

TRADE-OFFS OF MNE SUBSIDIARIES' ENGAGEMENT IN PROFIT SHIFTING

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ABSTRACT

This paper aims to identify the effects and trade-offs of different channels of profit-shifting from Poland. We apply the Tobit and panel-data approach to administrative tax data on passive income payments to 110,907 non-residents from 134 countries. This unique panel data set for 2012 – 2022 allows indicate that profit shifting is not a homogeneous phenomenon, as its effects vary substantially across transfer channels and dimensions of firm performance. While intra-group interest payments are consistently associated with lower profitability, free cash flow, investment activity, and sales growth, royalty-based transfers exhibit weaker negative and, in some cases, positive effects, suggesting productivity gains from technology and knowledge transfers. Furthermore, foreign ownership strengthens the effects of financial profit-shifting channels while mitigating the adverse consequences of transfers related to intangible assets.

Keywords: profit shifting, foreign shareholder, performance, profitability, growth

1. INTRODUCTION

This research aims to identify the determinants, effects and trade-offs of different channels of profit shifting from Poland. On the one hand, tax avoidance adds to the loss of fiscal revenues, while on the other hand, debt-based and equity-based FDI inflows can support firm and industry growth (Tørsløv et al., 2020; Igan et al., 2020) and then dividends or interests paid should be treated only as a cost of capital. So far, the literature has focused on determinants, channels and scale of profit shifting to countries with harmful tax competition. We exploit Tobit and fixed effects (FE) to evaluate the effects and externalities of engagement in profit-shifting activities.

We explore administrative tax data on passive income payments made by 40,000 residents to 110,907 non-residents from 134 countries for 2012 to 2022. This unique panel data set enables in-depth analysis of payers' and recipients' characteristics by merging it with financial and ownership data retrieved from the Orbis database.

Although many studies examine the determinants, channels, and scale of profit shifting to countries that engage in harmful tax competition, the profit-shifting effects on payers' growth, access to capital, and investments are also understudied. In the era of global minimum tax discussions, there is a lack of research on the impact of the WHT in host countries (applied to passive income transferred to non-residents) on FDI and passive flows

other than dividends, interests and royalties, i.e., asset management fees. In addition, most studies focus on US companies. Hence, studying Polish passive income payers to non-residents (WHT taxpayers) may provide valuable insights for other European countries. Value is added by using unique tax (administrative) data on Polish payers of passive income to non-residents (IFT-2R¹), covering the total population and separating each transaction at the firm level, distinguishing both parties of the transaction. This paper has vital implications for policymakers who make economic decisions that influence trade-offs between FDI flows to boost industry growth and withholding taxation to limit profit-shifting via passive flows to non-residents, mainly outside the EU.

Furthermore, this study investigates how foreign capital (for which passive income transfers represent compensation or cost of capital in the form of equity, debt, or intellectual capital) impacts the growth (rate of revenue growth, rate of assets growth) and profitability (return on sales ROS, return on assets ROA) of payers making passive income payments to non-residents. Using firm-level data for Polish companies retrieved from the Orbis database, including financial statements, allows for examining the effects of Polish firms' (subsidiaries of MNEs compared to nonaffiliated that pay to third parties or other domestic nonpayers of passive income abroad) engagement in profit-shifting via passive flows. Moreover, this research explores how much free cash flow the passive income payers could allocate to investments fell, how much their tangible and intangible capital expenditures (CAPEX) decreased. This way, our study adds original and unique value to existing knowledge on profit-shifting mechanisms, outcomes and externalities.

The remainder of the paper is structured as follows. Section 2 presents a literature review on profit shifting, motivation and direction. Section 3 provides the research description and formulates research questions. Section 4 describes the data, the research methodology and the empirical results and their interpretation. The last section provides a summary and discussion of the results obtained.

2. LITERATURE REVIEW

"Profit shifting" describes the practice whereby multinational enterprises (MNEs) reduce their tax burden across jurisdictions, primarily by using **intra-group financing**, **intangible assets** (such as royalties and service fees), and **transfer pricing** strategies. (Dharmapala, 2014; Dyreng et al., 2017; Gumpert et al., 2016; Elmes et al., 2021; Friedrich & Tepperova, 2021; Kaur & Kar, 2021). The former makes the profit shifting independent of the payer's financial situation (profitability, risk of default) and of the shareholders' meeting's decision on profit distribution after the fiscal year. Additionally, treating interest payments as tax-deductible costs reduces tax liability. Companies can shape where their reported profits appear internationally by adjusting how they are financed. In particular, they may rely on intra-group borrowing and allocate debt to jurisdictions with higher tax rates, allowing them to increase interest deductions and lower their overall tax liability

¹ In Poland, this is a type of declaration filed by entities making transactions with non-residents.

(Mintz & Smart, 2004; Hines & Hubbard, 1990; Collins & Shackelford, 1992; Froot & Hines, 1992; Grubert, 1998; Goerdts & Eggert, 2022). As a result, debt financing is often preferred over equity due to the added advantage of reducing taxable income. Dischinger and Riedel (2011) show that MNEs prefer to locate intangible assets in low-tax countries, possibly because they can choose favourable transfer prices. Bilicka and Scur (2021) highlight the importance of proper management and tax deductions' optimisation skills on profit shifting as the government taxes final taxable income (profits) rather than productivity. The relationship between better governance and potentially lower corporate tax revenues has cost-benefit implications. Following Bloom et al. (2013), better management, enabled by more tractable and predictable production, empowers firms to carry out effective tax planning and thus shift a larger share of profits to maximise their after-tax profits. From a macroeconomic perspective, their results suggest that heterogeneity in firm management quality may mediate the effectiveness of corporate tax cuts and should be considered when designing such policies. Tax optimisation through the use of countries with competitive tax jurisdictions has become a standard business strategy for multinationals from both developed and emerging markets (Beugelsdijk et al., 2010; Chari & Acikgoz, 2016; Jones & Temouri, 2016; Jones et al., 2018; Pereira et al., 2019; Kemme et al., 2020). In addition, according to estimates by Cobham et al. (2015), global tax revenue losses attributable to profit shifting may reach up to \$130 billion per year.. However, preliminary calculations based on administrative data on passive flows indicate that profit-shifting accounts for 5.6% of income and 6.6% of tax expenses. By 2016, more than twice as many payments were made to other countries as to tax havens, and by 2021, the latter saw a 44% increase.

