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Transfer (mis)pricing of multinational enterprises: evidence from Finland

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Abstract

This paper studies how firms manipulate their transfer prices to shift profit from high tax countries to low tax countries. Using detailed transaction-destination level firm data for years 2013-2019, I find evidence of Finnish multinational enterprises underpricing their exports to low tax destinations. By exploiting variation in corporate income tax rate differences and differences in the ownership of affiliates, I apply a triple difference estimation strategy. I find that a 1 percentage point increase in tax rate difference decreases export unit value by 1.2% among multinational firms exporting to low tax countries. My results suggest firms use transfer pricing as a complement channel, as firms more prone to other profit shifting mechanisms also underprice their exports more. Also, I provide evidence that transfer mispricing is concentrated in exports destined to countries where the multinational's affiliate has a higher level of economic activity. Where the results with exports are very robust, the results with imports are mixed, suggesting an asymmetrical pattern in transfer pricing.

Keywords: multinational firms, international corporate taxation, tax avoidance, profit shifting.
JEL codes: F23, H25, H26

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1 Introduction

Multinational enterprises play a central role in today's global economy, as they promote innovation and create a substantial number of jobs, making them indispensable drivers of economic growth and development. However, alongside their numerous advantages, multinationals also present certain challenges and drawbacks, with tax avoidance arising as a prominent concern. Multinationals have large incentives to decrease their overall global tax liability by shifting profit from high tax countries to low tax countries. Among other adverse effects, such as high tax countries losing tax revenue to low tax countries and competitive disadvantage caused to purely domestic firms, profit shifting reduces the worldwide tax revenue. Wier and Zucman (2022) estimate these lost global corporate income tax (CIT) revenues to be 10 per cent of global CIT revenues in 2019. Transfer pricing is one of the available mechanisms multinationals may use to shift profit. The term transfer pricing itself refers to the pricing of intra-firm transactions. Using transfer pricing to shift profits is often called tax-motivated transfer pricing or transfer mispricing. By overpricing exports from low tax countries to high tax countries and by underpricing exports from high tax countries to low tax countries, a multinational enterprise can locate more profit in a low tax country affiliate.

This paper provides evidence of multinationals manipulating their export prices of tangible goods in response to changes in CIT rates. By utilizing detailed data of Finnish export transactions combined with unique detailed accounting and ownership information from 2013-2019, I provide evidence of multinationals shifting profit to low tax destinations by exploiting transfer mispricing. Variation in the CIT rates over time allows me to identify the effect of tax-motivated transfer pricing on export unit values by comparing export unit values of the multinational before and after the tax rate change. I first compare multinational's change in export unit values to pure exporters, i.e. firms that don't have affiliates in the destination country, that are not affected by the tax rate change of the destination country. Second, I compare the change in multinational's export unit values in response to a tax rate change to the same firm's change in export unit values in another country that does not change its tax rate. This triple difference approach controls for omitted variable bias through three channels. Including firm-country-product fixed effect controls for the firm's average product price in a country. Simultaneously, product-country-year fixed effect accounts for shocks at the country-product level, while firm-year fixed effect controls for shocks happening at the firm level. Importantly, I also evaluate the validity of the pre-trend assumption by an event study design. The flat pre-trends I find support the identifying assumption of the approach.

I find evidence of tax-motivated transfer pricing in exports carried out by multinationals to low tax destinations. The baseline semi-elasticity estimate I find is -1.2, which suggests that as the tax rate difference to Finland increases by 1 percentage point (for example low tax country decreases its tax rate by 1 percentage points), a multinational with an affiliate located in that country decreases its export unit value by 1.2% compared to an exporter with no affiliate in that country. With the unique detailed accounting information, I am able to identify various heterogeneous effects. Among others, firms that are larger, have higher shares of intangible assets or have tax haven affiliates are more prone to tax-motivated transfer pricing. Additionally, the tax-motivated transfer pricing seems to only emerge in exports where the multinational's affiliate has a higher level of economic activity measured by turnover or employment in the destination country. My findings also do not provide clear evidence of transfer mispricing imports. This is also the case when I study the transfer mispricing by using tax haven indicator instead of tax difference as the tax incentive variable. I find some evidence of underpricing exports carried out to tax havens but no evidence of overpricing imports from tax havens.

My benchmark estimate of -1.2 is somewhat larger compared to the estimates by Cristea and Nguyen (2016) but smaller than the estimates introduced by Liu et al. (2020). I argue that the difference between the estimates of Liu et al. (2020) and Cristea and Nguyen (2016) is most likely because Liu et al. (2020) restrict their sample to multinational firms and only focus on variation in corporate tax rates whereas Cristea and Ngyuen (2016) also use variation in affiliate ownership status over time and include also purely domestic firms in the control group. My paper complements transfer pricing literature in several ways. First, my results imply that firms employ transfer pricing as a complementary channel to other profit shifting mechanisms. By utilizing the unique detailed firm data, I show that firms more inclined to profit shifting via other mechanisms than transfer pricing also engage in transfer mispricing to a greater extent. Second, I document that transfer mispring is most pronounced in exports to destinations where the multinational's affiliate has higher economic activity. Finally, my results suggest asymmetrical responses to tax differentials as the results on transfer mispricing imports are inconclusive.

My paper also contributes to tax policy discussion. First, I demonstrate that the firms in Finland obliged to prepare documentation on their transfer pricing practices, are actually the ones driving the results of transfer mispricing. This observation questions the efficiency of the existing policy in preventing such transfer mispricing. In the same vein, a study by Bustos et al. (2022) examining the implementation of OECD transfer pricing standards in Chile found no impact of the policy on the prices of traded goods. Second, according to the estimates by Wier

and Zucman (2022), the loss in corporate income tax revenue due to profit shifting in Finland has increased from 11% in 2015 to 14% in 2019. As these estimates are considerable from the government's point of view, it is crucial to understand how Finnish multinationals shift their profits. I provide evidence of tax-motivated transfer pricing by Finnish firms and estimate that the loss in income taxes due to transfer mispricing corresponds on average to roughly 1% of the income taxes paid by the firms in sample. Third, with this comprehensive data I am able to identify firm and product characteristics that are related to a larger scale of transfer mispricing and could be considered when designing targeted actions. Fourth, despite the implementation of several measures against profit shifting during my sample period from 2013-2019, the evidence of transfer mispricing I provide suggests that these actions may be insufficient at curbing profit shifting. Fifth, Finland has lowered its corporate income tax rate in 2014 from 24.5 per cent to 20 per cent, which gives variation in the tax rate differences during the sample period. Additionally, the Finnish corporate income tax rate is currently lower than the average of EU, global or OECD.[1] Therefore, finding evidence of tax-motivated transfer pricing with Finnish multinationals suggests that transfer pricing is also present in countries with relatively low or medium corporate income tax rates.

Several papers provide evidence of the profit shifting activities of multinationals. These include studies exploiting country-level aggregated data (e.g. Grubert and Mutti 1991, Hines and Rice 1994, Tørsløv et al. 2022), firm-level micro data (e.g. Huizinga and Laeven 2008, Dowd et al. 2017) and meta-analyses (e.g. Heckemeyer and Overesch 2017, Beer et al. 2020). The studies estimating the total scale of profit shifting often suffer from issues related to data availability and inability to provide identification set ups that enable the interpretation of the results as causal evidence of profit shifting.

As with profit shifting literature, also the earliest papers in transfer pricing literature use country-level aggregated data from the US (Swenson 2001, Clausing 2003). Swenson (2001) finds that import prices react to transfer pricing incentives generated by corporate income tax rate differences and tariffs, though the economic magnitude is small. Clausing (2003) finds a relationship between tax rates and intra-firm transaction prices as evidence of tax-motivated transfer pricing: intra-firm export prices are lower and intra-firm import prices higher when the destination country's tax rate is lower.

On the transaction-level micro data, the studies that can directly distinguish between intra-firm transactions and third party trade are by Bernard et al. (2006), Flaaen (2017), Davies et al. (2018) and Wier (2020). Bernard et al. (2006) pro-

[1] See for example KPMG (n.d.).

vide direct evidence of transfer price manipulation within US-based multinationals as they find that the export transfer price wedge, i.e. the price wedge between the transfer price and a directly comparable arm's length transaction, increases in response to lower foreign tax rates and higher tariffs. Flaaen (2017) exploits the same data source and finds that in response to the 2004 Homeland Investment Act the export transfer price wedge increased in low tax countries relative to high tax countries while at the same time import transfer price wedge decreased. Using a data set of French firms from year 1999, Davies et al. (2018) show that French multinationals engage in tax-motivated transfer pricing in exports to tax haven countries. However, they do not find evidence of transfer pricing when disregarding tax haven destinations. Wier (2020) in turn provides direct evidence of tax-motivated transfer pricing in imports using a transaction-level data of South African multinationals.

The most closely related papers to my study are by Vicard (2015), Cristea and Nguyen (2016) as well as Liu et al. (2020). In these studies, the authors do not directly identify whether the transaction is an intra-firm or a third party transaction. Instead, the authors assume the transaction to be intra-firm whenever the multinational has an affiliate located in the trade partner country. The advantage of this approach is that it takes into account the incentive multinationals have to manipulate also their third party prices. Thus, earlier studies comparing the intra-firm price and third party price may underestimate the true scale of tax-motivated transfer pricing. Vicard (2015) finds that French multinationals decrease (increase) the price of an export (import) to a low tax country where the multinational has an affiliate in response to an increase in the tax differential. The triple difference estimation strategy I use to identify transfer pricing follows the strategy introduced by Cristea and Nguyen (2016) and Liu et al. (2020). Both of the aforementioned papers find evidence of multinationals underpricing exports destined to low tax countries, former with Danish multinationals and latter with UK multinationals. Liu et al. (2020) further show that the change in the UK from a worldwide tax system to a territorial one in 2009 increased the extent of transfer mispricing.[2]

The rest of this paper is organized as follows. Section 2 discusses the issue of transfer pricing in more detail. Section 3 describes the methodology. Section 4 discusses the data in use. Section 5 presents the main results as well as the additional heterogeneity results. Finally, section 6 concludes.

[2]In a worldwide tax system multinationals pay taxes on all active business income earned, also the income earned abroad. Under a territorial system however multinationals only pay taxes on profits earned domestically (Liu et al., 2020).

2 Transfer pricing

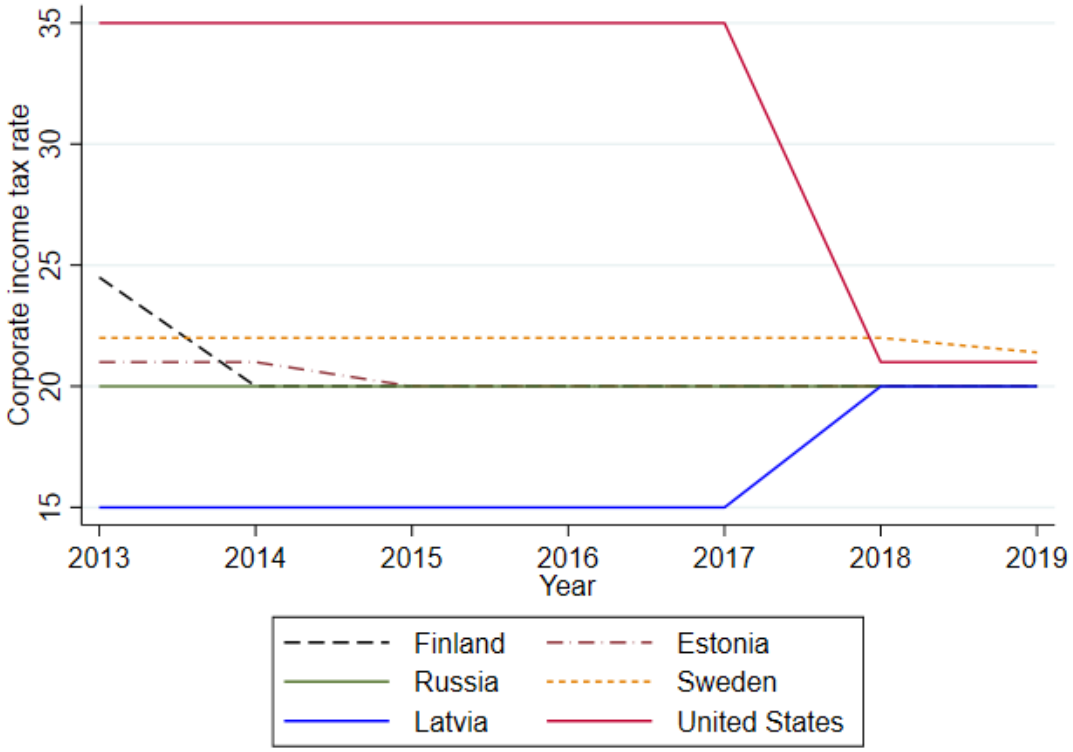
By transfer pricing multinationals can shift profits from high tax countries to low tax countries. To provide an example of this, imagine a situation in which the home country, that has a higher tax rate than the destination country, produces a product with a production cost of 8 euros and sells it to the lower tax partner at a price of 10 euros. Then the lower tax partner sells the product to a third party at a price of 20 euros and by assumption has no other costs related to the product. In this example, the home country firm reports a profit of 2 euros and the low tax country affiliate a profit of 10 euros. Thus, a larger share of the total profit generated by the product, that is 12 euros, is then taxed with the lower tax rate and hence, the multinational's global tax liability is reduced.

Multinationals must however take into account the rules of transfer pricing. According to the tax law in Finland and also in most other countries, the multinational should use the arm's length principle when pricing intra-firm transactions. The arm's length principle refers to the practice in which the price of the intra-firm transaction replicates the price of a third party transaction, that can be called a comparable transaction (Liu et al., 2020). Using the arm's length principle is however not straightforward, as many intra-firm transactions may not have comparable third party transactions. As highlighted by de Mooij (2005), determining the arm's length price for intangible goods, such as intellectual property rights, is even more difficult due to their unique nature. Another weakness of the arm's length principle is that the enforcement of it requires substantial resources from the tax administrations.[3] A multinational may take advantage of the weaknesses of the arm's length pricing system and charge a lower price compared to the arm's length price for an export from a high tax country to a low tax country, or respectively charge a higher price for an export from a low tax country to a high tax country (Beer et al., 2020). This way a larger share of the profits is taxed in the country with a lower tax rate.

