax rate.

German CFC rule does not apply to this specific country pair. Furthermore, since CFC rules only apply in the case of inbound profit shifting, *CFC-Relevant* and *Not CFC-Relevant* are not defined if *Inbound* equals zero.[20] Taken together, we estimate the following regression model:

$$\begin{aligned}\ln(EBIT_{i,s,j,p,t}) = {} & \beta_0 + \beta_1 Inbound_{s,p,t} \times Not\ CFC - Relevant_{s,p,t} + \beta_2 Inbound_{s,p,t} \times CFC - Relevant_{s,p,t} + \beta_3 Inbound_{s,p,t} \times PIT_{s,t} \\ & \times Not\ CFC - Relevant_{s,p,t} + \beta_4 Inbound_{s,p,t} \times PIT_{s,t} \times CFC - Relevant_{s,p,t} + \beta_5 PIT_{s,t} + X_{i,t} + \Pi_{s,t} + \partial_i + \gamma_{j,t} + \omega_{l,t} \\ & + \varepsilon_{i,t}\end{aligned} \tag{2}$$

where the variables *EBIT*, *Inbound*, and *PIT* are defined as above. We expect a positive effect of inbound shifting incentives on the subsidiary's profits if the CFC rule does not apply ($\beta_1 > 0$). The coefficient β_2 captures the effect of a binding CFC rule when an inbound shifting incentive exists. If CFC rules do not eliminate but reduce inbound profit shifting, we expect β_2 to be positive but smaller than β_1.

Our main coefficients of interest are β_3 and β_4. Given that *CFC-Relevant* and *Not CFC-Relevant* are mutually exclusive, β_3 and β_4 estimate the role of personal income taxes in muting profit shifting when the CFC rule is not binding (β_3) and when the CFC rule is binding (β_4). Consistent with H2, we expect the coefficient β_4 to be negative because the mitigating effect of personal income taxes on inbound profit shifting is primarily relevant when economic substance in the subsidiary is required. In contrast, the effect of personal income taxes on inbound profit shifting is expected to be smaller if the parent company's country does not impose a CFC rule or apply the CFC rule to the subsidiary ($\beta_3 < \beta_4$).

In addition, personal income taxes should not affect outbound profit shifting ($\beta_5 = 0$). Again, outbound profit shifting serves as a placebo test. Note that stricter substance requirements for transactions with the subsidiary imposed by anti-tax avoidance rules, such as CFC rules, in the parent country only apply in the case of inbound shifting (*Inbound* = 1) but not outbound profit shifting (*Inbound* = 0). For this reason, we cannot split the *PIT* coefficient β_5 into *CFC Relevant* and *Not CFC Relevant*. All other design choices — controls and fixed effects — follow Equation (1).

4.3. Sample selection and descriptive statistics

We use financial statement data for all controlled subsidiaries of European MNEs from 2006 to 2019 obtained from Bureau van Dijk's Amadeus database. Following prior literature (e.g., Darendeli et al., 2022; Ma et al., 2023; Ma et al., 2024), we end our sample in 2019 to avoid the exceptional economic and regulatory situation caused by COVID-19 affecting our results.[21] We keep firms with unconsolidated statements, firms that use the full calendar year as the basis for their financial statements, and subsidiaries with at least three observations prior to the sample selection process.[22] We exclude observations with total assets (turnover) of less than €100,000 (€1,000). Further, we exclude observations with negative or missing EBIT, cash, fixed assets, leverage, employees, or staff expenses (De Simone, 2016; De Simone et al., 2017). We exclude subsidiaries from the financial sector (NACE codes 64–66). To classify a subsidiary as belonging to an MNE, the global ultimate owner must reside in a different country and wholly own the subsidiary.[23] This requirement ensures that the parent company can exercise control over the subsidiary (e.g., Becker and Riedel, 2012; Beer and Loeprick, 2015).[24] We require each MNE to have at least two subsidiaries to compare subsidiaries within a group. Our final sample consists of 80,158 observations from 14,103 subsidiaries and 2,396 parent firms in 308 country-years. Panel A of Table 1 summarizes the sample selection process.

Panel B of Table 1 lists the sample countries with the number of observations and descriptive statistics on *Inbound* and personal income taxes by country. The distribution of countries is comparable to other studies (e.g., Beuselinck et al., 2015; De Simone and

[20] Considering *CFC-Relevant* and *Inbound* together, there are very few cases (971 observations) for which a CFC rule is applicable but does not have an inbound shifting incentive according to our definition of *Inbound* (two-percentage point difference of the *CIT-Differential*). As CFC rules should only be relevant in the inbound shifting case, we set these 971 observations to zero. To mitigate the concern that this assumption affects our results, we conduct two tests presented in Section OA.1, Online Appendix. First, we change the cutoffs for defining *Inbound*. Second, we drop small inbound shifting incentives ($-0.02 < CIT\text{-}Differential < 0$). In both tests, our results are very similar.

[21] The relevance of the corporate income tax rate and thus profit-shifting incentives is questionable in 2020 for at least two reasons. First, firms faced losses, which temporarily changed profit-shifting incentives. Second, many countries introduced temporary tax policy measures such as deferred tax payments or the (temporary) change in tax loss offset rules. Importantly, in untabulated tests, we find that our results are robust to including 2020.

[22] After applying our selection criteria, some observations (approximately 5.6% of the sample) belong to subsidiaries with only two firm years. The remaining observations belong to subsidiaries with at least three firm years.

[23] The Amadeus database enables us to link accounting data to ownership information (see also Dischinger and Riedel, 2011; Karkinsky and Riedel, 2012); however, it only provides information for the last reported date. Following Alexander et al. (2020), we use previous versions of the Amadeus database to match accounting information with historical ownership data. Only if a firm's ownership data are not included in an earlier Amadeus database version do we rely on the most recent ownership information for the entire sample period. In line with the work of Budd et al. (2005), this approach should only create a bias against finding significant results if the ownership structure changes.

[24] In Table A.6, Online Appendix, we show that our results are robust to relaxing this assumption and applying a less stringent ownership requirement of more than 50% (e.g., De Simone et al., 2017; Markle, 2016). In doing so, we also consider whether the ownership requirement for the application of the CFC rule is met.

Olbert, 2022). Almost all countries have subsidiaries with and without inbound shifting incentives. Two exceptions are France (a high-tax country without inbound profit-shifting incentives) and Ireland (a low-tax country where all subsidiaries have inbound shifting incentives).[25] The average personal income tax rates at the 75th income percentile vary between 7% in the Netherlands,[26] 10% in Bulgaria and France, and 31% in Belgium and Denmark. The income at the 75th income percentile varies from €4,678 in Serbia to €52,089 in Luxembourg in 2019, suggesting that income levels vary across countries. We note that the average staff expense per employee is higher than the income percentile reported (e.g., €20,470 in Serbia and €67,538 in Luxembourg). However, some important limitations of the staff expenses variable explain these differences. First, the variable "staff expenses" also comprises payments related to payroll taxes or the employer's social security contributions. Second, staff expenses include expenses that are not taxable for the employee in that year. For example, pension contributions paid by the employer are classified as staff expenses but do not increase the employee's taxable income in that year. This explains the sizable difference between the personal income tax base of the employee, the gross wage received, and staff expenses reported in Amadeus. Moreover, the data must be interpreted cautiously because wages are not a mandatory reporting item in local GAAP. For this reason, we use country-specific income statistics as our primary base of income percentiles in our analyses.

Due to cross-country differences in income levels, it is not reasonable to compare the personal income tax burden in the subsidiary country with that in the parent country. Hence, we focus on the average personal income tax rate in the subsidiary country as the driver of the tax cost for providing economic substance. This approach also explains why the difference in tax rates between the parent and subsidiary countries is not a suitable proxy for these tax costs in the subsidiary and why we use *PIT* in our analyses.

Panel A of Table 2 provides descriptive statistics for our tax variables. The difference between the corporate income tax rate in the subsidiary country and the parent country (*CIT-Differential*) has a mean (median) of −1.81% (−2.00%), which is comparable to prior literature (De Simone, 2016; Dischinger et al., 2014). This difference indicates that for approximately half of our observations, it is beneficial for parent companies to shift profits to their foreign subsidiaries (inbound profit shifting). The mean (median) average personal income tax rate ranges from 9.30% (7.35%) for the 25th income percentile to 19.34% (19.48%) for the 90th income percentile. CFC rules apply in approximately 26% of our country pair observations.

In Fig. 5, we provide additional statistics on the variation of *Inbound*. Specifically, in Panel A, we provide a histogram of the average value of *Inbound* by the parent company. A value of zero (one) indicates that all subsidiaries of a parent company never (always) have inbound profit-shifting incentives. About 75% of the parent companies have one or more subsidiaries with an inbound shifting incentive. For approximately 20% of the parent companies, all subsidiaries always have an inbound shifting incentive,[27] while for approximately 25% of the parent firms, subsidiaries never have any inbound shifting incentive. Since such parent companies are in countries with relatively low corporate tax rates in Europe (e.g., the United Kingdom, Sweden, or Cyprus), it is unsurprising that such firms only have subsidiaries in countries with higher tax rates than in the parent country.[28] Panel B of Fig. 5 shows that *Inbound* is relatively stable over our sample period but peaks in the last sample years, where *Inbound* averages slightly above 50%. In Panel C, we present descriptive statistics on the distribution of *Inbound* across industries of the group measured by the parent's NACE letter code.[29] Some industries stand out. The high values in industries D, E, and F can be explained by the parent companies mainly residing in countries with high corporate tax rates.[30] In contrast, industries O to S have fewer observations with inbound profit-shifting incentives because the parent countries have relatively low tax rates.[31] Finally, Panel D provides descriptive statistics on the number of subsidiaries per parent firm. More than 40% of our parent firms have two foreign subsidiaries. The number of parent companies with more than two foreign subsidiaries is steadily declining. Approximately 17.7% of the parent firms have seven or more subsidiaries (maximum 75). On average, MNEs have 12 subsidiaries, suggesting that the number of foreign subsidiaries is highly skewed.

In Panel B of Table 2, we present descriptive statistics for the firm variables, winsorized at the first and 99th percentiles. *EBIT* averages €3,660,130 (the median is €863,510). The mean (median) subsidiary has *Staff Expenses* of €8.7 million (€2.5 million), *Intangible Fixed Assets* of €1.3 million (€0.01 million), *Tangible Fixed Assets* of €9.5 million (€0.9 million), and a debt-to-asset ratio of 30% (26%). Panel C presents descriptive statistics of subsidiary country variables. The average GDP per capita is €33,482, GDP growth averages 1.4%, inflation averages 1.4%, and average unemployment is 9.37%.

[25] Although all Irish subsidiaries have an inbound shifting incentive in our sample, 85.5% of these observations are affected by the CFC rule in the parent country, thereby requiring substance in Ireland to justify inbound shifting. Hence, in these cases, the Irish personal income tax becomes relevant. We note that this might be different for U.S. MNEs because they face less restrictive substance requirements and can therefore shift profits to Ireland more easily.

[26] This low tax rate may appear surprising at first glance. However, there is a sizable national insurance contribution in the Netherlands, which we capture in the social security contribution variable instead of the tax variable.

[27] These MNEs contribute to the identification of *Inbound* × *PIT* because 382 of these 422 MNEs face variation in *PIT*.

[28] Note that these countries help estimate the coefficients on the control variables and serve as control observations in our empirical approach, which relies on changes in tax rates.

[29] If data are unavailable, we use the industry code of the subsidiaries that generated the highest revenues. We group industries if they have few observations (e.g., A – *agriculture, forestry, and fishing* and B – *mining and quarrying*).

[30] These are firms in the *Electricity, Gas, Steam and Air Conditioning Supply* sector (D), the *Water Supply; Sewerage, Waste Management and Remediation Activities* (E), and the *Construction* sector (F).

[31] These are the sectors of *Public Administration and Defense; Compulsory Social Security* (O), *Education* (P), *Human Health and Social Work Activities* (Q), *Arts, Entertainment and Recreation* (R), and *Other Services Activities* (S).

Table 1
Sample Selection and Country Distribution
This table describes the steps to arrive at the final sample and shows the country distribution. Panel A describes the steps to arrive at the final sample and shows the number of subsidiary-year observations and country-year observations. Panel B reports the geographical distribution of the subsidiaries, in addition to the average values for *Inbound* ("mean *Inbound*") and *PIT* measured at the 75th income percentile ("mean *PIT*"). In addition, we report the 75th percentile of the country-specific equivalized household income in EUR in 2019 and the average staff expense per employee.

