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# On the Real Consequences of Anti-Profit Shifting Laws: Transfer Price Documentation Rules and Multinational Firm Investment

Sabine Laudage Teles
Nadine Riedel
Kristina Strohmaier

EBERHARD KARLS UNIVERSITÄT TÜBINGEN

School of Business and Economics

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## Abstract

Over recent years, a growing number of countries have enacted rules that require multinational enterprises (MNEs) to document their intra-firm trade prices and show that they are set as in third-party trade. The intention is to limit opportunities for strategic trade mis-pricing and profit shifting to lower-tax affiliates within the multinational group. Using the introduction of the French transfer price (TP) documentation requirements in 2010 as a testing ground, we show that the rules exert real effects and shape MNEs' investment behavior. Affected businesses significantly lower their investments in France. Moreover, there are cross-border effects on affected firms' foreign group locations in low-tax countries, where investments equally decline. Our analyses show that investment responses are largely driven by increases in firms' effective tax costs; there is no indication that MNEs respond to compliance burdens associated with the laws.

JEL codes: F21, F23, H25, H26, H87

Keywords: multinational firm, investment, corporate taxation, transfer pricing

# 1    Introduction

Intra-firm trade prices (TP) determine how profit is split between multinational group affiliates. While international tax rules stipulate that intra-firm trade prices must be set at arm's length (that is, as in third-party trade), growing evidence suggests that multinational enterprises (MNEs) distort intra-firm prices to shift profits to low-tax entities (see e.g. Clausing, 2003; Davies et al., 2018; Liu et al., 2020). Mis-pricing of intra-firm trade is perceived to be responsible for much of aggregate multinational profit shifting to tax haven economies (see e.g. Heckemeyer and Overesch, 2017), in part reflecting that a significant fraction of international trade occurs within the boundaries of multinational groups (e.g. Antràs, 2003; Ru, 2015).

Over recent decades, countries around the world have enacted so-called transfer price documentation requirements to constrain this type of profit shifting behavior (see Figure 1). The regulations require MNEs to document their intra-firm trade prices and show that they are set according to arm's length provisions. The documentation must then be made available to the tax authority upon request or directly with the firm's corporate tax return.

Despite their growing prevalence, our understanding of the impact of transfer price documentation rules on multinational firm behavior is still lacking. Prior papers mostly focus on quantifying the impact of transfer pricing rules on trade mis-pricing behavior (e.g. Beer and Loeprick, 2015; Riedel et al., 2015; Wier, 2020; Bustos et al., 2022). In this paper, we add to the literature by documenting that TP documentation rules - arguably unintended by policymakers - also shape MNEs' real economic activity.

The analysis starts out with theoretical considerations. We illustrate that TP price documentation rules can impact firms' real economic activity through several channels: First, they constrain MNEs' opportunities to engage in profit shifting, thereby raising firms' effective marginal tax costs and deterring investment behavior. Note that these effects may accrue in the policy-changing country and abroad. Less shifting opportunities may, for example, lower firm investments at low-tax locations (in place to enable profit shifting). Investment effects at foreign high-tax locations are theoretically unclear: Rising tax costs may, on the one hand, deter investments there; but, on the other hand, MNEs, may also find it beneficial

**Figure 1:** Introduction of TP documentation requirements in law, 1996-2019
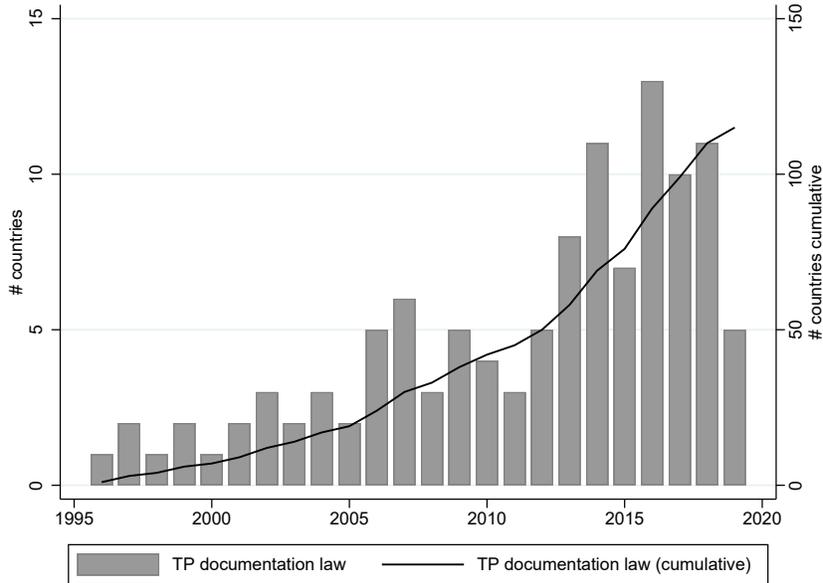
to relocate real activity from the policy-changing country to other group entities. Second, TP rules come with significant compliance costs, which, according to anecdotal evidence, can amount to several million US dollars for larger multinational entities (see Durst, 2010; Gauß et al., 2022). These costs may deter real economic activity. Again investment responses may occur in the policy changing country and at foreign group locations - where the effect on foreign entities is again theoretically unclear.[1]

We empirically test for a link between the introduction of TP documentation requirements and MNEs' real economic behavior using the introduction of TP documentation requirements in France in 2010 as a testing ground.[2] Our analysis relies on Bureau van Dijk's rich firm data comprising accounting and ownership information on multinational firms worldwide, with excellent coverage in France and other countries. We use this data to identify multinational

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[1]On the one hand, compliance burdens raise MNEs' costs and may thereby deter group investment in the policy-changing country and at MNEs' foreign group locations. On the other hand, if there are (e.g. managerial or financial) constraints on MNEs' aggregate investment, firms may find it optimal to relocate investment from the policy-changing country to foreign group locations, rendering the investment response at foreign entities positive.

[2]Note that other leading economies had largely introduced transfer price documentation rules earlier. An notable exception is Japan, which equally introduced transfer price documentation rules in 2010.

firms in France and their foreign group locations. Methodologically, we estimate dynamic difference-in-differences models that quantify how firms within the scope of the French TP documentation rules alter their real investments in France and at foreign group locations after the reform, relative to untreated control entities.

There are several threats to this empirical identification strategy that we aim to address in our empirical analysis. First, one may have concerns that estimates based on international firm data may be confounded by country-specific trends. If treated firms are located in countries with weaker underlying business trends, this would act as a confounder in the analysis. We tackle this concern by controlling for a full set of host-country year effects, thus comparing treated and control firms in the same country. The analysis thereby exploits that not all firms in France fell within the scope of the newly introduced TP documentation requirements: The documentation rules only applied to MNEs with revenues or assets of more than 400 million Euros at either firm within the multinational group (in France or abroad).[3]

Other concerns include that differences in the industry composition of treated and control firms paired with differential industry trends may confound our analysis. If firms in declining industries were overrepresented in the treated group, we would mis-interpret underlying industry trends as effects of our treatment. We tackle these concerns by showing that our results are robust to augmenting the empirical models by full sets of industry-year fixed effects of industry-country-year fixed effects. Analogously, we show that our estimates are robust to augmenting the set of regressors by a full set of parent-country year fixed effects. This non-parametrically absorbs any potential confounding factor or shock at the level of the MNEs' parent location.

There may, moreover, be concerns that our estimates might be biased by differential investment trends across firms of different size - in particular in the light of the fact that firm size determines whether businesses are within the scope of the French TP documentation provisions or not. In line with these considerations, a flourishing literature, for example, documents that industry concentration has risen over recent decades (see e.g. Martin et al.

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[3]Existing studies on international taxation commonly compare treated and control firms in different countries, see e.g. Heckemeyer and Overesch (2017).

(2022)), which might establish such a confounding link.

To address this concern, we use information on untreated firms outside France to model differential time trends in fixed asset investments across entities of different size. We then show that treated firms in France experienced a drop in fixed asset investments, even when allowing for such firm-size specific trends. Finally, also note that our dynamic difference-in-differences estimates support the common trend assumption underlying our difference-in-differences design: we show that fixed asset investments of treated and non-treated firms emerged in parallel prior to the reform. Fixed asset investments of treated relative to control firms only started to drop after the reform year 2010. Our preferred estimates suggest that treated firms, on average, reduce their fixed asset investment in France by 4% after the introduction of the TP documentation requirements.

In additional analyses, we shed light on the relative importance of the two potential transmission channels that might establish the observed investment response: increased tax costs vs. increased compliance burdens. Distinguishing between these effects is relevant for understanding the provisions' welfare implications and for optimal policy design. If TP-related investment responses stemmed from constrained profit shifting opportunities, they are a direct consequence of enforcing international tax provisions and reflect efficiency costs of tax collection. If firms, in turn, responded to the provisions compliance costs associated with TP provisions, these responses would arguably be unintended side effects and would not be limited to profit shifting entities.

Empirical identification follows prior evidence, which suggests that profit shifting is concentrated in (a relatively small number of) MNEs characterized by large intra-firm tax rate differentials and ownership links to tax havens and low-tax countries (e.g. Dowd et al. (2017); Davies et al. (2018)). If constraints on multinational profit shifting shape firms' investment response to the introduction of TP documentation rules, we would expect that it is these firms that respond to the provisions. MNEs with small intra-firm tax rate differentials (and, therefore, no profit shifting incentives) would, in turn, not be expected to respond. The inverse prediction emerges if it was compliance costs that shaped the observed effect. Then we would expect that investment responses would emerge irrespective of MNEs' intra-group tax rate differentials. The fixed costs nature of TP documentation compliance costs (where costs

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accrue per traded item but are arguably independent of trading volumes) would, moreover, predict that average tax costs on certain business lines and product varieties are smaller in larger firms, therefore triggering smaller investment responses.[4]

Our results suggest that investment responses are driven by shifting constraints and firms' higher tax costs. The drop in firm investments in France is centered around MNEs that are characterized by large intra-group tax rate differentials. MNEs characterized by small-intra group tax rate differentials do not alter their investment behavior, consistent with the notion that compliance burdens associated with TP documentation rules are not a major driver of firms' investment response. We, moreover, reject an inverse relation between firm size and the observed asset investment response as would have been expected if compliance costs shaped the investment response.

We then move on and test whether the introduction of TP documentation requirements exert effects beyond the policy-changing jurisdiction. The theoretical considerations suggest that investments at foreign group locations may increase or decline in response to the intro-duction of TP documentation requirements, rendering the sign and size of the cross-border effect an empirical question. Rich ownership information on multinational group affiliates worldwide allows us to identify firms that are treated by the French TP documentation rules with their group affiliates in France and in other countries. Focusing on affiliates outside France, we compare the investment behavior of firms that belong to treated and untreated MNE groups. All estimation models include a full set of host-country-year fixed effects, which absorb differential investment trends across countries. As before, we, moreover, non-parametrically control for time-varying confounders at the parent country or industry level and allow investment trends to differ across firms of different size.[5] Our findings suggest that investment activity at foreign group locations declines in response to the introduction of TP documentation rules. Estimated standard errors are large, however, rendering the effect statistically insignificant.

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[4]Note that, per traded item, compliance costs are largely fixed in nature. If firms operate several business lines and trade different items, the fixed costs may render certain activities unprofitable. If certain business lines or product varieties are taken off the market, this may nevertheless pop up as intensive margin response on the investment side.

[5]The base specifications include a full set of 2-digit industry-year fixed effects. In additional models, we show that our estimates are robust against including a full set of 2-digit industry-country-year fixed effects.

Additional analysis suggest a strong heterogeneity in the investment response at foreign group affiliates. Investments at affiliates in foreign low-tax country strongly decline in response to the French TP documentation provision, while estimated spillovers for foreign higher-tax locations are zero and statistically insignificant. This is consistent with the notion that firm investments respond to reduced profit shifting opportunities (that render some shifting-related investments in low-tax countries obsolete) rather than compliance burdens. The interpretation is corroborated by two further pieces of evidence. First, we illustrate that the strength of firms' investment response is uncorrelated with firm size. If compliance costs drove the effect of interest, we would have expected to see stronger responses at smaller firms (see our argumentation above). Second, we do not see systematically stronger investment responses on routes that are particularly strongly affected by TP-related compliance costs, namely on routes between France and MNE group affiliates that operate in industries that are among the most important input suppliers of the French parent firm's industry.

Furthermore note that the statistical significance of the results prevails under different assumptions on the correlation structure of error terms. Most importantly, randomization inference, which accounts for spatially-correlated error terms in a most flexible way, confirms that the estimated TP rule effects on firms' investment behavior in the policy-changing country and abroad are statistically different from zero.

In additional analyses, we furthermore pay particular attention to possible investment spillovers on less developed countries. Developing countries receive considerable financial support by donor nations in the developed world. In recent years, increasing attention has been paid to how "domestic" tax policies impact less-developed nations (Hoopes et al., 2022) - and to what extent these spillovers foster or hinder international development.[6] We add to this literature by showing that anti-tax avoidance measures, namely TP documentation rules, can exert negative externalities on MNE activity in less developed countries, in particular in those with attractive corporate tax environments. Given the importance of foreign direct investments for non-agricultural job creation and knowledge and productivity spillovers to

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[6]This includes potential spillovers of anti-tax avoidance and evasion policies by developed nations on developing countries with attractive tax policy design - pertaining to the notion that these countries might have little other option to attract foreign activity if anti-avoidance and evasion laws put a hold on these schemes (e.g. Ahairwe et al., 2021).

the domestic economy (see initial survey by De Mello, 1997; empirical study with Chinese firm data by Liu, 2008; meta study by Iamsiraroj and Ulubaşoğlu, 2015), these investment declines may exert relevant welfare consequences.

The findings have important policy implications. They show that the effect of transfer pricing rules are not limited to impacting paper profit shifting - but also shape firms' real economic activity. These responses are largely tax cost driven: the resulting deterrence of investment activity reflects the efficiency costs of levying taxes on MNEs (and enforcing them).[7]

Our paper also, in a broader sense, contributes to academic and political debates about fundamental reforms of the international corporate tax system, most prominently a switch to a system of profit consolidation and formula apportionment (EU (European Commission, 2015; European Commission, 2021) and the discussion in de Mooij et al. (2021) and Beer et al. (2022)). One of the main benefits of formula apportionment is that it abolishes incentives to mis-price intra-firm trade and hence the necessity for a TP documentation system. Our study adds to shedding light on the attached benefits.[8]

Our paper contributes to the literature on multinational profit shifting activities and constraints on them. A growing body of empirical evidence documents that MNEs relocate profits to lower-tax countries (see e.g. Riedel, 2018; Bilicka, 2019; Beer et al., 2020; Tørsløv et al., 2023 for recent surveys). Evidence suggests that one of the most prominent profit shifting channels are the distortions of prices for goods and services traded within the firm

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[7]Our findings, moreover, indicate that TP documentation rules lower multinational real economic activity in low-tax countries. This is relevant for policymakers - and consistent with the observation that the consequences of internationally coordinated anti-profit shifting policies for low-tax countries have determined the design of internationally coordinated anti-profit shifting initiatives in the OECD's "Base Erosion and Profit Shifting" (BEPS) project and the recent OECD minimum tax agreement. Hohmann et al. (2022) show that the BEPS projects' anti-treaty shopping clauses may have benefited conduit countries that attract anti-treaty shopping activity. In the OECD's minimum tax agreement (Pillar II), moreover, the first right to collect the minimum tax is, with the so-called domestic minimum top up tax, given to low-tax countries themselves.