As argued by Cristea and Nguyen (2016), multinationals may also manipulate the comparable third party export price in response to international tax rate differentials in addition to manipulating the transfer price itself. If the multinational manipulates the price of the comparable third party transaction, i.e. the arm's length price, to the desired direction (for example by lowering the third party export price when the export destination is a low tax country) the multinational can at the same time comply with the arm's length price tax regulations and shift profits. Therefore, comparing the arm's length price and transfer price may give a biased estimate of

[3]Finnish Tax Administration (2016) monitors transfer pricing by requesting transfer pricing documentation. However, the obligation only applies to large companies. For the exact conditions, see Finnish Tax Administration (2016).

Figure 1: CIT rates for Finland and its main affiliate locations



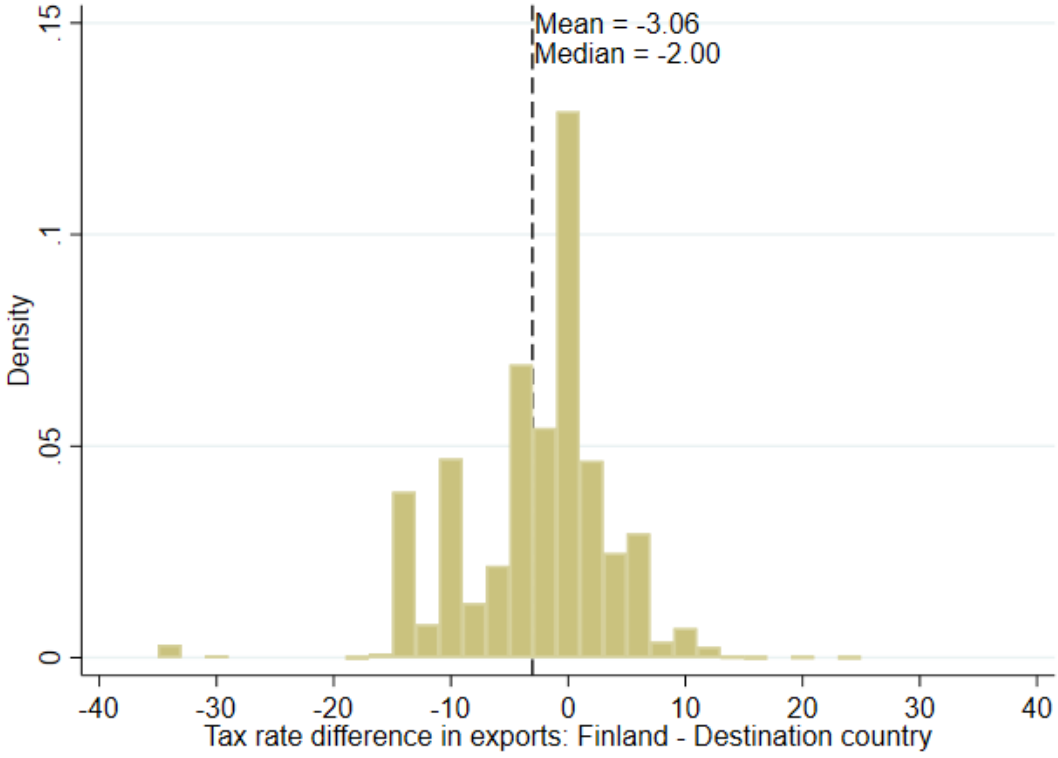
Source: KPMG (n.d.).
Notes: The figure presents the statutory corporate income tax rates for Finland and its main affiliate locations in 2013-2019. Main affiliate locations are determined in the first sample year (2013).

the true underlying transfer pricing behavior. Applying the triple difference method introduced by Cristea and Nguyen (2016) enables me to take into account also the manipulation of the third party export price as the model compares the price changes of the multinational to the price changes of a pure exporter with no tax incentive. I discuss the model in more detail in Section 3.

An obviously important factor determining the scale of transfer pricing is the tax rate dynamics.[4] Figure 1 plots the statutory corporate income tax rates for Finland and the top 5 countries with most affiliates in the first year of my sample period (2013). The figure clearly shows that in the beginning of the sample period, the Finnish tax rate was above most of the tax rates of these important affiliate destinations. However, after the tax rate decrease from year 2014 onward, the Finnish tax rate has been relatively low with only Latvia having a lower tax rate than Finland, and even Latvia catches up in the end of sample period. Figure 2

[4]Effective tax rates, which account for various deductions in addition to statutory tax rates, also influence profit shifting decisions of firms. In this paper, I primarily concentrate on statutory tax rates, as they are exogenous to the firm.

Figure 2: Distribution of tax rate difference in exports



Notes: The histogram plots the corporate income tax rate difference between Finland and the destination country of the export. Positive (negative) differences implies that the export destination country has a lower (higher) tax rate than Finland.

supports the story of Finland being a middle or even a relatively low taxed country. The histogram illustrates the fact that a large share of the exports of my main analysis sample are destined to countries with a similar or slightly higher tax rate than Finland (i.e. the tax rate difference is zero or negative). However, there are also transactions destined to countries with a positive tax rate difference, namely low tax countries. To conclude, finding evidence of transfer pricing in Finland would support the result that transfer pricing exists also in middle taxed countries where the tax incentive to transfer misprice is less pronounced.

3 Methodology

The estimation strategy I apply to estimate the extent of tax-motivated transfer pricing is based on the approach introduced by Cristea and Nguyen (2016). The approach takes into account the incentive multinationals have to manipulate also their arm's length (third party) prices in order to shift profit more through transfer mispricing. Instead of focusing on the true transfer prices that do not take into

account the manipulation of arm's length prices, the approach compares the change in export unit values in response to changes in the corporate tax rates between firms that have an affiliate in the export destination country to those firms without an affiliate. I will use the term intra-firm trade when the exporting firm has an affiliate in the destination country, even though I cannot say for sure that the trade is intra-firm as I do not observe the true receiving firm of the export. Term pure exporter on the other hand is used when the exporting firm has no affiliate in the destination country. The terms pure exporter and intra-firm exporter refer only to certain firm-country pairs as a firm that is a pure exporter may be an intra-firm exporter in exports destined to another country, where it has an affiliate.

Where my baseline analysis only exploits the changes in corporate tax rates as the treatment, Cristea and Nguyen (2016) also use the variation in affiliate ownership status as treatment. However, changes in affiliate ownership can be somewhat endogenous to the firm and for that reason, I use only continuous firm-country-affiliate pairs, i.e. either the firm has an affiliate in the destination country for the entire period or it does not have it in any period, as my main analysis sample. In other words, either the firm is a pure exporter or an intra-firm exporter to a given country for the entire period. I show some robustness results in Appendix A.8 and A.9 with samples including also the non-continuous pairs, namely including observations where the firm establishes or sells an affiliate in the export destination country during the sample period, thus switching from/to a pure exporter to/from an intra-firm exporter.

The effect of tax-motivated transfer pricing is identified as a triple difference (DDD) estimator that compares the difference in the export unit value of a multinational that has an affiliate in the destination country to the difference in the export unit value of an exporter with no affiliate in response to a change in the tax wedge as well as to the difference in the export unit value of the same multinational in a country that does not change its tax rate. First difference-in-differences (DD) estimator is obtained from the difference in the multinational's export unit value before (period 0) and after (period 1) the tax rate change in country j compared to the difference in the export unit value in the same periods of an exporter with no affiliate in country j. The second DD estimator compares the difference in the multinational's export unit value in country j, where there has been a tax rate change, to the difference in the multinational's export unit value in another country l with no change in the tax rate, i.e. $\tau_{l0} = \tau_{l1}$. Finally, the triple difference estimator is the difference of these two DD estimators and enables me to identify the effect of tax-motivated transfer pricing.

The identifying assumption is that in the absent of tax rate change, the MNE's intra-firm export unit value relative to the exporter with no affiliate would have evolved similarly in the country that changed its tax rate compared to MNE's intra-firm export unit value relative to the exporter in a control country. The triple difference specification I estimate is

$$\ln p_{ijkt} = \left[\beta_1 I_t^{LowTax} + \beta_2 I_t^{\text{HighTax}}\right] \times |\Delta\tau_{jt}| \times Aff_{ij(t)} + \alpha_{ijk} + \alpha_{jkt} + \alpha_{it} + \epsilon_{ijkt}, \quad (1)$$

where p_{ijkt} is the unit value p for product k exported by firm i to country j in year t. The effect of tax-motivated transfer pricing is estimated with the interaction term between $|\Delta\tau_{jt}|$ and $Aff_{ij(t)}$, where $Aff_{ij(t)}$ is a dummy variable that is equal to one if firm i owns an affiliate in country j in year t and is equal to zero otherwise. The subscript t is in parenthesis as in the main analysis I focus only on continuous firm-country-affiliate pairs, i.e. there is no variation in $Aff_{ij(t)}$ in t. However, the robustness tests in Appendix A.8 and A.9 allow for variation also in t. The term $|\triangle\tau_{jt}|$ on the other hand represents the absolute difference in statutory corporate income tax rates τ of the home country h and country j in year t (i.e. $|\triangle\tau_{jt}| = |\tau_{ht} - \tau_{jt}|$).

The coefficient of main interest in equation 1 (β) is decomposed for high and low tax countries to allow for the tax rate change effect to vary between different tax regimes. The dummy variable I_t^{LowTax} (I_t^{HighTax}) is 1 when the destination country j's corporate income tax rate is lower (higher) than the corporate income tax rate of home country (i.e. Finland) and otherwise 0. According to the tax incentives of transfer pricing, I should obtain a negative β_1, i.e. the β for the exports directed to low tax countries, as multinationals may find it optimal to underprice exports from high tax countries to low tax countries. The opposite is true for β_2 (the β for exports directed to high tax countries) as by overpricing exports to high tax countries enables the multinational to shift profits to the low tax country, thus β_2 should be positive.

α_{ijk} in equation 1 represents the firm-country-product fixed effect which controls for the firm's average price of a product in a given country. This takes into account the fact that firms may export different quality products to different markets. α_{jkt} is the country-product-year fixed effect that in turn controls for country and product level shocks like demand shocks or tariffs. Finally, α_{it} denotes the firm-year fixed effect that takes into account shocks happening at the firm level, for example changes in the productivity of the firm.

The fixed effects of equation 1 are defined following Liu et al. (2020). Easiest way to rationalize the chosen fixed effects is to provide an example of a 2*2*2-setting (i.e. 2 firms, 2 countries and 2 time periods) with two regular difference-in-differences (DD) set-ups which are then combined to a triple difference setting. In this example, there are 2 firms $i \in \{x, m\}$, where x is an exporter with no affiliates and m is a multinational that has affiliates in both countries $j \in \{c, b\}$. In period 1 the treatment country b changes its tax rate (i.e. $\tau_{b0} \neq \tau_{b1}$) while the control country's tax rate does not change ($\tau_{c0} = \tau_{c1}$).

The first DD set-up would be a so-called within country comparison, where the difference in the export price of the pure exporter in the treated country is compared to the difference in export price of the multinational in the treated country before and after the treatment. The specification would include year and firm fixed effects with the tax variable interacted with the affiliate dummy (which acts as the treatment indicator). However, to take into account the product dimension of the data, the fixed effects need to be interacted with product to compare these effects within products. Thus, the first DD would include firm-product (α_{ik}) and product-year (α_{kt}) fixed effects.

The second DD would on the other hand be a within firm comparison, where the unit values of the multinational's exports carried out to the control country are compared to the treated country again before and after treatment. Now the chosen fixed effects would be year and country fixed effects, but again these need to be interacted with the product dimension, thus ending up with product-year (α_{kt}) as well as country-product (α_{jk}) fixed effects. Finally, to extend the set-ups to include additional countries and firms, the first DD would need to be interacted with country fixed effects and the second one with firm fixed effects. Thus, combining all of this results in firm-country-product, country-product-year and firm-product-year fixed effects. However contrary to Liu et al. (2020), in my main specification I choose to use just firm-year fixed effects instead of firm-product-year fixed effects in order to include more observations. As robustness checks, I show the results with several different specification forms altering the combination of fixed effects.

To estimate the effect of changes in corporate income tax rates on transfer pricing, I also follow Fuest et al. (2018) and apply an event study design. Formally, I run the following specification

$$\ln p_{ijkt} = \sum_{l=-5}^{6} D_{j,t}^{l} \times (\beta_{1,l} I_t^{LowTax} + \beta_{2,l} I_t^{HighTax}) \times Aff_{ij} + \alpha_{ijk} + \alpha_{jkt} + \alpha_{it} + \epsilon_{ijkt}, \quad (2)$$

where instead of interacting the tax rate difference with the affiliate dummy, I have a set of dummies $D^l_{j,t}$ indicating a change in the country j's tax rate happening at $l = 0$. I estimate the specification separately for tax rate decreases, large tax rate decreases (at least 1 percentage points) and tax rate increases. Otherwise the variables are as defined in equation 1. The event study design also evaluates the common trend assumption in the pre-treatment periods, which is essential for assessing the validity of the triple difference strategy. The vast recent literature on the issues related to two-way fixed effects and difference-in-differences has not yet taken a clear stand on set-ups with triple differences, continuous and staggered treatment.[5] Therefore, I study the validity of the common trend assumption by binarizing the treatment to tax decreases and increases. Additionally, I also run robustness checks where the continuous treatment has been transformed to tax rate difference quartile or quintile indicators to address issues related to continuous treatments. These results are available in Appendix A.5.

4 Data

The estimation strategy requires data from transaction level to macro level. Starting from the micro level data, I combine information of Finnish firms' international trade to firm level information on ownership structures as well as accounting information.

The commodity data I exploit is provided by Finnish Customs and contains detailed information on all goods exported from and imported to Finland.[6] The data source provides information on traded tangible goods that physically either leave or enter Finland. Thus services, including patents and licenses, are excluded from this data source. The trade data is gathered from two different sources. Information on trade with other than EU Member States is obtained from customs declarations. Data from trade transactions with Member States in turn is received from the Intrastat reports declared by enterprises themselves. A firm has the obligation to submit Intrastat declarations when the value of the firm's EU trade exceeds a certain annual threshold value.[7] Thus, the smallest firms are exempted from declaring the Intrastat reports of their EU trade and the data source does not include these transactions. These two sources are then combined by the Finnish Customs to form

[5]There are several studies focusing on one of the mentioned dimensions, however no research on combining a continuous staggered treatment to a triple difference set-up.