Existing research clearly indicates that companies' engagement in profit shifting affects their **profitability indicators**. This happens on several levels, firstly by disguised profitability. Multinational firms may report artificially lower profits in high-tax jurisdictions despite strong global performance (Clausing, 2003; Dharmapala, 2014). Also, in more recent studies, such as Tørsløv et al. (2023), who estimate that a substantial share of global corporate profits is shifted to tax havens annually. Similarly, Blouin and Robinson (2020) provide evidence that income shifting significantly distorts the geographic allocation of reported profits.

Secondly, profit shifting affects operating-level indicators such as margins. Through transfer pricing strategies, especially involving intangibles and intra-group services, firms can manipulate reported revenues and costs, resulting in understated profitability in certain entities. While this mechanism was already highlighted by Grubert and Mutti (1991), more recent empirical work (e.g., Beer et al., 2020) confirms that profit shifting significantly alters reported margins, particularly in high-tax jurisdictions.

Finally, tax arbitrage undermines the reliability of traditional financial ratios (e.g., ROA, ROE) for multinationals (Desai, Foley & Hines, 2006). Because these measures rely on accounting profits that can be strategically relocated, they may no longer reflect underlying economic performance. Avi-Yonah et al. (2008) argue that profit shifting undermines the comparability of financial statements across jurisdictions, while Beer et al.(2020) show that

tax-motivated income reallocation complicates the interpretation of firm-level performance metrics.

The literature also indicates that profit shifting increases global **free cash flow** but can reduce its availability for domestic operations or shareholders. Mutti and Grubert (2009) indicate that firms engaging in profit shifting tend to accumulate larger free cash flows offshore. However, these funds are often trapped abroad due to repatriation taxes (especially in the US pre-2017), leading to inefficient capital allocation (Foley et al., 2007). Firms engaging in profit shifting not only accumulate higher global free cash flow but also exhibit distortions in its allocation. Evidence suggests that offshore cash holdings are often imperfect substitutes for domestic liquidity, leading firms to issue debt in home countries while retaining earnings abroad (Blouin & Krull, 2009). Some scholars argue that offshore cash holdings continue to distort firms' financing structures, as multinational corporations still maintain large foreign cash reserves while simultaneously issuing domestic debt (Alghamdi et al., 2024). Others contend that modern multinational firms increasingly treat global liquidity more flexibly, reducing the economic costs traditionally associated with unrepatriated earnings. Moreover, recent research questions whether profit shifting necessarily reduces shareholder welfare, as offshore cash accumulation may support share repurchases, tax-efficient capital allocation, and higher after-tax returns (Eulaiwi et al., 2024). At the same time, emerging studies on the OECD Global Minimum Tax (Pillar Two) suggest that stricter international anti-avoidance rules may further limit the advantages of offshore cash retention and reduce incentives for geographically fragmented liquidity management (Chen, 2024).

Furthermore, firms with substantial offshore cash holdings exhibit distinct financial behaviour, including higher domestic leverage and increased payout activity relative to real investment. These patterns are consistent with the presence of frictions in accessing foreign earnings, which influence observed capital allocation decisions (Blouin & Krull, 2009; Desai et al., 2001). Moreover, profit shifting can reduce **CAPEX** in high-tax jurisdictions where investment is most productive, while simultaneously distorting global capital allocation. This misallocation arises from heterogeneous incentives across jurisdictions. In parent countries, profit shifting is associated with lower domestic investment, as a larger share of earnings is retained abroad rather than reinvested locally (Desai et al., 2006).

On the other hand, subsidiaries in low-tax jurisdictions may experience overinvestment due to internal tax planning incentives. At the same time, subsidiaries located in low-tax jurisdictions may exhibit higher capital expenditures, reflecting tax-driven incentives to allocate profits and tangible assets to these entities. This pattern is consistent with internal capital market distortions induced by tax differentials, where investment is partially decoupled from real productivity considerations (Blouin et al., 2012; Mooij & Ederveen, 2008).

The literature also points out that while profit shifting may enhance **growth** for global players, it can harm industry competitiveness and fairness. Profit shifting may stimulate growth for multinationals by reducing effective tax rates and freeing up capital for

reinvestment (Huizinga & Laeven, 2008). However, it creates an uneven playing field, disadvantaging domestic-only firms (De Simone et al., 2019). Profit shifting affects resource allocation within industries by strengthening the position of tax-aggressive multinational firms, thereby increasing market concentration and reducing allocative efficiency. Studies using firm-level tax exposure and productivity data find that tax planning opportunities are associated with reallocation of market shares toward multinational firms, potentially crowding out purely domestic competitors (Blouin & Robinson, 2020; De Simone et al., 2019). While profit shifting may improve after-tax profitability and liquidity for multinational enterprises, its broader effects on productivity and market structure are more ambiguous. Tax-induced profit shifting can support firm growth by lowering effective tax burdens and increasing internal funds available for investment, particularly in large multinational groups with access to tax planning strategies (Huizinga & Laeven, 2008; Tørsløv et al., 2023).

The relationship between foreign ownership and profit shifting has been extensively examined in the international taxation literature. Previous studies suggest that multinational enterprises possess greater opportunities and incentives to engage in profit-shifting activities than purely domestic firms due to their ability to allocate income, costs, debt, and intangible assets across jurisdictions with different tax regimes (Huizinga & Laeven, 2008; Mintz & Weichenrieder, 2010). In particular, foreign-owned firms are more likely to use intra-group debt financing and royalty payments as mechanisms for reducing taxable income in high-tax countries (Buettner et al., 2012; Griffith et al., 2014). At the same time, the literature emphasizes that transactions involving intangible assets may serve not only tax-planning purposes but also facilitate technology transfer, knowledge spillovers, and productivity improvements within multinational groups (Desai et al., 2006; Karkinsky & Riedel, 2012). Consequently, foreign ownership is expected to moderate the relationship between profit-shifting activities and firm performance, strengthening the role of financial channels while potentially reducing the adverse effects associated with transfers of intangible assets.