[8]Most importantly, we find evidence consistent with the notion that firms respond to reduced profit shifting rather than compliance costs. There are also conceptual challenges of the separate accounting system beyond TP documentation rules. Critics of the system stress that the rules are not suited for the 21st century, where many goods and services traded within multinational firms are firm-specific, rendering it difficult or even impossible to identify adequate arm's length prices. Prior research also highlighted that, given the inherent differences in productivity and bargaining power between national and multinational firms, national firm trade may serve as a poor proxy for the unobserved prices of MNEs (Bauer and Langenmayr, 2013).

(see e.g. Clausing, 2003; Davies et al., 2018; Liu et al., 2020, Heckemeyer and Overesch, 2017).[9] The fiscal and economic consequences of profit shifting activities are suggested to be significant: Profit shifting strips tax revenues from high-tax countries (Tørsløv et al., 2023), can distort product market outcomes (Gauß et al., 2022), foster industry concentration (Martin et al., 2022) and international tax competition (Keen and Konrad, 2013).

Our analysis also closely connects to recent work that assesses the effectiveness of anti-profit shifting policies in constraining international tax avoidance (see Beer and Loeprick, 2015, Wier, 2020 and Bustos et al., 2022 on transfer pricing rules; Buettner et al., 2012, Blouin et al., 2015 and Bilicka et al., 2022 on limits on the deductibility of debt costs from the corporate tax base; and Ruf and Weichenrieder, 2012, Egger and Wamser, 2015 and Clifford, 2019 on CFC provisions). Possible effects of anti-profit shifting rules on firms' real economic activity has attracted less attention, in turn (see de Mooij and Liu, 2021; Bilicka et al., 2022; Merlo and Wamser, 2020, Suárez Serrato, 2019 for exceptions).[10]

The paper most closely related to ours is de Mooij and Liu (2020), who assess how the introduction of general TP rules, that is provisions that require MNEs to set intra-firm transfer prices at arm's length, impact MNEs' real economic behavior. We complement the literature by studying the effects of TP documentation rules that is of provisions that require MNEs to document their transfer prices and provide proof that they are set in line with arm's length principles. The rules as distinct - many countries which have general transfer pricing rules in place, have not enacted transfer price documentation requirements. [11] Our setting and data, moreover, allows for a sound empirical identification strategy that absorbs a large set of potential confounding factors. Contrary to prior evidence, we also explicitly test for the

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[9]Other prominent tax avoidance strategies comprise the strategic location of functions and assets at low-tax affiliates: immaterial property (e.g. Karkinsky and Riedel, 2012 and Griffith et al., 2014); headquarters functions (e.g. Voget, 2011); risk (e.g. Becker et al., 2020); sales (e.g. Lafitte and Toubal, 2022); financial services and lending (e.g. Goldbach et al., 2021).

[10]Bilicka et al. (2022) and Merlo and Wamser (2020) study real consequences of deduction limits on interest payments. Suárez Serrato (2019) shows that eliminating firms' access to tax havens can have adverse effects for their domestic economic activity, which spills over to local labor markets through the establishment networks of profit-shifting firms.

[11]In additional analyses, de Mooij and Liu (2020) also use variation related to a general index for the tightness of transfer pricing provisions, comprising a host of different dimensions, including e.g. methods to determine arm's length prices and possibilities for firms to agree with authorities on transfer prices in advance. de Mooij and Liu (2020) do not determine the impact of transfer price documentation requirements on firm behavior, in turn, which is the key aim of this paper.

relative importance of different potential drivers of observed investment responses - increased tax costs vs. increased compliance burdens.[12] And we are the first to show that the impact of TP documentation rules on firms' real investment is not restricted to the policy-changing country but that there are spillovers of the laws on foreign group affiliates. In that regard, we contribute to a growing literature that shows how shocks transmit within multinational firms, see e.g. Becker and Riedel (2012), Kleinert et al. (2015), Giroud and Mueller (2019) and Bilicka et al. (2022).[13]

The rest of the paper is structured as follows: Chapter two sketches theoretical considerations. In chapter three, we discuss the institutional background of TP documentation reform. Chapter four presents the dataset on multinational firms and summary statistics. In chapter five, we outline the estimation strategy and the identification of treatment and control groups. Chapter six shows the results on direct and spillover effects of the TP reform on investment in French and foreign affiliates. Finally, chapter seven concludes.

# 2    Theoretical Considerations

To obtain guidance for the empirical analysis, this section sketches theoretical considerations on the link between TP documentation rules and MNEs' real economic activity. TP documentation can impact firms' investment behavior through two channels: TP rules limit MNEs' ability to mis-price intra-firm trade. MNEs' investments may hence respond to the introduction of TP laws and related tax cost increases. On top of that, MNE investments may adjust in response to the compliance costs associated with TP regulations. Anecdotal evidence suggests that TP documentation costs can be high, amounting to several million

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[12]As sketched above, any response driven by increased tax costs is a necessity of taking MNEs (and enforcing that tax, that is avoiding implicit tax discrimination). If the investment responses, in turn, are shaped by compliance costs, these responses are an unintended side effect of the provision. Regulatory design might allow to avoid some of these costs (if MNEs without major intra-firm tax rate differentials were exempted from the regulation).

[13]The literature has largely been silent on cross-border effects of anti-profit shifting rules on MNEs' real economic behavior at foreign group locations. A notable exception is Bilicka et al. (2022) who show that a debt-cap rule introduced by the UK enhanced debt-holdings and investments at foreign group affiliates (reflecting incentive provided of the law to lower (increase) debt holdings and activity in the UK (abroad)). Our findings contrast this evidence in the sense that the anti-profit shifting laws assessed in this paper - TP documentation provisions - lower firms' real economic activity at foreign low-tax locations, while exerting no investment effects at other higher-tax locations.

US dollars for larger corporations (see e.g. Durst, 2010). These costs may thus shape firm behavior.

The sign of the effect of TP documentation requirements on multinational firm investment is a priori unclear. They hinge on the particular structure of TP documentation costs and activities of MNEs. If MNEs' use trade mis-pricing to lower their tax costs, restrictions on this shifting channel raise firms' tax costs and may deter real investments.

Investment responses may thereby not only accrue in the country that enacts the TP documentation requirements, but also at other nations. The sign of the cross-border effect is ambiguous. On the one hand, TP rules can negatively impact investments at foreign group locations by raising the group's tax burden and hence investment costs at all locations. On the other hand, in the presence of frictions like credit or oversight constraints, MNEs may respond to TP rule introductions by shifting investments across group locations, from the country that enacts TP documentation rules to other nations. Moreover, to the extent that MNEs engaged in real economic activity at low-tax locations to enable profit shifting in the first place, the introduction of TP documentation rules may render these schemes unprofitable and reduce these types of investments.

The second channel through which TP documentation requirements may impact firm investments are compliance costs associated with the TP documentation law. MNEs are affected by documentation rules, even if they do not engage in profit shifting at all. While empirical evidence suggests that there is heterogeneity in profit shifting activity across multinational firms (see e.g. Davies et al., 2018; Barrios and d'Andria, 2020; Bilicka et al., 2022), all firms with intra-firm trade (above given size thresholds) have to engage in transfer price documentation. The rules thus also impose costs on tax-compliant entities. These compliance costs can have negative efficiency consequences and may deter real economic activity by MNEs. As spelled out in the appendix, we, moreover, expect to see stronger responses by smaller MNEs, which - because of the structure of compliance costs - tend to face larger burdens.[14]

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[14]As spelled out in further detail in the appendix, transfer price documentation requirements impose transfer price documentation costs per product and service traded in house. The average documentation costs per product and service line are larger, the smaller the trading volumes and the profits attached to the business and service lines. If larger firms are characterized by higher trading volumes per product and service line, they face lower average costs and are hence less likely to respond to the introduction of transfer

Investment responses may thereby again emerge in the policy-changing country and at foreign group locations. MNEs may genuinely down-size their activity, leading to a drop of real economic activity in the policy-changing country and abroad, when compliance costs increase. In the presence of constraints on MNE investment, firms may, however, again also find it attractive to relocate real activity away from the country that introduces the TP documentation requirements. This may allow them to avoid intra-firm trade subject to the documentation provisions and hence save the additional compliance costs.[15]

Note, moreover, that we, in the following, interpret compliance costs in a broad sense, including costs from increased uncertainty related to TP documentation provisions: As 'true' arm's length prices are often not directly observable (because often there is no exactly comparable arm's length trade), there is a margin of ambiguity and arbitrariness built in the transfer pricing system, pertaining to conflicts between tax authorities and taxpayers on transfer pricing choices. If tax authorities obtain transfer pricing information from taxpayers, they may - next to identifying tax avoidance schemes - also increasingly challenge transfer pricing choices. Consistent with this observation, the introduction of transfer price documentation requirements has increased simultaneously with the number of tax disputes between taxpayers and tax authorities over transfer price setting. This uncertainty may also make it less attractive for MNEs to engage in cross-border investment. Again, if that was a relevant adjustment margin, we would expect to see investment responses in foreign countries, irrespective of their tax rate. And adjustments may be particularly strong where MNEs trade many inputs across borders.

In the following, we will empirically assess the effect of transfer price documentation requirements on multinational firms' real economic activity drawing on a salient policy reform in France.

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price documentation rules by reducing their real activity.

[15]Compliance cost-induced investment responses may, in principle, even be more complex than indicated in the main text as firms - to avoid compliance costs - may even decide to renationalize and relocate investment activity back to the parent country. This might, paradoxically, lead to an increase in firms' real economic activity in the country that enacts tighter transfer price provisions and lower investment activity abroad - rendering predicted investment effects ambiguous in *all* countries.

# 3   Institutional Background

As depicted in Figure 1, recent decades have seen the adoption of transfer price documentation requirements in many countries. Today, it is 116 nations, which have transfer price documentation requirements in place.

Despite their increasing prevalence, not much is known on the fiscal and economic effects of the provisions. In this paper, we empirically study the effect of the introduction of TP documentation rules in France on multinational firm behavior. The French reform is an ideal testing ground, as will be specified in detail further below.

France had general transfer pricing rules in place since the first half of the 20th century. While these provisions required French firms to set intra-firm trade prices at arm's length, enforcement was incomplete, as tax authorities could only request information on companies' transfer pricing choices in the course of audits when there was specific indication for misconduct and non-compliance by the firm. Evidence from the late 1990s suggests that French MNEs engaged in significant mis-pricing of intra-firm trade to shift profits to tax haven economies (see Davies et al., 2018).

In 2010, France introduced transfer price documentation requirements to tighten up the enforcement of transfer pricing rules. The regulations are specified in the French Tax Procedure Code: Article L 13 AA. From 2010 onwards, MNEs within the scope of the regulation were required to contemporaneously document their intra-firm transfer prices, prove that these prices are set in line with arm's length standards and make that documentation available to the tax authorities upon request. The documentation could thereby be requested by the authorities at any time, without specifying a reason or indication for irregularities and mis-pricing behavior.

Our empirical identification strategy exploits that not all multinational companies in France were treated by the reform. Firms were only required to contemporaneously document their intra-firm transfer prices if they fulfilled one of the following criteria:

- unconsolidated turnover or total assets above or equal to 400 million Euro; or

- a majority-owned subsidiary (in France or abroad) with turnover or total assets above or equal to 400 million Euro; or

- parent company (located in France or abroad) with turnover or total assets above or equal to 400 million Euro

Treatment assignment can hence hinge upon both, firm and MNE group characteristics. In-scope firms need to document the universe of intra-firm trade prices for all intra-firm imports to and exports from France and show that these prices are set as in third-party trade ("local file"). Firms must, moreover, share basic information with the authorities on the group's activities and global transfer pricing strategy ("global file").[16] The introduction of the TP documentation requirements was perceived as a significant tightening of French transfer pricing provisions. When the law was passed, Le Monde, a leading French newspaper, for example told its readers to prepare that, because of the reform, transfer pricing provisions were from now on "getting tougher" (Michel, 2010; Reuters, 2018). In the following, we will assess if and how the regulatory change impacted MNEs' real economic behavior.

Note that, to the best of our knowledge, there were no other policy change - in the tax or any other public policy domain - during our sample frame that might have exerted a differential impact on the real economic activity of firms treated by French TP documentation rules and control entities. Note that only after our sample frame, in 2016, France expanded its transfer pricing regulations to smaller firms and introduced changes to other anti-profit shifting provisions in the course of the BEPS project (e.g. introduced country-by-country reporting).

# 4 Data

France is an ideal testing ground to assess the impact of TP documentation rules on MNEs' investment, both for data and for methodological reasons. Data-wise we exploit that France introduced TP documentation requirements somewhat later than many other economically important industrialized countries, which had enacted the documentation provisions in the late 20th century or around the turn of the millenium, when high-quality data on multinational firms was still largely unavailable.

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[16]If the latter information is shared across tax authorities (and this information is new to the foreign tax authority), it may help to constrain profit shifting from foreign high-tax nations, other than France.

Our empirical exercise draws on Bureau van Dijk's Orbis dataset, which comprises balance sheet and ownership information on firms worldwide. In France and many other European countries, Bureau van Dijk draws on administrative data sources, implying that firm coverage is excellent and comparable to administrative data sources (Kalemli-Ozcan et al., 2015). Comparing Bureau van Dijk's data for France to official statistics for the manufacturing sector, Kalemli-Ozcan et al. (2015) report sales coverage rates well above 80%. Missing information tends to relate to smaller and unincorporated entities. Bureau van Dijk spends considerable efforts around the world to obtain information on large businesses. The Orbis database is hence widely perceived to be well suited to study the behavior of multinational firms, which belong to the leading firms in many countries (Johansson et al., 2017).

We use this data to quantify the impact of the French TP documentation rules on MNEs' real economic activity. Real activity is measured by firms' unconsolidated fixed assets, which are well covered in Bureau van Dijk's accounting data.[17]

The analysis draws on data for the years 2007 to 2016. We rely on data up to 2015 to avoid any confounding factors related to the OECD's BEPS provisions that OECD countries started enacting in 2016. The sample comprises multinational entities, which are identified from ownership information in the Orbis database.[18] Specifically, we define firms as MNEs if their Global Ultimate Owner (GUO) has at least one majority owned foreign affiliate. In case the GUO is missing in the data, we replace the missing GUO by the highest controlling shareholder. The analysis thereby accounts for indirect ownership structures (up to ten levels). In total, we identify 100,005 MNEs in our data, which comprise 366,427 distinct firms (including both, parents and subsidiary firms) in 183 home and 97 host countries. 39,393 firms are located in France. See tables 6 and 7 in the appendix for full country lists. More information on the preparation of the Orbis data is included in the data appendix.