[6]However transactions like through transports and transactions with no economical significance are excluded from the data.

[7]For example, in 2020 the threshold values for both exports and imports is 600,000 euros, whereas in 2017 the threshold values for imports and exports were 550 000 euros and 500 000 euros respectively (Finnish Customs, 2021).

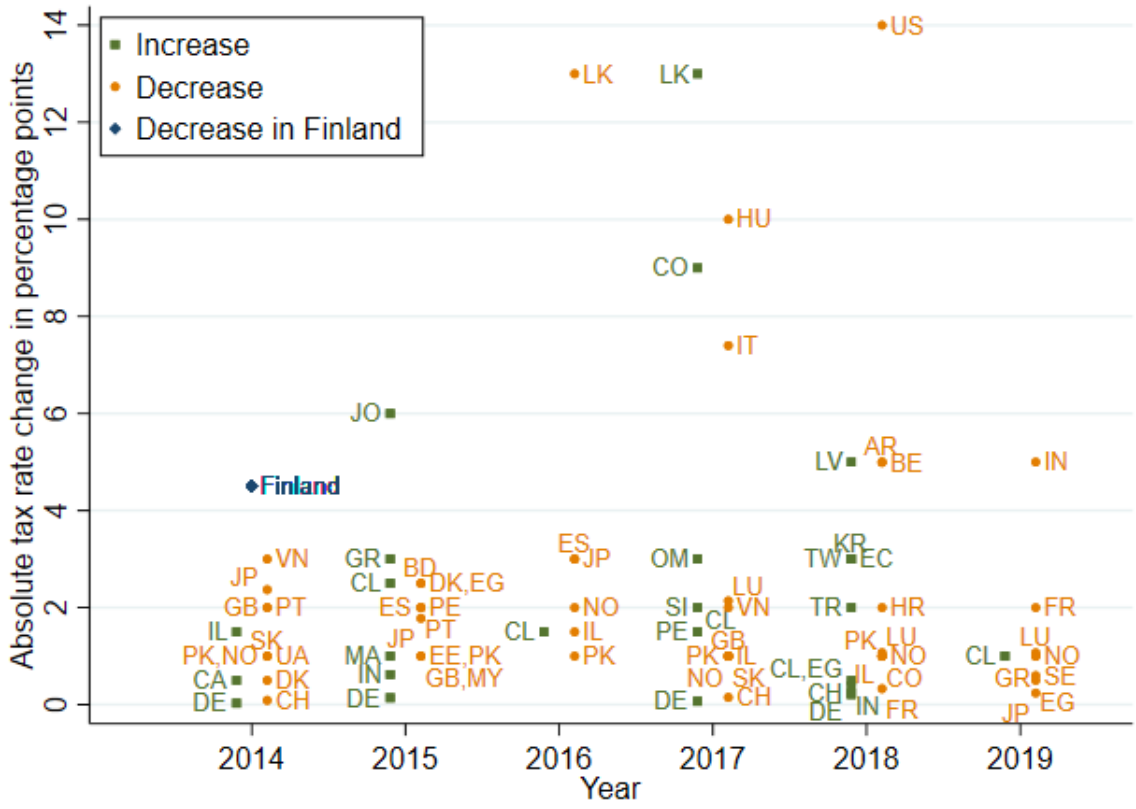
the International trade in goods (ITG) data set I use. I collapse the transaction data such that the unit of observation is at the firm-country-product-year level and focus only on exports in my main analysis. In other words, I observe the exported goods of each firm i in year t to each destination country j and at each CN code level k separately. Additionally, I observe quantity of the exported good in kilos and the price of the transaction in euros. Unit value of an export is then calculated by dividing the price of a transaction with its quantity.

In addition to the commodity level information provided by Finnish Customs, I exploit three different data sets provided by Statistics Finland in order to identify the multinational enterprises and obtain accounting information of all exporting firms. First, I exploit outward statistics on foreign affiliates which enables me to determine the locations of Finnish-owned foreign affiliates at a group level. Combining then this group level information of affiliate locations to a group data set allows me to link these affiliates to Finnish firms. The group data set also enables me to identify the location of a firm's foreign owner. The third data set provided by Statistics Finland is a financial statement data panel containing financial information of firms. I include several different variables, for example personnel, turnover, intangible assets and debt ratio, for the heterogeneity analyses. Each firm has a unique encrypted code by which I can combine the ownership information and financial information to the commodity level data. Finally, I also need some macro level data on statutory corporate income tax rates and retrieve these from the Corporate tax rates table provided by KPMG (n.d.). I combine the tax rates to the transaction and firm level data by the export destination country.[8] The additional regressions without country-year fixed effects include also country level control variables for which I exploit the information from the Penn World Table version 9.1 (Feenstra et al., 2015).

I restrict the sample to years 2013-2019 since the financial data in its current form is available from year 2013 onward. Additionally, I drop observations of traded commodities that are not linked to financial statement data. To increase the comparability of the treated group and control group, I exclude purely domestic firms from my main analyses. This means that I include only firms that have an affiliate in at least one foreign country during 2013 to 2019. The reason behind this is that purely domestic firms may differ substantially from multinationals. Additionally, to focus only on the identifying variation from the corporate income tax rates, I exclude the non-continuous intra-firm trade from the sample. Thus, firm-country pairs experiencing variation in the affiliate ownership during the sample period, i.e. estab-

[8]For some missing or inadequate tax rates the KPMG (n.d.) data is complemented with tax rates from Trading Economics (n.d.).

Figure 3: Changes in CIT rates in Finland and countries where at least one affiliate is observed during sample period.



Notes: The figure shows the changes in statutory corporate income tax rates during my sample period in export destinations where at least one intra-firm transaction is observed during 2013-2019. Blue symbol presents the tax rate decrease in Finland, yellow symbols present tax rate decreases and green symbols present tax rate increases. Year 2013 is omitted from the figure as it is the first year of the sample, thus changes in tax rates are not yet observed.

lishing or selling their affiliate during the sample period, are excluded from the main sample.[9] My final main regression sample consists of 427,403 export transactions of 3,028 different products (by the CN-classification) that are exported to 135 different countries. The exports are carried out by 1,020 firms. Of these, 484 firms carry out intra-firm exports, i.e. the firm has an affiliate located in at least one destination country of the export. However, on average they carry out exports to 5.3 different destination countries where they have affiliates. Of these 484 multinationals, 95 are ultimately owned by foreign companies.

The methodology exploits variation in corporate income tax rates to identify the scale of tax-motivated transfer pricing. Figure 3 shows the variation in corporate income tax rates in countries to which there is at least one exporting firm for which an affiliate is observed in the destination country, i.e. at least one intra-firm transaction. Of the 135 countries in the entire sample, 80 countries are classified as such intra-firm transaction countries. Figure 3 illustrates significant variation in tax rates throughout the entire sample period. Additionally, there are more often tax rate decreases (yellow symbols) than increases (green symbols). I also plot the Finnish tax rate decrease separately (blue symbol) in the figure. The largest tax rate decrease is the US tax rate decrease from 35 to 21 percent due to TCJA in the end of 2017. Contrarily the largest tax rate increase was in Sri Lanka when they increased their tax rate back to 28 percent in 2017 after the temporary tax rate cut of 2016. Of these affiliate destination countries, the mean tax rate increase as well as decrease is roughly 2.3 percentage points. Additionally, among the affiliate destination countries, roughly 38% (25%) experience a tax rate decrease (increase) at least once during the sample period. To phrase it differently, 53% of these countries underwent a change in their tax rates between 2013 and 2019.

Table 1 provides summary statistics of the main estimation sample. On average, the price of a firm-country-product-year export observation is 250,000 euros and the weight is roughly 230,000 kilos. Exporting firm has on average 752 employees during the fiscal year and has a turnover of roughly 449 million euros. The mean net profit is 13 million euros and the mean debt-equity ratio is 135. Panel C of Table 1 summarizes the dummy variables characterizing the MNE-status of a firm. Affiliate dummy receiving a mean of 0.386 suggests that 38.6 percent of all observations are carried by multinationals to foreign countries where they have an affiliate. Finally, the last panel of Table 1 provides summary statistics for the tax characteristics of destination countries. On average, the destination country of the export has a statutory corporate income tax rate of 24 percent. The mean of 0.228

[9] I also do the robustness checks without these restrictions, i.e. including also the purely domestic firms in Appendix A.9 and non-continuous intra-firm trade in Appendix A.8 and A.9.

Table 1: Summary statistics of exports

Variable	**Mean**	**St. dev.**	**P1**	**P99**	**Number**
Panel A: product characteristics					
Price (100,000 EUR)	2.5	40.9	0.00006	42	427,403
Quantity (100,000 kg)	2.3	60.2	0.00001	27	427,403
Differentiated product[1]	0.58	0.49	0	1	427,403
Panel B: firm characteristics					
Personnel	752	1,204	10	6,018	419,666
Turnover (100,000 EUR)	4,490	11,600	31	64,600	427,327
Net profit (100,000 EUR)	126	1,600	-1,060	2,690	427,403
Intangible assets/fixed assets	0.06	0.129	0	0.7	410,275
Debt-equity ratio	135.1	4,257	-232	1,148	418,901
Panel C: MNE-indicator variables					
Affiliate (Aff_{ij})	0.386	0.487	0	1	427,403
Foreign owned	0.274	0.446	0	1	427,403
Tax haven affiliated[2]	0.282	0.45	0	1	427,403
Panel D: destination country tax characteristics					
Statutory corporate income tax rate (τ_{jt})	0.236	0.062	0.125	0.356	427,403
Low corporate income tax rate (I_t^{LowTax})	0.228	0.42	0	1	427,403
High corporate income tax rate ($I_t^{HighTax}$)	0.568	0.495	0	1	427,403
Low tax wedge ($I_t^{LowTax} \times \lvert\Delta\tau_{jt}\rvert$)	0.009	0.02	0	0.095	427,403
High tax wedge ($I_t^{HighTax} \times \lvert\Delta\tau_{jt}\rvert$)	0.039	0.053	0	0.15	427,403
Tax haven destination	0.04	0.194	0	1	427,403

Notes: The table presents summary statistics for the exports and the exporting firms in my baseline sample, i.e. 2013-2019. The baseline sample is restricted to firms that have at least one foreign subsidiary during sample period and excludes non-continuous firm-country-affiliate pairs where the affiliate in the destination country is established or sold during the sample period. [1]The product is classified as a differentiated product by its CN-code according to the Rauch (1999) classification. [2]Firm has at least one affiliate located in a tax haven defined as Hines (2010).

of the low corporate income tax rate dummy suggests that about 22.8 percent of the observations are exported to countries with lower tax rate than Finland. Only 4% of the exports are carried out to countries defined as tax havens according to the list by Hines (2010).[10]

The main analysis of this study is done with exports, however I show some additional results with imports. With similar sample restrictions, the imports sample consists of 643,547 transactions imported by 1,241 unique firms. The mean of affiliate dummy in imports is 0.16, implying that 16% of imports are from origins where the importing firm has an affiliate. Additionally, 81% of imports are from high tax origin countries.[11]

5 Results

In this section I present the results of my study. First, I provide an event study graph as graphical evidence of tax-motivated transfer pricing in response to changes in corporate income tax rates. In my baseline results, I estimate the overall scale of tax-motivated transfer pricing in the exports carried out by Finnish multinationals. I also provide some quantification estimates of the effect of tax-motivated transfer pricing on corporate income tax revenue with the back-of-the-envelope calculations. The heterogeneity results I provide in Subsection 5.2 aim to identify firm, country and product characteristics that are related to an increased scale of transfer pricing. In Subsection 5.3 I show the baseline results but with imports to Finland instead of exports.

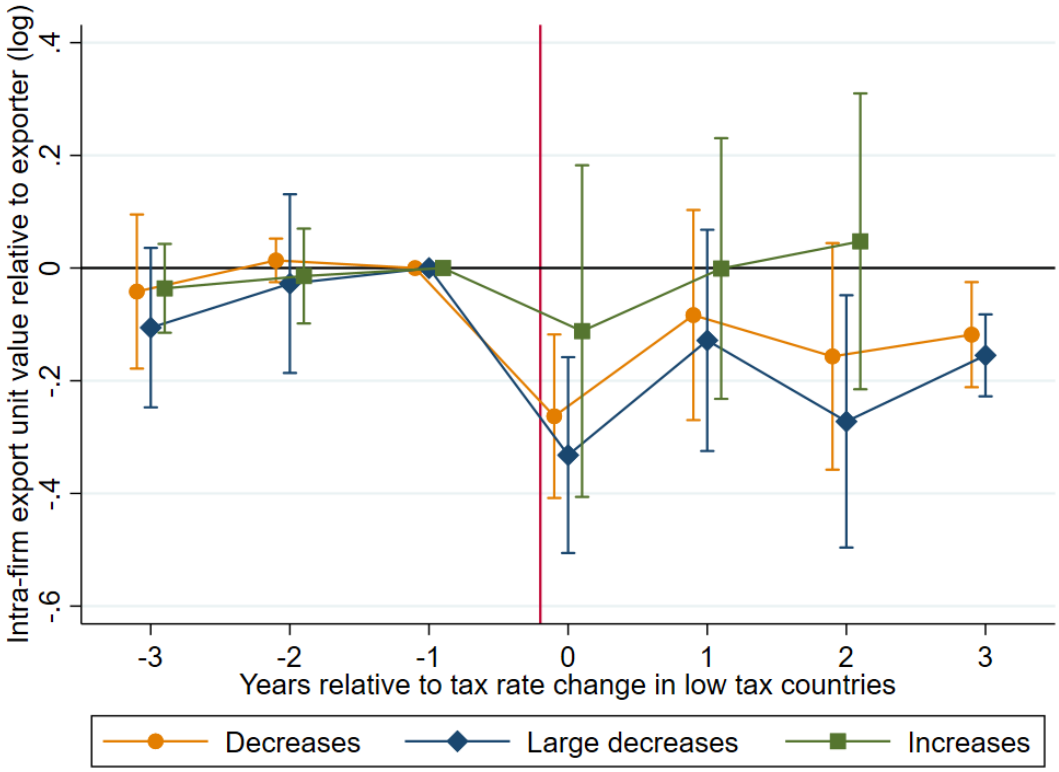
5.1 Main results

Graphical evidence

Figure 4 graphically inspects the effect of tax rate changes on export unit values by providing an event study graph. At year 0 there is a tax rate decrease (increase) in the low tax destination. If the country experiences several tax rate decreases (increases) during the sample period, the first decrease (increase) is studied. The graph plots the coefficient point estimates for the event dummies and confidence intervals at the 95% level following equation 2.[12] The estimation sample with tax rate decreases (increases) excludes the observations from countries that undergo a tax rate increase (decrease) during observation period.