3. RESEARCH DESIGN

In this study, we analyse profit shifting to countries engaging in harmful tax competition and others, taking into account the split of the sample into manufacturing and service sectors. It allows for checking whether the determinants of profit shifting differ depending on the flexibility of changing the geographical location of group members or the types of channels in response to changes in tax regulations. The administrative IFT-2R data allows the application of micro (firm-level) data analysis approaches for payers (domestic entities, including MNE subsidiaries and individual entities acting outside the business groups) and recipients (MNEs).

We merge administrative data with financial and ownership data retrieved from the Orbis database. As dependent variables, we consider profitability (i.e., return on sales (ROS) and return on assets (ROA)) and its changes due to engagement in profit-shifting, investment (CAPEX), firm growth and industry growth measured by the sales growth rate

and free cash flows. This research how foreign capital (for which passive income represents compensation or a cost of capital) affects the revenue growth or assets growth and profitability of payers making passive income payments to non-residents. We distinguish nonrefundable equity, interest-bearing debt funds or intellectual (intangible or human) capital. We use firm-level data for Polish companies retrieved from the Orbis database, including financial statements and ownership structures, to examine the effects of Polish firms' (subsidiaries of MNEs and individual entities acting outside business groups) engagement in profit-shifting via passive flows.

First, we check **[Q1]** how their profitability changed after shifting profits to non-residents. For this purpose, we measure the difference between ROS (ROA) in the following t and $t-1$ years. Next, we estimate how this change in profitability is affected by separate channels of profit shifting scaled by total assets (turnover) using a panel-data fixed-effects estimator.

Second, we test **[Q2]** how much free cash flow they could allocate to investments fell due to shifting profits abroad through different channels and indirectly due to varying capital injections, including equity, debt, intangible assets, or strategic advisory. We utilise the fixed effects panel data model for this purpose.

Third, we investigate **[Q3]** how capital expenditures dropped as a consequence of profit-shifting through various channels using the Tobit panel model, based on positive changes in the sum of depreciation and amortisation and a differential between tangible and intangible assets in the two following years.

Fourth, we examine **[Q4]** whether equity-based and debt-based FDI (for which passive income is paid) added to firm growth compared to domestic companies without foreign equity injections that did not transfer earnings to non-residents. We apply the Tobit model, controlling for foreign shareholders. We assess which capital (equity, debt, intangible assets, or strategic advisory) adds to the firm or industry's growth. We test the hypothesis that profit shifting definitely limits growth, or whether there is evidence of growth-stimulating effects from foreign capital injections.

Furthermore, based on the analysis of the potential use of foreign capital by enterprises described in Section 2, we expect that:

H1: *Foreign ownership moderates the relationship between profit-shifting activities and firm performance.*

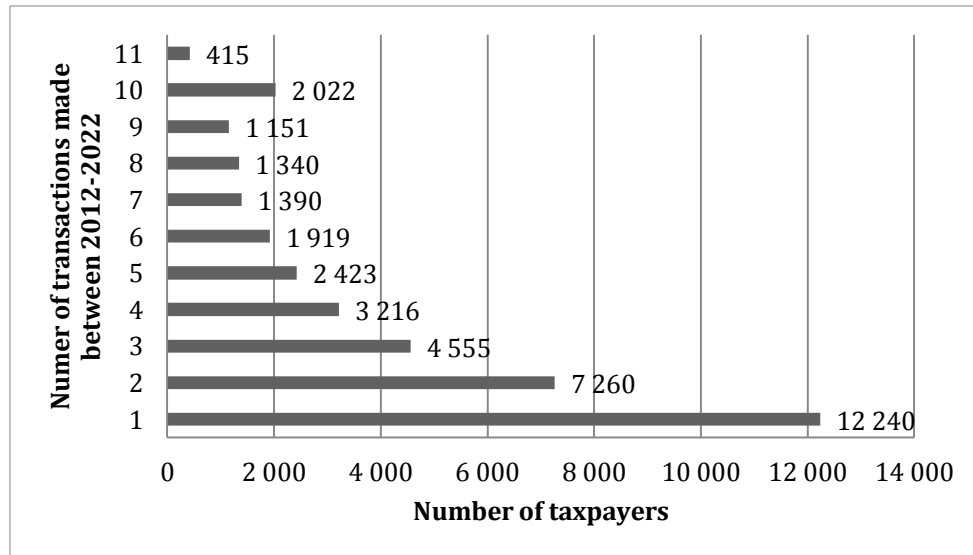
Specifically, foreign-owned firms are more likely to experience stronger effects of profit shifting through financial channels (interests) and weaker negative effects of profit shifting through intangible asset-related channels.

4. DATA SOURCES AND VARIABLE DEFINITIONS

The research sample covers data on beneficiaries from 134 countries who receive passive income transferred by over 40,000 Polish taxpayers (legal entities) and ca. 30,000 individuals (without financial reports) who paid WHT on this passive income and reported it in IFT-2R returns in 2012-2022. The number of payments made to non-residents has steadily

increased, as shown in Fig. 1. Out of the 40,000 Polish taxpayers (legal entities), only 415 made the transfer in each of the following eleven years analysed; 12,240 did so only once between 2012 and 2022, and 1,455 corrected the submitted IFT-2R tax form to negative numbers and therefore are counted as payers of zero payments. Statistics on the number of passive income transfers made abroad are shown in Figure 1.

Figure 1: Annual passive income flows frequency in 2012-2022



Source: Own elaboration based on IFT-2R returns using Stata/IC 16.0 software.