Panel A: Sample Selection

Reason for Sample Reduction	# firm-years	# country-years
Start: Controlled, nonfinancial, non-missing-EBIT companies with at least three years of data coverage and more than €100,000 total assets and more than €1,000 in turnover and with non-negative or non-missing cash, fixed assets, leverage, employees, or staff expenses	1,149,279	420
After the exclusion of non-multinational subsidiaries and parent firms outside Europe	269,148	340
After the exclusion of non-fully owned subsidiaries and parent firms with fewer than two subsidiaries	80,158	308

Panel B: Sample Composition

Country	Obs.	Mean *Inbound*	Mean *PIT*	P75 Income (2019)	Mean Staff exp.	Country	Obs.	Mean *Inbound*	Mean *PIT*	P75 Income (2019)	Mean Staff exp.
Austria	1,036	0.65	0.23	€34,323	€75,688	Latvia	158	0.78	0.21	€12,352	€20,236
Belgium	4,901	0.13	0.31	€31,739	€75,251	Luxembourg	316	0.33	0.20	€52,089	€67,538
Bulgaria	2,211	0.97	0.10	€6,438	€15,778	Netherlands	284	0.74	0.07	€32,690	€68,887
Croatia	2,120	0.79	0.13	€10,156	€25,054	Norway	2,098	0.23	0.21	€50,220	€72,267
Czech R.	6,619	0.85	0.11	€13,155	€25,140	Poland	4,596	0.87	0.15	€9,693	€22,869
Denmark	1,749	0.45	0.31	€40,845	€76,163	Portugal	2,066	0.21	0.15	€14,085	€38,150
Estonia	599	0.58	0.16	€16,532	€25,136	Romania	2,273	0.95	0.12	€5,806	€20,113
Finland	1,715	0.31	0.14	€33,417	€57,965	Serbia	2,133	0.91	0.11	€4,678	€20,470
France	7,619	0.00	0.10	€29,846	€69,015	Slovak R.	4,073	0.67	0.11	€10,544	€27,756
Germany	4,782	0.24	0.19	€31,533	€66,237	Slovenia	1,081	0.88	0.18	€18,168	€37,314
Hungary	1,655	0.93	0.16	€7,946	€27,713	Spain	7,315	0.34	0.18	€22,024	€50,547
Ireland	579	1.00	0.15	€35,420	€57,453	Sweden	2,599	0.56	0.30	€32,805	€72,128
Italy	11,158	0.20	0.17	€24,384	€60,831	U.K.	4,423	0.68	0.12	€30,685	€56,405
			Total				**80,158**	**0.47**	**0.16**	**€23,522**	**€49,712**

Table 2
Descriptive Statistics
This table provides descriptive statistics of our main variables for the 80,158 subsidiary-year observations from 2006 to 2019. Appendix B provides variable definitions.

	Mean	St. dev.	25th perc.	50th perc.	75th perc.
Panel A: Tax variables					
CIT-Differential	−0.0181	0.0907	−0.0800	−0.0200	0.0400
Inbound	0.4745	0.4994	0.0000	0.0000	1.0000
PIT at the 25th income percentile	0.0930	0.0641	0.0526	0.0735	0.1143
PIT at the 50th income percentile	0.1321	0.0622	0.0828	0.1262	0.1512
PIT at the 75th income percentile	0.1641	0.0633	0.1099	0.1591	0.1832
PIT at the 90th income percentile	0.1934	0.0644	0.1471	0.1948	0.2209
SSC at the 25th income percentile	0.3343	0.1927	0.1956	0.4107	0.4500
SSC at the 50th income percentile	0.3533	0.1656	0.1995	0.4107	0.4500
SSC at the 75th income percentile	0.3699	0.1425	0.2115	0.4107	0.4500
SSC at the 90th income percentile	0.3796	0.1299	0.2498	0.4107	0.4500
CFC-relevant	0.2585	0.4378	0.0000	0.0000	1.0000
Not CFC-Relevant	0.7415	0.4378	0.0000	1.0000	1.0000
Panel B: Firm variables					
EBIT	3,660,130	7,435,444	234,874	863,510	3,007,051
Staff expenses	8,708,075	17,100,000	782,321	2,494,785	7,684,685
Intangible fixed assets	1,257,711	4,569,150	0	11,202	203,626
Tangible fixed assets	9,452,251	24,800,000	107,747	914,751	5,656,123
Leverage	0.3003	0.2224	0.1186	0.2626	0.4440
Panel C: Country variables					
GDP per capita	33,482	17,476	19,827	33,969	43,664
GDP growth	0.0144	0.0243	0.0058	0.0169	0.0275
Control of corruption	0.9022	0.7737	0.2189	0.7251	1.5733
Inflation	0.0140	0.0130	0.0070	0.0121	0.0196
Unemployment	0.0937	0.0486	0.0611	0.0836	0.1134

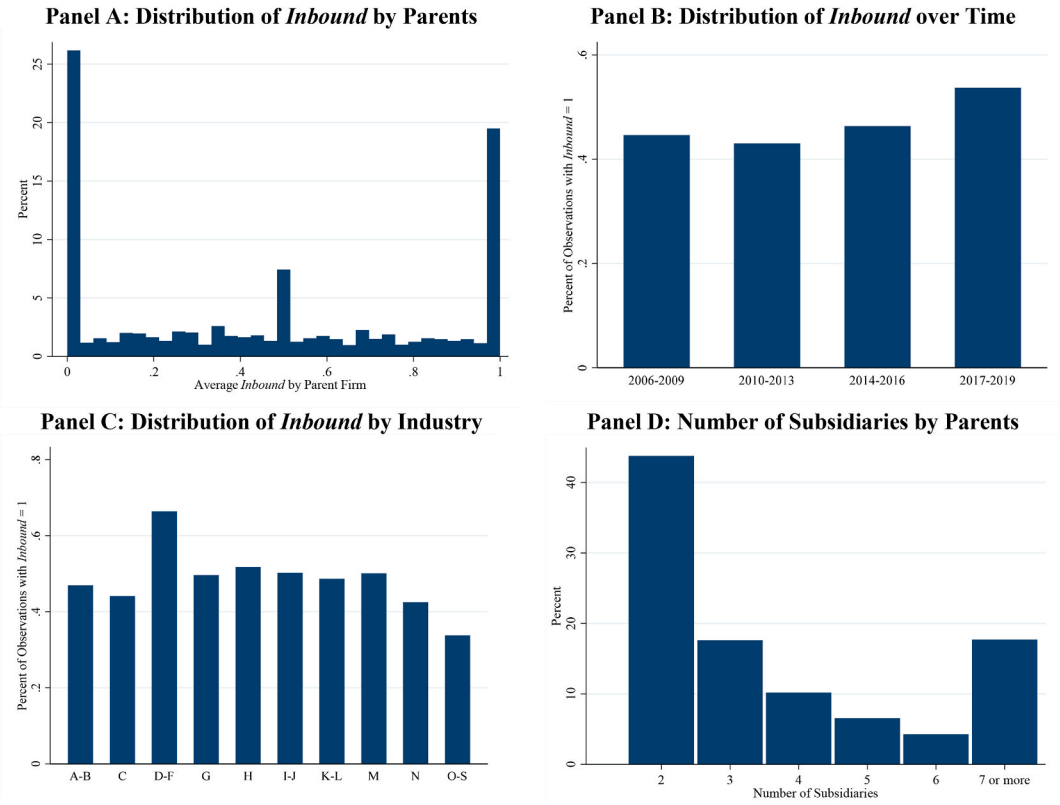

Fig. 5. Additional Descriptive Statistics
This figure provides descriptive statistics on inbound shifting incentives (*Inbound*) and the number of subsidiaries in our sample. Panel A shows the distribution of *Inbound* across parent firms. Panel B plots the distribution of *Inbound* over time. Panel C shows the distribution of *Inbound* across industries. Industries are classified following NACE codes: agriculture, forestry and fishing (A), mining and quarrying (B), manufacturing (C), electricity, gas, steam and air conditioning supply (D), water supply; sewerage, waste management and remediation activities (E), construction (F), wholesale and retail trade; repair of motor vehicles and motorcycles (G), transporting and storage (H), accommodation and food service activities (I), information and communication (J), financial and insurance activities (K), real estate activities (L), professional, scientific and technical activities (M), administrative and support service activities (N), public administration and defense; compulsory social security (O), education (P), human health and social work activities (Q), arts, entertainment and recreation (R), and other services activities (S). Panel D shows the distribution of the number of subsidiaries by parent firms.

5. Results

5.1. Personal income taxes and inbound profit shifting

Table 3 reports the results of testing H1. We only report the coefficient estimates of the main variables. Table A.7 of the Online Appendix reports all the other coefficients. In column 1, we estimate the effect of inbound profit-shifting incentives on subsidiaries' EBIT without including personal income taxes to establish that profit shifting exists in our sample. In columns 2 to 5, we include personal income taxes (*PIT*) and their interaction with inbound shifting incentives (*Inbound* × *PIT*). We estimate the role of personal income taxes at the 25th, 50th, 75th, and 90th income percentiles, respectively.

Across all columns in Table 3, we find a positive and significant effect of a subsidiary's inbound shifting incentive on its EBIT. The results show that subsidiaries with an inbound shifting incentive report EBIT that are, on average, 8.20% (column 1) to 9.61% (column 5) higher than subsidiaries without an inbound profit-shifting incentive. These results are economically comparable to the semi-elasticity of −0.8 shown in prior literature (e.g., Heckemeyer and Overesch, 2017), but below some estimates from the U.S., due to stricter anti-tax avoidance rules in our sample countries.[32] In columns 2 to 5, we find that personal income taxes negatively affect

[32] Specifically, this baseline estimate — which also captures cases in which personal income taxes and substance requirements should not affect inbound shifting — is close to the semi-elasticities shown for European firms (e.g., Weichenrieder, 2009) and slightly below some estimates using U.S. data (e.g., Grubert, 2003, 2012). However, the semi-elasticities for U.S. firms in other studies are higher (e.g., Clausing, 2009; Hines and Rice, 1994). The difference between the latter results and our baseline estimate is not surprising given that during our sample period firms faced stricter anti-tax avoidance rules than U.S. firms in the sample of Hines and Rice (1994) and Clausing (2009) (see Fig. 1).

Table 3
Personal Income Taxes and Inbound Profit Shifting
This table presents the results from estimating Equation (1). The dependent variable is the natural logarithm of EBIT *(EBIT)*. The primary independent variables are *Inbound*, a dummy variable equal to one if *CIT-Differential* is smaller than −2 percentage points, and its interaction with the average personal income tax rate (*PIT*) measured at the respective country-year-specific income percentiles. All regressions include control variables and subsidiary, parent-year, and industry-year fixed effects. Appendix B provides variable definitions. We report robust standard errors clustered at the parent-subsidiary country pair level in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	Exp. sign	(1)	(2)	(3)	(4)	(5)
Income level for PIT			25th perc.	50th perc.	75th perc.	90th perc.
Dependent variable				**EBIT**		
Inbound (β_1)	+	0.0820***	0.0804***	0.0867***	0.0926***	0.0961***
		(0.0261)	(0.0245)	(0.0241)	(0.0244)	(0.0251)
PIT (β_2)	?		−0.0035	−0.0037	−0.0040	0.0003
			(0.0049)	(0.0049)	(0.0053)	(0.0057)
Inbound × PIT (β_3)	−		−0.0050*	−0.0070**	−0.0080***	−0.0081***
			(0.0027)	(0.0027)	(0.0026)	(0.0028)
Control variables		Yes	Yes	Yes	Yes	Yes
Fixed effects			Subsidiary, parent-year, and industry-year			
Clustered standard errors			Parent-subsidiary country pair			
Observations		80,158	80,158	80,158	80,158	80,158
Adjusted R-squared		0.8345	0.8345	0.8345	0.8345	0.8345

inbound profit shifting ($\beta_3 < 0$). This result is significant across specifications and supports H1. To determine the economic magnitude of our estimates, we interpret the results for personal income taxes at the 75th income percentile in column 4. The estimates indicate that a subsidiary with an inbound shifting incentive reports a 9.26% higher EBIT (=β_1). An increase in the personal income tax rate by one percentage point[33] from the average personal income tax in the sample decreases profit shifting to a subsidiary in this low-tax country by approximately 8.64% (=β_3/9.26%).