[10] Appendix A.1 provides the list of tax haven countries.
[11] For summary statistics of imports, see Appendix A.2.
[12] The regression coefficient estimates are reported in Appendix A.3.

Figure 4: Average intra-firm export unit value compared to a pure exporter in low tax countries relative to changes in destination country tax rate.



Notes: The figure plots event study estimates ($\hat{\beta_{1,l}}, l \in [-3,3]$) and the corresponding 95% confidence intervals for three specifications. Event study dummies D^l_{jt} are equal to 1 for a tax rate decrease, a large tax rate decrease (greater than or equal to 1pp) or a tax rate increase, where the change in country j's tax rate happens at $l = 0$. Formally the event study regressions are written as $\ln p_{ijkt} = \sum_{l=-5}^{6} D^l_{j,t} \times (\beta_{1,l} I_t^{LowTax} + \beta_{2,l} I_t^{HighTax}) \times Aff_{ij} + \alpha_{ijk} + \alpha_{jkt} + \alpha_{it} + \epsilon_{ijkt}$. Regressions include firm-country-product, country-product-year and firm-year fixed effects. In specifications with tax rate decrease (increase) dummies, I exclude countries that experience a tax rate increase (decrease) during observation period. The standard errors of the regressions are clustered at country-year level. All low tax country event study estimates for each specification are reported in Appendix A.3.

Figure 4 plots the intra-firm export unit value compared to a third-party exporter relative to a change in destination country's corporate income tax rate in low tax countries. The pre-trends seem to be parallel in the years before tax rate change with tax rate decreases as well as with tax rate increases. With tax rate decreases and large tax rate decreases (i.e. tax rate decreases that are at least 1 percentage points) I find a negative and mostly statistically significant effect of tax rates on the export price as the relative export unit value drops in the year of tax rate change and remains negative for the post years. These trends are in line with the hypothesis that an increased tax rate difference should decline the intra-firm export price as it becomes more profitable for the multinational to underprice its exports. On the contrary when the low tax country increases its tax rate, the tax difference to Finland will decrease, thus decreasing the incentive to underprice exports. I do not find clear evidence of multinationals increasing their intra-firm export prices relative to third-party exporters, i.e. decreasing the scale of underpricing, as all of the coefficients in Figure 4 with tax rate increases are close to zero. As a robustness check I do the event study analysis also excluding year 2013, i.e. keeping only years where the Finnish corporate income tax rate is constant. The results are very similar and are available in Appendix A.4.

Baseline results

Table 2 presents the main results with the baseline sample that includes only continuous intra-firm trade and continuous third party trade, i.e. there is no within firm-country variation in the affiliate dummy during the sample period. The dependent variable is the logarithm of unit value of the export, that is the price divided by its quantity. Column 1 of Table 2 presents the results from estimating the regression model of equation (1), i.e. including the firm-country-product, country-product-year and firm-year fixed effects. The statistically significant coefficient of -1.2 for low tax countries suggests that when the tax difference increases by 1 percentage points, export unit value of a multinational that has an affiliate in the destination decreases by about 1.2 percent compared to a pure exporter exporting the same product to the same country. However, the corresponding coefficient for high tax countries does not show any coefficient that is statistically different from zero.

In columns 2-5 of Table 2 I alternate the set of included fixed effects.[13] Column 2 includes the more restrictive firm-product-year fixed effects as opposed to firm-year fixed effects. In columns 3-5 I include logarithm of employment and logarithm of

[13]In Appendix A.7, I keep the sample constant across specifications by restricting to only those observations included in my main specification, column 1 of Table 2. I also do not include any control variables. The results are very robust to these adjustments.

Table 2: Effect of tax differentials on export unit values - main results

	Dependent variable: log(Unit Value of Export$_{ijkt}$)				
	(1)	(2)	(3)	(4)	(5)
$Aff_{ij} \times \lvert\Delta\tau_{jt}\rvert \times I_t^{LowTax}$	-1.203***	-0.965**	-1.268***	-3.181***	-1.148***
	(0.353)	(0.452)	(0.326)	(0.762)	(0.367)
$Aff_{ij} \times \lvert\Delta\tau_{jt}\rvert \times I_t^{HighTax}$	0.198	-0.102	0.092	0.931***	0.034
	(0.246)	(0.246)	(0.223)	(0.287)	(0.156)
ln employment$_{it}$			-0.011	0.057***	-0.021
			(0.015)	(0.009)	(0.017)
ln turnover$_{it}$			0.019*	-0.044***	0.017
			(0.011)	(0.006)	(0.012)
Aff_{ij}				-0.086***	-0.11***
				(0.023)	(0.012)
Fixed effects					
Firm * Country * Product	Yes	Yes	Yes		
Country * Product * Year	Yes	Yes	Yes	Yes	Yes
Firm * Year	Yes				
Firm * Product * Year		Yes			
Firm * Product					Yes
Observations	427,403	333,096	415,710	558,210	521,938
R^2	0.931	0.95	0.927	0.661	0.851

Notes: This table presents the triple difference estimates, β_1 and β_2, of the regression model 1. Coefficients measure the effect of tax-motivated transfer pricing on export unit values. Affiliate indicates if the export is classified as an intra-firm export, i.e. if the exporting firm has an affiliate in the export destination country j. $|\Delta\tau_{jt}|$ is the absolute tax rate difference between Finland and country j. I_t^{LowTax} ($I_t^{HighTax}$) indicates if the destination country j has a lower (higher) tax rate than Finland in year t. Columns 2-5 provide alternative combinations of fixed effects and control variables. The estimation sample is restricted to firms that have at least one foreign subsidiary during sample period and excludes non-continuous firm-country-affiliate pairs where the affiliate is established or sold during the sample period. Standard errors in parentheses are clustered at country-year level. ***, ** and * denote significance at the 1%, 5% and 10% levels respectively. My preferred specification is shown in column 1.

turnover as firm control variables since these regressions do not include any firm-year level fixed effects. Columns 4 and 5 also include the affiliate dummy as these specifications do not include firm-country-product fixed effects. In all specifications, the coefficient of main interest, that is the triple interaction term with the low tax dummy, is negative and statistically significant, suggesting that the result from column 1 is not driven by the chosen set of fixed effects. The coefficient point estimates are also quite similar in magnitude to column 1, except in column 4 where the estimate is the most negative, -3.2. In column 4 the coefficient point estimate also for high tax destinations is statistically significant and positive. All in all, results from Table 2 suggest that multinationals underprice their exports to low tax destinations where they have affiliates.

As said, main results only include continuous intra-firm and third party trade and firms that have at least one foreign affiliate during the sample period. Appendix Tables A.8 and A.9 relax these restrictions. Both allow also for variation in the affiliate dummy within firm-country pairs. In addition, Appendix A.9 includes also purely domestic firms. The results are qualitatively similar with all of these samples. What can be seen however is that when non-continuous intra-firm trade is included the coefficient point estimates are closer to the ones introduced by Cristea and Nguyen (2016). Cristea and Nguyen (2016) also include non-continuous intra-firm trade and purely domestic firms in their estimation, thus this result is not that surprising. The largest differences between the estimates with different sample restrictions seem to arise with the most demanding fixed effects, i.e. those specifications that include three dimensional fixed effect(s). Finally, restricting the sample to include only firms with a foreign affiliate at some point in the sample produces more negative estimates without having that much impact on standard errors when focusing on the main specification, i.e. column 1 of Appendix A.8 and A.9.

Quantification of the effects

To quantify the effects of transfer mispricing, I perform some back-of-the-envelope calculations of the impact of transfer mispricing on the Finnish corporate income tax revenue. Following previous literature, these tentative back-of-the-envelope calculations rely on the assumption that multinationals do not alter their export quantities in response to changes in tax rates. Nevertheless, the estimates provide a picture of the potential macro implications of tax-motivated transfer pricing. To estimate the total profit shifted by transfer pricing in year t, I use the following equation

$$ShiftedProfit_t = \sum_{j \in LowTax,t} \hat{\beta}_1 \cdot |\Delta\tau_{jt}| \cdot exports_{MNEjt}, \tag{3}$$

where country j has a lower tax rate than Finland. $\hat{\beta}_1$ in turn is the coefficient for the triple interaction term I have estimated, for which I use my baseline regression's coefficient estimate of -1.203 from column 1 of Table 2. $|\Delta\tau_{jt}|$ represents again the absolute tax difference between Finland and country j in year t. Finally, $exports_{MNEjt}$ denotes the total volume of exports destined to country j that are exported by Finnish multinationals with affiliates in country j in year t.

I find that in 2013, Finnish multinationals shifted about 156 million euros, which corresponds to a tax revenue loss of roughly 38 million euros with the Finnish tax rate of 24.5% in 2013. However, after the tax rate change to 20% from 2014 onward the estimates of shifted profits as well as lost tax revenue decline substantially. On average during 2014-2019, Finnish multinationals shifted roughly 17 million euros yearly, which lead to a tax revenue loss of 3.4 million euros per year. Most of the decline in shifted profits and tax revenue loss is caused by the fact that there are fewer countries with lower tax rate after reduced tax rate. In 2013, the sample included 31 countries identified as low tax countries whereas the number is on average 18 countries in 2014-2019. Finally, comparing the estimated lost tax revenues to the corporate income taxes paid by these firms in Finland, the loss is equivalent to 3.9% of the income taxes paid by these firms in 2013.[14] From 2014 onward the loss is on average 0.5% of the income taxes paid by these firms. Thus, the decline in the corporate income tax rate has decreased the estimated tax revenue loss both in absolute and relative terms.

5.2 Heterogeneity analyses

Transfer pricing and firm characteristics

In this subsection I present evidence of heterogeneity in tax-motivated transfer pricing with respect to different firm, country and product characteristics. First, I try to identify firm characteristics that indicate more tax-motivated transfer pricing. Finding firm or product characteristics that are more prone to tax-motivated transfer pricing could improve the allocation of resources of tax authorities in monitoring the transfer pricing of those types of products or firms. First, Table 3 presents the firm heterogeneity results with respect to the firm's size. The variable of main interest is interacted with different size indicators to identify the effects of firm's size on the scale of tax-motivated transfer pricing. Column 1 of Table 3 interacts $Aff_{ij} \times |\Delta\tau_{jt}| \times I_t^{LowTax}$ with three indicators of employment size based on the time-

[14] Comparing to the total corporate income tax revenue in Finland, the loss corresponds to 0.8% of the total corporate income tax revenue. Finnish corporate income tax revenue was about 4.8 billion euros in 2013 (OECD, 2022).

Table 3: Heterogeneity of tax-motivated transfer pricing by firm size

	Dependent variable: log(Unit Value of Export$_{ijkt}$)			
$Aff_{ij} \times \lvert\Delta\tau_{jt}\rvert \times I_t^{LowTax}$	(1)	(2)	(3)	(4)
× Employment$_{small,i}$	-1.857***			
	(0.61)			
× Employment$_{medium,i}$	-0.634			
	(0.597)			
× Employment$_{large,i}$	-1.378**			
	(0.56)			
× Turnover$_{small,i}$		-0.885		
		(0.624)		
× Turnover$_{medium,i}$		-0.702		
		(0.63)		
× Turnover$_{large,i}$		-1.763***		
		(0.561)		
× Exports Share$_{low,it}$			-0.687	
			(0.442)	
× Exports Share$_{medium,it}$			-0.819**	
			(0.417)	
× Exports Share$_{high,it}$			-2.117***	
			(0.426)	
× Large firm$_{0,it}$				0.112
				(0.924)
× Large firm$_{1,it}$				-1.366***
				(0.365)
Observations	427,372	427,399	427,403	427,403
R^2	0.931	0.931	0.931	0.931

Notes: This table presents the triple difference estimates for low tax destinations, β_1, of the regression model 1 for different firm sizes. Coefficients measure the effect of tax-motivated transfer pricing on export unit values. The heterogeneous effects are estimated by interacting the triple interaction term with firm size indicator variables. Employment and turnover indicators refer to terciles of the distribution of number of employees and turnover, respectively. Exports share indicators refer to the tercile distribution of the yearly total weight exported by the firm of a given product category compared to the yearly total weight exported by all firms of that product category. Large firm indicates if the firm is large according to EU's small and medium sized enterprises definition. Coefficients are omitted from the table, but all regressions include also the triple interaction term with high tax dummy as well as firm-country-product, country-product-year and firm-year fixed effects. Standard errors in parentheses are clustered at country-year level. ***, ** and * denote significance at the 1%, 5% and 10% levels respectively.

invariant measure of the firm size with respect to the sample.[15] Using employment as the size indicator gives some mixed results as the smallest and largest groups receive the statistically significant estimates that are also the most negative ones.

Column 2 instead employs the size of turnover during sample period. These results on the other hand show the most negative and statistically significant estimate for the largest group which gives support to the hypothesis of increased transfer pricing with largest multinational firms. Finally, column 3 uses the interaction variable indicators for the exports shares.[16] The results imply that multinationals responsible of exporting a higher share of a certain product tend to transfer misprice more as the interaction coefficients are -0.8 and -2.2 for the medium and large export share groups respectively. Again, the interaction with low share of exports shows an estimate that is not statistically significant. The results of column 3 imply that multinationals engage in transfer mispricing when exporting products for which tax authorities might possess less accurate pricing information due to fewer exporters. Whereas with employment and turnover in columns 1 and 2, I cannot reject the null hypotheses that the three coefficients are all equal, I can reject the null hypotheses in column 3 at the 1% significance level.