We use the accounting and ownership data at hand to identify firms that are treated by the French TP provisions. It is one key advantage of our testing ground that the data at hand includes information on the variables (turnover and total assets), which determine

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[17] Coverage rates for other activity measures like unconsolidated employment tend to be smaller, in turn. In general, the literature has shown some skepticism against the use of employment information from accounting sources, which is perceived to be prone to mis-measurement, see e.g. Bajgar et al. (2020).

[18] The ownership data from Orbis is static and refers to the download year (2018). We assume that the ownership structures did not change for the majority of our firm observations over the sample period.

**Table 1:** Summary Statistics

| Variable | Obs | Mean | Std. Dev. | Min | Max | Tax Haven | Low-Tax |
|---|---|---|---|---|---|---|---|
| **Panel A: Full Sample** | | | | | | | |
| ln(fixed assets) | 2,590,859 | 7.427 | 3.258 | 0 | 14.340 | 26.4% | 24.1% |
| Δ(fixed assets) prior 2010 | 427,798 | 1555.753 | 21930.08 | -96329 | 145975 | 27.4% | 23.7% |
| ln(operating revenue) | 2,490,015 | 8.602 | 2.894 | 0 | 14.223 | 26.1% | 24.4% |
| profitability (EBIT/total assets) | 1,751,508 | 0.116 | 0.135 | 0.001 | 0.763 | 26.0% | 24.0% |
| Minimum group tax rate | 2,610,945 | 0.186 | 0.092 | 0 | 0.410 | 26.4% | 24.2% |
| **Panel B: Treated Firms in France** | | | | | | | |
| ln(fixed assets) | 167,047 | 7.694 | 3.346 | 0 | 14.340 | 63.0% | 38.1% |
| Δ(fixed assets) prior 2010 | 31,061 | 2083.585 | 25336.76 | -96329 | 145975 | 63.6% | 39.0% |
| ln(operating revenue) | 166,874 | 8.472 | 3.458 | 0 | 14.223 | 63.0% | 38.1% |
| profitability (EBIT/total assets) | 103,968 | 0.113 | 0.125 | 0.001 | 0.763 | 62.2% | 38.4% |
| Minimum group tax rate | 167,120 | 0.145 | 0.088 | 0 | 0.361 | 63.0% | 38.1% |
| **Panel C: Treated Firms outside France** | | | | | | | |
| ln(fixed assets) | 162,028 | 7.599 | 3.370 | 0 | 14.340 | 67.7% | 45.5% |
| Δ(fixed assets) prior 2010 | 29,009 | 2110.471 | 25790.32 | -96329 | 145975 | 68.1% | 46.0% |
| ln(operating revenue) | 158,765 | 8.704 | 3.206 | 0 | 14.223 | 67.6% | 45.5% |
| profitability (EBIT/total assets) | 103,636 | 0.117 | 0.130 | 0.001 | 0.763 | 67.6% | 46.5% |
| Minimum group tax rate | 162,530 | 0.138 | 0.087 | 0 | 0.361 | 67.7% | 45.6% |

Source: Bureau van Dijk's Orbis database. All financial variables in thousand USD. The variables fixed assets, operating revenue and profitability are winsorised at the top and bottom one percentiles. The variable Δ(fixed assets) measures changes in fixed assets in the pre-treatment years (2007-2009). The last two columns present the fraction of MNE groups with tax haven affiliates or low-tax affiliates (defined by minimum tax rate lower than 12.5 percent) respectively.

treatment assignment, and on ownership links that allow identifying whether parent and subsidiary firms pass the size threshold and thereby trigger treatment. Specifically, following our discussion in the previous section, firms are defined as treated if they themselves feature turnover/total assets above 400 million Euros or have a parent or subsidiary firm above these size thresholds.

The analysis draws on 2,919,819 firm-year observations, 299,663 of which are in France. Table 1 gives the summary statistics, for the full sample of all firms (Panel A) as well as for the sample of treated firms that are located in France (Panel B) and firms outside France that belong to multinational groups that are treated by the French TP documentation requirement (Panel C). The latter set of firms have a French global ultimate owner and thus falls within the scope of the French TP regulation.[19]

Figure 2 provides a graphical depiction of the worldwide group network of multinational

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[19]In all estimation models given in this paper, firms are defined as treated if the size threshold of the French TP documentation rules are passed in at least one post-reform year. Note that all estimates are robust to defining treatment based on turnover/asset information from the pre-treatment period.

**Figure 2:** French Affiliates Worldwide
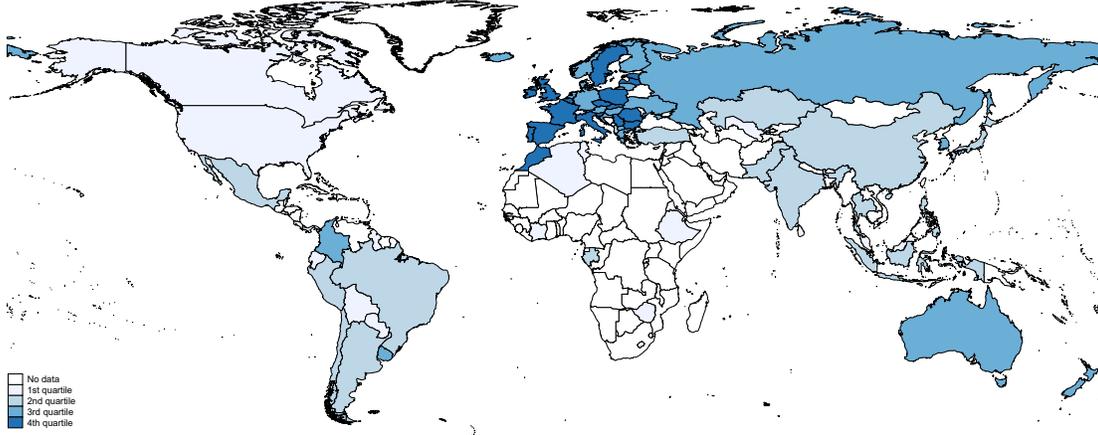


Notes: The figure depicts the number of affiliates per country that belong to MNEs with a global ownership link to France, normalized on countries' GDP.

firms that are headquartered in France, specifically the number of affiliates of French GUOs per country, relative to country's GDP. French MNEs mainly feature affiliates in Europe, other OECD countries and some former French colonies like Morocco.[20]

Fixed assets and other firm variables are winsorized at the 1% level. The average firm in our data has fixed assets of 53,223 thousand USD. The average fixed assets of treated firms in France (Panel B) amount to 77,890 tousand USD; the average assets of treated firms outside France (Panel C) amount to 76,211 thousand USD. The asset distribution of treated firms closely resembles the asset distribution in the full sample, see Figure 3.

# 5    Estimation Strategy

The goal of our empirical analysis is to assess how multinational firms change their investment behaviour in reponse to a salient TP documentation reform in France. In a first set of specifications, we assess the impact of the reform on the real activity of treated firms in France ("direct effect"). In a second step, we determine the impact on the real activity of treated MNEs outside France ("spillover effect on foreign group affiliates").

Methodologically, we draw on a difference-in-differences-design and compare changes in

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[20]Similarly, Figure 10 in the Appendix shows the number of treated foreign affiliates of French GUOs per country, relative to country's GDP.

**Figure 3:** Histograms on ln fixed assets (treated vs. control firms)
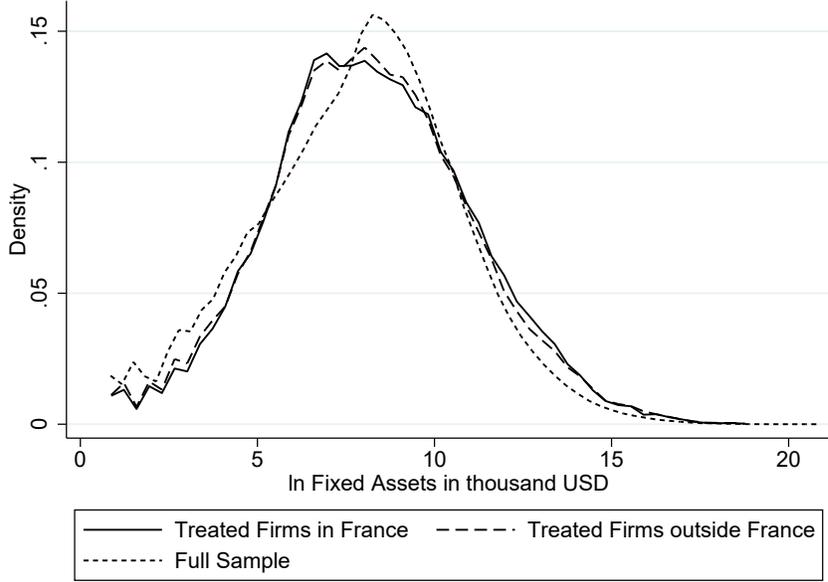


Notes: The variable ln fixed assets is measured in thousand USD and zero values are excluded from this graph.

the real activity of affiliates that are treated and untreated by the French TP provisions. When quantifying the direct effect, we restrict the sample to firms located in France and compare the evolution fixed assets of firms within the scope of the French TP documentation requirements to non-treated firms in France. Formally, the specification reads

$$lnFIAS_{ikht} = \sum_{j=\underline{j}, j \neq -1}^{\bar{j}} \beta_j b_{it}^j + X_{it}'\delta + \mu_i + \pi_{kt} + \phi_{ht} + \epsilon_{ikht} \qquad (1)$$

where the dependent variable is the log of fixed assets of firm $i$ in industry $k$ with parent in home country $h$ in year $t$. Firms for which the conditions spelled out in Section 3 apply are coded as treated by the TP documentation rule. We then include lead and lag dummies relative to event time ($b^j$) for three years before and six years after treatment to assess the dynamics of the French TP reform in 2010. The first event lead $j = -1$ is excluded to avoid multicollinearity between all leads and lags. The $\beta_j$s capture how investment differs for treated firms relative to control firms before and after treatment.

The specification, moreover, includes a full set of 2-digit NACE industry-year fixed effects

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($\pi_{kt}$), which absorb differential time-trends in asset investments across industries. Furthermore, we add a full set of parent-country-year fixed effects ($\phi_{ht}$), which non-parametrically absorbs shocks at the level of firms' headquarters country. Following de Mooij and Liu (2020), we also include standard controls for firm-level determinants of corporate investment decisions ($X'_{it}$), namely firm profitability and sales.

One remaining concern is that the asset investment of larger and smaller firms in France followed a differential time trend in our sample frame. We address this concern twofold. First, we show that the common trend assumption holds prior to the reform: asset investments of treated and control firms followed a similar path prior to the reform. Second, we rerun the estimation model in the full sample of firms, including those outside France, and use the information on the foreign entities to model time trends in fixed asset investments across firms of different size. Defining deciles of the firms size distribution, we interact the firm size dummies with a full set of year fixed effects and add them to the vector of regressors. Formally, the modified estimation model reads:

$$lnFIAS_{ikcmht} = \sum_{j=\underline{j}, j \neq -1}^{\bar{\bar{j}}} \gamma_j b_{it}^j + X'_{it}\kappa + \rho_i + \alpha_{kt} + \zeta_{ht} + \chi_{ct} + \xi_{mt} + \epsilon_{ikcmht} \qquad (2)$$

where the variable definition follows Equ. (1): $lnFIAS_{ikcmht}$ depicts the fixed assets of firm $i$ in host country $c$, belonging to an MNE group from home country $h$, with firm size decile $m$, industry $k$ at time $t$. The model now additionally includes a full set of host country-year fixed effects $\chi_{ct}$ to allow for differential time trends in asset investments across host countries. Empirical identification hence again stems from comparing treated firms in France to non-treated firms in France. The data on firms outside France are used to identify the firm-size specific trends ($\xi_{mt}$) and the effects of other control regressors. Note that we drop MNE affiliates from the sample if they are located outside France but belong to MNE groups that are treated by the introduction of the French TP documentation requirements. As these firms might, as specified below, themselves be affected by the introduction of the TP documentation requirement, keeping them in the sample could bias our estimates. Moreover, we will show that estimates of Equ. (2) are robust to dropping firms in foreign countries (other than France) that experienced changes in corporate tax rules - corporate tax reforms

or changes in anti-profit shifting rules - that might alter firms' asset investment.

In a second step, we test for spillover effects of the introduction of TP documentation rules in France on the economic activity at foreign group locations. The sample comprises all firms *outside France*. Affiliates of MNE groups that are treated by the French transfer pricing rules are now included in the estimation sample and form the treatment group. The formal estimation model reads:

$$lnFIAS_{ikcmht} = \sum_{j=\underline{j}, j \neq -1}^{\bar{j}} \psi_j o_{it}^j + X'_{it}\omega + \rho_i + \alpha_{kt} + \zeta_{ht} + \chi_{ct} + \xi_{mt} + \epsilon_{ikcmht} \quad (3)$$

where variables are defined analogously to Equ. (1); $o_{it}^j$ are the leads and lags of the treatment dummy (now indicating foreign affiliates in MNE groups treated by the reform). Note that the specification again non-parametrically controls for time-varying shocks at the firms' host-country ($\chi_{ct}$) and home-country-level ($\zeta_{ht}$) as well as for time-varying shocks at the industry-level ($\alpha_{kt}$) and across firms of different size ($\xi_{mt}$).

As specified in detail below, we will show that our estimates are robust to further refinements. These include controlling more fine-grained for industry-trends in asset investments and for augmenting the set of regressors by industry-country-year fixed effects. In the latter specifications, the effect of interest are identified by comparing the evolution of fixed asset investments of firms in the same country and the same industry that are treated and untreated by the French TP documentation requirements (further conditioning on the other control variables spelled out above).

We also take great care to assess the robustness of our findings to alternative assumptions on the clustering of errors. Whether firms are treated by the reform hinges on their characteristics and on the characteristics of the multinational group with which they are affiliated. We show that the statistical significance of our estimates remains unchanged when we allow for clustering of errors at the affiliate or MNE group level or the level of 2-digit industry level. We, moreover, use randomization inference. The advantage of this inference technique is that it does not hinge on any distributional assumptions about the structure of the error terms. See below for further details.

# 6   Results

In this section, we present results of direct and spillover effects of the French TP documentation reform in 2010 on firms' fixed assets using a dynamic diff-in-diff regression approach.

## Direct effect

*Base Analysis*

Figure 4 gives our estimates for the direct effect of TP rules on firms' real activity as specified in Equation (1). The sample is restricted to firms in France and the specification includes firm, industry-year and parent-country-year fixed effects. Standard errors allow for clustering at the firm level. The figure depicts the point estimates for the leads and the lags of the treatment indicator ($\hat{b}^j$) and 95% confidence intervals. The event window spans the years 2007 to 2015. The estimates indicate that prior to the introduction of the French TP documentation rules real economic activity emerged in parallel between treated and control firms in France. After treatment, fixed asset investments in treated firms dropped relative to control entities, with the treatment effect gradually increasing over time. The average fixed asset decline in the post-reform period amounts to 6.1%, see Spec. (1) in Table 8 in the Appendix.