To reconcile this effect with prior literature, we calculate the elasticity of inbound profit shifting to changes in *PIT*. Our calculation yields an elasticity of −1.42,[34] which is reasonable given the range of elasticity estimates from −1.5 to −4.5 in prior literature (e.g., Grubert and Mutti, 1991, 2000; Hines and Rice, 1994). In monetary terms, the estimate from column 4 of Table 3 suggests that profit shifting to low-taxed subsidiaries amounts to €2.4bn (0.0926 × €3.67 million mean EBIT × 7,052 number of subsidiaries with inbound shifting incentives) for our sample MNEs. An increase of one percentage point in the average personal income tax rate at the 75th income percentile translates into a decline in profit shifting to low-taxed subsidiaries from €2.4bn to €2.2bn, or €2.04 million per MNE to €1.86 million.[35] Note that this estimate of an 8.6% decline also includes cases without strict economic substance requirements and thus, personal income taxes are not a friction. As we show in Section 5.2, the decrease in profit shifting due to a one percentage point increase in the personal income tax rate increases to 20% if there is a binding CFC rule. Moreover, in Section 6.5, we show that in terms of the economic magnitude, personal income taxes have a similar or even higher effect on profit shifting than other profit-shifting costs. Overall, our results show that personal income taxes can impose substantial costs to profit shifting, thereby limiting the scope of profit shifting to subsidiaries in low-tax countries with high personal income tax rates.

Considering the case of outbound profit shifting, our placebo coefficient β_2 shows no significant effect of personal income taxes on outbound profit shifting. This nonsignificant result further supports that our main findings — personal income taxes mitigate profit shifting — are unique to inbound profit shifting. Moreover, the results in columns 2 to 5 suggest that the muting effect of personal income taxes on inbound profit shifting (β_3) increases with income percentiles. For example, at the 75th income percentile, inbound profit shifting declines by 8.6% (see above) for a one percentage point increase in *PIT*, while the effect is only 6.2% (=0.0050/0.0804) at the 25th percentile. In monetary terms, a one percentage point increase in *PIT* translates into a decrease in shifted profits by about €0.18 (€0.11) million per MNE at the 75th (25th) income percentile.[36] This finding is consistent with the notion that highly paid

[33] To interpret our findings, we use a one percentage point increase because this is representative of changes in our sample (e.g., Luxembourg in 2013, Netherlands in 2015, Czech Republic in 2009, or approximately the cumulative change in Ireland from 2015 to 2018). Moreover, when we consider the variation that is not absorbed by the fixed effects (Breuer and deHaan, 2024), we observe a within-fixed effects standard deviation of the average personal income tax rate at the 75th income percentile for inbound shifting cases (*Inbound* = 1) of 0.83 percentage points.

[34] We calculate the elasticity by dividing the profit-shifting response (−8.64% = −0.0080/0.0926) by the percent increase in tax rates stemming from a one percentage point increase in the tax rate relative to the sample mean (=1%/16.41%).

[35] Given that the average MNE has 12 foreign subsidiaries and that half of them have inbound shifting incentives in our regression (i.e., six subsidiaries), this translates into approximately €2.04 million shifted profits per MNE (=9.26% × 6 subsidiaries × €3.67 million average EBIT of a subsidiary). If the income tax rate increases by one percentage point, the shifted profits per MNE decrease from €2.04 million to €1.86 million (=(9.26%–0.8%) × 6 subsidiaries × €3.67 million). This decline translates into a decrease of profit shifting to low-tax subsidiaries from €2.4bn to €2.2bn (=(9.26%–0.8%) × €3.67 million mean EBIT × 7,052 number of subsidiaries with inbound shifting incentives).

[36] The decline in shifted profits by about €0.11 million per MNE at the 25th percentile equals shifted profits per MNE of €1.77 million (=8.04% × 6 subsidiaries × €3.67 million average EBIT) minus shifted profits per MNE of €1.66 million if the income tax rate increases by one percentage point (=(8.04%–0.5%) × 6 subsidiaries × €3.67 million).

employees are important to justify economic substance because they, for example, have decision-making rights. However, these employees also imply higher substance costs, which, in turn, mitigate inbound profit shifting.

5.2. Substance requirements and the muting effect of personal income taxes in profit shifting

We next expand the analysis from Table 3 and test H2, which predicts that the muting effect of personal income taxes on inbound shifting arises because they represent the costs of providing economic substance needed to justify inbound shifting. Table 4 reports the results of estimating Equation (2). Across all columns, we find a positive and significant effect of inbound shifting incentives on subsidiaries' EBIT when CFC rules are not binding (β_1) and when they are binding (β_2). This result indicates that CFC rules alone cannot eliminate profit shifting (e.g., Alexander et al., 2020; Clifford, 2019).

Considering the role of personal income taxes in inbound shifting incentives, we find a nonsignificant effect when the CFC rule is not binding (β_3). This is consistent with our expectation that personal income taxes do not affect profit shifting when a CFC rule is not binding. Importantly, personal income taxes significantly reduce inbound shifting incentives when a CFC rule is binding ($\beta_4 < 0$). The muting effect of personal income taxes on inbound profit shifting is significantly larger when CFC rules are binding and strict substance requirements are imposed relative to the case when CFC rules do not exist or apply ($\beta_4 > \beta_3$). This finding supports H2. The economic magnitude of this finding is sizable. The estimates in column 3 indicate that an increase in the average personal income tax by one percentage point reduces profit shifting to low-taxed subsidiaries when a CFC rule is binding by about 20% ($=\beta_4/\beta_2 = 1.70\%/8.34\%$). As mentioned in the introduction, this magnitude may appear large and might result from the strict anti-tax avoidance rules in our sample of European multinationals.

To provide more insights into the economic magnitude of the results, Fig. 6 plots the overall muting effect of personal income taxes in the case of inbound profit-shifting incentives and binding CFC rules (i.e., $\beta_2 + \beta_4$) for incremental changes in personal income taxes by 0.5 percentage points (ranging from -3 to $+3$ percentage points around the sample mean tax rate). The advantage of this approach is that it allows us to quantify the critical level of personal income tax rates at which they can mute profit shifting if a CFC rule is binding (based on the estimates in Table 4). Across all panels, Fig. 6 shows that, in the case of binding CFC rules, as soon as the personal income tax rate in a subsidiary country is only more than one percentage point above the sample average personal income tax rate (in the case of the 25th (50th) percentile at (above) the average income tax rate), the effect of inbound shifting incentives on subsidiaries' EBIT is no longer significant at the 5% level. That is, there is no longer any statistically significant profit shifting to the subsidiary in the low-tax country if the CFC rule is binding. This result implies that binding CFC rules are effective if the costs of providing economic substance are sufficiently high. If, however, personal income taxes are lower and thus the cost of providing economic substance is sufficiently low (i.e., the personal income tax rate is less than one percentage point above the sample average tax rate), MNEs continue to engage in some profit shifting even in the presence of binding CFC rules. This result also explains why CFC rules alone cannot eliminate profit shifting.

In the case of outbound profit shifting, we continue to find a nonsignificant effect of personal income taxes on subsidiaries' EBIT (β_5), supporting the notion that personal income taxes represent costs of providing economic substance and are only relevant for inbound profit shifting. In sum, the results from Sections 5.1 and 5.2 show that combining anti-tax avoidance measures with personal income taxes substantially reduces firms' incentives to shift profits to low-tax countries.

5.3. Robustness tests

We conduct several robustness tests to support our findings. In Section OA.1 of the Online Appendix, we describe all robustness tests in detail and tabulate the related findings. For example, we use firm-specific and industry-specific personal income tax rates to address the concern that we determine personal income tax rates based on the country-year-specific income distribution, which may not capture the wage level of our specific firms or industries. Further, we use the average personal income tax rate at the 2006 income percentile (the first sample year) to mitigate the concern that changes in personal tax rates affect investment and employment in the subsidiary country, leading to potential changes in the future income distribution or personal income tax rate. Moreover, we exclude single countries, address concerns about concurrent changes in personal and corporate tax rates, change the definition of *Inbound*, change the fixed-effects structure, and change the dependent variable. Collectively, our results are robust across these various tests.

6. Supplemental tests

This section presents three sets of additional tests to corroborate our main findings. First, we test the two assumptions underlying our hypotheses. Specifically, we validate that labor is needed and used to justify inbound shifting (Section 6.1). We also explore variation to the extent to which firms bear a part of the personal income tax burden (Section 6.2). Second, to link our results to prior literature and other costs of profit shifting, we explore differences in adjustment costs and other profit-shifting costs (Section 6.3). We also examine a broader set of anti-tax avoidance rules (Section 6.4) and compare the economic magnitude of personal income taxes to other profit-shifting costs (Section 6.5). Third, we address concerns about a lack of data on tax havens, particularly dot tax havens outside the EU (Section 6.6).

6.1. Tax incentives and shifting of labor

We start by providing evidence that, consistent with the OECD guidelines (2010, 2013a, 2013b), labor input provides economic

Table 4
Personal Income Taxes, Inbound Profit Shifting, and CFC Rules
This table presents the results from estimating Equation (2). The dependent variable is the natural logarithm of EBIT (*EBIT*). The primary independent variables are *Inbound*, a dummy variable equal to one if *CIT-Differential* is smaller than −2 percentage points; the average personal income tax rate (*PIT*) measured at the country-year-specific income percentiles; *CFC-Relevant*, a dummy variable equal to one if a CFC rule applies; *Not CFC-Relevant*, a dummy variable defined as 1 – *CFC-Relevant*; and the interactions between these variables. All regressions include control variables and subsidiary, parent-year, and industry-year fixed effects. Appendix B provides variable definitions. We report robust standard errors clustered at the parent-subsidiary country pair level in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	Exp. sign	(1)	(2)	(3)	(4)
Income level for PIT		25th perc.	50th perc.	75th perc.	90th perc.
Dependent variable			**EBIT**		
Inbound profit-shifting incentives					
Inbound × Not CFC-relevant (β_1)	+	0.0858***	0.0901***	0.0971***	0.1036***
		(0.0262)	(0.0267)	(0.0266)	(0.0263)
Inbound × CFC-relevant (β_2)	+	0.0620*	0.0768**	0.0834***	0.0822***
		(0.0333)	(0.0313)	(0.0311)	(0.0316)
Role of PIT in inbound profit-shifting incentives					
Inbound × PIT	–	−0.0065	−0.0066	−0.0075	−0.0034
× Not CFC-relevant (β_3)		(0.0050)	(0.0049)	(0.0056)	(0.0061)
Inbound × PIT	–	−0.0114**	−0.0154***	−0.0170***	−0.0127**
× CFC-relevant (β_4)		(0.0047)	(0.0046)	(0.0051)	(0.0058)
Role of PIT in outbound profit-shifting incentives					
PIT (β_5)	?	−0.0030	−0.0032	−0.0043	−0.0003
		(0.0050)	(0.0048)	(0.0052)	(0.0056)
Test of H2: $\beta_4 \neq \beta_3$					
Difference	–	*−0.0049**	*−0.0088****	*−0.0094****	*−0.0092****
[t-stat.]		*[-1.75]*	*[-2.92]*	*[-3.01]*	*[-2.73]*
Control variables		Yes	Yes	Yes	Yes
Fixed effects			Subsidiary, parent-year, and industry-year		
Clustered standard errors			Parent-subsidiary country pair		
Observations		80,158	80,158	80,158	80,158
Adjusted R-squared		0.8345	0.8345	0.8345	0.8345

substance in low-tax countries in our setting. First, Panel A of Table 5 presents descriptive statistics on the median and the average number of employees per subsidiary.[37] To document that firms use labor input to provide economic substance to substantiate profit shifting, we test whether firms locate more employees in countries with inbound shifting incentives (*Inbound* = 1). Consistent with our argument that the cost of locating employees to such countries is a function of the personal income tax rate, we expect firms to locate more employees in these subsidiaries where the country's personal income tax rate is low. To this end, we define an indicator variable, *Low PIT*, which is equal to one if the personal income tax rate is below the top tercile. *High PIT* is defined as 1 – *Low PIT*. The average (median) number of employees is 230 (73) if there is an inbound shifting incentive and the personal income tax rate is low (*Inbound* = 1 and *Low PIT* = 1). Consistent with our assumptions, this average (median) is the highest number of employees across all cases. If there is no inbound shifting incentive (*Inbound* = 0) or if the personal income tax rate is high (*High PIT* = 1), subsidiaries have fewer employees. These descriptive statistics also indicate that MNEs appear to locate a non-trivial number of employees in these subsidiaries.

Second, we document that applying strict nexus and substance requirements is associated with shifting labor to substantiate tax positions. To this end, we run regressions with the number of employees as the dependent variable. As a measure of strict substance requirements, we use the applicability of CFC rules or the broader composite index *Tax Strictness Score*, which covers more anti-tax avoidance rules in the parent country. We include turnover as a control for firm size (in natural logarithm), country-level control variables by the host and parent countries, subsidiary country-fixed effects, and industry-year fixed effects. Panel B of Table 5 shows the results. Consistent with the notion that employees are essential to provide economic substance and to justify transfer prices, the findings indicate that stricter nexus and substance requirements in the parent country are associated with more employees in a foreign subsidiary.