Column 4 of Table 3 provides estimates of the tax semi-elasticity separately for large firms (i.e. those that are large according to EU's SME definition) and for other firms. This categorization is quite intriguing also because in Finland, small and medium sized firms are exempted from transfer pricing documentation requirements (Finnish Tax Administration, 2016). Thus, only firms that are large according to EU's SME definition are required to prepare transfer pricing documentations and provide the documentation to tax authorities upon the authorities' request. The results from column 4 of Table 3 suggest that large enterprises are the ones underpricing their exports to low tax countries as the coefficient is -1.4 and statistically significant. At the same time, the coefficient point estimate for other firms is not statistically different from zero. To conclude, the evidence of Table 3 suggests that larger firm size is related to an increased scale of tax-motivated transfer pricing. This also means that firms required to prepare documentations on their transfer pricing practices are the ones transfer mispricing the most, which questions the effectiveness of the current policy.

[15]Employment and turnover size indicators are based on the tercile distribution of the time-invariant measure of that variable. For example, firm is grouped as having low employment size if the mean number of employees during sample period is in the lowest tercile of all firm means.

[16]The share of exports is computed by dividing the total weight of a certain product exported by a company in a given year divided by the total weight of the same product exported by all companies in that year.

Table 4: Heterogeneity of tax-motivated transfer pricing by profit shifting variables

$Aff_{ij} \times \lvert\Delta\tau_{jt}\rvert \times I_t^{LowTax}$	(1)	(2)	(3)	(4)	(5)
× Intangible/fixed assets$_{small,i}$	-0.084				
	(0.648)				
× Intangible/fixed assets$_{medium,i}$	-1.33***				
	(0.503)				
× Intangible/fixed assets$_{large,i}$	-2.504***				
	(0.725)				
× Positive royalty expenses$_{0,i}$		-0.829			
		(0.663)			
× Positive royalty expenses$_{1,i}$		-1.404***			
		(0.342)			
× Intra-firm interest share$_{small,i}$			-0.492		
			(0.617)		
× Intra-firm interest share$_{medium,i}$			-1.451**		
			(0.571)		
× Intra-firm interest share$_{large,i}$			-1.724**		
			(0.83)		
× Intra-firm debt share$_{small,i}$				-1.307**	
				(0.579)	
× Intra-firm debt share$_{medium,i}$				0.114	
				(0.809)	
× Intra-firm debt share$_{large,i}$				-1.506**	
				(0.63)	
× Tax haven affiliated$_{0,it}$					-0.425
					(0.448)
× Tax haven affiliated$_{1,it}$					-2.133***
					(0.518)
Observations	424,150	427,403	426,601	357,895	427,403
R^2	0.93	0.931	0.931	0.926	0.931

Notes: This table presents the triple difference estimates for low tax destinations, β_1, of the regression model 1 for different types of firms. Dependent variable is the logarithm of the export unit value. The heterogeneous effects are estimated by interacting the triple interaction term with indicator variables. Intangible/fixed assets, intra-firm interest share and intra-firm debt share indicators refer to terciles of the distribution of intangible assets over fixed assets, intra-firm interest expenses over total interest expenses and intra-firm debt over total debt, respectively. Positive royalty expenses indicates if the firm has positive royalty expenses. Tax haven affiliated indicates if the firm has an affiliate in a tax haven location defined as Menkhoff and Miethe (2019). Coefficients are omitted from the table, but all regressions include also the triple interaction term with high tax dummy as well as firm-country-product, country-product-year and firm-year fixed effects. Standard errors in parentheses are clustered at country-year level. ***, ** and * denote significance at the 1%, 5% and 10% levels respectively.

Profit shifting literature has introduced some firm characteristics that may be indicative of profit shifting. For example, firms with higher shares of intangible assets with respect to fixed assets are often seen to be more involved in profit shifting activities, as intangible assets give the multinational increased opportunities to shift profits. Results introduced in Table 4 interacts again the triple interaction term with different profit shifting variables and indicators of their levels. The indicators for terciles in columns 1, 3 and 4 are formed in a similar way as in Table 3. Column 1 of Table 4 uses the three indicators on the time-invariant measure of the share of firm's intangible assets to fixed assets. The results suggest that the firms with higher shares of intangible assets tend to transfer misprice more their exports to low tax countries as the coefficient estimate of the interaction term is most negative with the highest group. Column 2 supports this observation as the tax semi-elasticity estimate is more negative and statistically significant only with firms that have positive royalty expenses. Having positive royalty expenses may be related to profit shifting via the intellectual property channel as firms may locate valuable patents and trademarks in low jurisdictions and shift profit there by paying royalties from higher taxed countries.

Columns 3 and 4 in turn explore the debt shifting channel of profit shifting. Column 3 of Table 4 uses three indicators of the time-invariant intra-firm interest expenses to total interest expenses share. Results suggest that firms with higher share of intra-firm interest expenses underprice their exports to low tax countries more. However, results from column 4 are somewhat mixed as the smallest and largest groups in intra-firm debt to total debt share show the most negative semi-elasticity estimates. Nevertheless, intra-firm interest expenses are more indicative of debt shifting. This is because interest expenses capture both mechanisms: namely inflating intra-firm expenses and strategically locating debt in high tax countries. All in all, results from columns 1-3 of Table 4 suggest that transfer pricing may be used by multinationals as a complement profit shifting rather than as a substitute between channels. Finally, column 5 estimates the tax semi-elasticity separately for firms with tax haven affiliates and for firms with no tax haven affiliates since having an affiliate in a tax haven destination could imply of the firms' tax aggressiveness. The coefficient point estimate is more negative and only statistically significant for firms that have at least one affiliate located in a tax haven country. This suggests that these firms also more aggressively underprice their exports to low tax destinations. In columns 1 and 5 I can reject the null hypotheses that the coefficients are equal to one another at 10% and 5% significance levels respectively, whereas in columns 2-4 I cannot reject the null hypotheses.

Table 5: Heterogeneity tax-motivated transfer pricing by corporate group variables

	Dependent variable: log(Unit Value of Export$_{ijkt}$)				
$Aff_{ij} \times \lvert\Delta\tau_{jt}\rvert \times I_t^{LowTax}$	(1)	(2)	(3)	(4)	(5)
× Affiliate turnover$_{small,i}$	0.028				
	(0.847)				
× Affiliate turnover$_{large,i}$	-1.404***				
	(0.364)				
× Affiliate employment$_{small,i}$		0.882			
		(0.718)			
× Affiliate employment$_{large,i}$		-1.463***			
		(0.358)			
× Affiliate personnel costs$_{small,i}$			0.458		
			(0.726)		
× Affiliate personnel costs$_{large,i}$			-1.419***		
			(0.356)		
× Affiliate investments$_{small,i}$				-1.126	
				(0.693)	
× Affiliate investments$_{large,i}$				-1.216***	
				(0.386)	
× Foreign owned$_{0,it}$					-0.966**
					(0.457)
× Foreign owned$_{1,it}$					-2.861***
					(0.859)
Observations	427,403	427,403	427,403	427,403	427,403
R^2	0.931	0.931	0.931	0.931	0.931

Notes: This table presents the triple difference estimates for low tax destinations, β_1, of the regression model 1 for different types of corporate groups. Coefficients measure the effect of tax-motivated transfer pricing on export unit values. The heterogeneous effects are estimated by interacting the triple interaction term with indicator variables. Affiliate turnover, employment, personnel costs and investments indicators refer to lower and upper halves of the distribution of the export destination country's affiliate's turnover, employment, personnel costs and investments, respectively. Foreign owned indicates if the ultimate owner of the company group is a foreign company. Coefficients are omitted from the table, but all regressions include also the triple interaction term with high tax dummy as well as firm-country-product, country-product-year and firm-year fixed effects. Standard errors in parentheses are clustered at country-year level. ***, ** and * denote significance at the 1%, 5% and 10% levels respectively.

With the data I have, I can also analyze what is the effect of affiliate's economic activity on transfer mispricing. In other words, I may estimate whether the firms transfer misprice more to low tax countries where their affiliates have a high level of economic activity compared to countries with affiliates that have lower levels of economic activity. In columns 1 to 4 of Table 5 I estimate the tax semi-elasticity estimate in exports destined to low tax countries separately for firms that have below and above median economic activity in the destination country. In other words, the firms are grouped to small and large firms according to whether their sample mean in that destination country of the given variable is above or below the median value of the sample. In all variables, turnover, employment, personnel costs and investments, the larger group receives a statistically significant semi-elasticity estimate that is also negative. On the other hand, the small groups do not show any coefficient estimates that are statistically different from zero. These results imply that the scale of tax-motivated transfer pricing is focused on destinations where the affiliate has a higher level of economic activity. Of columns 1-4, I can reject the null hypotheses of coefficients being equal to each other in columns 2 and 3 at the 1% and 5% siginificance levels, respectively. Finally, in column 5 of Table 5 I study if company groups that are ultimately owned by foreign companies transfer misprice more aggressively. The results from column 5 imply that foreign owned firms indeed are more aggressive in tax-motivated transfer pricing. The null hypothesis that the coefficients of column 5 are equal to one another can be rejected at 10% significance level.

Transfer pricing and export destination country

Turning to export destination country heterogeneity, Table 6 represents results where the variable of main interest, $Aff_{ij} \times |\Delta\tau_{jt}| \times I_t^{LowTax}$, has been interacted with different country sub-sample indicators. Column 1 of Table 6 reports the baseline result derived already in Table 2 to ease comparison. Columns 2 and 3 interact the triple interaction term with tax haven indicators. The tax haven countries are defined according to Hines (2010) and Menkhoff and Miethe (2019) in column 2 and 3 respectively. Both lists are provided in Appendix A.1. First, the triple interaction terms themselves in columns 2 and 3 are statistically significant and around -1.1, implying that there is tax-motivated transfer pricing even to low tax destinations that are not classified as tax havens. In both columns the interaction term with tax haven dummy is negative, suggesting there would be more underpricing to low tax destinations that are tax havens. However, the coefficient point estimates lack statistical significance, primarily due to the minor share of exports destined for tax

Table 6: Heterogeneity of tax-motivated transfer pricing by export destination country

	Dependent variable: log(Unit Value of Export$_{ijkt}$)					
	(1)	(2)	(3)	(4)	(5)	(6)
$Aff_{ij} \times \lvert\Delta\tau_{jt}\rvert \times I_t^{LowTax}$	-1.203***	-1.1***	-1.125***	-1.147***	-1.52***	-2.002***
	(0.353)	(0.358)	(0.355)	(0.374)	(0.378)	(0.355)
$Aff_{ij} \times \lvert\Delta\tau_{jt}\rvert \times I_t^{LowTax} \times I^{\text{TaxHaven,1}}$		-2.03				
		(1.732)				
$Aff_{ij} \times \lvert\Delta\tau_{jt}\rvert \times I_t^{LowTax} \times I^{\text{TaxHaven,2}}$			-1.277			
			(1.641)			
$Aff_{ij} \times \lvert\Delta\tau_{jt}\rvert \times I_t^{LowTax} \times I_t^{\text{CFC,3}}$				-0.423		
				(0.876)		
$Aff_{ij} \times \lvert\Delta\tau_{jt}\rvert \times I_t^{LowTax} \times I^{\text{OECD}-\text{country}}$					0.619*	
					(0.347)	
$Aff_{ij} \times \lvert\Delta\tau_{jt}\rvert \times I_t^{LowTax} \times I^{\text{EU}-\text{country}}$						1.113
						(0.699)

Notes: This table presents the triple difference estimates for low tax destinations, β_1, of the regression model 1 for different types of countries. The heterogeneous effects are estimated by interacting the triple interaction term with country group indicator variables. Coefficients measure the effect of tax-motivated transfer pricing on export unit values. First column is the baseline result introduced in Table 2. N=427,403 and R^2=0.931 in all regressions. Coefficients are omitted from the table, but all regressions include also the triple interaction term with high tax dummy as well as firm-country-product, country-product-year and firm-year fixed effects. Standard errors in parentheses are clustered at country-year level. ***, ** and * denote significance at the 1%, 5% and 10% levels respectively. [1]Tax haven countries defined according to Hines (2010). [2]Tax haven countries defined according to Menkhoff and Miethe (2019). [3]CFC (controlled foreign corporation) indicates countries with statutory tax rate below the Finnish CFC-rules.

havens and the limited variation in the tax rates among tax havens. Tax havens also often attract multinational profits by providing secrecy laws or other favorable tax rules, such as patent boxes, either in addition to or in contrast to the statutory corporate income tax rates. For these reasons, I run regressions in Appendix A.10 in which I exploit tax haven indicator variable as the tax incentive variable contrary to tax rate difference.[17] The results in Appendix A.10 suggest that multinationals underprice exports in a larger magnitude when the destination country is a tax haven.

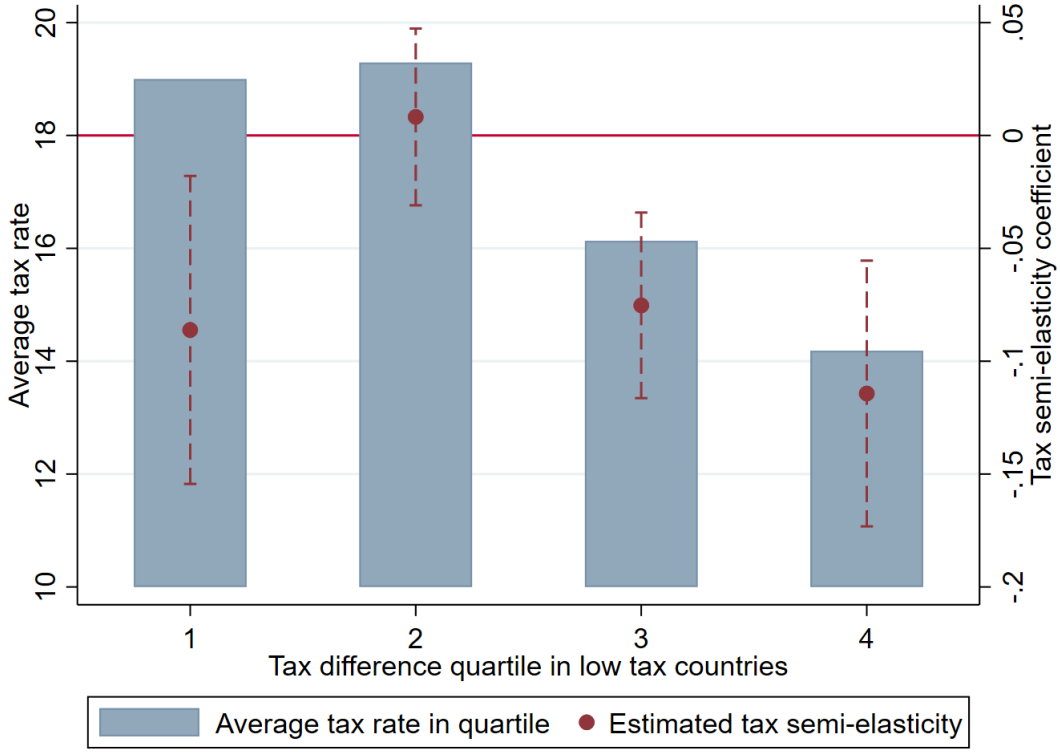
Column 4 of Table 6 interacts the low tax triple interaction term with a CFC (controlled foreign corporation) -indicator variable. CFC-variable receives the value 1 if the destination country's statutory corporate income tax rate is below the CFC-threshold determined by Finnish tax law, i.e. the tax rate is less than 60% of the Finnish tax rate (Finnish Tax Administration, 2021). The tax level of the affiliate is actually evaluated at the effective tax rate, but since I do not have information on the effective tax rates of the affiliates abroad I need to use the statutory tax rate of the country as a proxy. If the CFC-rules apply, i.e. the effective tax rate of the foreign affiliate is below the given threshold, the undistributed profit of the affiliate can be taxed in Finland. For that reason, the multinational firms may be incentivised to shift profit to countries that are just above the CFC-threshold. The results of column 4 however suggests that the scale of tax-motivated transfer pricing to non-CFC and CFC-countries does not differ as the interaction term with the CFC-dummy is not statistically significant.