Using merged administrative data with financial and ownership data retrieved from the Orbis database for 2012 to 2022, we examine changes in taxpayers' profitability due to profit shifting to non-residents. For this purpose, the defined dependent and control variables will be used in individual estimations. Table 1 presents the definitions of all variables used. The baseline model to be estimated has the following form:

$$y_{it} = \beta_1 \text{foreign_shareholder}_{it} + \beta_2 \text{size_a}_{it} + \beta_3 \ln_PS_channel_s_{it} + \beta_4 \text{foreign_shareholder}_{it} \# \ln_PS_channel_s_{it} + u_{it}$$

$$y_{it} = \beta_1 \text{foreign_shareholder}_{it} + \beta_2 \text{size_a}_{it} + \beta_3 \ln_PS_channel_a_{it} + \beta_4 \text{foreign_shareholder}_{it} \# \ln_PS_channel_a_{it} + u_{it}$$

where: y – dependent variable: *ROS*, *ROA*, *FCFF*, *CAPEX*, *growth_S* ;

index i denotes the units of study 1, 2, ...,

index t represents the following years from 2012 to 2022.

Table 1: Definitions of variables

Variable	Definition
Dependent variables	
ROS	$\frac{\text{profit before tax}}{\text{operating turnover}}$
ROA	$\frac{\text{profit before tax}}{\text{total assets}}$
D. ROS	$ROS_t - ROS_{t-1}$, indicating the change in the year under review (t) compared to the previous year ($t-1$)

D.ROA	$ROA_t - ROA_{t-1}$, indicating the change in the year under review (t) compared to the previous year (t-1)
ln_FCFF	$\ln(1 + ((1 - \text{tax rate}) \times EBIT + \text{depreciation \& amortisation} - CAPEX - \text{working capital}))$, taking into account 19% as the main corporate income tax (CIT) rate
ln_CAPEX	$\ln(1 + (\text{tangible assets}_t - \text{tangible assets}_{t-1}) + (\text{intangible assets}_t - \text{intangible assets}_{t-1}) + \text{depreciation \& amortisation})$
growth_S	$\frac{\text{operating turnover}_t}{\text{operating turnover}_{t-1}}$
Control variables	
size_s	$\ln(1 + \text{operating turnover}_t)$
size_a	$\ln(1 + \text{total assets}_t)$
foreign_shareholder	a binary variable taking the value of one if a firm has at least one foreign shareholder and 0 otherwise
Test variables	
ln_PS_channel_s	$\ln(1 + \frac{\text{profitshifting}}{\text{operating turnover}})$, where profit shifting is a sum of taxable and non-taxable payments for each channel, i.e., dividend, interests, license and consulting.
ln_PS_channel_a	$\ln(1 + \frac{\text{profit shifting}}{\text{total assets}})$, where profit shifting is a sum of taxable and non-taxable payments for each channel, i.e. dividend, interests, license and consulting.

Source: Own elaboration based on Orbis database using Stata/IC 16.0 software

4.1. Statistical analysis of variables

The entire sample is split into manufacturing (34,276 obs.) and service (106,348 obs.) payers with passive flows to non-residents to verify whether the magnitude of profit shifting varies with the flexibility to change the location of group members (factories or service providers) in response to changes in tax regulations. Given the relatively “rigid” (difficult to alter) area of the manufacturing industry’s infrastructure, we expect more vital linkage to tax havens to occur in the service industry. This is directly related to the predominant type of capital available to both sectors: physical (fixed assets) and human. However, unlike tangible assets, such as warehouses and production halls, the services sector relies more on intangible assets, which offer greater relocation flexibility. A binary variable, *foreign_shareholder*, was also included in the analysis to indicate whether the taxpayer in question has foreign capital (1: 64,586 obs.) or not (0: 76,038 obs.). Table 2 presents the descriptive statistics for variables and also a summary of the sample breakdown by industry.

Table 2: Descriptive statistics of variables

Variable	Obs	Mean	Std. Dev.	Min	Max
continuous variables					
ROS	140,624	0.0154	0.3096	-1	.9369
D.ROS	140,624	0.3206	1.3133	0	11.11
ROA	140,624	0.0694	0.2726	-0,8797	0.7438
D.ROA	140,624	0.1388	0.2789	0	1.0847
ln_FCFF	140,624	1.5114	10.2372	-24.9566	22.6014

ln_CAPEX	140,624	5.1020	6.7617	0	25.1173
growth_A	140,624	0.7332	0.7136	0	4.7
growth_S	140,624	0.8083	1.1210	0	10.38
size_a	140,624	16.3078	2.5047	6.9087	26.8011
size_s	140,624	16.4276	2.4710	6.9087	26.4019
foreign_shareholder	140,624	0.4593	0.4983	0	1

Source: Own elaboration based on IFT-2R and Orbis Database.

4.2. Results

Based on the *D.ROS* and *D.ROA* variables measuring the difference in profitability across the following years, we answer question **Q1**.

Table 3: Breakdown by industry of the variables *D.ROS* and *D.ROA*

Percentiles	D.ROS			D.ROA		
	entire sample	manufacturing	services	entire sample	manufacturing	services
50%	0.0095	0.0100	0.0093	0.0122	0.0115	0.0124
75%	0.1014	0.0822	0.1092	0.1098	0.0930	0.1169
90%	0.5010	0.3212	0.5846	0.4814	0.3341	0.5536
Obs	140,624	34,276	106,348	140,624	34,276	106,348
Sum of Wgt.	140,624	34,276	106,348	140,624	34,276	106,348
Mean	0.3206	0.2408	0.3463	0.1388	0.1086	0.1486
Std. Dev.	1.3134	1.1614	1.3577	0.2788	0.2259	0.2932

Source: Own elaboration based on IFT-2R and Orbis Database.

The *D.ROS* variable breakdown (Table 3) shows that at the median, the loss on sales due to profit shifting is less than 1% of revenue, but in the third quartile, this loss is 10%, while the average loss due to transfers of profits is as much as 32% of revenue. The *D.ROA* variable breakdown shows that at the median, the loss in asset value due to profit shifting is a little over 1%; at the third quartile, the loss is more than 10% and the average loss due to profit transfer is as much as 13% of asset value.

Similarly, a breakdown of the *D.ROS* (*D.ROA*) variable shows that the median loss on sales (asset value) resulting from profit transfers in both the services and manufacturing sectors is approximately 1% of revenue. On average, the loss on sales due to profit shifting in services is 34.63 pp. of revenue, compared with 24.08 pp. in the manufacturing industry. The average loss in assets due to passive income transfers to non-residents is 14.86 pp. in services compared to 10.86 pp. in manufacturing.