In the final step, we directly examine the relationship between personal income taxes and economic substance. We regress the share of staff expenses in a subsidiary relative to an MNE's total staff expenses on the personal income tax rate of the subsidiary country and the personal income tax rate of the parent country. Consistent with our prediction that higher personal income taxes increase costs of economic substance and thereby reduce the incentive to shift profits, higher personal income taxes in the *subsidiary* country are expected to reduce the share of wages in this country. In contrast, higher personal income tax rates in the *parent* country should increase staff expenses in a subsidiary country because it could be more beneficial for the MNE to locate employment abroad instead of in the parent country. While this test cannot distinguish between relocating employees within an MNE or hiring new employees, this

[37] There is no uniform definition of economic substance. However, we acknowledge that substance is not only constituted by the number of employees but also by the type of jobs and decision rights (e.g., OECD, 2013a; 2013b).

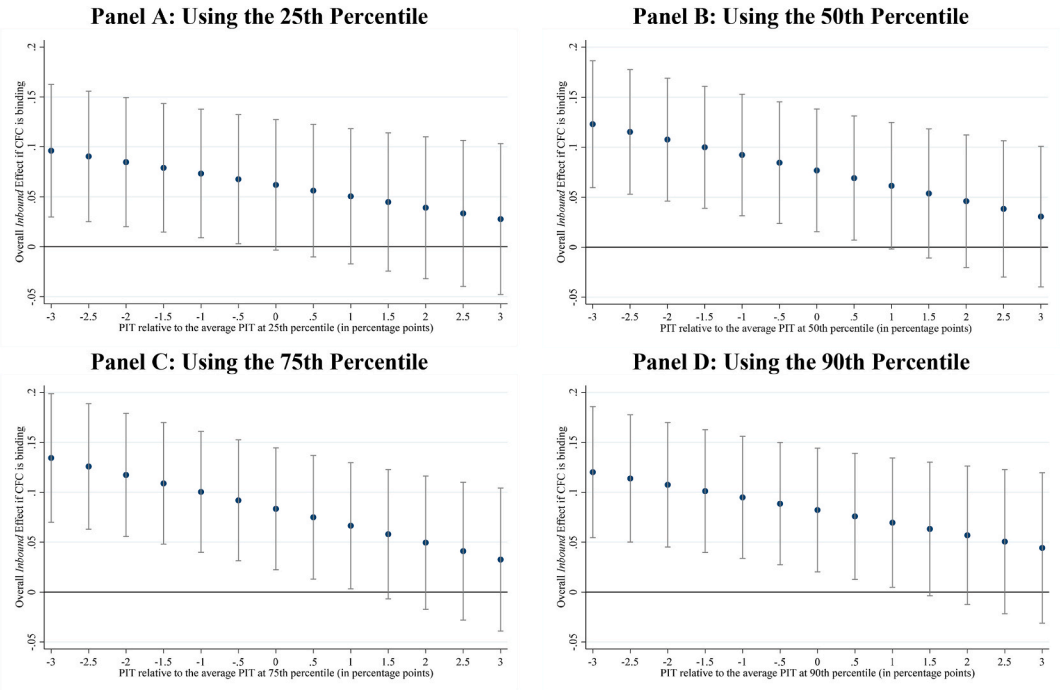

Fig. 6. Effect of Inbound Profit Shifting and CFC Rules, Breakdown by Personal Income Taxes
This figure displays the point estimates along with the 95% confidence intervals of the overall effect of *Inbound* for different changes in the personal income tax rate—measured from −3 to 3 percentage points relative to the average personal income tax rate—when a CFC rule applies (i.e., $\beta_2 + \beta_4$ from Table 4). The average personal income tax is measured at the 25th income percentile in Panel A, the 50th income percentile in Panel B, the 75th income percentile in Panel C, and the 90th income percentile in Panel D, respectively. We use the coefficient estimates from Table 4. Standard errors are clustered at the parent-subsidiary-country pair level.

distinction is irrelevant to the profit-shifting consequences. We control for all subsidiary and macroeconomic factors from Equation (1) and for the parent country and subsidiary corporate tax rates (which are captured by *Inbound* in the main models), consumer price index for food, life expectancy, and average wage. We include subsidiary and industry-year fixed effects and cluster our standard errors at the country-industry level.

Panel C of Table 5 reports the results for the PIT variables. The coefficients on the controls are reported in Table A.8 of the Online Appendix. Across all columns, personal income taxes in the subsidiary country are associated with lower staff expenses, indicating that personal income taxes increase the cost of employment, resulting in lower labor input and thus lower economic substance. Moreover, personal income taxes in the parent country are associated with higher staff expenses in subsidiaries (except for the 25th income percentile). These results differ from those of Giroud and Rauh (2019), who do not find an effect of the personal income tax on the employee count. The difference between ours and their findings can be explained and reconciled in two ways. First, Giroud and Rauh (2019) use the *marginal* personal income tax rate, whereas we use the *average* tax rate. This is because we consider how the employees' overall personal income tax burden affects the cost of employment, whereas Giroud and Rauh (2019) explore the role of the owners' income taxes in investment and employment decisions. Second, for the latter reason, Giroud and Rauh (2019) reasonably assume that the firm owners are in the top income tax bracket. We differ from their approach by using the average tax burden at different income percentiles because we consider employees and not the owners. The former are more likely to be below the cutoff for the top marginal income tax rate.[38] In sum, our results imply that (1) personal income taxes can drive the location of employees, (2) labor input is important in profit shifting, and (3) substance requirements trigger more labor investments in subsidiaries. These findings support the necessary conditions underlying our hypotheses.

6.2. *Role of tax incidence*

Another key assumption of our main tests is that MNEs bear part of the employees' personal income tax burden. However, because we cannot directly test this assumption due to a lack of wage data, we take two steps to address the question. First, we test the correlation between personal income taxes and wages in a country. We expect a positive correlation if the incidence of personal income

[38] Future research could explore the role of the employees' average personal income tax burden on the employee count using the data of Giroud and Rauh (2019).

Table 5
Tax Incentives, Labor Costs, and Shifting of Labor
This table presents descriptive statistics and empirical results on the notion that labor is needed to justify economic substance in low-taxed subsidiaries. In Panel A, we provide descriptive statistics on the median and the average number of employees per subsidiary. In Panel B, we test nexus requirements. The dependent variable is the natural logarithm of the number of employees. The primary independent variables are *CFC-Relevant*, a dummy variable equal to one if a CFC rule applies, and *Tax Strictness Score*, which measures the strength of anti-tax avoidance rules. All regressions in Panel B include control variables and subsidiary country and industry-year fixed effects. We report robust standard errors clustered at the parent level in parentheses. In Panel C, we examine the effect of personal income taxes on the labor share. The dependent variable is the country-specific share of subsidiary wages of the (reported) total wages of the MNE. The primary independent variables are the average personal income tax rate (*PIT*) of the subsidiary country and the *PIT* value of the parent country, measured at the respective country-year-specific income percentiles. All regressions in Panel C include control variables and subsidiary and industry-year fixed effects. We report robust standard errors clustered at the country-industry level in parentheses. Appendix B provides variable definitions. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Descriptive Statistics, Number of Employees, Breakdown by Tax Incentives

	Average Number of Employees			Median Number of Employees		
	Low PIT	High PIT	*Δ Low PIT versus High PIT*	Low PIT	High PIT	*Δ Low PIT versus High PIT*
Inbound = 0	196	194	*2*	55	62	*−7****
			[0.48]			*[-5.85]*
Inbound = 1	230	208	*22****	73	66	*7****
			[4.53]			*[5.07]*
Δ Inbound = 0 vs. Inbound = 1	*−34****	*−14****		*−18****	*−4****	
	[-9.70]	*[-2.91]*		*[-17.73]*	*[-2.67]*	

Panel B: Nexus Requirements and Labor in Subsidiaries

	(1)	(2)
Dependent variable	**Number of Employees**	
CFC-Relevant	0.1187***	
	(0.0308)	
Tax Strictness score		0.0255*
		(0.0148)
Controls	Yes	Yes
Fixed effects	Subsidiary country and industry-year	
Observations	80,158	80,158
Adjusted R-squared	0.7009	0.7003

Panel C: Personal Income Taxes and the Share of Labor Costs

	(1)	(2)	(3)	(4)
Income level for PIT	25th perc.	50th perc.	75th perc.	90th perc.
Dependent variable	**Share of Total Wages in the Subsidiary Country**			
PIT	−0.1753***	−0.1557***	−0.1731***	−0.1709***
	(0.0577)	(0.0529)	(0.0613)	(0.0584)
PIT (parent country)	0.0725	0.1178*	0.1710**	0.1673***
	(0.0572)	(0.0637)	(0.0698)	(0.0647)
Controls	Yes	Yes	Yes	Yes
Fixed effects	Subsidiary and industry-year			
Observations	74,132	74,132	74,132	74,132
Adjusted R-squared	0.9270	0.9270	0.9271	0.9271

taxes partly falls on firms because employees negotiate higher wages to compensate for higher personal income taxes. We use country-level data on hourly wage rates provided by the International Labor Organization (ILO). However, there are some caveats. First, the data are unavailable for all sample countries (e.g., Serbia is not covered) and years (e.g., coverage in 2014 and 2015 is relatively poor). Second, the data can only inform us about associations. One advantage of the data is that hourly wage rates do not cover social security contributions and other payroll taxes, which are, for example, included in the Eurostat data. Hence, we use the ILO data for a country-year sample of 162 observations. Considering these limitations, we plot the hourly wage rate in a subsidiary country on the y-axis and the personal income tax on the x-axis. We use the 75th percentile (90th percentile) in Panel A (Panel B) of Fig. 7. We find a positive association between income taxes and the hourly wage rate. The slope of the fitted line is positive and statistically significant. This supports the notion that, on average, there is a positive association between hourly wage rates and personal income tax rates.

In the second step, we provide indirect evidence related to tax incidence. Specifically, we assess cases in which firms are more likely to bear more of the personal income tax burden. The general notion of tax incidence is that the tax is borne by those "who cannot easily adjust" (Kotlikoff and Summers, 1987, p. 1047). We operationalize this notion through relative elasticities of demand and supply in the labor market (Dyreng et al., 2022; Weyl and Fabinger, 2013). Our approach uses different proxies for relative elasticities of labor demand and supply, which we sort into three groups: *Firm*-level characteristics, general *economic* factors, and *locational* characteristics.

The general idea is that the muting effect of personal income taxes on profit shifting (*Inbound* × *PIT*) should be stronger if firms bear more of the personal tax burden, i.e., firms are less elastic and thus have lower labor market power.[39] Note that *Inbound* captures the existence of profit shifting and should be significant in high- and low-elasticity cases.

As *firm*-level characteristics at the subsidiary level, we explore variation in size, the relative importance of labor versus capital, and financial constraints. Larger firms can more easily attract talent (Idson and Oi, 1999), making the firm relatively more elastic. Firms with more labor input must substantiate more economic substance via labor relative to a firm with greater tangibility. Hence, firms with higher labor-to-capital ratios should be less elastic in the labor market. Next, we explore differences in financial constraints using the Z-Score (Altman, 1968). Constrained firms are less financially flexible in investment decisions (Graham, 2022), making their capital and labor demand relatively inelastic. Finally, we explore variations in operating margins at the consolidated parent level. MNEs with a higher margin likely have more market power, making them relatively more elastic in local labor markets (Lerner, 1934). We thus expect that smaller subsidiaries, subsidiaries with high labor-to-capital ratios, financially constrained subsidiaries, or groups with a low margin are more likely to bear their employees' income tax burden.

As *economic* factors, we use labor market characteristics in the subsidiary country. Since country characteristics are relatively coarse, we use a score based on five country-level factors. Specifically, we expect that firms bear more of the burden if (1) the union density is high (as greater union density and more collective bargaining give employees more power (Fuest et al., 2018)), (2) the labor force and (3) the share of skilled labor are low (both because firms then compete more for the needed employees, giving workers more power (Fuest et al., 2018)), (4) social support is low (as employees demand a higher salary to compensate for a lack of social services (e.g., Feldstein, 2005)), and (5) unemployment is low (because there is more competition by firms for employees (Jacob and Vossebürger, 2022)). We split each of these characteristics at the year-specific 25th percentile and define a dummy variable equal to one for each component. The value 1 (0) indicates greater (lower) labor market power by firms. We then build a score of *Labor Market Power* ranging from 0 (least market power by firms) to 5 (greatest market power by firms). In our empirical tests, we split the sample at a value of 3.