The size of the estimate is consistent with prior findings in the literature, indicating that changes in anti-profit shifting laws can exert considerable real economic effects. de Mooij and Liu (2020) find that MNE investment in the policy-changing country decreases by 11.4 percent after the introduction of general TP regulations. Bilicka et al. (2022) find that the introduction of the Worldwide Debt Cap in the UK lowers investment (measured by fixed assets) by multinational firms in the UK also by 11.4 percent.

This estimate turns out to be robust against a number of robustness checks. Most importantly we reestimate the model as given in Equation (2), allowing for different trends in investment behavior across firms in different size classes (see the baseline series in Figure 5). As firm size class-specific trends are modeled by the behavior of firms other than France, we drop observations that might act as a confounder in the analysis (see Section 5). Most importantly, we exclude firms located outside France but affiliated with MNE groups that

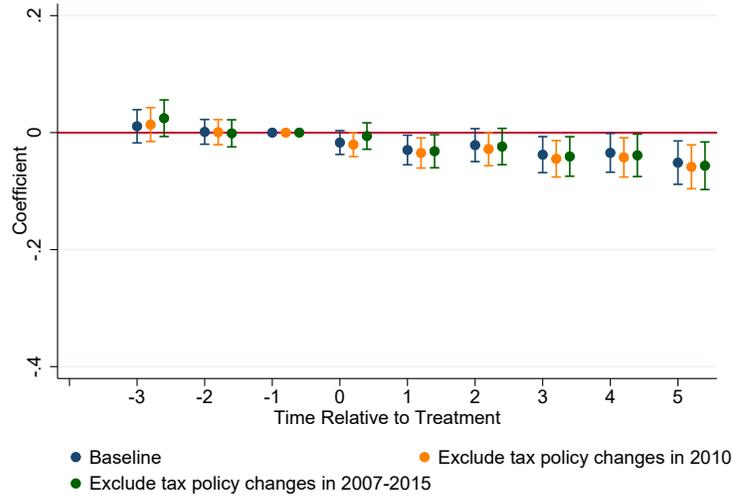**Figure 4:** Base Analysis - Direct Effect on Affiliates in France
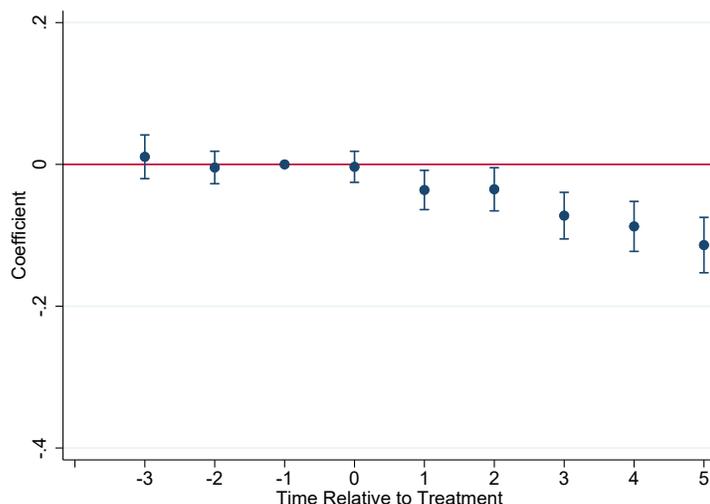


Notes: The figure shows dynamic difference-in-differences estimates for the effect of TP documentation rules on the investment of affected MNEs in France. The specification controls for firm fixed effects, parent-country-year fixed effects and industry-year fixed effects as well as the firm-level controls depicted in the main text. Point estimates and 95% confidence bounds depicted. See the main text for details.

are treated by the French TP documentation rules.

In additional specifications, we also drop firms from countries that experienced major corporate tax reforms or changes in anti-profit shifting measures, either in their host country or at their parent location. Note that this is a precautionary measure in the sense that any policy shock that is homogenous across firms within the same host country or firms with parents in the same home country would be absorbed by the host-country-year fixed effects and the parent country-year fixed effects, included in the base analysis and would not act as a confounder. If policy reforms in foreign countries, in turn, exerted differential effects on firms of different size, the estimates of the underlying firm size specific trends might be biased, as might be the treatment effect of interest. In Figure 5, we levy rich information on corporate tax reforms and reforms of anti-shifting regulations. We present estimates from two types of specifications: the first drops firms in countries with a major corporate tax reform in 2010 in the sense that the countries' corporate tax rate changed by more than one percentage point in 2010 or a change in anti-profit shifting provisions, namely i) the introduction of transfer pricing legislation or documentation requirements in law or as guidelines; ii) the introduction of controlled foreign company (CFC) provisions; iii) the

**Figure 5:** Large sample - Direct Effect on Affiliates in France

introduction of thin-capitalization or earnings stripping rules or changes in the thresholds for the debt-to-equity ratio or interest-earnings ratio given in the law above which interest deduction is denied; the second specification drops firms from countries that experienced a corporate tax rate change of more than one percentage point during the whole sample frame (2007 to 2015) or a change in anti-profit shifting regulations. The estimates are presented in Figure 5. While the point estimates become somewhat smaller in size relative to the base specification, the general pattern of the findings remains unchanged. See also Table 8 in the Appendix.

We, moreover, ran robustness checks to assess whether the statistical significance of our baseline results from Figure 5 hinges on assumptions on the error correlation structure. In the base analysis, we allow for clustering at the firm level and hence for serial correlation. Figure 11 in the Appendix shows that standard errors remain largely unchanged when we allow for clustering at the level of the multinational group, at the level of 2-digit industries or at the host-country-year level.

In additional robustness tests, we, furthermore, rely on randomization inference as origi-

nated in Fisher (1935). The merit of this inferential technique is that it does not hinge on any distributional assumptions about the structure of the error terms. We randomly permute the treatment. For each permuted treatment variable, we run a simple difference-in-difference regression including all control variables and fixed effects given in Equ. (2) and calculate the respective t-statistics. This randomization procedure is repeated 1000 times, and the resulting distribution of t-statistics is compared to the t-statistic for the original regressor. To account for a regional component in the treatment assignment process, randomization is within the strata of GUO countries.

Figure 12 Panel (a) in the Appendix shows the distribution of t-statistics of all permutations and compares it to the actual t-statistic of the true treatment effect (cf. Spec. (3) of Table 8). The reference distribution of t-statistics is centered closely around zero, and our original t-statistic is placed in the far left tail of the reference distribution, corroborating that our estimate is statistically significantly different from zero. The corresponding two-sided p-value is below 0.01.

*Channel Analysis*

As spelled out in the section on theoretical considerations, the observed effects might relate to TP documentation rules reducing multinational profit shifting opportunities and increasing firms' tax costs or, alternatively, to enhanced compliance costs from the new documentation requirements.

We propose to distinguish between the two channels by comparing investment response behavior of multinational groups that are and are not characterized by large intra-firm tax rate differentials. Only the latter groups do have relevant incentives to transfer income from higher to lower-tax affiliates, in particular in the light of prior evidence on multinational profit shifting, which suggests that shifting activities increase overproportionally in intra-firm tax rate differentials (see Dowd et al., 2017). If intra-firm tax gaps are zero or small, profit shifting is unlikely to be a relevant phenomenon. If the latter groups' asset investments, nevertheless, respond to the introduction of TP documentation rules, these responses are plausibly driven by compliance costs associated with TP regulations.

We proxy for intra-firm tax rate differentials by exploiting information on ownership

structures of multinational groups. We determine whether firms belong to multinational groups with majority-owned affiliates in tax haven countries, as defined by conventional tax haven lists. In the following, we present estimates which define tax havens based on the list put forward by Dharmapala and Hines (2009), but similar results emerge when we use alternative tax haven lists (results available upon requests). Alternatively, we identify multinational groups with low tax affiliates, as determined by statutory corporate tax rates below 12.5 percent - or, in alternative specifications, higher thresholds.

Figure 6 depicts estimates from specifications, where we spilt the treatment group in firms that belong to MNE groups with and without tax haven affiliates and firms that belong to MNE groups with and without low-tax affiliates, respectively. The negative investment response is centered around firms linked to tax haven or low-tax entities. MNE groups with small intra-firm tax rate differentials, in turn, do not show a significant investment response. The point estimate for the investment response is small in firms that belong to MNE groups without tax haven affiliates or low-tax affiliates with a statutory corporate tax rate below 12.5%. The same holds true if we further restrict the sample to firms with smaller intra-firm tax rate differentials as measured by intra-group minimum tax rates above 15%, 17.5% and 20% (see Figure 13 in the Appendix). The results are also estimated in simple before-after diff-in-diff regressions (see Table 9 in the Appendix). This is consistent with investment responses being driven by increased tax costs, rather than enhanced compliance burdens. See Figure 14 Panel (a) in the Appendix, which presents estimates from specifications where we split the sample in treated firms with above and below median size within the treated group - as measured by average total assets across the full sample frame. In line with this interpretation, we find that smaller firms show weaker response behavior than larger entities: if compliance costs were the main driver of the investment effect, we would expect to see the opposite pattern.

Taken together, our evidence suggests that TP documentation rules negatively impact MNEs' real activity in the policy-changing country. In the following subsection, we test for spillover effects of TP documentation provisions on foreign group locations.

**Figure 6:** Sample Split by Intra-Group Tax Differential - Direct Effect on Affiliates in France
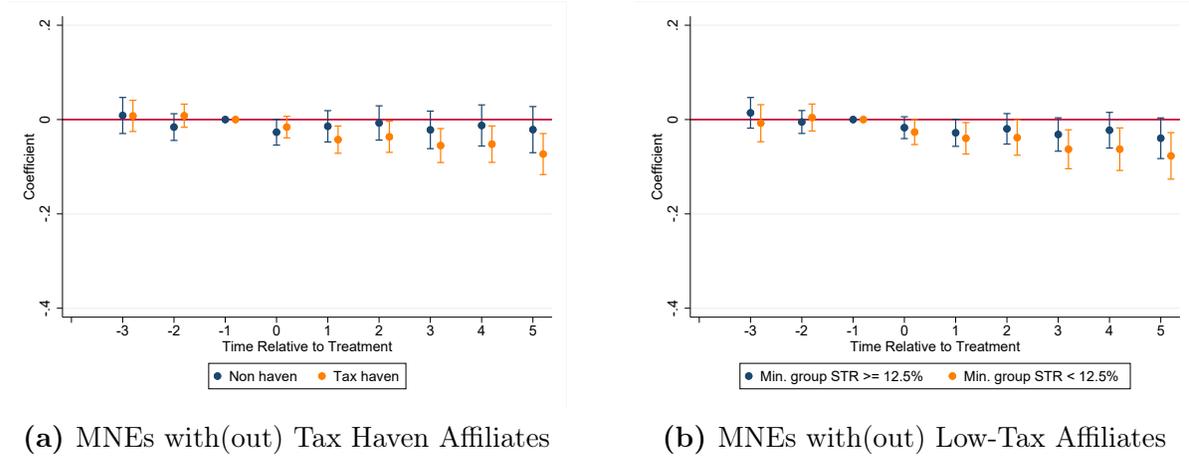


**(a)** MNEs with(out) Tax Haven Affiliates      **(b)** MNEs with(out) Low-Tax Affiliates

Notes: The figure shows dynamic difference-in-differences estimates for the effect of TP documentation rules on the investment of affected MNEs in France, where firms are split according to different measures for MNEs' intra-firm tax rate differential: as measured by the ownership of tax haven affiliates (Panel A) and the ownership of low-tax affiliates (Panel B). The specification controls for a full set of firm, host-country-year, parent-country-year, industry-year and firm-size-year fixed effects as well as the firm-level controls depicted in the main text. Point estimates and 95% confidence bounds depicted. See the main text for details.

## Spillover effects

As sketched above, we test for spillover effects of the reforms, restricting the sample to firms outside France. Following our definition in Section 3, firms are tabbed as treated if they belong to MNE groups that are within the scope of the French transfer price documentation rules. The baseline estimates are presented in Figure 7 and Table 10. The specifications include full sets of firm fixed effects, industry-year fixed effects, host-country-year fixed effects and home country-year fixed effects as well as the control variables specified in Section 4.

The dynamic difference-in-differences estimates are presented in Figure 7. Again, we do not find indication for differences in trends in investment behavior between treated and control groups prior to treatment, supporting the common trend assumption. After treatment, the investment activity in treated firms dropped relative to control firms, with the effect gradually increasing over time. Quantitatively, the base specification in Panel (a) suggests that investment by treated firms declined by 7.2% on average in the post-reform period (see also column (1) in Table 10 in the Appendix), rendering the effect comparable to the direct effect on firms in France.

**Figure 7:** Base Analysis - Spillover of TP Documentation Requirements on Affiliates Outside France

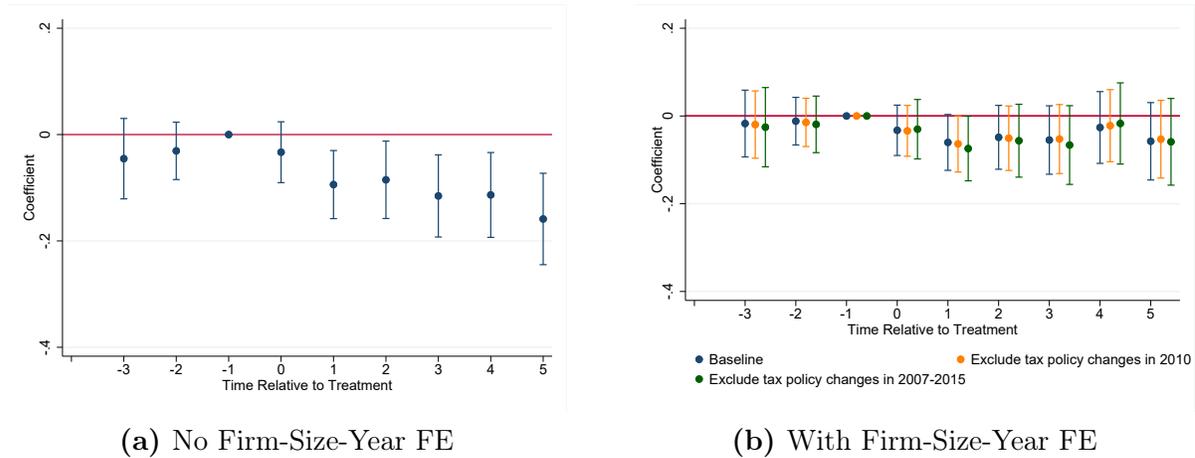

**(a)** No Firm-Size-Year FE

**(b)** With Firm-Size-Year FE

Notes: The figure shows dynamic difference-in-differences estimates for the effect of TP documentation rules on the investment of affected MNEs outside France. The specification controls for a full set of firm fixed effects, host-country-year fixed effects, parent-country-year fixed effects and industry-year fixed effects as well as the firm-level controls depicted in the main text. Point estimates and 95% confidence bounds depicted. See the main text for details.

Analogously to the base analysis in Panel (a), we, moreover, reran the model with a full set of firm size class-year fixed effects, thus absorbing potential differences in the emergence of fixed assets over time (see Figure 7 Panel (b)). Similar to the estimation of the direct effect, we also present specifications, where we drop firms that are either themselves hosted in countries that experienced a corporate tax reform or changes in anti-profit shifting regulations or that belong to MNE groups with major corporate tax changes or changes in anti-profit shifting rules in their parent location (either in 2010 or during the full sample frame). As in the base analysis for the direct effect of TP laws on firms in the policy-changing country, this lowers the point estimates and, in this case, also renders it statistically insignificant.