Next, we analyzed changes in return on sales (ROS), free cash flow (ln_FCFF), and investment opportunities (ln_CAPEX) across individual channels, taking into account profit shifting within each analyzed channel and the interaction of individual payment channels with the *foreign_shareholder* variable. The estimation results are presented in Table 4.

Table 4: FE and Tobit results for ROS, ln_FCFF and ln_CAPEX

variable	ROS, fe	ln_FCFF, TOBIT II(0)	ln_FCFF, TOBIT ul(0)	ln_CAPEX, TOBIT II(0)
foreign_shareholder	(omitted)	1.9887*** (0.1638)	-2.370*** (0.2103)	2.1093*** (0.1346)
size_s	0.1031***	3.0521***	-2.210***	3.0912***

	(0.0007)	(0.0359)	(0.0426)	(0.0292)
ln_PS_dividend_a	0.0115**	1.5744**	10.200***	-0.1215
	(0.0073)	(0.5596)	(1.609)	(0.4273)
foreign_shareholder#c.ln_PS_dividend_a	0.0085**	-0.1808	-0.8990	-0.1967
	(0.0076)	(0.5835)	(1.668)	(0.4454)
ln_PS_interest_a	-0.0210***	-3.156**	1.5985	-6.634***
	(0.0113)	(1.361)	(1.590)	(1.2740)
foreign_shareholder#c.ln_PS_interest_a	0.0255***	-3.200**	-1.055	2.6504**
	(0.0132)	(1.575)	(1.761)	(1.3805)
ln_PS_licence_a	-0.0041**	2.6921***	-3.068***	2.6830***
	(0.0081)	(0.5750)	(0.7348)	(0.4309)
foreign_shareholder#c.ln_PS_licence_a	0.0214***	-2.324***	2.8919***	-1.968***
	(0.0110)	(0.7770)	(1.023)	(0.5802)
ln_PS_consulting_a	-0.0364***	-1.918***	1.3963**	-0.9624***
	(0.0053)	(0.4483)	(0.5583)	(0.3320)
foreign_shareholder#c.ln_PS_consulting_a	0.0214***	0.83834	-1.344**	0.9428**
	(0.0071)	(0.5695)	(0.7166)	(0.4155)
_cons	-1.6782*	-61.00	55.778	-56.41
	(0.0130)	(0.6227)	(0.7465)	(0.4993)
Number of observations	140 624	140 624	140 624	140 624
Number of groups	34 796	34 796	34 796	34 796
F test	1904.83***			
F test that all u _i =0	4.89***			
Wald test		8361.44***	3544.04***	12655.55***
LR test p-value		4567.53***	2762.33***	1.2e+04***

* p < 0.1, ** p < 0.05, *** p < 0.01, in parentheses, deviations of estimators (standard errors).

The results of the fixed-effects model indicate that the impact of profit shifting on firms' operational profitability (ROS) differs substantially depending on the channel through which profits are transferred. In the case of dividend-based profit shifting, the baseline coefficient equals 0.0115, while the interaction effect with foreign ownership amounts to 0.0085. Consequently, for firms with a foreign shareholder, the total effect increases to approximately 2,0 percentage points (pp). However, this result should be interpreted with caution, as the positive association may primarily reflect the fact that more profitable firms are more likely to engage in dividend transfers.

With respect to profit shifting conducted through interest payments, the estimated coefficient is negative and statistically significant at -0.0210, indicating that a 1% increase in interest-based profit shifting is associated, on average, with a decline in ROS of approximately 2.1 pp. This finding suggests that intra-group debt financing may reduce firms' operational efficiency by increasing debt servicing costs. At the same time, the positive interaction coefficient with foreign ownership (0.0255) implies that, in firms with foreign shareholders, the net effect becomes positive. Specifically, a 1% increase in profit shifting through the interest channel is associated with an increase in ROS of approximately 4.5 pp. in foreign-owned firms. This may indicate that multinational enterprises utilize intra-group financing more efficiently or combine it with additional organizational and technological advantages.

In the case of royalty-based profit shifting, the baseline coefficient equals -0.0041, suggesting a modest negative effect of this channel on the operational profitability of

domestic firms. However, the positive and statistically significant interaction effect with foreign shareholder (0.0214) results in a positive total effect of approximately 1.7 pp. for firms with foreign capital participation. This finding suggests that royalty transfers within multinational enterprise groups may enhance productivity through the transfer of technology, patents, and managerial know-how.

The strongest negative impact on ROS is observed for profit shifting conducted through consulting and management service fees. The estimated coefficient of -0.0364 indicates that a 1% increase in consulting-based transfers is associated, on average, with a decline in ROS of approximately 3.6 pp. Although the positive interaction effect with foreign ownership (0.0214) partially mitigates this negative relationship, the net effect remains negative at approximately -1.5 pp. These results suggest that payments for intangible services are primarily extractive in nature and may constitute an artificial mechanism for shifting profits abroad rather than supporting firms' productive activity.

Next, we apply a Tobit model estimation using the free cash flow to the firm (*FCFF*) as the dependent variable to resolve **Q2** on how much free cash flow they could allocate to investments that fell due to profit shifting. The strongest negative effect is observed for profit shifting conducted through interest payments, although this relationship is identified only for firms with positive cash flows (lower censoring at 0). The baseline coefficient equals -3.156 , indicating that an increase in interest-based profit shifting leads to a significant reduction in firms' free cash flows. Furthermore, the negative interaction coefficient with foreign ownership, amounting to -3.200 , implies that for firms with foreign shareholders, a 1% increase in profit shifting through the interest channel is associated, on average, with a decline in *FCFF* of approximately 6.36%. This finding provides strong support for the hypothesis that intra-group debt financing is used as a mechanism for profit shifting and the extraction of financial resources from subsidiary firms.