Finally, as *locational* factors, we follow a similar approach and use five characteristics that capture locational factors that make a country more attractive (i.e., employees are more likely to bear the personal income tax burden) versus less attractive (i.e., employers must compensate employees for the personal income tax). Specifically, we argue that quality of life and the attractiveness of a location are greater when (1) the consumer price index for food is lower (Eckstein and Wilson, 1962), (2) the local government provides substantial health services (measured by the health expenditures to GDP ratio (e.g., Gruber, 1994)), (3) life expectancy is higher (e.g., Acemoglu and Johnson, 2007), (4) there is the freedom to make life choices (Rahman and Veenhoven, 2018), and (5) there is a favorable climate (measured by the average temperature (Fleming et al., 2018)). We split each of these characteristics at the median and define a dummy variable equal to one for each component, where 1 (0) indicates greater (lower) attractiveness of the location. We then build the *Location Score* ranging from 0 (least market power by firms due to unfavorable locational factors) to 5 (greatest market power by firms). In our empirical tests, we split the sample at a value of 3.[40]

The results are reported in Table 6. For all three groups of characteristics, we find that when firms are more likely to bear the personal income tax burden (i.e., when the subsidiary or the group has relatively low power in the labor market, when labor market conditions are unfavorable for firms, or when the location is not very attractive), personal income taxes have a significant muting effect on profit shifting (*Inbound* × *PIT* < 0). If firms are less likely to bear the personal income tax burden, the muting effect of personal income taxes on profit shifting is significantly smaller, as indicated by the significant differences in all six cases.[41]

Importantly, we find no difference in the effect of *Inbound* on a subsidiary's EBIT across groups when we sort observations based on subsidiary characteristics in Panel A. In line with our expectations, the muting effect of personal income taxes matters when there is a significant *Inbound* effect. One exception is the split based on the relative importance of labor versus capital (column 3). However, the magnitude of the *Inbound* coefficient in the low group is almost identical to that in the high group (column 4), suggesting a power issue in this test. In Panel B, we find significantly larger effects of inbound shifting incentives on a subsidiary's EBIT in the "low" groups when we split observations based on group and subsidiary country characteristics. A potential explanation for why subsidiaries in groups with low margins respond more strongly to inbound shifting incentives could be that more competition reduces the ability to pass on corporate taxes to their stakeholders, which is associated with more profit shifting (Dyreng et al., 2022). The stronger effect of inbound shifting incentives when subsidiaries are located in less attractive countries and countries with low labor market power might be explained by the fact that these countries often have lower corporate tax rates, which result in more inbound shifting incentives. However, more importantly and consistent with Panel A, the muting effect of personal income taxes matters when there is a significant *Inbound* effect. Overall, while these tests do not directly test incidence, they corroborate the assumption that when firms are expected to bear more of the tax burden, i.e., when the cost of providing economic substance is higher, personal income taxes reduce corporate tax-induced profit shifting.

[39] While we cannot perfectly rule out that the incidence is related to the CFC status, it appears unlikely that our findings related to incidence are driven by CFC rules. The CFC status is determined in the parent country, whereas the personal income tax is raised in the subsidiary country. Since the (local) labor market characteristics in the subsidiary country determine the incidence, it appears to be more plausible that the subsidiary country characteristics are most relevant. However, we cannot rule out that cross-border pressures from CFC rules may also affect other countries' labor markets.

[40] Our results are robust to adding the housing consumer price index to the score (see Table A.9, Online Appendix).

[41] We note that in one case, the main coefficient on *PIT* is significant. The other coefficients on *PIT* are nonsignificant. Moreover, the findings on the economic and locational factors are robust to using the difference between the parent and the subsidiary country (Table A.9, Online Appendix). These tests support the notion that economic and locational factors also matter when considered relative to the headquarters' country.

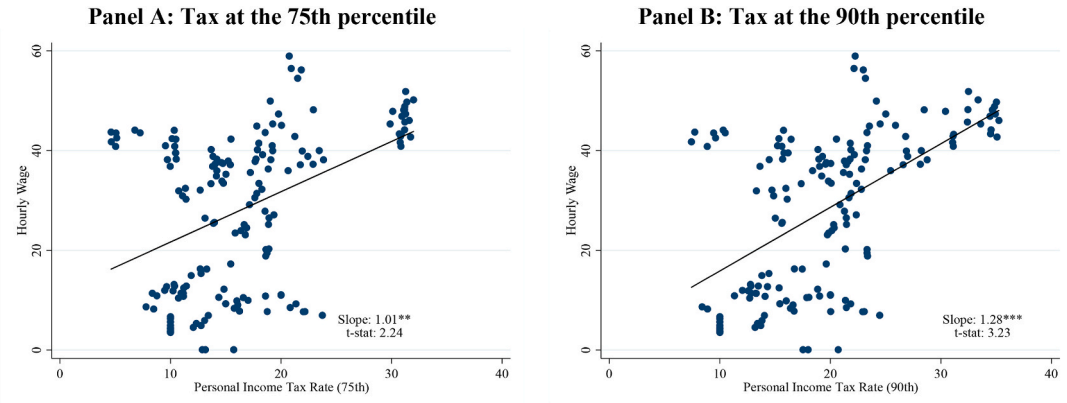

Fig. 7. Hourly Wage Rates and Personal Income Taxes
This figure shows the association between personal income taxes measured at the 75th (90th) income percentile in Panel A (Panel B) and the hourly wage rate. We estimate the fitted line with standard errors clustered at the subsidiary country level. Data on hourly wage rates are from https://ilostat.ilo.org/topics/labour-costs/# (last accessed 07/24).

6.3. *Other profit-shifting costs*

Next, we examine the notion that profit shifting is a trade-off between costs and benefits. Firms are expected to respond to changes in tax incentives if the benefit from potential tax savings outweighs profit-shifting costs. Given this trade-off, we should find a stronger muting effect of personal income taxes on profit-shifting activities if other profit-shifting costs are sufficiently low, i.e., when firms have an incentive to shift profits to the subsidiary. We test this prediction in two ways.

First, we explore differences in industry-specific transfer pricing adjustment costs. The general idea is that profit shifting, for example, through transfer pricing, can respond to changes in the tax environment if adjustments in transfer prices can also be justified. For example, in innovative industries with short product development cycles and many new products, it is easier to defend adjustments in transfer pricing in a tax audit (i.e., adjustment costs are low). In contrast, adjustment costs are relatively high in industries with stickier products and fewer innovations because it is harder to defend changes in transfer prices in a tax audit when the underlying product does not change materially. Hence, we expect personal income taxes to play a more (less) important role when adjustment costs are low (high). We empirically test this notion by comparing less versus more innovative industries based on the 2021 OECD Survey of Business Innovation Statistics and the Eurostat Community Innovation Survey (CIS-2018).[42] We obtain parent country- and parent industry-specific information on (1) active innovation firms, (2) product innovations, and (3) process innovations. We split these three characteristics at the parent country-specific median and define a dummy variable for each component, where one (zero) indicates lower (greater) innovativeness. We then build a *TP Adjustment Costs Index* ranging from 0 (high innovativeness, i.e., low adjustment costs) to 3 (low innovativeness, i.e., high adjustment costs). In our tests, we split the sample at the median.

Second, we explore variations in the governance quality and the lack of financial secrecy in the subsidiary country as proxies for non-tax profit-shifting costs. Within our European sample, governance quality is expected to have a negative association with profit shifting because a slightly more corrupt environment or some corruption in the tax administration can facilitate profit shifting, making it less costly to shift profits (Al-Hadi et al., 2022; Bilicka and Seidel, 2020). We measure *Governance Quality* as the first principal component of five Worldwide Governance Indicators related to profit shifting (Kaufmann et al., 2010): Control of corruption, government effectiveness, political stability, rule of law, and regulatory quality. Moreover, *Financial Transparency* is an additional cost factor because more financial transparency facilitates the detection of profit-shifting strategies (Schjelderup, 2016). We measure *Financial Transparency* based on the 2021 financial secrecy index provided by the Tax Justice Network. We multiply this index by −1 so that higher values imply greater financial transparency and higher profit-shifting costs. We split both variables at the year-specific 75th percentile and define a dummy variable equal to one (zero) for each cost, indicating high (low) profit-shifting costs. We build the variable *Governance Index*, ranging from 0 (lower non-tax-related profit-shifting costs) to 2 (higher non-tax-related profit-shifting costs). In our cross-sectional test, we split the sample at the median.

Consistent with our predictions, Table 7 provides two important insights. First, we find a positive and significant *Inbound* coefficient in industries with low transfer pricing adjustment costs, i.e., more innovative industries (column 1) and countries with lower governance (column 3). These effects are statistically different from those of the subsample with higher profit-shifting costs, indicating that firms facing high profit-shifting costs cannot immediately respond to changes in income-shifting incentives or may find it too costly to respond to them. Second, we find a negative and significant interaction of *Inbound* and *PIT* when inbound shifting matters, i.e., when adjustment costs and governance quality are lower. We also find that the muting effect of personal income taxes differs significantly across partitions. In sum, our results are consistent with profit shifting being a trade-off between costs and benefits.

[42] The reference period is 2016–2018 (https://www.oecd.org/sti/inno/inno-stats.htm, last accessed 07/24).

Table 6
Relative Elasticities in the Labor Market.
This table presents the results from estimating Equation (1), conditional on the relative elasticity of firms vis-à-vis employees. The dependent variable is EBIT. The primary independent variable is the interaction of *Inbound* with the average personal income tax rate (*PIT*) measured at the country-year-specific 75th income percentile. In Panel A, we split the sample at the industry-specific second tercile of a *Size Index* (columns 1 and 2), year-specific bottom tercile of *K/L* (columns 3 and 4), and country-industry-specific second tercile of the *Z-Score* (columns 5 and 6), respectively. In Panel B, we split the sample at the parent country-specific second tercile of the *Group Margin* (columns 1 and 2), a *Labor Market Power* score of 3 in the subsidiary country (columns 3 and 4), and a *Location Score* of 3 in the subsidiary country (columns 5 and 6), respectively. We report the coefficients when testing for the statistical differences between *Inbound* in the respective *High* vs. *Low* sample. We also report the coefficients when testing for the statistical differences between the interaction effects, *Inbound* × *PIT*(75th), of the *High* vs. *Low* sample. All regressions include control variables and subsidiary, parent-year, and industry-year fixed effects. Appendix B provides variable definitions. We report robust standard errors clustered at the parent-subsidiary country pair level in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Relative Elasticities Based on Subsidiary Characteristics

Dependent variable	**EBIT**					
Sorting variable	Size Index		K/L		Z-Score	
	Low	High	Low	High	Low	High
	(1)	(2)	(3)	(4)	(5)	(6)
Inbound	0.0940***	0.0780	0.0638	0.0619*	0.0899***	0.0623
	(0.0313)	(0.0530)	(0.0580)	(0.0327)	(0.0285)	(0.0430)
PIT(75th)	−0.0040	0.0094	0.0089	−0.0111	0.0013	−0.0201
	(0.0073)	(0.0108)	(0.0127)	(0.0068)	(0.0074)	(0.0136)
Inbound × PIT(75th)	−0.0087**	0.0024	−0.0202***	−0.0060*	−0.0118***	0.0037
	(0.0041)	(0.0056)	(0.0077)	(0.0036)	(0.0039)	(0.0067)
Diff. High vs. Low Inbound	*−0.0159*		*−0.0018*		*−0.0275*	
[t-stat.]	*[-0.27]*		*[-0.03]*		*[-0.63]*	
Diff. High vs. Low Inbound × PIT	*0.0111**		*0.0142**		*0.0155***	
[t-stat.]	*[1.70]*		*[1.77]*		*[2.10]*	
Controls & FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	58,390	14,756	26,725	53,433	49,374	29,305
Adjusted R-squared	0.7855	0.7686	0.7831	0.8378	0.8240	0.8423

Panel B: Relative elasticities based on group and subsidiary country characteristics

Dependent variable	**EBIT**					
Sorting variable	Group margin		Labor market power		Location score	
	Low	High	Low	High	Low	High
	(1)	(2)	(3)	(4)	(5)	(6)
Inbound	0.1837***	−0.0194	0.2490***	0.0597	0.0846***	−0.1299
	(0.0362)	(0.0500)	(0.0854)	(0.0375)	(0.0266)	(0.1285)
PIT(75th)	0.0043	−0.0245**	−0.0002	0.0088	0.0051	0.0120
	(0.0088)	(0.0111)	(0.0190)	(0.0088)	(0.0083)	(0.0211)
Inbound × PIT(75th)	−0.0148***	−0.0019	−0.0252***	−0.0082	−0.0121***	0.0064
	(0.0037)	(0.0055)	(0.0096)	(0.0051)	(0.0032)	(0.0097)
Diff. High vs. Low Inbound	*−0.2031****		*−0.1894***		*−0.2145**	
[t-stat.]	*[-3.44]*		*[-2.18]*		*[-1.75]*	
Diff. High vs. Low Inbound × PIT	*0.0129***		*0.0170**		*0.0185***	
[t-stat.]	*[1.99]*		*[1.67]*		*[2.01]*	
Controls & FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	33,124	16,828	22,525	46,907	53,867	21,933
Adjusted R-squared	0.8219	0.8611	0.8089	0.8243	0.8379	0.7891