Finally, columns 5 and 6 of Table 6 study if the scale of tax-motivated transfer pricing differs between countries that belong to OECD or EU, respectively. In both columns the additional interaction term receives a positive coefficient point estimate, suggesting that the scale of tax-motivated transfer pricing is lower in exports destined to OECD or EU destinations. However, only the coefficient point estimate from column 5 is statistically significant at the 10% significance level.

With respect to country heterogeneity, I can also study if the transfer mispricing is concentrated to exports destined for the lowest taxed countries as the tax incentive for transfer mispricing is the largest in those exports. Figure 5 plots coefficient estimates of affiliate dummy interacted with different tax rate quartile bins in low tax countries (i.e. tax rate difference divided into 4 bins) instead of the continuous treatment variable of tax difference. Categorizing the continuous treatment variable also serves as a robustness check. Left y-axis shows the average tax rate of the quar-

[17] As this estimation method exploits variation in the affiliate ownership, the regressions provided in Appendix A.10 include also the non-continuous firm-country-affiliate pairs, i.e. observations where the affiliate is established or sold during the sample period. Additionally, I use the fixed effects suggested by Wier (2020) to include as many observations as possible.

Figure 5: Tax difference quartiles as treatment variables



Notes: The figure plots triple difference estimates of quartile indicators ($\widehat{\beta_{LowTax,q}}, q \in [1,4]$) and the corresponding 95% confidence intervals with red dots and dashed lines. The right-hand side y-axis represents the scale for the coefficient estimates. Blue bars represent the average tax rate in each quartile and left-hand side y-axis represents its scale. Quartile indicators $Q_{j,t}^{q,LowTax}$ are equal to 1 when the tax difference between Finland and low tax country j is in the qth quartile of the tax difference distribution. Formally the regression is written as $\ln p_{ijkt} = \sum_{q=1}^{4}(\beta_{LowTax,q}Q_{j,t}^{q,LowTax} + \beta_{HighTax,q}Q_{j,t}^{q,HighTax}) \times Aff_{ij} + \alpha_{ijk} + \alpha_{jkt} + \alpha_{it} + \epsilon_{ijkt}$. Regression includes firm-country-product, country-product-year and firm-year fixed effects. The standard errors of the regression are clustered at country-year level. The regression results are reported in Appendix A.5.

tile bin, whereas right y-axis shows the estimated coefficient point estimates and their 95% confidence intervals. Figure 5 illustrates how the coefficient of the tax semi-elasticity becomes more negative once the tax difference to Finland increases (i.e. the tax rate of the low tax country decreases). This is as would expected since the larger tax incentive to shift profits to the low tax country, the more multinationals will want to underprice their exports.[18] However, I cannot reject the null hypotheses that the four coefficients are equal to one another. The estimate of the second bin is statistically not different from zero. This could yet be due to the fact that Finland had a higher tax rate in the first sample year, thus even though the tax rate difference is larger, the tax rate of the low tax country may be relatively higher than in the other bins. I provide results in Appendix A.5 where I have excluded the first sample year.

Transfer pricing and product differentiation

Finally, on the product level the most intriguing dimension to study is whether multinationals transfer misprice more with differentiated products than with reference priced products. Multinationals may be able to transfer misprice more when trading differentiated products since the arm's length price of a differentiated product is more difficult for the tax authority to define as it is for a good that is exchanged on a regular basis. Table 7 presents the product heterogeneity results. Column 1 is again replication of column 1 in Table 2 to ease comparison. Column 2 instead includes only those products that have a CN-code identified as a differentiated product by the classification introduced by Rauch (1999). Column 3 includes products that are not classified as differentiated. The results from Table 7 support the hypothesis that tax-motivated transfer pricing is a larger problem with differentiated products. The statistically significant coefficient of the triple interaction term in column 2 with differentiated products is -1.6. In turn, the non-differentiated products in column 3 does not result with a coefficient estimate that is statistically different from zero. These results are in line with previous studies showing that tax-motivated transfer pricing primarily centers around products with distinct characteristics.

5.3 Imports

In addition to mispricing exports, multinationals may shift profit by transfer mispricing their imports. Table 8 studies the tax-motivated transfer pricing of imports

[18] Appendix A.5 provides the regression results of Figure 5. As a robustness check I perform the regressions by dividing the sample into 5 bins instead of 4. These results are qualitatively similar and also available in Appendix A.5.

Table 7: Heterogeneity of tax-motivated transfer pricing by product differentiation

	Dependent variable: log(Unit Value of Export$_{ijkt}$)		
Sample	All products	Differentiated products	Non-differentiated products
	(1)	(2)	(3)
$Aff_{ij} \times \lvert\Delta\tau_{jt}\rvert \times I_t^{LowTax}$	-1.203***	-1.6***	-0.45
	(0.353)	(0.388)	(0.593)
$Aff_{ij} \times \lvert\Delta\tau_{jt}\rvert \times I_t^{HighTax}$	0.198	0.308	0.08
	(0.246)	(0.247)	(0.363)
Firm * Country * Product FE	Yes	Yes	Yes
Country * Product * Year FE	Yes	Yes	Yes
Firm * Year FE	Yes	Yes	Yes
Observations	427,403	247,481	178,503
R^2	0.931	0.919	0.945

Notes: This table presents the triple difference estimates, β_1 and β_2, of the regression model 1 for different types of products. Coefficients measure the effect of tax-motivated transfer pricing on export unit values. The heterogeneous effects are estimated by splitting the sample according to whether the product is classified as a differentiated product or not by Rauch (1999). Standard errors in parentheses are clustered at country-year level. ***, ** and * denote significance at the 1%, 5% and 10% levels respectively.

to Finland. Affiliate dummy equals one if the importing firm has an affiliate in the origin country of the import. I follow Wier (2020) in defining the fixed effects in my regressions with imports and include firm-year, firm-product, country-year, product-year and product-country fixed effects in my main specification. The choice of appropriate fixed effects for imports may differ from that for exports. This distinction arises because, unlike with exports, we do not observe the exporting firm (i.e. with imports this is the firm in the foreign country). For exports, including firm-country-product fixed effects is reasonable, as firms may exhibit pricing to market -behavior where they export different quality of the same products to different countries. However, this logic doesn't apply the same way to imports since there is only one market, Finland. Additionally, country-product-year fixed effects were included to capture the demand shocks or tariffs in exports at the country-product level. Given that the market is Finland, product-year fixed effects suffice to capture these. Nevertheless, I provide results in column 4 of Table 8 also using the same fixed effects as in my main results with exports.

Table 8 presents the main results with imports, where my preferred specification is presented in column 1 and columns 2-5 alter the set of fixed effects.[19] The results from columns 1-3 provide no evidence of transfer mispricing imports from low or high tax countries as the coefficient point estimates of the triple interaction terms are close to zero and statistically insignificant. However, when using the same set of fixed effects as with exports in column 4 and the even more demanding firm-product-year fixed effects in column 5, the coefficients of the high tax triple interaction term are negative and statistically significant, suggesting underpricing of imports from high tax destinations where the importing firm has an affiliate. This would imply that multinationals shift profit into Finland from these high tax countries. Yet the results from columns 4 and 5 should be taken cautiously, as the results from columns 1-3 of Table 8 and the additional regressions in Appendix A.11 do not support this evidence. Nevertheless, any of the results with imports from low tax destinations do not provide evidence of overpricing imports. This suggests an asymmetrical pattern in transfer mispricing as I provide highly robust evidence of transfer mispricing exports destined to low tax countries, but no evidence of overpricing imports from low tax destinations. Additionally, the results on transfer mispricing imports from high tax countries are very mixed.

[19] Appendix A.11 complements by providing alternative combinations of fixed effects.

Table 8: Effect of tax differentials on import unit values

	Dependent variable: log(Unit Value of Import$_{ijkt}$)				
	(1)	(2)	(3)	(4)	(5)
Aff_{ij}	-0.084***	-0.053***	-0.09***		
	(0.012)	(0.011)	(0.013)		
$Aff_{ij} \times \lvert\Delta\tau_{jt}\rvert \times I_t^{LowTax}$	-0.102	0.139	-0.222	0.671	0.719
	(0.487)	(0.503)	(0.744)	(0.817)	(1.415)
$Aff_{ij} \times \lvert\Delta\tau_{jt}\rvert \times I_t^{HighTax}$	0.058	-0.134	-0.055	-0.713***	-1.184***
	(0.151)	(0.137)	(0.169)	(0.195)	(0.298)
ln employment$_{it}$			-0.01		
			(0.011)		
ln turnover$_{it}$			-0.001		
			(0.008)		
Fixed effects					
Firm * Year	Yes	Yes		Yes	
Firm * Product	Yes	Yes	Yes		
Country * Year	Yes	Yes			
Product * Year	Yes	Yes			
Product * Country	Yes				
Firm * Country * Product				Yes	Yes
Country * Product * Year			Yes	Yes	Yes
Firm * Product * Year					Yes
Observations	932,567	960,361	745,253	643,547	371,992
R^2	0.825	0.781	0.824	0.918	0.946

Notes: This table presents the triple difference estimates, β_1 and β_2, but with import unit value as the dependent value opposed to export unit value. Coefficients measure the effect of tax-motivated transfer pricing on import unit values. Affiliate indicates if the import is classified as an intra-firm import, i.e. if the importing firm has an affiliate in the import's origin country j. $|\Delta\tau_{jt}|$ is the absolute tax rate difference between Finland and country j. I_t^{LowTax} ($I_t^{HighTax}$) indicates if the origin country j has a lower (higher) tax rate than Finland in year t. Columns 2-5 provide alternative combinations of fixed effects and control variables. Standard errors in parentheses are clustered at country-year level. ***, ** and * denote significance at the 1%, 5% and 10% levels respectively

6 Conclusion

Profit shifting carried out by multinational enterprises is a largely acknowledged problem. In order to address profit shifting effectively, it is essential to study the mechanisms used to shift profit to low tax countries. In this paper I provide evidence of tax-motivated transfer pricing carried out by multinational enterprises in their exports from Finland. By using data on tangible goods exported during 2013-2019 linked with information on affiliate ownership and financial statements, I find that when the tax rate incentive to a low tax country increases by 1 percentage points, i.e. either the low tax destination country lowers its tax rate by 1 percentage point or Finland increases its tax rate by 1 percentage point, a multinational that has an affiliate located in that country decreases the price of the export by 1.2 percent relative to an exporter with no affiliate located in the destination country in question.

In addition, the findings from my heterogeneity analyses reveal that firm and product characteristics, such as product differentiation, affect the scale of transfer pricing. The scale of transfer mispricing is particularly elevated among larger firms. These insights provide policymakers and tax authorities a basis to design more efficient and targeted actions. Moreover, my study identifies different profit shifting indicators associated with a larger scale of transfer mispricing. This suggests that firms may use transfer mispricing not as a substitute but as a complementary channel for profit shifting. I also present evidence of transfer mispricing in exports destined to also non-tax havens, implying that transfer mispricing is not restricted to only transactions with tax havens. Additionally, my results imply that transfer mispricing is primarily concentrated in exports to destinations where the affiliate has a higher level of economic activity. Finally, while the I find robust evidence of underpricing exports to low tax destinations, I find no evidence of overpricing imports from low tax destinations to Finland. This suggests an asymmetrical pattern in shifting profit by transfer pricing.

Even though I find evidence of tax-motivated transfer pricing in exports, the back-of-the-envelope calculations suggest that tax revenue losses caused by transfer pricing are not notably large. The seemingly moderate estimates of the impact that transfer pricing of tangible goods has on the Finnish corporate income tax revenue are influenced by the relatively low corporate income tax rate in Finland. Thus, only about every fourth export is actually destined to a low tax country. Although there is evidence of multinationals shifting profit to low tax countries by underpricing exports, there is no corresponding evidence of shifting profit to Finland by overpricing exports to high tax countries. This suggests that while transfer pricing is indeed a utilized channel for profit shifting to low tax countries,

it is not commonly employed for shifting profit into middle tax countries. As I find only modest effects of transfer pricing on Finnish corporate income tax revenue, more research on the additional channels of profit shifting is necessary to comprehensively understand the factors contributing to the 14% corporate tax revenue loss in Finland, as suggested by Wier and Zucman (2022).