A negative impact on *FCFF* is also observed in the case of profit shifting conducted through consulting and management service fees. The estimated coefficient of -1.918 suggests that an increase in consulting-based transfers significantly reduces firms' cash flows. This result is consistent with the argument that management fees and payments for intangible services may serve as transfer pricing mechanisms facilitating the transfer of financial resources to related entities. In contrast, for firms with negative cash flows (upper censoring at 0), the total effect becomes positive, suggesting that transactions conducted by these firms with foreign-related entities are more likely to reflect genuine business activity rather than purely profit-shifting motives.

Different results are obtained for royalty payments. The baseline coefficient of 2.692 indicates a positive effect of this channel on *FCFF*. This may suggest that the use of intangible assets and intellectual property enhances firms' productivity and their ability to generate cash flows. At the same time, the negative interaction effect with foreign ownership (-2.324) reduces the total effect for foreign-owned firms to approximately 0.368. This finding implies that although royalty payments may have a productive character, part of

these benefits is offset within multinational enterprise groups by a greater scale of royalty-based profit transfers to parent companies.

Third, we use the Tobit model estimation with the logarithm of capital expenditures (*CAPEX*) as the dependent variable to check for **Q3** how much their (taxpayers') investments in tangible and intangible assets dropped. We consider only new investments as opposed to disinvestments. The Tobit model estimates for *CAPEX* indicate that firms with foreign ownership exhibit higher levels of investment activity than purely domestic firms. This finding is consistent with the view that foreign-owned enterprises benefit from greater access to capital, technology, and organizational resources, which may facilitate investment expenditures.

At the same time, profit shifting conducted through interest payments exerts a strong negative effect on corporate investment. The baseline coefficient equals -6.634 , indicating that an increase in interest-based profit shifting is associated with a substantial reduction in capital expenditures. Although the positive interaction term with foreign ownership (2.650) partially offsets this effect, the overall impact remains clearly negative. These results suggest that intensive reliance on intra-group debt financing may constrain firms' ability to undertake capital investments and support the view that intra-group borrowing may serve as a mechanism for profit shifting.

In the case of royalty payments, the baseline coefficient amounts to 2.683 , indicating a positive relationship between royalty-based profit shifting and firms' investment activity. This finding may reflect the role of technology transfers, intellectual property, and other intangible assets in supporting corporate investment. However, the negative interaction effect with foreign ownership (-1.968) reduces the total effect for foreign-owned firms to approximately 0.715 . This suggests that although royalty payments remain positively associated with investment expenditures, their beneficial impact is weaker within multinational enterprise groups, where a larger share of royalty payments may be directed toward parent companies.

A negative relationship is also observed for profit shifting conducted through consulting and management service fees. The estimated coefficient indicates that an increase in consulting-based transfers reduces firms' capital expenditures, suggesting that payments for intangible services may divert financial resources away from productive investment. This result is consistent with the interpretation that such transfers are more likely to serve as mechanisms for reallocating profits within multinational groups than as expenditures directly supporting firms' investment activity.

To verify the robustness of the main findings, the models were re-estimated using alternative measures of profit-shifting channels scaled by firms' sales revenues (*ln_PS_channel_s*). The results of these robustness tests, reported in Table 6 in the Appendix, are broadly consistent with the baseline findings and confirm the robustness of the main conclusions.

Fourth, we inspect trade-offs of equity-based and debt-based FDI (for which passive income in the form of dividends or interest is paid) and intangible and intellectual capital (whose costs are paid via royalties and immaterial service fees). We seek to test **Q4** whether foreign capital adds to firm growth compared to domestic firms (i.e., without foreign shareholders) that did not transfer earnings to non-residents. For this purpose, we apply the Tobit model using two alternative censoring specifications. First, a lower-censored Tobit model with a censoring threshold of 1, focusing on firms that recorded growth in sales revenues during the 2012–2022 period. Second, an upper-censored Tobit model with a censoring threshold of 1, capturing firms that experienced a decline in sales revenues over the same period. The estimation results are presented in Table 5.

Table 5: Tobit results for growth_S

variable	growth_S, TOBIT ll(1)			growth_S, TOBIT ul(1)		
	entire sample	manu-facturing	services	entire sample	manu-facturing	services
foreign_shareholder	-0.0121 (0.0129)	0.0282 (0.0220)	-0.0237 (0.0158)	0.0743*** (0.0048)	0.1155*** (0.0101)	0.0624*** (0.0055)
size_a	0.1267*** (0.0028)	0.0943*** (0.0050)	0.1439*** (0.0034)	0.0920*** (0.0009)	0.0993*** (0.0019)	0.0907*** (0.0010)
ln_PS_dividend_s	-0.3425*** (0.0617)	-0.2927*** (0.1119)	-0.3581*** (0.0734)	-0.0605*** (0.0189)	-0.0751* (0.0463)	-0.0572*** (0.0206)
foreign_shareholder# c.ln_PS_dividend_s	0.1672** (0.064)	0.12072 (0.1152)	0.1869** (0.0764)	0.0150 (0.0198)	0.0069 (0.0478)	0.0201 (0.0218)
ln_PS_interest_s	0.1782** (0.0737)	0.0599 (0.1848)	0.1869** (0.0831)	-0.0522** (0.0263)	-0.0288 (0.0803)	-0.0541** (0.0278)
foreign_shareholder# c.ln_PS_interest_s	-0.2502** (0.0883)	-0.1509 (0.2214)	-0.2627** (0.0996)	-0.0459 (0.0306)	-0.1344 (0.0968)	-0.0364 (0.0321)
ln_PS_licence_s	-0.0501 (0.0482)	-0.3091** (0.1300)	-0.0182 (0.0538)	0.1244*** (0.0174)	0.0087 (0.0506)	0.1386*** (0.0185)
foreign_shareholder# c.ln_PS_licence_s	0.0304 (0.0657)	0.2798** (0.1476)	0.0112 (0.0775)	-0.0766*** (0.0244)	0.0261 (0.0603)	-0.0841*** (0.0273)
ln_PS_consulting_s	0.1662*** (0.0309)	-0.0091 (0.1294)	0.1717*** (0.0335)	0.0522*** (0.0113)	-0.0196 (0.0549)	0.0500*** (0.0115)
foreign_shareholder# c.ln_PS_consulting_s	-0.1184** (0.0419)	-0.1046 (0.1448)	-0.0969** (0.0466)	-0.0234 (0.0154)	-0.0271 (0.0615)	-0.0072 (0.0161)
_cons	-1.804*** (0.0472)	-1.161*** (0.0894)	-2.118*** (0.0574)	-0.7833*** (0.0145)	-0.9284*** (0.0340)	-0.7579*** (0.0165)
Number of obs.	140 624	34 276	106 348	140 624	34 276	106 348
Number of groups	34 796	7 125	27 671	34 796	7 125	27 671
Wald test	2261.73***	431.97***	1875.76***	12095.71***	3014.22**	8652.04***
LR test p-value	594.20***	222.68***	409.64***	875.18***	191.44***	691.00***