6.4. Role of other anti-tax avoidance rules

Next, we examine cross-sectional differences in the anti-tax avoidance rules in the parent country. While the focus on CFC rules in Section 5.2 provides high internal validity because we capture the applicability of CFC rules for the specific parent-subsidiary country pair, there may be other nexus and substance requirements based on other anti-tax avoidance rules in the parent country. To provide more external validity, we conduct two tests. First, we expand the set of tax system characteristics in the parent country to cover (1) CFC rules, (2) transfer pricing documentation requirements, (3) exit taxes, (4) country-by-country reporting, and (5) general anti-avoidance rules. Building on these characteristics, we define the *Tax Strictness Score*, which captures the strength of these five tax regulations in the parent country. Second, we expand the *Tax Strictness Score* by including the strength of tax enforcement in the parent country as an additional component. We use the number of tax auditors from the OECD (2009) scaled by the total labor force, similar to Alexander et al. (2020). Adding tax enforcement also allows us to consider the parent country's ability to enforce anti-tax avoidance

Table 7
Other Profit-Shifting Costs
This table presents the results from estimating Equation (1), conditional on transfer pricing adjustment costs and governance. The dependent variable is *EBIT*. The primary independent variable is the interaction of *Inbound* with the average personal income tax rate (*PIT*) measured at the country-year-specific 75th income percentile. In columns 1 and 2, we split the sample at the median *TP Adjustment Cost Index*. In columns 3 and 4, we split the sample at the median *Governance Index* in the subsidiary country. In addition, we report the coefficients when testing for the statistical differences between *Inbound* in the respective *High* vs. *Low* sample. We also report the coefficients when testing for the statistical differences between the interaction effects, *Inbound* × *PIT(*75th*)*, of the *High* vs. *Low* sample. All regressions include control variables and subsidiary, parent-year, and industry-year fixed effects. Appendix B provides variable definitions. We report robust standard errors clustered at the parent-subsidiary country pair level in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Dependent variable	**EBIT**			
Sorting variable	TP Adjustment Cost Index		Governance Index	
	Low	High	Low	High
	(1)	(2)	(3)	(4)
Inbound	0.1790***	0.0264	0.1046***	−0.0470
	(0.0288)	(0.0383)	(0.0279)	(0.0871)
PIT(75th)	0.0057	−0.0101	−0.0049	−0.0110
	(0.0100)	(0.0074)	(0.0065)	(0.0130)
Inbound × PIT(75th)	−0.0214***	−0.0001	−0.0119***	−0.0001
	(0.0055)	(0.0042)	(0.0033)	(0.0055)
Diff. High vs. Low Inbound	*−0.1526****		*−0.1516**	
[t-stat.]	*[-3.11]*		*[-1.73]*	
Diff. High vs. Low Inbound × PIT	*0.0212****		*0.0119**	
[t-stat.]	*[2.98]*		*[1.92]*	
Controls & FE	Yes	Yes	Yes	Yes
Observations	29,580	37,158	51,188	28,970
Adjusted R-squared	0.8259	0.8470	0.8365	0.8047

rules. The strength of these six characteristics (*Tax Strictness Score* plus the tax enforcement) is denoted by the *ATA Score*. We then split the sample at the bottom quarter *Tax Strictness Score* (*ATA Score*) per subsidiary country-year cluster in columns 1 and 2 (3 and 4) of Table 8. Consistent with our main results from Table 4, we find that when substance requirements are stronger (i.e., higher *Tax Strictness Score* or *ATA Score*), personal income taxes mute inbound shifting. The muting effect of personal income taxes is statistically smaller when substance requirements are less strict.

6.5. *Economic magnitude relative to other cost factors*

In the next step, we compare the economic magnitude of personal income taxes to other cost factors potentially affecting profit shifting. We do this to put the magnitude of the personal income tax from Section 5.1 into perspective and to better understand the economic importance of personal income taxes vis-à-vis other potential drivers of profit shifting and costs of providing economic substance. To this end, we standardize each variable, including the personal income taxes. In Table A.10 of the Online Appendix, we then include the interaction of *Inbound* with other profit-shifting costs from Section 6.3 as well as labor cost components and location factors from Section 6.2. The main effects of each variable are included in the regressions but are not tabulated. We find that the magnitude of the effect of personal income taxes is either comparable to or higher than these other costs (except for union density). This result corroborates the notion that personal income taxes are an economically important cost factor in limiting profit shifting.

6.6. *Role of tax havens*

Finally, we discuss and address two concerns about our findings and the role of tax havens. First, one might ask why not every (tax haven) country implements an attractive combination of low corporate *and* personal income tax rates. Second, irrespective of this question, due to a lack of available data on (dot) tax haven operations outside and inside Europe, our estimates may be biased.

6.6.1. *Why do countries not implement low corporate and low personal income tax rates?*

Building on Dharmapala and Hines (2009), we argue that not all tax havens can successfully attract MNEs and their employees. Recall that due to stringent anti-tax avoidance rules in the EU and most OECD countries, firms must locate employees in tax havens to justify economic substance. However, the potential country (or haven) where a European MNE considers basing employees needs to meet specific requirements. For example, for employees to relocate, the country needs to be sufficiently developed, in particular, relative to the standards of the parent country. If a country has a low corporate tax rate and a low personal income tax rate, the country may not have sufficient tax revenues to provide high-quality infrastructure and living conditions (e.g., education, roads, healthcare, safety, quality of governance). Since tax revenues often predominantly stem from personal income taxes, a country that wants to attract MNEs and their employees will not be able to implement low personal taxes in addition to low corporate taxes while providing

Table 8
Anti-Tax Avoidance Rules
This table presents the results from estimating Equation (1), conditional on anti-tax avoidance rules. The dependent variable is *EBIT*. The primary independent variable is the interaction of *Inbound* with the average personal income tax rate (*PIT*) measured at the country-year-specific 75th income percentile. In columns 1 and 2 (3 and 4), we split the sample at the bottom quarter *Tax Strictness Score* (*ATA Index*) per country-year cluster. The *Tax Strictness Score* and *ATA Index* are measured in the parent country. We report the coefficients when testing for the statistical differences between the interaction effects, *Inbound* × *PIT(*75th*)*, of the *High* vs. *Low* sample. All regressions include control variables and subsidiary, parent-year, and industry-year fixed effects. Appendix B provides variable definitions. We report robust standard errors clustered at the parent-subsidiary country pair level in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Dependent variable	**EBIT**			
Sorting variable	Tax Strictness Score		ATA Score	
	Low	High	Low	High
	(1)	(2)	(3)	(4)
Inbound	0.0631	0.1268***	0.0643	0.1368***
	(0.0577)	(0.0275)	(0.0565)	(0.0279)
PIT(75th)	−0.0026	−0.0005	−0.0083	−0.0015
	(0.0090)	(0.0079)	(0.0092)	(0.0077)
Inbound × PIT(75th)	0.0004	−0.0140***	−0.0001	−0.0139***
	(0.0060)	(0.0041)	(0.0064)	(0.0043)
Difference High vs. Low	*−0.0145***		*−0.0138**	
[t-stat.]	*[-2.01]*		*[-1.80]*	
Controls & FE	Yes	Yes	Yes	Yes
Observations	33,237	46,921	29,001	45,129
Adjusted R-squared	0.8284	0.8369	0.8294	0.8372

attractive living conditions.[43] In addition, to meet the economic substance requirements, MNEs also need a sufficiently large workforce or sufficient migration in the country. However, dot tax havens have very little absolute net migration to their countries. Thus, MNEs may find it hard to establish the necessary economic substance in dot tax havens because these countries are either not sufficiently well developed for employees to relocate to or are simply too small to host the required number of employees for MNEs to justify economic substance.

6.6.2. Addressing the lack of data on tax havens

Second, we address the concern that the lack of information on tax havens in our sample—particularly those with low corporate and personal income tax rates, such as the Cayman Islands or Bermuda—could bias our findings. As argued in Section 6.6.1, dot tax havens are unlikely to be a relevant tax-planning tool for the firms in our sample. To empirically support this notion, we conduct several tests, which are discussed in detail in Section OA.2 of the Online Appendix. These results yield two key insights. First, we find that while MNEs from countries with strict anti-tax avoidance rules have tax haven operations, these operations do not lead to lower effective tax rates (ETRs). Second, we find that the profit shifting by subsidiaries and the muting effect of personal income taxes do not differ between firms with high versus low use of tax havens. Collectively, these findings suggest that our conclusions are not contingent on whether we observe and include tax haven subsidiaries in our sample. Although we acknowledge that we cannot fully control for profit shifting to tax havens and, therefore, rule out potential sample selection issues, our inferences do not appear to be influenced by the unobserved presence of tax havens. This outcome can be explained by the strict anti-tax avoidance rules in many OECD countries, which limit the effectiveness of tax haven operations for tax avoidance.

7. Conclusion

This paper examines the effect of personal income taxes on corporate tax-induced profit shifting. We find that profit shifting to low-tax countries is significantly reduced when the subsidiary country has a high personal income tax rate. This finding is consistent with the idea that personal income taxes increase the costs associated with providing the economic substance required to justify profit shifting to low-tax countries, as mandated in all EU and many other OECD countries. Supporting our interpretation, we further show that when low-taxed subsidiaries are affected by strict substance requirements imposed by the headquarters' country, personal income taxes have a stronger muting effect on profit shifting. Specifically, a one percentage point increase in the subsidiary's personal income tax rate reduces profit shifting by about 20% when these strict substance requirements are binding. Moreover, our results suggest that

[43] Figure A.2, Online Appendix, shows that personal income tax revenues have a strong positive association with the Human Development Index (HDI) (a composite measure of life expectancy, education, and economic development). Moreover, while a few dot tax havens have a high HDI score, many are well below most EU countries' HDI scores.

when personal income taxes are sufficiently high (i.e., one percentage point above the sample average personal income tax rate), MNEs no longer exhibit statistically significant profit shifting to low corporate tax countries within our European setting. MNEs appear to engage in profit shifting only when personal income tax rates are low enough to allow them to provide the necessary economic substance for shifting profits to these countries.

Our findings have important implications for the policy debate on curbing cross-border profit shifting and the current debate on its extent (e.g., Clausing et al., 2021; Tørsløv et al., 2023; Wier and Zucman, 2022). Our results indicate that the design of existing tax systems in the EU and most OECD countries—specifically, the combination of corporate tax rules (tax rates and anti-tax avoidance measures) and personal income taxes—already significantly reduce profit shifting in our sample, even without the implementation of a global minimum tax. Thus, while a global minimum tax could introduce substantial compliance costs for MNEs, it may not lead to a significant reduction in profit shifting, particularly for European MNEs.

However, we acknowledge the caveat that we focus only on the EU-based subsidiaries of European MNEs. Our findings suggest that previous profit-shifting estimates involving European MNEs, such as those in Davies et al. (2018), may no longer accurately represent the current situation and might overstate the current extent of profit shifting, given the increasingly stringent anti-tax avoidance rules in Europe (e.g., Brühne et al., 2024). However, our findings do not suggest that prior research has overstated the current extent of profit shifting by U.S. firms, even after the recent U.S. tax reform in 2018 (Garcia-Bernardo et al., 2022). This is because the strictness of U.S. anti-tax avoidance rules, such as the Base Erosion and Anti Abuse Tax, has been questioned in recent studies (e.g., Laplante et al., 2024). Instead, our results imply that if the U.S. or other countries were to implement strict and binding nexus requirements, personal income taxes in the subsidiary countries, combined with these rules, could significantly constrain profit shifting, regardless of the global minimum tax or other additional policy measures.

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Appendix A. Assumptions about Personal Income Tax Calculation

This appendix describes the assumptions used to determine the average personal income tax rate. We use the dataset of Jacob and Vossebürger (2022) and expand their data until the year 2019. The income tax burden is calculated for an unmarried, non-government employee without children. We neglect the tax deductibility of social contributions, work-related expenses, and earned income tax credits. For example, for Austria, we do not consider commuting expenses (for a lack of data), and we do not include the personal tax credit in Denmark because this credit is zero above certain income levels, or we assume that the taxpayer is under 65 (53) years old in Spain (Finland), as there are higher allowances for older people.[44] All calculations consider standard deductions and standard allowances. Further, several countries implement regional personal income taxes. We use the population-weighted average regional tax rate in Denmark, Finland, Italy, and Sweden. If there is no data on the population-weighted average as in Croatia, Spain, and the United Kingdom, we use the tax rate in the capital city or region. Moreover, we include all mandatory income tax surcharges (in the Czech Republic, Germany, Greece, Luxembourg, Portugal, and Spain). Finally, we neglect voluntary taxes, such as the church tax in Germany.