A potential rationale for the considerable size of the point estimate combined with the large standard error is that there is heterogeneity in response behavior across firms. Figure 8 Panel (a) and Table 11 point to a strong drop in investment activity at low-tax affiliates (with an average statutory tax rate smaller than or equal to 12.5%), while investments at higher-tax locations remain unaffected. Again, this insight does not change when we restrict the sample to higher-tax firms hosted in countries with average statutory corporate tax rates above 15, 20, 25 and 30%, see Figure 8 Panel (b). The findings are consistent with

**Figure 8:** Low vs. High-Tax Affiliates - Spillover of TP Documentation Requirements on Affiliates Outside France



**(a)** Low-Tax vs. High-Tax Affiliates
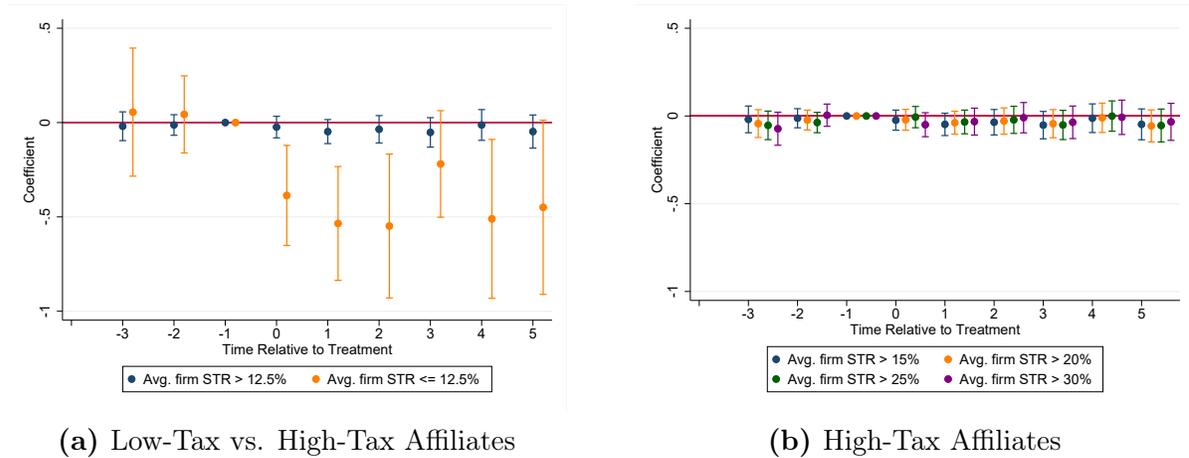


**(b)** High-Tax Affiliates

Notes: The figure shows dynamic difference-in-differences estimates for the effect of TP documentation rules on the investment of affected MNEs outside France. The specification controls for a full set of firm, host-country-year, parent-country-year, industry-year and firm-size-year fixed effects as well as the firm-level controls depicted in the main text. Point estimates and 95% confidence bounds depicted. See the main text for details.

prior analyses pointing to firms' investment responses being driven by reduced profit shifting opportunities rather than corporate compliance costs.

This interpretation is corroborated by further evidence presented in Figures 14 and 15 in the Appendix. In Figure 14 Panel (b), we show that smaller multinational firms - with below median total assets within our sample frame - again do not show systematically stronger investment responses than their larger counterparts - firms with above median total assets within our sample frame, as would be predicted if compliance costs drove the observed investment response. Figure 15, moreover, illustrates that investment effects are again also not systematically stronger in foreign entities that operate in industries that are closely connected to their parent firms in France through input links. Specifically, we use input-output table information for France in 2010 from the input-output table database (OECD, 2021) and merge it to the industries of our foreign affiliates and French GUOs in our Orbis dataset.[21] Focusing on important input-output industry relations is a proxy for the importance of real

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[21]The industry classes in the input-output tables (IOT) group some industry classes from Orbis (NACE two-digit) further together. Thus, one IOT industry class translates into 1-7 two-digit NACE industry classes in our Orbis data. We split all industry groups to the NACE two-digit level.

intra-group trade of the considered affiliates. If compliance cost drove the observed behavior, we would expect investment effects to be centered around these firms. This is rejected by Figure 15 in the Appendix, where we compare investment responses by firms that operate in industries that belong to the top three input suppliers to the industry of the parent firm or belong to the top 50% of the most important input industries for the industry of MNEs' parent firm. We interpret this pattern to suggest that investment responses are largely tax cost driven. Real economic activity at foreign high-tax firms within multinational groups seems to be unaffected by the introduction of TP documentation requirements.

Finally, we pay some attention to understanding the cross-border effect of the French TP reform on less developed nations. As depicted in Figure 2 (world map), MNE groups headquartered in France have ownership ties to the less developed world, among others to former colonies. The merit of anti-profit shifting laws for developing countries have been fiercely debated over recent years (see e.g. Collier and Riedel, 2018). In this paper, we offer a different perspective and ask how anti-profit shifting rules set in the developed world may impact less developed nations. In that regard, we contribute to an emerging literature that assesses how tax policy choices by developed nations impact developing countries (see e.g. Hoopes et al., 2022). This is of particular interest in the light that countries around the world committed to development goals and support developing nations in their quest for better living conditions for their populations through monetary and non-monetary goals. It is hence important to understand to what extent their own tax policy choices are consistent with these goals and development aims.

We assess this question in the context of the introduction of TP documentation rules in France. Figure 9 reestimates the spillover analysis laid out in Equation (3) in two subsamples: First, for firms in high income countries as defined by the World Bank Classification and second for firms in low and middle income countries. The estimates turn out qualitatively and quantitatively similar in both subsets of samples, indicating that TP documentation rules do exert negative spillovers on foreign investment behavior in both sets of countries. For low and middle income countries, the point estimate turns out larger in size than in the full sample of foreign firms (cf. Spec. (2) in Table 15) and marginally gains statistical significance. Again, investment responses tend to be driven by firms in developing countries that offer

**Figure 9:** Developed vs. Developing Countries - Spillover of TP Documentation Requirements on Affiliates Outside France
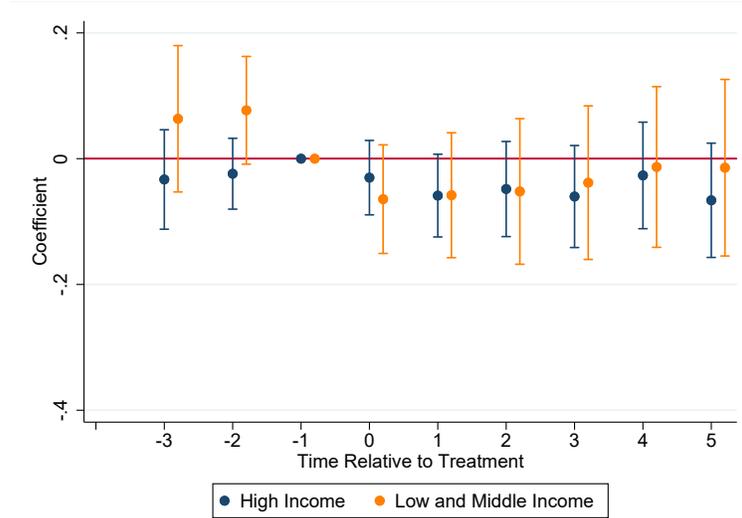


Notes: The figure shows dynamic difference-in-differences estimates for the effect of TP documentation rules on the investment of affected MNEs outside France. The treated group is split in affiliates with fixed assets in developed and developing countries. The specification controls for a full set of firm, host-country-year, parent-country-year, industry-year and firm-size-year fixed effects as well as the firm-level controls depicted in the main text. Point estimates and 95% confidence bounds depicted. See the main text for details.

attractive corporate tax schemes, as measured by statutory corporate tax rates below 20% or 12.5% (cf. Spec. (3) and (4) in Table 15). The extent that less developed countries' welfare more strongly hinges on the inflow of foreign direct investments, e.g. for non-agricultural job creation and knowledge and productivity spillovers to the local economy (Hale and Xu, 2022), developing countries may suffer particularly strongly from a given decline in MNE investment in response to the studied TP reform.

# 7    Conclusions

In this paper, we study the impact of transfer price documentation rules on MNEs' real economic activity. Using the introduction of TP documentation rules in France as a testing ground and relying on rich data on multinational firms and their activity in France and worldwide, we show that TP documentation rules deter the real economic activity of affected multinational firms. We provide evidence consistent with the notion that the effect largely relates to reduced profit shifting opportunities and increased tax costs. We, in turn, do

find indication that TP-related compliance costs shape the real economic activity of MNEs. Finally, we add to an emerging literature, which shows that tax policies do not only impact activity in the policy-changing country, but that effects may also emerge at foreign group locations: The introduction of TP documentation requirements is found to significantly lower MNEs' real economic activity at foreign low-tax locations, presumably reflecting a reduction in profit-shifting related real activity.

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# A    Data Appendix

In this section, we document the data collection and cleaning of the construction of our final panel dataset on MNCs worldwide. The purpose is to show our rigorous sample selection approach and make our data processing transparent and reproducible for other researchers. We start with a full-access version of Bureau van Dijk's Orbis database of more than 50 million firms worldwide. We use a downloaded version of the database from 2018 (accessed by University of Tübingen). We use financial data on firms and data on firms' ownership links. For the ownership links, we use the 50 percent Global Ultimate Owners (GUO) definition.

Our data cleaning and merging consists of three steps: First, we download and clean data on firm financials. Second, we prepare ownership data on GUOs, Controlling Shareholders (CSH) and subsidiary lists and identify the MNC groups. Third, we merge the financials and ownership data and analyse the coverage for countries over time. This yields our final sample for the Orbis MNC dataset.

### Orbis Financial Data

Our download is a full version of Orbis financials data for the years 2007 to 2016. We follow quite conservative cleaning steps as recommended in a discussion paper of the Tinbergen Institute (Kalemli-Ozcan et al., 2022). First, we drop consolidated account observations (step 2); then we drop observations with missing accounting close dates (step 3); firm-year level duplicates (step 4); firm-year level observations where total assets, employments and operating revenue are missing simultaneously (step 5); firms with negative total assets, employment, sales, or tangible fixed assets in at least one year (steps 6 to 9). Table 2 shows how the sample size of the Orbis Financials dataset (2018) reduces by concluding the data cleaning steps named above. The cleaned Orbis Financials data sample consists of 6.35 million firms and 37.5 million observations mainly for the years 2007-2016. This sample amounts to 69.5% of the downloaded Orbis Financials data. Most observations are dropped when excluding consolidated accounts (step 2).

**Table 2:** Orbis Financials Data Cleaning

| Step | Description | Firms | Observations | % of step 1 |
|------|-------------|-------|--------------|-------------|
| 1 | Downloaded | - | 53,977,057 | 100.00 |
| 2 | Keep unconsolidated accounts | 6,358,749 | 37,700,525 | 69.85 |
| 3 | Drop observations with missing accounting close date | 6,358,749 | 37,700,522 | 69.85 |
| 4 | Drop duplicates by firm and year | 6,358,749 | 37,574,085 | 69.61 |
| 5 | Drop firm-year observation if total assets, employment, and operating revenue are missing simultaneously | 6,357,907 | 37,525,162 | 69.52 |
| 6 | Drop firm if total assets are negative in any year | 6,357,855 | 37,523,246 | 69.52 |
| 7 | Drop firm if employment is negative in any year | 6,357,855 | 37,523,246 | 69.52 |
| 8 | Drop firm is sales are negative in any year | 6,357,386 | 37,517,041 | 69.51 |
| 9 | Drop firm if tangible fixed assets are negative in any year | 6,357,215 | 37,503,101 | 69.48 |

Source: BvD's Orbis database (2018). Full version downloaded by Uni Tübingen.

**Orbis Ownership Data**

This subsection documents the identification strategy and sample selection of MNCs using Orbis ownership data from 2018. The ownership structures reported by Orbis are static for the most recent year (2018). The data includes information on the global ultimate owners (GUOs), the controlling shareholders on different levels as well as subsidiaries on different levels. There are two possibilities to identify MNC groups from the ownership data. First, we use data on firms and their GUO to identify corporate groups. We define a corporate group as a MNC group if at least one majority owned firm is located in another country than the GUO. Hence, we use the following GUO definition: a firm is a GUO if its ownership share is larger than 50.01%, it has no identified shareholders, and it is the highest quoted shareholder. Second, we use full subsidiary lists and identify MNC groups if at least one majority owned subsidiary is located abroad.

In the following, we describe the data processing more in detail. From the Orbis 2018 data download, we use three different datasets: the GUO dataset, the controlling shareholder dataset, and the subsidiaries dataset. The GUO dataset contains data on immediate shareholders (ISH), GUOs, and domestic ultimate shareholders (DUOs). There is only one time invariant observation per firm. The controlling shareholder dataset contains all controlling shareholders (CSH) listed between the subject company and the GUO. Hence, there are several observations per firm, and the variable CSH-level indicates the length of links between the subject firm and the controlling shareholder. From this dataset, we identify the

**Table 3:** Orbis Ownership Structure Data

| Step | Description | Firms | GUOs | % of firms step 1 |
|------|-------------|-------|------|-------------------|
| 1 | Download GUO data | 14,379,027 | 2,947,121 | 100.00 |
| 2 | Non-missing GUO | 4,180,776 | 2,947,121 | 29.08 |
| 3 | Fill in GUO by CSH | 4,183,495 | 2,948,853 | 29.09 |
| 4 | Missing GUO country | 611,165 | 544,137 | 4.25 |
| 5 | Unknown GUO country (WW/YY/ZZ) | 608,370 | 542,254 | 4.23 |
| 6 | Drop duplicates and remaining missing GUOs | 4,183,494 | 2,948,853 | 29.09 |
| 7 | Append subsidiary list | 4,183,494 | 2,948,853 | 29.09 |
| 8 | Corporate groups | 4,183,494 | 2,948,853 | 29.09 |
| 9 | Foreign ultimate links | 4,182,776 | 2,948,569 | 29.08 |
| 10 | MNC groups | 4,182,953 | 2,948,569 | 29.09 |

highest controlling shareholder of a firm. Both the GUO and the CSH datasets are available for different GUO definitions. We use the 50% ownership GUO definition. In addition, the subsidiaries dataset contains full lists of parent firms' first-level subsidiaries. Firms are listed as parents and subsidiaries in the dataset, since only first-level ownership shares are reported (direct and total shares). The level of observation is the parent firm, for which as many observations exist as subsidiaries the firm has.