* p < 0.1, ** p < 0.05, *** p < 0.01, in parentheses, deviations of estimators (standard errors).

For firms characterized by positive sales growth, dividend-based profit shifting exhibits a statistically significant negative association with revenue growth. The estimated coefficient of -0.3425 indicates that a higher intensity of dividend transfers relative to sales revenues is

associated with lower sales growth. However, the positive interaction term with foreign ownership (0.1672) partially offsets this effect, reducing the total impact for foreign-owned firms to approximately -0.175 . Similar results are observed in the services sector, where the mitigating effect of foreign ownership is particularly pronounced. These findings suggest that although dividend transfers may divert resources away from business expansion, multinational firms appear better able to absorb their adverse effects.

The results for interest-based profit shifting are markedly different. In the full sample, the coefficient is positive and statistically significant (0.1782), indicating that greater reliance on intra-group financing is associated with higher sales growth. This finding may reflect the role of debt financing in supporting firms' expansion and operational activities. However, the interaction term with foreign ownership is negative (-0.2502), implying that the overall effect becomes negative for foreign-owned firms. A similar pattern is observed in the services sector. This suggests that while debt financing may support growth in domestic firms, intensive use of intra-group borrowing within multinational groups may increasingly serve profit-shifting purposes, ultimately constraining sales growth.

Royalty-based profit shifting displays sector-specific effects. While no statistically significant relationship is observed for the full sample, a significant negative effect emerges in the manufacturing sector (-0.3091). Notably, this relationship is almost entirely offset by the positive interaction with foreign ownership (0.2798), resulting in a near-zero net effect. This finding may indicate that royalty payments within multinational manufacturing firms are associated with technology transfers, patents, and know-how that compensate for the potential negative consequences of profit shifting.

Consulting and management service fees exhibit a positive and statistically significant association with sales growth. The coefficient for the full sample equals 0.1662, while a similarly strong effect is observed in the services sector (0.1717). These findings suggest that expenditures on consulting and management services may enhance organizational efficiency and support business expansion. Nevertheless, the negative interaction with foreign ownership (-0.1184) indicates that the positive impact is considerably weaker among multinational firms, where part of these payments may be motivated by tax-planning considerations rather than genuine business needs.

A substantially different pattern emerges for firms experiencing declining sales revenues. In this group, foreign ownership itself exerts a positive and highly significant effect, indicating that foreign-owned firms tend to experience less severe sales contractions than domestic firms. This effect is particularly pronounced in the manufacturing sector, suggesting that multinational enterprises may benefit from greater resilience during periods of adverse market conditions.

Dividend-based profit shifting remains negatively associated with sales performance in firms experiencing declining revenues. The coefficient of -0.0605 indicates that higher dividend transfers are associated with deeper reductions in sales, while the interaction with foreign ownership is statistically insignificant. This suggests that dividend payments do not appear to support firms facing deteriorating market performance.

The effect of interest-based profit shifting also changes substantially in firms with declining sales. Unlike the positive association observed among growing firms, the coefficient becomes negative (-0.0522), indicating that greater reliance on intra-group debt financing is associated with stronger sales contractions. This finding supports the view that debt-based profit shifting may exacerbate financial constraints and reduce firms' ability to respond effectively to adverse market conditions.

In contrast, royalty payments exhibit a positive relationship with sales performance among firms experiencing declining revenues. The estimated coefficient of 0.1244 for the full sample and 0.1386 for the services sector suggests that access to intangible assets, proprietary technologies, and intellectual property may help firms mitigate declines in sales revenues. Although the positive effect is weaker in foreign-owned firms due to the negative interaction term, it remains positive overall. These results indicate that royalty payments may perform a productive function by facilitating technology transfer and enhancing firms' competitive capabilities even during periods of economic difficulty.

Similarly, consulting and management service fees display a positive association with sales performance among firms experiencing declining revenues. The positive coefficients suggest that such services may contribute to restructuring processes, organizational adaptation, and operational improvements that help firms limit the magnitude of sales declines.

5. CONCLUSIONS

In this study, we identified externalities of engagement in profit-shifting strategies by exploiting unique administrative tax data on passive income flows to 134 countries made by 40,000 corporate residents. The results of this study indicate that the impact of profit shifting on firm performance depends both on the specific transfer channel used and on the dimension of performance under consideration. In the case of operational profitability (ROS), the findings show that profit shifting through **interest payments and consulting fees is generally associated with lower profitability among domestically owned firms**. This pattern suggests that these mechanisms may raise operating costs and reduce the efficiency of resource allocation. However, the analysis also reveals that foreign ownership significantly moderates these relationships. For firms belonging to multinational groups, the negative effects of interest-based transfers and royalty payments are notably weaker, and in some cases even turn positive. **This implies that multinational enterprises may combine profit-shifting practices with productivity enhancing advantages**, such as access to cheaper financing, advanced technologies, managerial expertise, and superior organizational capabilities. Taken together, the evidence demonstrates that profit-shifting channels do not exert uniform effects on firm performance. Some intra-group transfers may simultaneously serve tax-planning purposes while also supporting productive improvements within firms.