To illustrate our approach, Table A.1 presents a tax rate calculation for Ireland. We account for the Irish standard personal income tax credit for singles of €1,650, credited against the income tax liability. We then use the 75th income percentile, which is approximately €35,420. The resulting tax payment is €7,108 (row II). This payment is reduced by the personal tax credit of €1,650 (row III), which results in a total tax liability of €5,458 (row IV), or approximately 15.41% of the income (row V). This average tax burden of 15% is close to the median personal income tax rate across all sample countries. For the income at the 90th percentile, the average tax rate is 21.43%. Only for a very high-income level (for Ireland) of €100,000, the average tax rate is over 31% and thus, very high.

[44] Age-specific allowances are also implemented in Bulgaria, Ireland, Malta, Sweden, and the Slovak Republic. We assume that special regimes neither for older nor for younger people (e.g., as in Sweden for under 26 years old) apply. For more detailed country-specific assumptions, see the Online Appendix of Jacob and Vossebürger (2022).

Table A.1
Income tax calculation for Ireland, 2019

		75th percentile	90th percentile	Extreme case
I	Taxable income	€35,420	€46,910	€100,000
II	Tax payment	20% × €35,300 + 40% × (€35,420 - €35,300) = €7,108	20% × €35,300 + 40% × (€46,910 - €35,300) = €11,704	20% × €35,300 + 40% × (€100,000 - €35,300) = €32,940
III	Personal credit	€1,650	€1,650	€1,650
IV	Total tax (= II – III)	€5,458	€10,054	€31,290
V	**Average tax Rate (=IV/I)**	**15.41%**	**21.43%**	**31.29%**

Appendix B. Variable Definitions

Variable	Description
Tax variables	
ATA Score	Anti-tax avoidance score in the parent country, which consists of the *Tax Strictness Score* plus an indicator variable equal to one if the tax enforcement in the parent country is above the median. We measure tax enforcement as the number of tax auditors from the OECD (2009) scaled by *Labor Force*, similar to Alexander et al. (2020).
BJS Score	Index capturing the strictness of anti-tax avoidance rules from Brühne et al. (2024).
C	Sales-weighted tax incentive measure by Huizinga and Laeven (2008).
CFC-Relevant	Indicator variable equal to one if the subsidiary country's corporate income tax rate is below the CFC threshold rate of the parent country and zero otherwise. Source: Brühne et al. (2024) and KPMG tax handbooks.
CIT-Differential	Difference in the statutory tax rate between the subsidiary country and the parent country. Source: Jacob et al. (2019) and KPMG tax handbooks.
Dot Tax Haven Use	Natural logarithm of the number of subsidiaries in dot tax havens following the lists from De Simone and Olbert (2022). Source: Orbis.
Inbound	Indicator variable equal to one if *CIT-Differential* is smaller than −2 percentage points and zero otherwise.
Not CFC-Relevant	1 – *CFC-Relevant*.
PIT	Average personal income tax rate at the 25th, 50th, 75th, and 90th income percentiles. Source: Jacob and Vossebürger (2022), EY, KPMG, EU, and OECD. Income percentiles are from https://ec.europa.eu/eurostat/databrowser/view/ilc_di01/default/table?lang=en.
SSC	Social security contribution, calculated at the 25th, 50th, 75th, and 90th income percentiles. Source: Jacob and Vossebürger (2022).
Tax Haven Use	Natural logarithm of the number of subsidiaries in tax havens following the lists from De Simone and Olbert (2022). Source: Orbis.
Tax Strictness Score	Index of a parent country's anti-tax avoidance rules similar to Brühne et al. (2024). The index proxies for (1) general anti-tax avoidance rules, (2) country-by-country reporting, (3) exit taxes, (4) transfer pricing regime (0.5 for only arm's length principle and 1 for a more complex system), (5) CFC regime (1 when the strictness of the CFC rule measured as the low-tax country threshold tax rate divided by the statutory tax rate in the parent country is above the sample median and zero otherwise). The index ranges from 0 (low) to 5 (strict nexus requirements). Source: Brühne et al. (2024) and KPMG tax handbooks.
Firm variables (source: Amadeus)	
EBIT	Earnings before interest and taxes, in EUR.
Intangible Fixed Assets	Intangible fixed assets, in EUR.
K/L	Tangible assets scaled by the number of employees.
Leverage	Total debt scaled by total assets.
Number of Employees	Number of employees.
PLBT	Profit and loss before taxes, in EUR.
Share of Total Wages in Subsidiary Country	Share of an MNE's total staff expenses in a subsidiary country.
Size	Natural logarithm of total assets.
Size Index	Index consisting of the number of employees and turnover. Both variables are defined as indicators after sample splits at the respective second tercile per industry. The index ranges from 0 (small) to 2 (large).
Staff Expenses	Total staff expenses, in EUR.
Tangible Fixed Assets	Tangible fixed assets, in EUR.
Wage per *Employee*	Staff expenses scaled by the number of employees, in EUR.
Z-Score	Calculated as $Z = 0.717 \times A + 0.847 \times B + 3.107 \times C + 0.42 \times D + 0.998 \times E$, where A is working capital over total assets, B is other shareholder funds over total assets, C is EBIT over total assets, D is shareholder funds over book value of liabilities, and E is turnover over total assets.
Group variables	
3-Year ETR	Three-year effective tax rate $\frac{\sum_{t=0}^{2}(PTEBX \times CIT) - \sum_{t=0}^{2} CTP}{\sum_{t=0}^{2} PTEBX}$ following Atwood et al. (2012), where *PTEBX* is earnings before taxes and extraordinary items, *CIT* is the corporate tax rate, and *CTP* is income taxes minus deferred taxes. Source: Osiris.
Cash	Total cash scaled by the prior year's total assets. Source: Osiris.

(*continued on next page*)

(*continued*)

Variable	Description
Group Margin	Earnings before interest and taxes scaled by sales. Source: Orbis.
Guo	Label for the parent firm or parent country.
Intangibles	Intangible assets scaled by the prior year's total assets. Source: Osiris.
Leverage	Total debt scaled by total assets. Source: Osiris.
PPE	Fixed assets scaled by the prior year's total assets. Source: Osiris.
ROA	Earnings before interest, taxes, depreciation, and amortization scaled by the prior year's total assets. Source: Osiris.
Sales Growth	Natural logarithm of revenues scaled by the prior year's revenues. Source: Osiris.
Size	Natural logarithm of total assets. Source: Osiris.
TP Adjustment Costs	The first principal component of the three variables used in the *TP Adjustment Cost Index* ((1) innovation-active firms, (2) product innovations, and (3) process innovations).
TP Adjustment Cost Index	The index of transfer pricing adjustment costs proxies for innovativeness using parent country and parent industry-specific information on (1) innovation-active firms (proportion of firms engaged in innovation-oriented activities), (2) product innovations (proportion of firms with a new or improved good or service), and (3) process innovations (proportion of firms with a new or improved business process for one or more business functions), computed using indicator variables and sample splits at the parent country-specific median. The index can range from 0 (high innovativeness, i.e., low TP adjustment costs) to 3 (low innovativeness, i.e., high TP adjustment costs). Source: 2021 OECD survey of business innovation statistics and the Eurostat Community innovation Survey (CIS-2018) with reference period 2016–2018.
Country variables	
Average Wage	Average hourly earnings of employees. Source: Ilostat.
Cloud Coverage	The proportion of a country's cloud coverage. Source: Climate data Store from the European Commission, Copernicus, ECMWF, and climate change service.
Control of Corruption	Country's control of corruption. Source: World Bank.
Cool	*Temperature* multiplied by −1.
CPI Food	Consumer price index: Food and non-alcoholic beverages. Source: Ilostat.
CPI Housing	Consumer price index: Housing, water, electricity, gas, and other fuels. Source: Ilostat.
Employment	*Unemployment* multiplied by −1.
Financial Transparency	Financial secrecy index 2021 multiplied by −1. Source: Tax Justice Network.
Freedom	Freedom to make life choices. Source: World happiness report.
GDP Growth	Annual percentage growth rate of the GDP in constant 2010 USD. Source: World Bank.
GDP per *Capita*	GDP per capita in constant 2010 USD. Source: World Bank.
Governance Index	Index of a country's governance consisting of *Governance Quality* and *Financial Transparency*. Both variables are defined as indicators after sample splits at the respective 75th percentile per year. The governance index ranges from 0 (low) to 2 (high).
Governance Quality	The first principal component of the five worldwide governance indicators (Kaufmann et al., 2010): Control of corruption, government effectiveness, political stability, rule of law, and regulatory quality. Source: World Bank.
Health Spendings	Current health expenditure (% of GDP). Source: World Bank.
Inflation	The price rate change in a country is measured by the annual growth rate of the GDP implicit deflator. Source: World Bank.
Labor Force	Total labor force. Source: World Bank.
Labor Force Education	Labor force with advanced education (% of the total working-age population with advanced education). Source: World Bank.
Labor Market Power	Index capturing firms' labor market power based on (1) *Union Density*, (2) *Labor Force*, (3) *Labor Force Education*, (4) *Social Support*, and (5) *Unemployment*. We split each variable at the year-specific 25th percentile to define dummy variables. The sum of the dummy variables results in a score ranging from 0 (least market power) to 5 (greatest market power).
Lack of Freedom	*Freedom* multiplied by −1.
Life Expectancy	Healthy life expectancy at birth. Source: World happiness report.
Location Score	Index proxying for the attractiveness of a country based on (1) *CPI Food*, (2) *Health Spendings*, (3) *Life Expectancy*, (4) *Freedom*, and (5) *Temperature*. We split each variable at the median to define dummy variables. The sum of the dummy variables results in a score ranging from 0 (unfavorable location) to 5 (favorable location).
Low Health Spendings	*Health Spendings* multiplied by −1.
Low Labor Force	*Labor Force* multiplied by −1.
Low Labor Force Education	*Labor Force Education* multiplied by −1.
Low Social Support	*Social Support* multiplied by −1.
Short Life Expectancy	*Life Expectancy* multiplied by −1.
Social Support	Social support index. Source: World happiness report.
Temperature	Air temperature measured in kelvin. Source: Climate data Store from the European Commission, Copernicus, ECMWF, and climate change service.
Unemployment	Number of unemployed people scaled by the total labor force. Source: World Bank.
Union Density	Trade union density rate (%). Source: Ilostat.

Appendix C. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jacceco.2024.101758.

References

Acemoglu, Daron, Johnson, Simon, 2007. Disease and development: the effect of life expectancy on economic growth. J. Polit. Econ. 115, 925–985.
Al-Hadi, Ahmed, Taylor, Grantley, Richardson, Grant, 2022. Are corruption and corporate tax avoidance in the United States related? Rev. Account. Stud. 27, 344–389.