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A Appendix

A.1 Country listings

Tax havens		EU members
Andorra	Macao	Austria
Anguilla	Malaysia[1]	Belgium
Antigua and Barbuda	Maldives	Bulgaria
Aruba	Malta	Croatia
Austria[1]	Marshall Islands	Cyprus
Bahamas	Mauritius	Czech Republic
Bahrain	Micronesia[2]	Denmark
Barbados	Monaco	Estonia
Belgium[1]	Montserrat	Finland
Belize	Nauru	France
Bermuda	Netherlands[1]	Germany
British Virgin Islands	Niue	Greece
Cayman Islands	Palau[1]	Hungary
Chile[1]	Panama	Ireland
Cook Islands	Samoa	Italy
Costa Rica	San Marino	Latvia
Curaçao	Seychelles	Lithuania
Cyprus	Singapore	Luxembourg
Djibouti[2]	Sint Maarten	Malta
Dominica	St. Kitts and Nevis	Netherlands
Gibraltar	St. Lucia	Poland
Grenada	St. Martin[2]	Portugal
Guernsey	St. Vincent and the Grenadines	Romania
Hong Kong	Switzerland	Slovakia
Ireland	Tonga	Slovenia
Isle of Man	Trinidad and Tobago	Spain
Jersey	Turks and Caicos Islands	Sweden
Jordan	U.S. Virgin Islands[1]	United Kingdom[3]
Lebanon	Uruguay[1]	
Liberia	Vanuatu	
Liechtenstein	Vatican City[1]	
Luxembourg		

Sources: Tax havens: Hines (2010) and Menkhoff and Miethe (2019); EU members: European Union (2021); Euro members: European Union (2021)

Notes:[1]Country is only included in the tax haven list by Menkhoff and Miethe (2019). [2]Country is only included in the tax haven list by Hines (2010). [3]United Kingdom was a member of the European Union until 31 January 2020. Hines (2010) includes "Netherland Antilles" in his list, however Curaçao and Sint Maarten separated on the 10th of October 2010.

A.2 Summary statistics of imports

Variable	Mean	St. dev.	P1	P99	Number
Panel A: product characteristics					
Price (100,000 EUR)	1.34	27.2	0.00011	17.2	932,567
Quantity (100,000 kg)	1.35	75.4	0.00001	5.76	932,567
Differentiated product[1]	0.58	0.494	0	1	932,567
Panel B: firm characteristics					
Personnel	750	1,376	6.8	6,747	922,419
Turnover (100,000 EUR)	5,250	13,600	23.8	66,200	931,430
Net profit (100,000 EUR)	98.3	1,470	-1,340	2,840	932,567
Intangible assets/fixed assets	0.06	0.134	0	0.719	874,279
Debt-equity ratio	72.5	1,986	-375	857	917,076
Panel C: MNE-indicator variables					
Affiliate (Aff_{ij})	0.163	0.369	0	1	932,567
Foreign owned	0.269	0.443	0	1	932,567
Tax haven affiliated[2]	0.18	0.384	0	1	932,567
Panel D: destination country tax characteristics					
Statutory corporate income tax rate (τ_{jt})	0.254	0.055	0.125	0.35	932,567
Low corporate income tax rate (I_t^{LowTax})	0.165	0.371	0	1	932,567
High corporate income tax rate ($I_t^{HighTax}$)	0.77	0.421	0	1	932,567
Low tax wedge ($I_t^{LowTax} \cdot \lvert\Delta\tau_{jt}\rvert$)	0.005	0.016	0	0.095	932,567
High tax wedge ($I_t^{HighTax} \cdot \lvert\Delta\tau_{jt}\rvert$)	0.054	0.048	0	0.15	932,567
Tax haven destination	0.036	0.185	0	1	932,567

Notes: The table presents summary statistics for the imports and the importing firms in my baseline imports sample, i.e. 2013-2019. The baseline sample is restricted to firms that have at least one foreign subsidiary during sample period and excludes non-continuous firm-country-affiliate pairs where the affiliate in the origin country is established or sold during the sample period.

[1]The product is classified as a differentiated product by its CN-code according to the Rauch (1999) classification. [2]Firm has at least one affiliate located in a tax haven defined as Hines (2010). The statistics is from the imports data sample.

A.3 Event study estimates of tax rate changes

	Dependent variable: log(Unit Value of Export$_{ijkt}$)		
	Decrease	Large decrease	Increase
	(1)	(2)	(3)
F6	-0.005		
	(0.029)		
F5	-0.219**	-0.255**	-0.059
	(0.095)	(0.101)	(0.053)
F4	0.042	-0.055	-0.064
	(0.09)	(0.097)	(0.042)
F3	-0.042	-0.106	-0.036
	(0.07)	(0.072)	(0.04)
F2	0.014	-0.028	-0.014
	(0.02)	(0.081)	(0.043)
L0	-0.263***	-0.332***	-0.112
	(0.074)	(0.089)	(0.15)
L1	-0.083	-0.128	-0.001
	(0.095)	(0.1)	(0.118)
L2	-0.157	-0.272**	0.048
	(0.102)	(0.114)	(0.134)
L3	-0.118**	-0.155***	
	(0.048)	(0.037)	
L4	-0.065**	-0.071**	
	(0.03)	(0.03)	
L5	-0.072*	-0.075**	
	(0.04)	(0.035)	
Firm * Country * Product FE	Yes	Yes	Yes
Country * Product * Year FE	Yes	Yes	Yes
Firm * Year FE	Yes	Yes	Yes
Observations	350,080	219,371	204,148
R^2	0.929	0.931	0.929

Notes: This table presents the event study estimates for low tax destinations plotted in Figure 4. Table presents the $\beta_{1,l}$ from $\ln p_{ijkt} = \sum_{l=-5}^{6} D_{j,t}^{l} \times (\beta_{1,l} I_t^{LowTax} + \beta_{2,l} I_t^{HighTax}) \times Aff_{ij} + \alpha_{ijk} + \alpha_{jkt} + \alpha_{it} + \epsilon_{ijkt}$, where event study dummies $D_{j,t}^{l}$ are equal to 1 for a tax rate decrease, a large tax rate decrease (greater than or equal to 1 pp) or a tax rate increase. The estimation sample is the baseline sample. Estimation sample for tax rate decreases (increases) excludes countries that experience a tax rate increase (decrease) during sample period. Standard errors in parentheses are clustered at country-year level. ***, ** and * denote significance at the 1%, 5% and 10% levels respectively.

A.4 Event study estimates of tax rate changes with constant Finnish corporate income tax rate

	Dependent variable: log(Unit Value of Export$_{ijkt}$)		
	Decrease	Large decrease	Increase
	(1)	(2)	(3)
F4			-0.075*
			(0.041)
F3	-0.129	-0.125	-0.05
	(0.099)	(0.089)	(0.04)
F2	-0.069	-0.022	-0.059*
	(0.084)	(0.078)	(0.036)
L0	-0.312***	-0.302***	-0.139
	(0.078)	(0.084)	(0.161)
L1	-0.163*	-0.095	-0.086
	(0.097)	(0.101)	(0.123)
L2	-0.228**	-0.248**	0.009
	(0.097)	(0.113)	(0.151)
L3	-0.118**	-0.149***	
	(0.047)	(0.045)	
L4	-0.072**	-0.071**	
	(0.031)	(0.033)	
L5	-0.093**	-0.093**	
	(0.044)	(0.041)	
Firm * Country * Product FE	Yes	Yes	Yes
Country * Product * Year FE	Yes	Yes	Yes
Firm * Year FE	Yes	Yes	Yes
Observations	299,311	187,042	173,119
R^2	0.933	0.934	0.937

Notes: This table presents the event study estimates for low tax destinations plotted in Figure 4. Table presents the $\beta_{1,l}$ from $\ln p_{ijkt} = \sum_{l=-5}^{6} D_{j,t}^{l} \times (\beta_{1,l} I_t^{LowTax} + \beta_{2,l} I_t^{HighTax}) \times Aff_{ij} + \alpha_{ijk} + \alpha_{jkt} + \alpha_{it} + \epsilon_{ijkt}$, where event study dummies $D_{j,t}^{l}$ are equal to 1 for a tax rate decrease, a large tax rate decrease (greater than or equal to 1 pp) or a tax rate increase. The estimation sample is the baseline sample excluding year 2013 to keep Finnish corporate income tax rate constant within the sample years (i.e. all the variation in the tax difference comes from changes in the corporate income tax rate of the destination country). Estimation sample for tax rate decreases (increases) excludes countries that experience a tax rate increase (decrease) during sample period. Standard errors in parentheses are clustered at country-year level. ***, ** and * denote significance at the 1%, 5% and 10% levels respectively.

A.5 Non-linear tax effects on transfer mispricing

	Dependent variable: log(Unit Value of Export$_{ijkt}$)			
	Quartiles	Quartiles (2014-2019)	Quintiles	Quintiles (2014-2019)
	(1)	(2)	(3)	(4)
$Aff_{ij} \times Q(U)^{1,LowTax}$	-0.086**	-0.104**	-0.097***	-0.104**
	(0.035)	(0.043)	(0.036)	(0.043)
$Aff_{ij} \times Q(U)^{2,LowTax}$	0.008	-0.087	-0.014	-0.074
	(0.02)	(0.133)	(0.029)	(0.137)
$Aff_{ij} \times Q(U)^{3,LowTax}$	-0.075***	-0.064**	-0.026	-0.091
	(0.021)	(0.028)	(0.027)	(0.134)
$Aff_{ij} \times Q(U)^{4,LowTax}$	-0.114***	-0.305***	-0.084***	-0.064**
	(0.03)	(0.111)	(0.028)	(0.028)
$Aff_{ij} \times QU^{5,LowTax}$			-0.131***	-0.304***
			(0.035)	(0.111)
$Aff_{ij} \times Q(U)^{1,HighTax}$	0.024	0.028	0.012	0.029
	(0.02)	(0.02)	(0.022)	(0.02)
$Aff_{ij} \times Q(U)^{2,HighTax}$	-0.014	0.011	-0.031	0.011
	(0.039)	(0.036)	(0.04)	(0.037)
$Aff_{ij} \times Q(U)^{3,HighTax}$	0.051	0.027	0.005	0.005
	(0.043)	(0.043)	(0.044)	(0.046)
$Aff_{ij} \times Q(U)^{4,HighTax}$	0.03	0.081**	0.066	0.108**
	(0.038)	(0.037)	(0.048)	(0.049)
$Aff_{ij} \times QU^{5,HighTax}$			0.046	0.085**
			(0.038)	(0.038)
Firm * Country * Product FE	Yes	Yes	Yes	Yes
Country * Product * Year FE	Yes	Yes	Yes	Yes
Firm * Year FE	Yes	Yes	Yes	Yes
Observations	427,403	364,517	427,403	364,517
R^2	0.931	0.934	0.931	0.934

Notes: This table shows the triple difference estimates with quartile and quintile indicators of the tax difference as the treatment instead of the continuous treatment. The estimation sample is the baseline sample in columns 1 and 3, whereas columns 2 and 4 exclude year 2013 to keep Finnish CIT rate constant during the sample years (i.e. all variation in the tax difference comes from changes in the CIT rate of the destination country). Columns 1 and 2 present $\beta_{LowTax,q}$ and $\beta_{HighTax,q}$ from $\ln p_{ijkt} = \sum_{q=1}^{4}(\beta_{LowTax,q}Q_{j,t}^{q,LowTax} + \beta_{HighTax,q}Q_{j,t}^{q,HighTax}) \times Aff_{ij}$ $+\alpha_{ijk} + \alpha_{jkt} + \alpha_{it} + \epsilon_{ijkt}$, where quartile indicator variables $Q_{j,t}^{q,LowTax}$ ($Q_{q,t}^{q,HighTax}$) indicate in which quartile bin of tax difference in low (high) tax countries the country is in. Columns 3 and 4 present $\beta_{LowTax,qu}$ and $\beta_{HighTax,qu}$ from $\ln p_{ijkt} = \sum_{qu=1}^{5}(\beta_{LowTax,qu}QU_{j,t}^{qu,LowTax}$ $+\beta_{HighTax,qu}QU_{j,t}^{qu,HighTax}) \times Aff_{ij} + \alpha_{ijk} + \alpha_{jkt} + \alpha_{it} + \epsilon_{ijkt}$, where quintile indicator variables $QU_{j,t}^{qu,LowTax}$ ($QU_{j,t}^{qu,HighTax}$) indicate in which quintile bin of tax difference in low (high) tax countries the country is in. Standard errors in parentheses are clustered at country-year level. ***, ** and * denote significance at the 1%, 5% and 10% levels respectively.

A.6 Main results with different fixed effects

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Aff_{ij}	-0.109***	-0.116***	-0.115***	-0.116***	-0.104***	-0.082***	-0.084***	-0.096***	-0.115***	-0.118***
	(0.011)	(0.009)	(0.009)	(0.024)	(0.017)	(0.014)	(0.014)	(0.012)	(0.042)	(0.025)
$Aff_{ij} \times \lvert\Delta\tau_{jt}\rvert \times I_t^{LowTax}$	-0.548*	-0.58**	-0.572*	-2.421***	-1.007**	-0.996**	-0.941**	-0.796**	-3.226***	-2.779***
	(0.286)	(0.266)	(0.296)	(0.75)	(0.499)	(0.411)	(0.411)	(0.37)	(1.114)	(0.774)
$Aff_{ij} \times \lvert\Delta\tau_{jt}\rvert \times I_t^{HighTax}$	0.096	0.095	0.09	0.974***	-0.185	0.193	0.189	0.22	2.929***	0.989***
	(0.145)	(0.12)	(0.125)	(0.249)	(0.183)	(0.186)	(0.186)	(0.159)	(0.482)	(0.252)
ln employment$_{it}$			-0.023	0.076***					0.455***	0.07***
			(0.017)	(0.009)					(0.019)	(0.009)
ln turnover$_{it}$			0.019*	-0.06***					-0.484***	-0.054***
			(0.011)	(0.006)					(0.016)	(0.006)
ln $population_{jt}$				0.035***	0.004	0.598***	0.525***		0.079***	0.034***
				(0.005)	(0.004)	(0.201)	(0.202)		(0.007)	(0.006)
ln $real\ GDP\ per\ capita_{jt}$				0.088***	0.061***	-0.016	-0.02		0.113***	0.094***
				(0.012)	(0.01)	(0.1)	(0.098)		(0.021)	(0.014)
ln exchange rate$_{jt}$				0.012***	-0.006**	-0.083***	-0.086***		0.016***	0.013***
				(0.003)	(0.003)	(0.025)	(0.024)		(0.005)	(0.003)
Fixed effects										
Firm * Year	Yes	Yes			Yes	Yes	Yes	Yes		
Firm * Product	Yes	Yes	Yes							
Country * Year	Yes	Yes	Yes					Yes		
Product * Year	Yes	Yes	Yes	Yes			Yes	Yes		
Product * Country	Yes					Yes	Yes	Yes		
Year									Yes	
Product										Yes
Observations	787,740	831,059	815,097	586,706	607,504	565,289	560,326	822,470	591,751	591,013
R^2	0.856	0.816	0.811	0.607	0.523	0.763	0.768	0.763	0.059	0.596

Notes: This table shows the triple difference estimates, β_1 and β_2, of the regression model 1 but with alternative combinations of fixed effects and control variables. Dependent variable is the logarithm of the export unit value. Coefficients measure the effect of tax-motivated transfer pricing on export unit values. The estimation sample is the baseline sample but columns with country level control variables only include years 2013-2017 as the country level information is missing for years 2018–2019. Standard errors in parentheses are clustered at country-year level. ***, ** and * denote significance at the 1%, 5% and 10% levels respectively.