The findings regarding free cash flow to the firm (FCFF) provide stronger evidence of the exploitative nature of certain profit-shifting mechanisms. Among the channels examined, **interest-based profit shifting has the most significant negative impact on firms' ability to generate free cash flow**. This impact is particularly pronounced in firms with

foreign capital, where the magnitude of the decline in FCFF is significantly greater. These results confirm the view that intra-group debt financing serves as an effective tool for transferring financial resources from subsidiaries to affiliated entities. **Payments for advisory and management services also reduce free cash flow**, indicating that such transfers may facilitate the relocation of profits within multinational groups. In contrast, **royalty payments show a positive relationship with FCFF**, suggesting that transfers involving intellectual property and intangible assets may generate productivity gains and enhance firms' ability to generate cash flows. In summary, the findings regarding FCFF indicate that financial channels are primarily associated with resource extraction, while transfers related to intangible assets may simultaneously support value creation within firms.

The analysis of capital expenditures (CAPEX) shows that profit-shifting practices can meaningfully influence firms' investment decisions. **The strongest negative effect appears in the case of interest-based transfers**, suggesting that extensive use of intra-group debt financing reduces the funds available for long-term investment projects. Although foreign ownership partly weakens this relationship, the overall impact remains negative, indicating that debt-driven profit shifting may constrain firms' investment capacity. In contrast, **royalty payments are positively associated with investment spending**. This pattern suggests that access to technology, patents, and other intangible assets encourages firms to invest and supports their long-term development. Transfers related to **consulting services show the opposite tendency: they are negatively linked to investment expenditure**, implying that at least some of these payments may divert resources away from productive investment. Overall, the investment results indicate that profit-shifting channels based on financial contracts tend to reduce firms' growth potential, while channels connected to technology transfer may stimulate investment and modernization. These findings are consistent with Hypothesis H1.

The results for sales growth provide additional evidence that the effects of profit shifting vary considerably across transfer channels and firm characteristics. **Dividend-based profit shifting is consistently associated with lower sales growth**, suggesting that the distribution of profits may reduce the resources available for business expansion. Interest-based profit shifting exhibits a more nuanced relationship. While **intra-group debt financing appears to support sales growth in domestic firms**, its effect becomes negative in foreign-owned firms, indicating that intensive use of debt within multinational groups may increasingly reflect profit-shifting motives rather than operating activity financing. In contrast, **royalty payments are positively associated with sales performance**, particularly among firms experiencing declining revenues, suggesting that access to technology, intellectual property, and intangible assets may strengthen firms' competitiveness and mitigate adverse market conditions. **Consulting and management service fees also display a positive relationship with sales growth**, which may reflect improvements in organizational efficiency and managerial practices. Overall, the sales growth results support Hypothesis H1 and indicate that channels linked to knowledge transfer and business support

services are more likely to contribute to firm expansion, whereas financial and dividend-based channels appear to be associated with weaker growth performance, especially in multinational enterprises. Finally, the results provide support for Hypothesis H1, which assumes that foreign ownership moderates the relationship between profit-shifting activities and firm performance. The findings indicate that foreign-owned firms are more strongly affected by profit shifting through financial channels, particularly interest payments, which are associated with lower cash flows, investment activity, and sales growth. At the same time, the negative effects of profit shifting through intangible asset-related channels, especially royalty payments, are considerably weaker and, in some cases, even positive. This suggests that while financial channels are primarily used for profit extraction, transfers related to intangible assets may simultaneously generate productivity-enhancing benefits through technology transfer and knowledge spillovers.

This way, our findings add original and unique value to existing knowledge on profit-shifting mechanisms, outcomes and externalities. Our conclusions have vital implications for policymakers who make economic decisions that influence trade-offs between FDI flows to boost industry growth and withholding taxation to limit profit-shifting via passive flows to non-residents, mainly outside the EU.

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Appendix

Table 6: Robustness check results for ROA, ln_FCFE and ln_CAPEX

variable	ROA, fe	ln_FCFE, TOBIT II(0)	ln_FCFE, TOBIT ul(0)	ln_CAPEX, TOBIT II(0)
foreign_shareholder	(omitted)	2.401*** (0.1646)	-1.17*** (0.2048)	1.9704*** (0.1382)
size_a	0.0578*** (0.0010)	2.555*** (0.0344)	-2.71*** (0.0433)	2.8983*** (0.0296)
ln_PS_dividend_s	0.0136** (0.0055)	0.9821** (0.4260)	7.301*** (1.365)	-0.9871*** (0.3886)
foreign_shareholder#c.ln_PS_dividend_s	0.0019 (0.0058)	-0.0809 (0.4574)	-0.5229 (1.429)	0.42486 (0.4105)
ln_PS_interest_s	-0.006** (0.0031)	-2.4252*** (0.3308)	0.9151*** (0.3525)	-2.814*** (0.2715)
foreign_shareholder#c.ln_PS_interest_s	-0.009** (0.0040)	-2.616*** (0.4382)	-0.1517 (0.4274)	0.00624 (0.3244)
ln_PS_licence_s	-0.032*** (0.0075)	1.495** (0.6407)	-3.450*** (0.7597)	2.1288*** (0.4497)
foreign_shareholder#c.ln_PS_licence_s	0.0307*** (0.0108)	0.0046 (0.9228)	1.675 (1.123)	-1.048 (0.6643)
ln_PS_consulting_s	-0.039*** (0.0036)	-4.532*** (0.4647)	-0.3637 (0.3821)	-1.240*** (0.2585)
foreign_shareholder#c.ln_PS_consulting_s	0.0187*** (0.0047)	0.76578 (0.5827)	-0.0679 (0.4884)	0.57643** (0.3239)
_cons	-0.871*** (0.0174)	-52.44*** (0.5860)	63.322*** (0.7579)	-52.86*** (0.4996)
Number of observations	140 624	140 624	140 624	140 624
Number of groups	34 796	34 796	34 796	34 796
F test	386.22***			
F test that all u _i =0	4.62***			
Wald test		6874.51***	4505.73***	11027.39***
LR test p-value		5080.40***	2726.57***	1.4e+04***

* p < 0.1, ** p < 0.05, *** p < 0.01, in parentheses, deviations of estimators (standard errors).