Alexander, Anna, De Vito, Antonio, Jacob, Martin, 2020. Corporate tax reforms and tax-motivated profit shifting: evidence from the EU. Account. Bus. Res. 50, 309–341.
Altman, Edward I., 1968. Financial ratios, discriminant analysis and the prediction of corporate bankruptcy. J. Finance 23, 589–609.
Atwood, T.J., Drake, Michael S., Myers, James N., Myers, Linda A., 2012. Home country tax system characteristics and corporate tax avoidance: international evidence. Account. Rev. 87, 1831–1860.
Becker, Johannes, Riedel, Nadine, 2012. Cross-border tax effects on affiliate investment—evidence from European multinationals. Eur. Econ. Rev. 56, 436–450.
Beer, Sebastian, Loeprick, Jan, 2015. Profit shifting: drivers of transfer (mis)pricing and the potential of countermeasures. Int. Tax Publ. Finance 22, 426–451.
Beuselinck, Christof, Deloof, Marc, Vanstraelen, Ann, 2015. Cross-jurisdictional income shifting and tax enforcement: evidence from public versus private multinationals. Rev. Account. Stud. 20, 710–746.
Bilicka, Katarzyna, Seidel, André, 2020. Profit shifting and corruption. Int. Tax Publ. Finance 27, 1051–1080.
Blair-Stanek, Andrew, 2015. Intellectual property law Solutions to tax avoidance. UCLA Law Rev. 62, 2–73.
Blomquist, Sören, Selin, Håkan, 2010. Hourly wage rate and taxable labor income responsiveness to changes in marginal tax rates. J. Publ. Econ. 94, 878–889.
Blouin, Jennifer, Robinson, Leslie A., 2023. Accounting for the Profits of Multinational Enterprises: Double Counting and Misattribution of Foreign Affiliate Income. SSRN working paper.
Breuer, Matthias, Ed deHaan, 2024. Using and interpreting fixed effects models. J. Account. Res. 62, 1183–1226.
Brothers, Joseph P., 2014. From the Double Irish to the Bermuda Triangle. Tax Analysts, November, pp. 687–695.
Brühne, Alissa I., Jacob, Martin, Schütt, Harm H., 2024. Technological changes and countries' tax policy design: evidence from anti-tax avoidance rules. Management Science, forthcoming.
Budd, John W., Konings, Jozef, Slaughter, Matthew J., 2005. Wages and international rent sharing in multinational firms. Rev. Econ. Stat. 87, 73–84.
Chow, Travis K., Hoopes, Jeffrey L., Maydew, Edward L., 2023. Profit shifting during foreign tax holidays. Account. Rev. 98, 1–28.
Clausing, Kimberly A., 2003. Tax-motivated transfer pricing and US intrafirm trade prices. J. Publ. Econ. 87, 2207–2223.
Clausing, Kimberly A., 2009. Multinational firm tax avoidance and tax policy. Natl. Tax J. 62, 703–725.
Clausing, Kimberly A., 2016. The effect of profit shifting on the corporate tax base in the United States and beyond. Natl. Tax J. 69, 905–934.
Clausing, Kimberly, Saez, Emmanuel, Zucman, Gabriel, 2021. Ending corporate tax avoidance and tax competition: a plan to collect the tax deficit of multinationals. SSRN working paper.
Clifford, Sarah, 2019. Taxing multinationals beyond borders: financial and locational responses to CFC rules. J. Publ. Econ. 173, 44–71.
Darendeli, Alper, Fiechter, Peter, Hitz, Jörg-Markus, Lehmann, Nico, 2022. The role of corporate social responsibility (CSR) information in supply-chain contracting: evidence from the expansion of CSR rating coverage. J. Account. Econ. 2–3, 101525.
Davies, Ronald B., Martin, Julien, Parenti, Mathieu, Toubal, Farid, 2018. Knocking on tax haven's door: multinational firms and transfer pricing. Rev. Econ. Stat. 100, 120–134.
De Simone, Lisa, 2016. Does a common set of accounting standards affect tax-motivated income shifting for multinational firms? J. Account. Econ. 61, 145–165.
De Simone, Lisa, Klassen, Kenneth J., Seidman, Jeri K., 2017. Unprofitable affiliates and income shifting behavior. Account. Rev. 92, 113–136.
De, Simone, Lisa, Mills, Lillian F., Stomberg, Bridget, 2019. Using IRS data to identify income shifting to foreign affiliates. Rev. Account. Stud. 24, 694–730.
De Simone, Lisa, Olbert, Marcel, 2022. Real effects of private country-by-country disclosure. Account. Rev. 97, 201–232.
Dharmapala, Dhammika, 2014. What do we know about base erosion and profit shifting? A review of the empirical literature. Fisc. Stud. 35, 421–448.
Dharmapala, Dhammika, Hines, James R., 2009. Which countries become tax havens? J. Publ. Econ. 93, 1058–1068.
Dischinger, Matthias, Knoll, Bodo, Riedel, Nadine, 2014. The role of headquarters in multinational profit shifting strategies. Int. Tax Publ. Finance 21, 248–271.
Dischinger, Matthias, Riedel, Nadine, 2011. Corporate taxes and the location of intangible assets within multinational firms. J. Publ. Econ. 95, 691–707.
Drake, Katharine D., Goldman, Nathan C., Murphy, Francis, 2022. Foreign employment, income shifting, and tax uncertainty. Account. Rev. 97, 183–212.
Dyreng, Scott, Hanlon, Michelle, 2021. Tax avoidance and multinational firm behavior. Chapter 10 in the Book Entitled *Global Goliaths: Multinational Corporations in the 21st Century Economy*. The Brookings Institution, Washington, D.C.
Dyreng, Scott D., Jacob, Martin, Jiang, Xu, Müller, Maximilian A., 2022. Tax incidence and tax avoidance. Contemp. Account. Res. 39, 2622–2656.
Dyreng, Scott D., Lindsey, Bradley P., 2009. Using financial accounting data to examine the effect of foreign operations located in tax havens and other countries on U. S. multinational firms' tax rates. J. Account. Res. 47, 1283–1315.
Dyreng, Scott D., Lindsey, Bradley P., Markle, Kevin S., Shackelford, Douglas A., 2015. The effect of tax and nontax country characteristics on the global equity supply chains of U.S. multinationals. J. Account. Econ. 59, 182–202.
Eckstein, Otto, Wilson, Thomas A., 1962. The determination of money wages in American industry. Q. J. Econ. 76, 379–414.
Elemes, Anastasios, Blaylock, Bradley, Spence, Crawford, 2021. Tax-motivated profit shifting in big 4 networks: evidence from Europe. Account. Org. Soc. 95, 101267.
Feldstein, Martin, 2005. Rethinking social insurance. Am. Econ. Rev. 95, 1–24.
Fleming, David, Grimes, Arthur, Lebreton, Laurent, Maré, David, Nunns, Peter, 2018. Valuing sunshine. Reg. Sci. Urban Econ. 68, 268–276.
Fuest, Clemens, Hugger, Felix, Neumeier, Florian, 2022. Corporate profit shifting and the role of tax havens: evidence from German country-by-country reporting data. J. Econ. Behav. Organ. 194, 454–477.
Fuest, Clemens, Peichl, Andreas, Siegloch, Sebastian, 2018. Do higher corporate taxes reduce wages? Micro evidence from Germany. Am. Econ. Rev. 108, 393–418.
Garcia-Bernardo, Javier, Janský, Petr, Zucman, Gabriel, 2022. Did the Tax Cuts and Jobs Act Reduce Profit Shifting by US Multinational Companies? NBER Working Paper, 30086.
Giroud, Xavier, Rauh, Joshua, 2019. State taxation and the Reallocation of business activity: evidence from Establishment-level data. J. Polit. Econ. 127, 1262–1316.
Graham, John R., 2022. Presidential address: corporate finance and reality. J. Finance 77, 1975–2049.
Gruber, Jonathan, 1994. The incidence of mandated maternity benefits. Am. Econ. Rev. 84, 622–641.
Gruber, Jonathan, Saez, Emmanuel, 2002. The elasticity of taxable income: evidence and implications. J. Publ. Econ. 84, 1–32.
Grubert, Harry, 2003. Intangible income, intercompany transactions, income shifting, and the choice of location. Natl. Tax J. 56, 221–242.
Grubert, Harry, 2012. Foreign taxes and the growing share of U.S. multinational company income abroad: profits, not sales, are being globalized. Natl. Tax J. 65, 247–281.
Grubert, Harry, Mutti, John, 1991. Taxes, tariffs and transfer pricing in multinational corporate decision making. Rev. Econ. Stat. 73, 285–293.
Grubert, Harry, Mutti, John, 2000. Do taxes influence where U.S. corporations invest? Natl. Tax J. 53, 825–839.
Harris, Jeremiah, O' Brien, William, 2018. U.S. worldwide taxation and domestic mergers and acquisitions. J. Account. Econ. 66, 419–438.
Heckemeyer, Jost H., Overesch, Michael, 2017. Multinationals' profit response to tax differentials: effect size and shifting channels. Can. J. Econ. 50, 965–994.
Hines, James R., Rice, Eric M., 1994. Fiscal paradise: foreign tax havens and American business. Q. J. Econ. 109, 149–182.
Hopland, Arnt O., Lisowsky, Petro, Mardan, Mohammed, Schindler, Dirk, 2018. Flexibility in income shifting under losses. Account. Rev. 93, 163–183.
Huizinga, Harry, Laeven, Luc, 2008. International profit shifting within multinationals: a multi-country perspective. J. Publ. Econ. 92, 1164–1182.
Huizinga, Harry, Laeven, Luc, Nicodeme, Gaetan, 2008. Capital structure and international debt shifting. J. Financ. Econ. 88, 80–118.
Idson, Todd L., Oi, Walter Y., 1999. Workers are more productive in large firms. Am. Econ. Rev. 89, 104–108.
Jacob, Martin, Michaely, Roni, Müller, Maximilian A., 2019. Consumption taxes and corporate investment. Rev. Financ. Stud. 32, 3144–3182.
Jacob, Martin, Vossebürger, Robert, 2022. The role of personal income taxes in corporate investment decisions. J. Corp. Finance 77, 102275.
Janský, Petr, Palanský, Miroslav, 2019. Estimating the scale of profit shifting and tax revenue losses related to foreign direct investment. Int. Tax Publ. Finance 26, 1048–1103.
Karkinsky, Tom, Riedel, Nadine, 2012. Corporate taxation and the choice of patent location within multinational firms. J. Int. Econ. 88, 176–185.
Kaufmann, Daniel, Kraay, Aart, Mastruzzi, Massimo, 2010. The worldwide governance indicators: Methodology and analytical issues. World Bank Policy Research Working Paper Series No., 5430

Klassen, Kenneth J., Lang, Mark, Wolfson, Mark, 1993. Geographic income shifting by multinational corporations in response to tax rate changes. J. Account. Res. 31, 141–173.
Klassen, Kenneth J., Laplante, Stacie K., 2012. Are U.S. multinational corporations becoming more aggressive income shifters? J. Account. Res. 50, 1245–1285.
Kotlikoff, Laurence J., Summers, Lawrence H., 1987. Chapter 16 tax incidence. Handb. Publ. Econ. 2, 1043–1092.
Laffitte, Sébastien, Toubal, Farid, 2022. Multinationals sales and profit shifting in tax havens. Am. Econ. J. Econ. Pol. 14, 371–396.
Laplante, Stacie K., Lewellen, Christina M., Lynch, Daniel P., Samuel, David M.P., 2024. 'Just BEAT it' do firms reclassify costs to avoid the base erosion and anti-abuse tax (BEAT) of the TCJA? J. Account. Econ. 2–3, 101648.
Lerner, Abba P., 1934. The concept of monopoly and the measurement of monopoly power. Rev. Econ. Stud. 1, 157–175.
Ma, Mark Shuai, Thomas, Wayne B., 2023. Economic consequences of operating lease recognition. J. Account. Econ. 2–3, 101566.
Ma, Tao, Wang, Yakun, Zhao, Yuping, 2024. Individual auditor turnover and audit quality—large sample evidence from U.S. Audit Offices. The Accounting Review, forthcoming.
Markle, Kevin, 2016. A comparison of the tax-motivated income shifting of multinationals in territorial and worldwide countries. Contemp. Account. Res. 33, 7–43.
OECD, 2009. Tax Administration in OECD and Selected Non-OECD Countries: Comparative Information Series (2008). OECD Publishing.
OECD, 2010. OECD Transfer Pricing Guidelines for Multinational Enterprises and Tax Administrations 2010. OECD Publishing.
OECD, 2013a. Addressing Base Erosion and Profit Shifting. OECD Publishing.
OECD, 2013b. Action Plan on Base Erosion and Profit Shifting. OECD Publishing.
OECD, 2020. Global revenue statistics database. https://stats.oecd.org/Index.aspx?DataSetCode=RS_GBL.
Piketty, Thomas, Saez, Emmanuel, Stantcheva, Stefanie, 2014. Optimal taxation of top labor incomes: a tale of three elasticities. Am. Econ. J. Econ. Pol. 6, 230–271.
Rahman, Amanina Abdur, Veenhoven, Ruut, 2018. Freedom and happiness in nations: a research synthesis. Applied Research in Quality of Life 13, 435–456.
Schjelderup, Guttorm, 2016. Secrecy jurisdictions. Int. Tax Publ. Finance 23, 168–189.
Tax Justice Network, 2020. The axis of tax avoidance. In: Time for the EU to Close Europe's Tax Havens.
Tørsløv, Thomas, Wier, Ludvig, Zucman, Gabriel, 2023. The missing profits of nations. Rev. Econ. Stud. 90, 1499–1534.
Weichenrieder, Alfons J., 2009. Profit shifting in the EU: evidence from Germany. Int. Tax Publ. Finance 16, 281–297.
Weyl, E. Glen, Fabinger, Michal, 2013. Pass-through as an economic tool: Principles of incidence under imperfect competition. J. Polit. Econ. 121, 528–583.
Wier, Ludvig, Zucman, Gabriel, 2022. Global Profit Shifting. UNU-WIDER Working, pp. 1975–2019. Paper 2022/121.
Williams, Braden M., 2018. Multinational tax incentives and offshored U.S. jobs. Account. Rev. 93, 293–324.