Table 3 presents the sample selection steps for MNC identification using Orbis ownership data from 2018. The downloaded GUO dataset includes more than 14 million ownership links from which 4.18 million firms have a non-missing GUO. In case, the GUO dataset does not provide a GUO for a firm, we replace it with the highest CSH from the CSH dataset. From the CSH dataset, we only use the information on the highest CSH and merge this information to the GUO dataset. In step 3, the missing GUO can be replaced by the highest controlling shareholder for 2,719 firms. Furthermore, some firms have a GUO, but the residence country of the GUO is unknown (GUO ID starts with II, WW, YY, or ZZ). We flag these firms and later exclude them in our empirical analysis. In step 4, the GUO country code is missing and can be replaced by the first two digits of the bvdidnumber in 611,165 cases. However, for 608,370 firms the country of the GUO remains unknown (step 5). In step 6, we identify one duplicate firm (bvdidnumber= SG197301118N) and dropped it. In addition, we drop 10,195,532 observations for which the GUO ID number is missing.

In step 7, we append ownership information from the subsidiaries dataset (4,191,792

**Table 4:** Orbis Subsidiary Lists Data

| 1st level | 2nd level | 3rd level | 4th level | 5th level | 6th level | 7th level | 8th level | 9th level | 10thlevel |
|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| 2,949,119 | 1,305,625 | 808,068 | 586,323 | 479,756 | 422,450 | 394,166 | 376,275 | 367,532 | 364,434 |

observations) to the GUO dataset. We only append majority owned subsidiaries with a direct or total ownership share of more than 50 percent for subsidiary levels 1-10. This increases our sample size to 10,356,863 firm-subsidiary level observations. Table 4 provides an overview on the number of subsidiaries appended at different levels.

In step 8, we identify 2,948,853 corporate groups, i.e. groups of firms with the same GUO. Within these corporate groups, we identify 10,225,466 foreign ultimate links between firms and GUOs or subsidiaries and GUOs (step 9), i.e. a firm/subsidiary is located in another country than its GUO. Step 10 reports 2,948,569 MNC groups with at least one majority owned foreign affiliate. This is our MNC sample from the GUO data 2018 including 4,182,953 firms, 2,948,569 GUOs, and the respective first to tenth level subsidiaries. The median MNC group size is 94, where 2,487,542 MNCs have a group size of one, i.e. they only consist of the firm and the GUO, and possibly subsidiaries.

**Merge of Orbis Finanacials and Ownership Data**

In the following, we merge the time-invariant MNC ownership links data to the cleaned panel of financial firm data. We report the counts of firms and owners for the matched sample in Table 5. All reported counts of firms and owners are distinct values and vary by the amount of observations per variable over time. We only keep firms for which at least two observations of the variables EBIT, totals assets and fixed assets are available. Furthermore, we only keep the observations of the matched sample, for which ownership and financial data is available.

For our baseline sample, we further restrict the dataset and drop firms with missing information on their GUO country (2,417,828 observations deleted). Furthermore, we drop firms with missing industry codes. We winsorize all our financial variables (pre-tax profits, fixed assets, operating revenue) at top and bottom 1 percentile. We further limit our sample to firms with al least three observations for fixed assets and operating revenues. This leaves

**Table 5:** Financials and Ownership Orbis Data (2007-2016)

|  | Distinct counts |
| --- | --- |
| Matching variable | bvdidnumber |
| Matched sample: | |
| GUOs | 1,489,502 |
| Firms | 2,171,037 |
| Baseline sample: | |
| GUOs | 100,005 |
| Firms | 366,427 |

us with a baseline MNC sample of 366,427 firms and 100,005 GUOs. The firm coverage in host and home countries is reported in tables 6 and 7.

**Table 6:** List of host countries

| country | Freq. | country | Freq. | country | Freq. |
|---------|-------|---------|-------|---------|-------|
| AL | 152 | GA | 9 | MT | 9,227 |
| AR | 310 | GB | 289,897 | MU | 202 |
| AT | 29,011 | GR | 17,567 | MX | 618 |
| AU | 26,015 | GT | 6 | MY | 4 |
| BA | 6,576 | GY | 9 | NL | 33,776 |
| BB | 8 | HK | 18 | NO | 100,430 |
| BE | 103,509 | HR | 19,940 | NZ | 5,469 |
| BF | 8 | HU | 23,662 | PA | 48 |
| BG | 22,690 | ID | 2,704 | PE | 761 |
| BM | 12 | IE | 31,611 | PH | 8,321 |
| BO | 47 | IL | 16 | PK | 308 |
| BR | 4,121 | IN | 34,619 | PL | 90,733 |
| CA | 6 | IR | 9 | PT | 69,730 |
| CH | 753 | IS | 1,507 | PY | 19 |
| CI | 18 | IT | 301,444 | RO | 83,922 |
| CL | 587 | JM | 22 | RS | 18,657 |
| CN | 104,186 | JP | 68,337 | RU | 161,173 |
| CO | 23,605 | KN | 8 | SE | 157,271 |
| CV | 10 | KR | 24,065 | SI | 16,480 |
| CY | 1,001 | KV | 35 | SK | 41,226 |
| CZ | 84,135 | KZ | 1,811 | SV | 35 |
| DE | 142,931 | LB | 6 | TH | 736 |
| DK | 18,484 | LI | 88 | TN | 11 |
| DM | 9 | LK | 330 | TR | 7,753 |
| DO | 7 | LR | 3 | TT | 26 |
| DZ | 450 | LT | 12,534 | TW | 16,357 |
| EC | 235 | LU | 22,728 | UA | 41,276 |
| EE | 16,668 | LV | 19,962 | US | 37 |
| ES | 212,303 | MA | 3,191 | UY | 468 |
| ET | 6 | MC | 8 | UZ | 3 |
| FI | 43,038 | MD | 166 | VE | 9 |
| FR | 333,372 | ME | 831 | ZW | 5 |
| GA | 9 | MK | 3,322 | | |

Notes: This table lists the number of observations per host country. The firms in the dataset are located in 97 different host countries.

**Table 7:** List of home (GUO) countries

| country | Freq. | country | Freq. | country | Freq. | country | Freq. | country | Freq. |
|---------|-------|---------|-------|---------|-------|---------|-------|---------|-------|
| AD | 367 | CR | 155 | IE | 23,522 | MK | 923 | SE | 136,767 |
| AE | 4,690 | CU | 51 | IL | 8,151 | ML | 4 | SG | 7,935 |
| AF | 25 | CV | 61 | IN | 27,745 | MN | 50 | SI | 11,678 |
| AG | 10 | CW | 5,332 | IQ | 115 | MO | 252 | SK | 10,276 |
| AI | 219 | CY | 64,113 | IR | 527 | MR | 31 | SL | 26 |
| AL | 398 | CZ | 29,924 | IS | 2,136 | MT | 6,044 | SM | 676 |
| AM | 290 | DE | 235,163 | IT | 246,578 | MU | 1,919 | SN | 35 |
| AO | 360 | DK | 41,504 | JM | 94 | MV | 3 | SO | 10 |
| AR | 653 | DM | 339 | JO | 267 | MX | 3,132 | SR | 208 |
| AT | 55,609 | DO | 46 | JP | 133,787 | MY | 2,130 | ST | 52 |
| AU | 24,196 | DZ | 627 | KE | 24 | MZ | 10 | SV | 36 |
| AW | 40 | EC | 122 | KG | 86 | NA | 11 | SY | 543 |
| AZ | 250 | EE | 7,684 | KH | 35 | NG | 149 | SZ | 6 |
| BA | 2,638 | EG | 612 | KI | 14 | NI | 33 | TG | 15 |
| BB | 124 | ER | 7 | KN | 798 | NL | 87,447 | TH | 2,016 |
| BD | 65 | ES | 155,880 | KP | 126 | NO | 86,351 | TJ | 19 |
| BE | 77,574 | ET | 6 | KR | 18,916 | NP | 9 | TM | 42 |
| BF | 10 | FI | 41,952 | KV | 31 | NR | 4 | TN | 481 |
| BG | 8,266 | FJ | 9 | KW | 1,074 | NZ | 1,998 | TR | 11,385 |
| BH | 372 | FR | 276,593 | KY | 23,998 | OM | 332 | TT | 35 |
| BJ | 10 | GA | 35 | KZ | 2,408 | PA | 5,075 | TW | 24,237 |
| BM | 16,813 | GB | 200,151 | LA | 7 | PE | 458 | TZ | 48 |
| BN | 70 | GE | 212 | LB | 2,461 | PG | 16 | UA | 6,754 |
| BO | 26 | GH | 79 | LC | 20 | PH | 3,832 | US | 240,066 |
| BR | 4,575 | GI | 2,406 | LI | 7,017 | PK | 262 | UY | 324 |
| BS | 2,504 | GM | 20 | LK | 466 | PL | 25,628 | UZ | 325 |
| BW | 13 | GN | 14 | LR | 643 | PS | 20 | VA | 19 |
| BY | 2,857 | GR | 12,593 | LT | 8,693 | PT | 37,298 | VC | 332 |
| BZ | 2,453 | GT | 14 | LU | 82,071 | PW | 10 | VE | 300 |
| CA | 18,368 | GW | 22 | LV | 5,391 | PY | 18 | VG | 27,018 |
| CG | 79 | GY | 54 | LY | 279 | QA | 1,170 | VN | 126 |
| CH | 69,307 | HK | 10,390 | MA | 1,653 | RO | 6,344 | WS | 345 |
| CI | 68 | HN | 3 | MC | 1,159 | RS | 7,280 | YE | 11 |
| CL | 1,353 | HR | 10,111 | MD | 1,134 | RU | 63,288 | ZA | 3,582 |
| CM | 147 | HT | 16 | ME | 618 | SA | 1,417 | ZW | 5 |
| CN | 60,591 | HU | 15,586 | MG | 80 | SC | 5,658 | | |
| CO | 12,895 | ID | 1,996 | MH | 1,169 | SD | 20 | | |

Notes: This table lists the number of observations per home country. The GUOs in the dataset are located in 183 different home countries.

# B    Results Appendix

This Appendix presents additional Figures and Tables referred to in the main text and beyond.

**Figure 10:** Foreign Treated Affiliates Worldwide
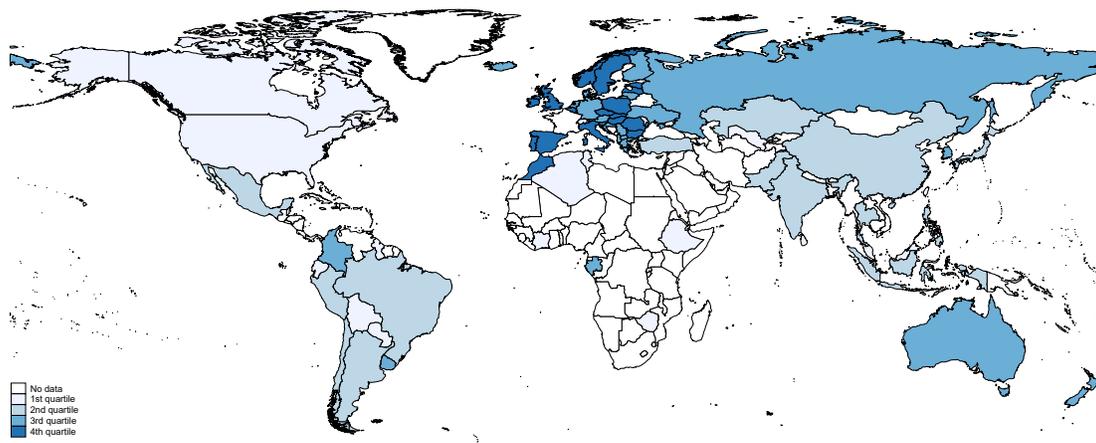


Notes: The figure depicts the number of foreign affiliates per host country that belong to MNEs with a global ownership link to France and at least one affiliate above the TP threshold of 400 million Euros in turnover/totals assets, normalized on countries' GDP.

**Figure 11:** Robustness - Alternative Clustering CHOOSE 1 DIRECT and 1 SPILLOVER GRAPH!
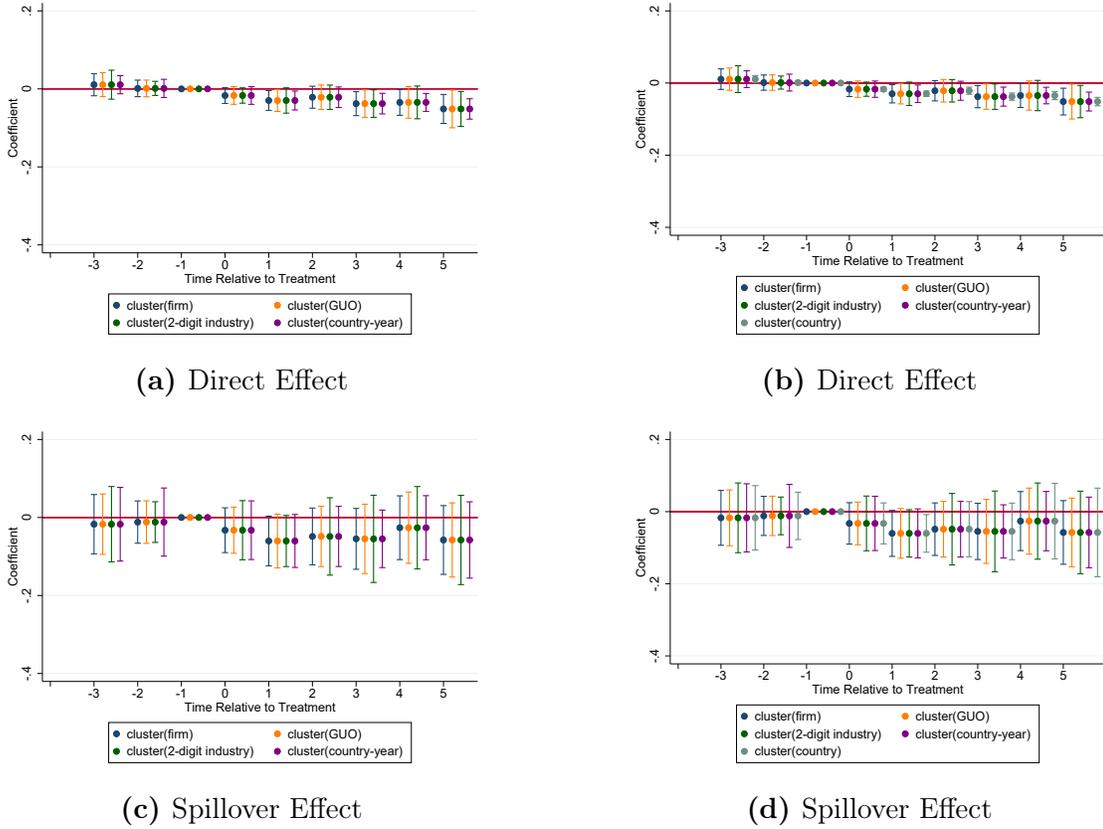


**(a)** Direct Effect



**(b)** Direct Effect



**(c)** Spillover Effect



**(d)** Spillover Effect

Notes: The figure shows dynamic difference-in-differences estimates for the effect of TP documentation rules on the investment of affected MNEs outside France. The standard errors are clustered at levels as indicated in the figure legend. The specification controls for a full set of firm, host-country-year, parent-country-year, industry-year and firm-size-year fixed effects as well as the firm-level controls depicted in the main text. Point estimates and 95% confidence bounds depicted.