A.7 Different fixed effects with baseline sample

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Aff_{ij}				-0.093***	-0.131***	-0.134***	-0.139***	-0.139***	-0.16***
				(0.027)	(0.011)	(0.011)	(0.01)	(0.01)	(0.038)
$Aff_{ij} \times \lvert\Delta\tau_{jt}\rvert \times I_t^{LowTax}$	-1.203***	-0.965**	-1.11***	-3.48***	-1.407***	-1.21***	-1.196***	-1.209**	-4.158***
	(0.353)	(0.452)	(0.279)	(0.804)	(0.319)	(0.29)	(0.262)	(0.288)	(1.009)
$Aff_{ij} \times \lvert\Delta\tau_{jt}\rvert \times I_t^{HighTax}$	0.198	-0.102	0.14	0.811***	-0.087	-0.05	-0.157	-0.161	2.047***
	(0.246)	(0.246)	(0.208)	(0.289)	(0.147)	(0.15)	(0.144)	(0.145)	(0.407)
Fixed effects									
Firm * Country * Product	Yes	Yes	Yes						
Country * Product * Year	Yes	Yes	Yes	Yes	Yes				
Firm * Year	Yes					Yes	Yes		
Firm * Product * Year		Yes							
Firm * Product					Yes	Yes	Yes	Yes	
Country * Year						Yes	Yes	Yes	
Product * Year						Yes	Yes	Yes	Yes
Product * Country						Yes			
Observations	427,403	333,096	427,403	427,403	427,403	427,403	427,403	427,403	427,403
R^2	0.931	0.95	0.927	0.689	0.871	0.849	0.827	0.822	0.592

Notes: This table shows the regressions provided in Table 2 and Appendix A.6 w with observations restricted to those included in column 1 of Table 2. Column 1 is a replication of column 1 in Table 2. Regressions do not include any control variables but the results are very similar if control variables are included. These results with control variables included are available upon request. Dependent variable is the logarithm of the export unit value. Standard errors in parentheses are clustered at country-year level. ***, ** and * denote significance at the 1%, 5% and 10% levels respectively.

A.8 Results with non-continuous intra-firm trade included

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Aff_{ijt}	-0.001	0.001	0.004	-0.078***	-0.081***	-0.087***	-0.095***	-0.085***	-0.137***
	(0.011)	(0.013)	(0.01)	(0.018)	(0.009)	(0.008)	(0.008)	(0.007)	(0.02)
$Aff_{ijt} \times \lvert\Delta\tau_{jt}\rvert \times I_t^{LowTax}$	-0.591**	-0.507	-0.708***	-2.615***	-1.06***	-0.58**	-0.551**	-0.513**	-1.991***
	(0.28)	(0.314)	(0.223)	(0.58)	(0.282)	(0.242)	(0.224)	(0.235)	(0.639)
$Aff_{ijt} \times \lvert\Delta\tau_{jt}\rvert \times I_t^{HighTax}$	-0.035	-0.255	-0.052	0.702***	-0.158	-0.052	-0.01	-0.015	1.069***
	(0.143)	(0.164)	(0.13)	(0.201)	(0.119)	(0.109)	(0.096)	(0.096)	(0.221)
ln employment$_{it}$			-0.013	0.052***	-0.016			-0.013	0.074***
			(0.011)	(0.008)	(0.013)			(0.013)	(0.008)
ln turnover$_{it}$			0.019**	-0.045***	0.022**			0.023**	-0.062***
			(0.009)	(0.005)	(0.011)			(0.01)	(0.005)
ln $population_{jt}$									0.036***
									(0.006)
ln $real\,GDP\,per\,capita_{jt}$									0.086***
									(0.013)
ln exchange rate$_{jt}$									0.01***
									(0.003)
Fixed effects									
Firm * Country * Product	Yes	Yes	Yes						
Country * Product * Year	Yes	Yes	Yes	Yes	Yes				
Firm * Year	Yes					Yes	Yes		
Firm * Product * Year		Yes							
Firm * Product					Yes	Yes	Yes	Yes	
Country * Year						Yes	Yes	Yes	
Product * Year						Yes	Yes	Yes	Yes
Product * Country						Yes			
Observations	570,189	458,379	555,160	732,771	688,650	976,561	1,021,679	1,002,170	722,911
R^2	0.93	0.95	0.927	0.656	0.848	0.853	0.816	0.812	0.607

Notes: This table shows the regressions provided in Table 2 and Appendix A.6 with a sample that includes also the non-continuous firm-country-affiliate pairs, where the affiliate in the destination country is established or sold during sample period. Columns with country level control variables only include years 2013-2017 as the country level information is missing for years 2018–2019. Affiliate indicates if the export is classified as an intra-firm export, i.e. if the exporting firm has an affiliate in the export destination country j in year t. Dependent variable is the logarithm of the export unit value. Standard errors in parentheses are clustered at country-year level. ***, ** and * denote significance at the 1%, 5% and 10% levels respectively.

A.9 Results with domestic firms and non-continuous intra-firm trade included

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Aff_{ijt}	-0.008	0.001	0.004	-0.027*	-0.08***	-0.088***	-0.093***	-0.083***	-0.098***
	(0.01)	(0.013)	(0.009)	(0.016)	(0.008)	(0.008)	(0.007)	(0.007)	(0.02)
$Aff_{ijt} \times \lvert\Delta\tau_{jt}\rvert \times I_t^{LowTax}$	-0.348	-0.34	-0.794***	-3.012***	-1.129***	-0.722***	-0.655***	-0.689***	-2.182***
	(0.259)	(0.288)	(0.19)	(0.514)	(0.27)	(0.248)	(0.23)	(0.242)	(0.644)
$Aff_{ijt} \times \lvert\Delta\tau_{jt}\rvert \times I_t^{HighTax}$	-0.002	-0.276**	-0.062	0.847***	-0.112	-0.01	0.045	0.03	1.189***
	(0.115)	(0.13)	(0.106)	(0.192)	(0.097)	(0.095)	(0.088)	(0.086)	(0.237)
ln employment$_{it}$			-0.021***	0.052***	-0.028***			-0.028***	0.082***
			(0.006)	(0.012)	(0.007)			(0.007)	(0.014)
ln turnover$_{it}$			0.02***	-0.056***	0.033***			0.03***	-0.076***
			(0.007)	(0.01)	(0.007)			(0.007)	(0.011)
ln $population_{jt}$									0.033***
									(0.006)
ln $real\,GDP\,per\,capita_{jt}$									0.106***
									(0.017)
ln exchange rate$_{jt}$									0.008**
									(0.004)
Fixed effects									
Firm * Country * Product	Yes	Yes	Yes						
Country * Product * Year	Yes	Yes	Yes	Yes	Yes				
Firm * Year	Yes					Yes	Yes		
Firm * Product * Year		Yes							
Firm * Product					Yes	Yes	Yes	Yes	
Country * Year						Yes	Yes	Yes	
Product * Year						Yes	Yes	Yes	Yes
Product * Country						Yes			
Observations	1,042,742	784,333	1,009,169	1,392,382	1,252,689	1,627,105	1,684,634	1,638,325	1,219,169
R^2	0.931	0.951	0.926	0.628	0.851	0.852	0.823	0.817	0.565

Notes: This table shows the regressions provided in Appendix A.8 with a sample that includes also the purely domestic firms, i.e. firms that do not have any foreign subsidiaries. Thus, the estimation sample includes exports for all firms with financial statement available. Columns with country level control variables only include years 2013-2017 as the country level information is missing for years 2018–2019. Dependent variable is the logarithm of the export unit value. Affiliate indicates if the export is classified as an intra-firm export, i.e. if the exporting firm has an affiliate in the export destination country j in year t. Standard errors in parentheses are clustered at country-year level. ***, ** and * denote significance at the 1%, 5% and 10% levels respectively.

A.10 Tax haven dummy as tax incentive indicator

Sample	*Exports*			*Imports*		
Dependent variable	*log(Unit Value of Transaction$_{ijkt}$)*					
Aff_{ijt}	(1)	(2)	(3)	(4)	(5)	(6)
× Tax Haven[1]$_0$	-0.095***			-0.035***		
	(0.006)			(0.009)		
× Tax Haven[1]$_1$	-0.067**			0.058		
	(0.027)			(0.039)		
× Tax Haven[2]$_0$		-0.092***			-0.037***	
		(0.007)			(0.009)	
× Tax Haven[2]$_1$		-0.122***			0.011	
		(0.018)			(0.016)	
× European Haven$_0$[3]			-0.091***			-0.036***
			(0.007)			(0.009)
× European Haven$_1$[3]			-0.158***			0.015
			(0.019)			(0.015)
Fixed effects						
Firm * Year	Yes	Yes	Yes	Yes	Yes	Yes
Firm * Product	Yes	Yes	Yes	Yes	Yes	Yes
Country * Year	Yes	Yes	Yes	Yes	Yes	Yes
Product * Year	Yes	Yes	Yes	Yes	Yes	Yes
Product * Country	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,627,105	1,627,105	1,627,105	3,569,925	3,569,925	3,569,925
R^2	0.852	0.852	0.852	0.816	0.816	0.816

Notes: This table explores tax haven indicators as an alternative tax incentive variable to the tax differential. The regression specifications follow Wier (2020). The table reports the estimates for β_0 and β_1 from $\ln p_{ijkt} = (\beta_0 I_0^{TaxHaven} + \beta_1 I_1^{TaxHaven}) * Aff_{ijt} + \alpha_{it} + \alpha_{ik} + \alpha_{jt} + \alpha_{kt} + \alpha_{kj} + \epsilon_{ijkt}$. Coefficients measure the effect of establishing an affiliate in the destination (origin) country on export (import) unit values separately in a non-tax haven and tax haven country. Affiliate indicates if the transaction is classified as an intra-firm, i.e. if the exporting (importing) firm has an affiliate in the export (import) destination country j in year t. Tax haven variables indicate if the trading partner country is classified as a tax haven. The estimation sample includes all observations, i.e. also non-continuous firm-country-affiliate pairs. Standard errors in parentheses are clustered at country-year level. ***, ** and * denote significance at the 1%, 5% and 10% levels respectively.
[1]Tax haven countries defined according to Hines (2010). [2]Tax haven countries defined according to Menkhoff and Miethe (2019). [3]Tax haven countries defined according to Menkhoff and Miethe (2019) and are located in Europe.

A.11 Results of imports with different fixed effects

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Aff_{ij}		0.089***	-0.052***	-0.043	-0.226***	-0.083***	-0.081***	-0.077***	-0.158**	-0.044*
		(0.024)	(0.012)	(0.027)	(0.043)	(0.012)	(0.012)	(0.01)	(0.069)	(0.026)
$Aff_{ij} \times \lvert\Delta\tau_{jt}\rvert \times I_t^{LowTax}$	-0.14	-0.19	-0.055	-0.089	-2.531	-0.621	-0.777*	-0.582	2.681	-0.385
	(0.822)	(0.963)	(0.505)	(1.139)	(1.601)	(0.452)	(0.463)	(0.497)	(2.74)	(1.091)
$Aff_{ij} \times \lvert\Delta\tau_{jt}\rvert \times I_t^{HighTax}$	-0.575***	0.016	-0.155	1.355***	1.819***	0.078	0.074	0.026	4.307***	1.349***
	(0.205)	(0.343)	(0.14)	(0.382)	(0.575)	(0.191)	(0.191)	(0.16)	(0.743)	(0.371)
ln employment$_{it}$	-0.022**	0.1***	-0.009	0.115***					0.34***	0.113***
	(0.01)	(0.01)	(0.009)	(0.011)					(0.019)	(0.01)
ln turnover$_{it}$	-0.006	-0.067***	-0.002	-0.072***					-0.301***	-0.071***
	(0.007)	(0.007)	(0.008)	(0.008)					(0.016)	(0.007)
ln $population_{jt}$				0.04***	0.046***	-0.073	-0.17		0.115***	0.04***
				(0.014)	(0.009)	(0.24)	(0.245)		(0.02)	(0.014)
ln $real\ GDP\ per\ capita_{jt}$				0.465***	0.318***	0.235**	0.222**		0.518***	0.467***
				(0.038)	(0.031)	(0.092)	(0.087)		(0.059)	(0.039)
ln exchange rate$_{jt}$				0.016*	0.027***	-0.145***	-0.144***		0.088***	0.016*
				(0.008)	(0.008)	(0.031)	(0.032)		(0.012)	(0.008)
Fixed effects										
Firm * Country * Product	Yes									
Country * Product * Year	Yes	Yes								
Firm * Year					Yes	Yes	Yes	Yes		
Firm * Product			Yes							
Country * Year			Yes					Yes		
Product * Year			Yes	Yes			Yes	Yes		
Product * Country						Yes	Yes	Yes		
Year									Yes	
Product										Yes
Observations	632,763	822,241	946,883	704,223	722,967	692,928	687,907	1,004,982	709,153	708,552
R^2	0.916	0.606	0.778	0.519	0.358	0.692	0.696	0.685	0.047	0.511

Notes: This table shows the regressions provided in Table 8 but with alternative combinations of fixed effects and control variables. Columns with country level control variables only include years 2013-2017 as the country level information is missing for years 2018–2019. Dependent variable is the logarithm of the import unit value. Coefficients measure the effect of tax-motivated transfer pricing on import unit values. The estimation sample is the baseline sample. Standard errors in parentheses are clustered at country-year level. ***, ** and * denote significance at the 1%, 5% and 10% levels respectively.