**Figure 12:** Randomization Inference
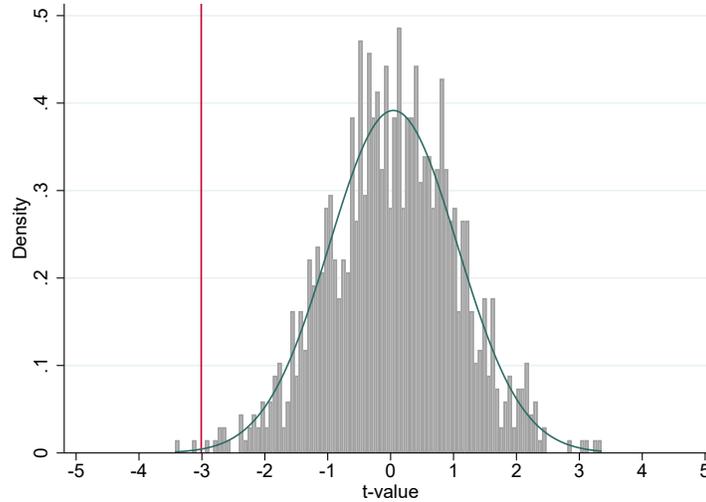


**(a)** Direct Effect



**(b)** Spillover Effect

Notes: The graphs show the t-statistics of the true treatment effect (vertical red line) and the randomization distribution (grey bars) with 1,000 permutations. For each permutation, we estimate the effect of logarithmized fixed assets on the TP reform in 2010 including all control variables and the full set of fixed effects. We use automatic resampling within the Stata package ritest. The resampling is kept constant within firms (cluster option at firm level). We permute the treatment variable within the strata of (a) GUO countries and (b) host countries.

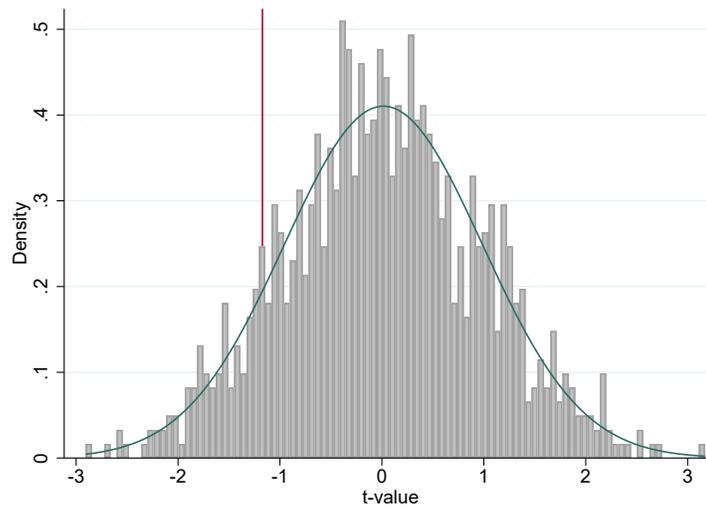**Figure 13:** Direct Effect on Affiliates in France - Groups with low tax rate differentials



Notes: The figure shows dynamic difference-in-differences estimates for the effect of TP documentation rules on the investment of affected MNEs in France, where treated firms are restricted to groups with low tax rate differentials. Low tax rate differentials are proxied by excluding groups with very low-tax affiliates (minimum STR below indicated threshold value) from the treatment group. The specification controls for a full set of firm, host-country-year, parent-country-year, industry-year and firm-size-year fixed effects as well as the firm-level controls depicted in the main text. Point estimates and 95% confidence bounds depicted. See the main text for details.

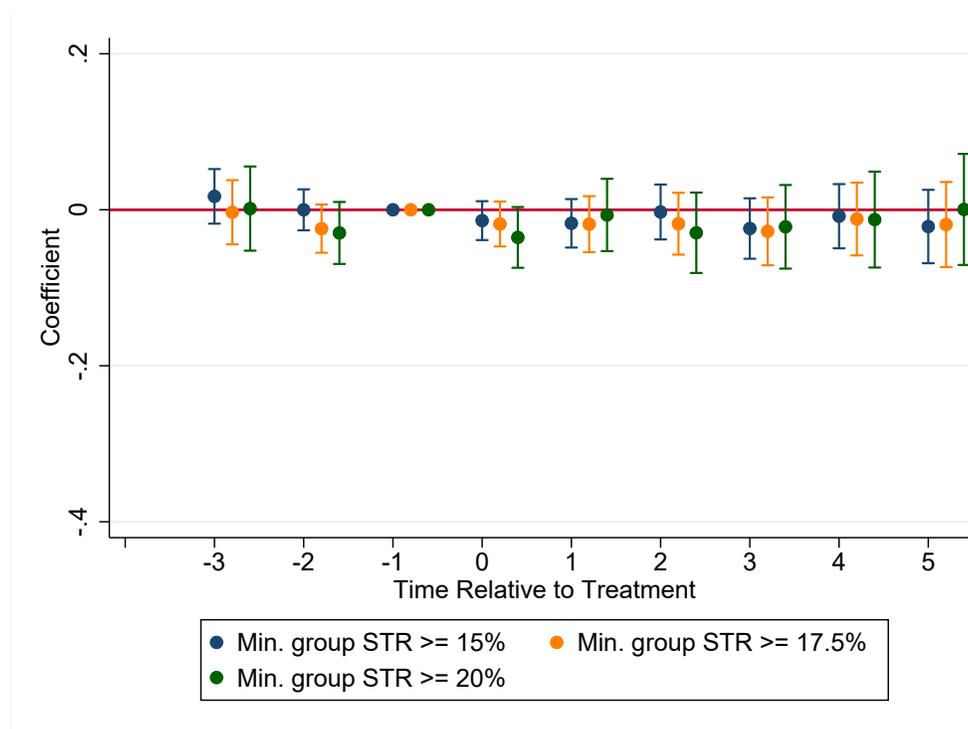**Figure 14:** Sample Split - Large vs. Small Firms
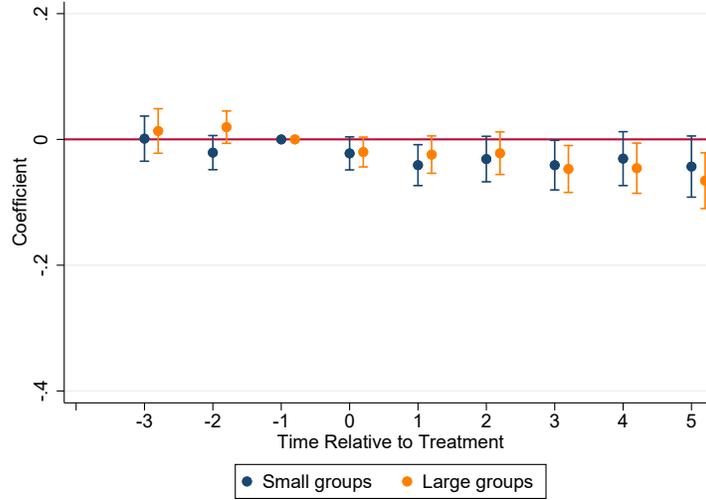


**(a)** Direct Effect



**(b)** Spillover Effect

Notes: The figure shows dynamic difference-in-differences estimates for the effect of TP documentation rules on the investment of affected MNE affiliates in France (a) and outside France (b), where treated firms are split according to size, above and below the median of average unconsolidated total assets. The specification controls for a full set of firm fixed effects, host-country-year fixed effects, parent-country-year fixed effects, industry-year fixed effects and firm-size-year fixed effects as well as the firm-level controls depicted in the main text. Point estimates and 95% confidence bounds depicted. See the main text for details.

**Figure 15:** Spillover effects - Sample Split Important vs. Unimportant Input Industries



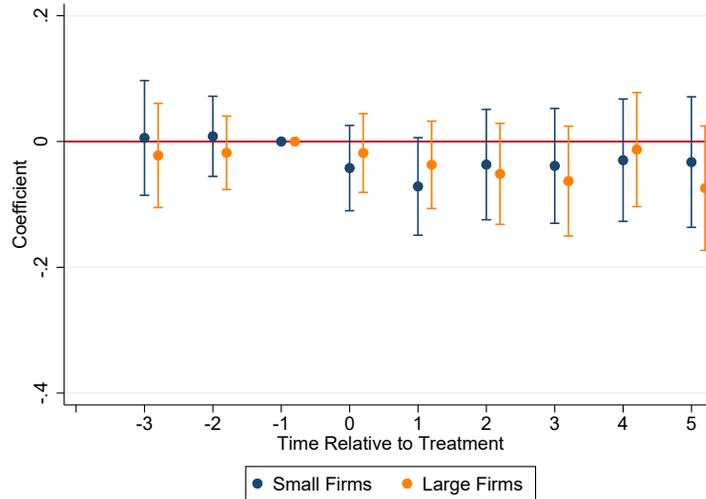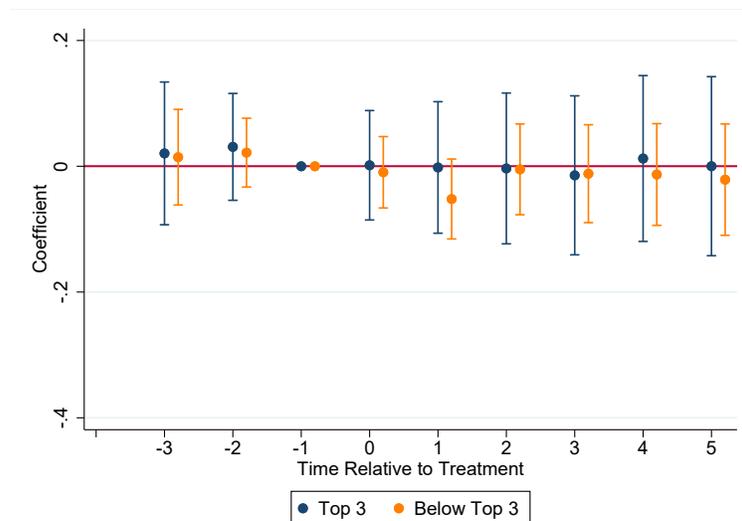**(a)** Top 3 Input Industries
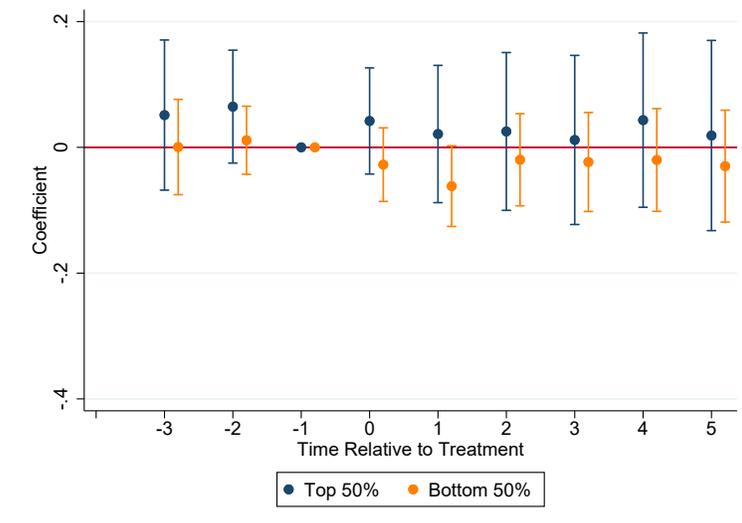


**(b)** Top 50% Input Industries

Notes: The figure shows dynamic difference-in-differences estimates for the effect of TP documentation rules on the investment of affected MNEs outside France. The treated group is split in affiliates in top 3 or top 50% of input industries of their French parents. The specification controls for a full set of firm, host-country-year, parent-country-year, industry-year and firm-size-year fixed effects as well as the firm-level controls depicted in the main text. Point estimates and 95% confidence bounds depicted. See the main text for details.

**Table 8:** Base Analysis - Direct Effect on Affiliates in France

|  | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| treat x post | -0.0613*** | -0.0577*** | -0.0387*** | -0.0459*** | -0.0433*** |
|  | (0.0130) | (0.0120) | (0.0121) | (0.0123) | (0.0135) |
| min. group tax rate | -0.00774 | -0.375*** | -0.332*** | -0.278*** | 0.0521 |
|  | (0.142) | (0.0623) | (0.0655) | (0.0787) | (0.139) |
| ln(operating revenue) | 0.481*** | 0.463*** | 0.453*** | 0.460*** | 0.477*** |
|  | (0.0161) | (0.00421) | (0.00461) | (0.00553) | (0.0157) |
| profitability | -1.725*** | -1.729*** | -1.713*** | -1.726*** | -1.652*** |
|  | (0.0555) | (0.0181) | (0.0190) | (0.0220) | (0.0522) |
| _cons | 2.914*** | 3.423*** | 3.512*** | 3.427*** | 3.041*** |
|  | (0.153) | (0.0406) | (0.0443) | (0.0530) | (0.150) |
| Firm FE | YES | YES | YES | YES | YES |
| Industry-year FE | YES | YES | YES | YES | YES |
| Host-country-year FE | NO | YES | YES | YES | YES |
| GUO-country-year FE | YES | YES | YES | YES | YES |
| Firm-size-year FE | NO | NO | YES | YES | YES |
| N | 189323 | 1648324 | 1487840 | 1081416 | 200439 |
| r2 | 0.951 | 0.938 | 0.934 | 0.931 | 0.951 |

Notes: The results show simple diff-in-diff regression results estimated with OLS. The dependent variable is logarithmized fixed assets (winsorized at top and bottom one percentiles). The treatment is the introduction of TP documentation requirements in France in 2010. The treatment group includes French firms in MNE groups, where at least one affiliate has unconsolidated turnover or gross assets above or equal to 400 million euros. The control group consists of French firms, where neither the firm nor one affiliate meets the TP threshold value, or non-French firms in MNE groups with no French affiliation (e.g. French GUO). Column (1) restricts the sample to French firms only. Column (2) estimates the specification for the large sample with French and non-French control group firms. Column (3) adds firm-size specific time trends as fixed effects. We measure firm size by the average unconsolidated total assets per firm in pre-treatment years. Then we interact deciles of the firm size variable with year dummies. Columns (4) and (5) exclude firms where there was a tax rate change or change in anti-profit shifting rules in 2010 (4) or from 2007-2015 (5) respectively (see Section 3 for details). Hence, the sample shrinks quite a lot in specification (5), when the control group is restricted to countries with no such tax policy changes over the whole sample period. Standard errors in parentheses and clustered at the firm level. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

**Table 9:** Tax Haven and Low Tax Affiliates - Direct Effect on Affiliates in France

| | (1) Tax haven | (2) No haven | (3) Haven interaction | (4) tax < 12.5% | (5) tax ≥ 12.5% | (6) tax ≥ 15% | (7) tax ≥ 17.5% | (8) tax ≥ 20% |
|---|---|---|---|---|---|---|---|---|
| treat x post | -0.0526*** | -0.0170 | | -0.0428*** | -0.0377*** | -0.0286* | -0.0180 | -0.0136 |
| | (0.0140) | (0.0159) | | (0.0161) | (0.0139) | (0.0152) | (0.0174) | (0.0223) |
| treat x post x haven | | | -0.0545 | | | | | |
| | | | (0.0392) | | | | | |
| min. group tax rate | -0.346*** | -0.341*** | -0.308** | -0.351*** | -0.340*** | -0.338*** | -0.352*** | -0.350*** |
| | (0.0674) | (0.0670) | (0.151) | (0.0676) | (0.0669) | (0.0673) | (0.0677) | (0.0684) |
| ln(operating revenue) | 0.453*** | 0.453*** | 0.477*** | 0.454*** | 0.451*** | 0.451*** | 0.453*** | 0.453*** |
| | (0.00465) | (0.00465) | (0.0108) | (0.00465) | (0.00465) | (0.00466) | (0.00466) | (0.00467) |
| profitability | -1.710*** | -1.711*** | -1.932*** | -1.712*** | -1.710*** | -1.710*** | -1.711*** | -1.708*** |
| | (0.0192) | (0.0193) | (0.0450) | (0.0194) | (0.0192) | (0.0193) | (0.0194) | (0.0195) |
| _cons | 3.511*** | 3.507*** | 3.359*** | 3.494*** | 3.524*** | 3.520*** | 3.508*** | 3.506*** |
| | (0.0447) | (0.0447) | (0.107) | (0.0447) | (0.0446) | (0.0447) | (0.0448) | (0.0449) |
| N | 1450909 | 1426212 | 375194 | 1427420 | 1449701 | 1435310 | 1419910 | 1406094 |
| r2 | 0.934 | 0.933 | 0.923 | 0.933 | 0.933 | 0.933 | 0.933 | 0.933 |

Notes: The results show simple diff-in-diff regression results estimated with OLS. The dependent variable is logarithmized fixed assets (winsorized at top and bottom one percentiles). All specifications include fixed effects for firms, industry-year, host-country-year, parent-country-year and firm-size-year. Columns (1) and (2) split the treatment group for MNE groups with or without a tax haven affiliate based on the tax haven list provided in Dharmapala and Hines (2009). In column (3), the treatment indicator is further interacted with a tax haven group dummy. In columns (4) to (8), the treatment group is restricted to firms with a minimum statutory group tax rate below or above the stated threshold value. Standard errors in parentheses and clustered at the firm level. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

**Table 10:** Base Analysis - Spillover Effects on Affiliates Outside France

|  | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| treat x post | -0.0733** | -0.0686** | -0.0350 | -0.0334 | -0.0334 |
|  | (0.0298) | (0.0303) | (0.0299) | (0.0301) | (0.0337) |
| min. group tax rate | -0.449*** | -0.452*** | -0.442*** | -0.454*** | -0.654* |
|  | (0.0799) | (0.0818) | (0.0853) | (0.106) | (0.339) |
| ln(operating revenue) | 0.450*** | 0.448*** | 0.436*** | 0.449*** | 0.523*** |
|  | (0.00456) | (0.00453) | (0.00504) | (0.00612) | (0.0219) |
| profitability | -1.696*** | -1.692*** | -1.676*** | -1.689*** | -1.600*** |
|  | (0.0207) | (0.0208) | (0.0219) | (0.0254) | (0.0855) |
| _cons | 3.572*** | 3.585*** | 3.691*** | 3.561*** | 2.800*** |
|  | (0.0441) | (0.0440) | (0.0485) | (0.0587) | (0.219) |
| Firm FE | YES | YES | YES | YES | YES |
| Industry-year FE | YES | NO | YES | YES | YES |
| Industry-host-country-year FE | NO | YES | NO | NO | NO |
| Host-country-year FE | YES | NO | YES | YES | YES |
| GUO-country-year FE | YES | YES | YES | YES | YES |
| Firm-size-year FE | NO | NO | YES | YES | YES |
| N | 1147806 | 1142872 | 1025367 | 724156 | 63599 |
| r2 | 0.938 | 0.940 | 0.934 | 0.931 | 0.945 |

Notes: The results show simple diff-in-diff regression results estimated with OLS. The dependent variable is logarithmized fixed assets (winsorized at top and bottom one percentiles). The treatment is the introduction of TP documentation requirements in France in 2010. The treatment group includes foreign affiliates with French GUOs in MNE groups, where at least one affiliate has unconsolidated turnover or gross assets above or equal to 400 million Euros. The control group consists of non-French firms with no French affiliates above the threshold. In columns (1) - (3), different fixed effects are introduced. For instance, column (3) adds firm-size specific time trends as fixed effects. We measure firm size by the average unconsolidated total assets per firm in pre-treatment years. Then we interact deciles of the firm size variable with year dummies. Columns (4) and (5) exclude firms where there was a tax rate change or change in anti-profit shifting rules in 2010 (4) or from 2007-2015 (5) respectively (see Section 3 for details). Hence, the sample shrinks quite a lot in specification (5), when the control group is restricted to countries with no such tax policy changes over the whole sample period. Standard errors in parentheses and clustered at the firm level. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

**Table 11:** Splits at Average Firm Tax Rates - Spillover Effects on Affiliates Outside France

| | (1) avg. tax ≤ 26% | (2) avg. tax > 26% | (3) avg. tax ≤ 12.5% | (4) avg. tax > 12.5% | (5) Haven Firm | (6) No Haven Firm |
|---|---|---|---|---|---|---|
| treat x post | -0.0778** | -0.00814 | -0.471*** | -0.0236 | -0.247 | -0.0299 |
| | (0.0363) | (0.0328) | (0.161) | (0.0298) | (0.182) | (0.0297) |
| min. group tax rate | -0.421*** | -0.439*** | -0.414*** | -0.445*** | -0.414*** | -0.443*** |
| | (0.0864) | (0.0856) | (0.0868) | (0.0853) | (0.0868) | (0.0853) |
| ln(operating revenue) | 0.436*** | 0.435*** | 0.434*** | 0.437*** | 0.434*** | 0.437*** |
| | (0.00509) | (0.00506) | (0.00511) | (0.00504) | (0.00511) | (0.00504) |
| profitability | -1.674*** | -1.678*** | -1.676*** | -1.676*** | -1.676*** | -1.676*** |
| | (0.0221) | (0.0221) | (0.0223) | (0.0219) | (0.0223) | (0.0219) |
| _cons | 3.688*** | 3.709*** | 3.704*** | 3.692*** | 3.706*** | 3.690*** |
| | (0.0489) | (0.0487) | (0.0491) | (0.0485) | (0.0491) | (0.0485) |
| N | 1001869 | 1009278 | 986884 | 1024263 | 986892 | 1024255 |
| r2 | 0.934 | 0.934 | 0.934 | 0.934 | 0.934 | 0.934 |

Notes: The results show simple diff-in-diff regression results estimated with OLS. The dependent variable is logarithmized fixed assets (winsorized at top and bottom one percentiles). All specifications include fixed effects for firms, industry-year, host-country-year, parent-country-year, and firm-size-year. In columns (1) to (4), the treatment group is restricted to firms with an average statutory tax rate below or above the stated threshold values. Columns (5) - (6) restrict the treatment group to firms in tax haven or no tax haven countries based on the tax haven list provided in Dharmapala and Hines (2009). Standard errors in parentheses and clustered at the firm level. Significance levels: $* \ p < 0.1$, $** \ p < 0.05$, $*** \ p < 0.01$

**Table 12:** Splits at Minimum Group Tax Rates - Spillover Effects on Affiliates Outside France

| | (1)<br>tax ≤ 12.5% | (2)<br>tax > 12.5% | (3)<br>avg. tax ≤ 12.5% | (4)<br>avg. tax ≤ 20% | (5)<br>Tax haven | (6)<br>No haven |
|---|---|---|---|---|---|---|
| treat x post | -0.0663** | 0.0346 | -0.471*** | -0.144*** | -0.0392 | -0.0199 |
| | (0.0315) | (0.0395) | (0.161) | (0.0511) | (0.0315) | (0.0394) |
| min. group tax rate | -0.447*** | -0.410*** | -0.414*** | -0.409*** | -0.420*** | -0.385*** |
| | (0.0857) | (0.0864) | (0.0868) | (0.0865) | (0.0838) | (0.0839) |
| ln(operating revenue) | 0.435*** | 0.435*** | 0.434*** | 0.435*** | 0.435*** | 0.435*** |
| | (0.00506) | (0.00509) | (0.00511) | (0.00510) | (0.00502) | (0.00506) |
| profitability | -1.674*** | -1.678*** | -1.676*** | -1.676*** | -1.674*** | -1.682*** |
| | (0.0221) | (0.0221) | (0.0223) | (0.0222) | (0.0217) | (0.0220) |
| _cons | 3.703*** | 3.693*** | 3.704*** | 3.696*** | 3.699*** | 3.698*** |
| | (0.0486) | (0.0490) | (0.0491) | (0.0490) | (0.0481) | (0.0486) |
| N | 1013545 | 997602 | 986884 | 990955 | 1050696 | 1016741 |
| r2 | 0.934 | 0.934 | 0.934 | 0.934 | 0.934 | 0.934 |

Notes: The results show simple diff-in-diff regression results estimated with OLS. The dependent variable is logarithmized fixed assets (winsorized at top and bottom one percentiles). All specifications include fixed effects for firms, industry-year, host-country-year, parent-country-year, and firm-size-year. Columns (1) and (2) split the treatment group below and above 12.5% of the minimum statutory group tax rate. Columns (3) and (4) are similarly to column (1) restricting the treatment group to groups with a minimum group tax rate below 12.5%, but additionally the treatment group is further restricted to low-tax firms with average statutory tax rates below 12.5 or 20%. Columns (5) - (6) restrict the treatment group to groups with or without tax haven affiliates based on the tax haven list provided in Dharmapala and Hines (2009). Standard errors in parentheses and clustered at the firm level. Significance levels: $*$ $p < 0.1$, $**$ $p < 0.05$, $***$ $p < 0.01$

**Table 13:** Firm Size Splits - Spillover Effects on Affiliates Outside France

| | (1)<br>Small Firms | (2)<br>Large Firms | (3)<br>Small & avg. tax > 12.5% | (4)<br>Small & avg. tax > 20% |
|---|---|---|---|---|
| treat x post | -0.0559 | -0.0158 | -0.0357 | -0.0288 |
| | (0.0341) | (0.0341) | (0.0340) | (0.0360) |
| | | | | |
| min. group tax rate | -0.438*** | -0.422*** | -0.440*** | -0.442*** |
| | (0.0860) | (0.0860) | (0.0860) | (0.0862) |
| | | | | |
| ln(operating revenue) | 0.436*** | 0.435*** | 0.436*** | 0.435*** |
| | (0.00507) | (0.00508) | (0.00507) | (0.00507) |
| | | | | |
| profitability | -1.669*** | -1.683*** | -1.669*** | -1.670*** |
| | (0.0220) | (0.0222) | (0.0220) | (0.0221) |
| | | | | |
| _cons | 3.669*** | 3.728*** | 3.670*** | 3.679*** |
| | (0.0486) | (0.0489) | (0.0486) | (0.0487) |
| N | 1005250 | 1005897 | 1004614 | 1001474 |
| r2 | 0.934 | 0.934 | 0.934 | 0.934 |

Notes: The results show simple diff-in-diff regression results estimated with OLS. The dependent variable is logarithmized fixed assets (winsorized at top and bottom one percentiles). All specifications include fixed effects for firms, industry-year, host-country-year, parent-country-year, and firm-size-year. Columns (1) and (2) split the treatment group below and above the median of average total assets. Columns (3) and (4) restrict the treatment sample to small firms similarly to column (1), but in addition the treatment group is further restricted to low-tax firms with average tax rates below 12.5 or 20%. Standard errors in parentheses and clustered at the firm level. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

**Table 14:** French Input Industry Splits - Spillover Effects on Affiliates Outside France

|  | (1) Top 50% | (2) Bottom 50% | (3) Top 3 | (4) Below Top 3 |
|---|---|---|---|---|
| treat x post | -0.0167 | -0.0382 | -0.0208 | -0.0379 |
|  | (0.0495) | (0.0310) | (0.0480) | (0.0308) |
| min. group tax rate | -0.436*** | -0.420*** | -0.439*** | -0.417*** |
|  | (0.0865) | (0.0854) | (0.0864) | (0.0854) |
| ln(operating revenue) | 0.434*** | 0.436*** | 0.434*** | 0.437*** |
|  | (0.00509) | (0.00506) | (0.00509) | (0.00507) |
| profitability | -1.675*** | -1.677*** | -1.676*** | -1.675*** |
|  | (0.0222) | (0.0220) | (0.0222) | (0.0220) |
| _cons | 3.707*** | 3.693*** | 3.709*** | 3.690*** |
|  | (0.0489) | (0.0487) | (0.0489) | (0.0487) |
| N | 993646 | 1014262 | 995485 | 1012423 |
| r2 | 0.934 | 0.934 | 0.934 | 0.934 |

Notes: The results show simple diff-in-diff regression results estimated with OLS. The dependent variable is logarithmized fixed assets (winsorized at top and bottom one percentiles). All specifications include fixed effects for firms, industry-year, host-country-year, parent-country-year, and firm-size-year. Columns (1) and (2) split the treatment group above and below the 50% important input industries for French GUOs. Columns (3) and (4) split the treatment group above and below the top three important input industries for French GUOs. Important input industries for French GUOs are identified from the input-output tables for France in 2010 from the input-output table database (OECD, 2021). Standard errors in parentheses and clustered at the firm level. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

**Table 15:** Income Group Splits - Spillover Effects on Affiliates Outside France

|  | (1) HICs | (2) LMICs | (3) LMICs & avg. tax ≤ 20% | (4) LMICs & avg. tax ≤ 12.5% |
|---|---|---|---|---|
| treat x post | -0.0300 | -0.0736 | -0.238*** | -0.284*** |
|  | (0.0307) | (0.0463) | (0.0766) | (0.109) |
| min. group tax rate | -0.445*** | -0.412*** | -0.415*** | -0.416*** |
|  | (0.0855) | (0.0866) | (0.0868) | (0.0868) |
| ln(operating revenue) | 0.436*** | 0.434*** | 0.434*** | 0.434*** |
|  | (0.00505) | (0.00510) | (0.00511) | (0.00511) |
| profitability | -1.678*** | -1.674*** | -1.676*** | -1.677*** |
|  | (0.0220) | (0.0222) | (0.0222) | (0.0223) |
| _cons | 3.691*** | 3.705*** | 3.703*** | 3.705*** |
|  | (0.0486) | (0.0490) | (0.0491) | (0.0491) |
| N | 1021315 | 989832 | 987177 | 986156 |
| r2 | 0.934 | 0.934 | 0.934 | 0.934 |

Notes: The results show simple diff-in-diff regression results estimated with OLS. The dependent variable is logarithmized fixed assets (winsorized at top and bottom one percentiles). All specifications include fixed effects for firms, industry-year, host-country-year, parent-country-year, and firm-size-year. Columns (1) and (2) split the treatment group into firms in high income (HIC) versus low and middle income (LMIC) countries. Columns (3) and (4) use the sub-treatment sample of firms in LMICs from column (2), but further restrict the treatment group to low-tax firms below the indicated average statutory tax rate value. Standard errors in parentheses and clustered at the firm level. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$