PROFIT SHIFTING FROM SERVICES AND MANUFACTURING: DOUBLE TAX TREATIES AND GENERAL ANTI-AVOIDANCE RULE

ABSTRACT

This study aims to investigate the impact of double tax treaties and the general anti-avoidance rule (GAAR) on profit shifting in the services and manufacturing sectors. We adopt the Knowledge-Capital framework to check whether transfers to non-residents are explained by trade theory dedicated to foreign direct investments. We apply the Generalised Method of Moments and difference-in-differences approach to administrative tax data of transfers to 110,907 non-residents in 134 countries from 2012 to 2019. Findings show that GAAR reduces profit shifting, except for interest. Service companies engage in more aggressive and frequent profit shifting than manufacturing firms, whose passive income payments abroad are well explained by the Knowledge-Capital model, reflecting the cost of foreign capital (i.e., dividends or interest). Fewer profits are transferred to tax havens on the EU list with double tax treaties. The destination for passive income transfers depends on exemption from withholding tax and double tax treaties, which allow non-residents to avoid taxation on dividends.

Keywords: passive income, profit shifting, double taxation treaties, general anti-avoidance rule, tax havens, tax avoidance

1. INTRODUCTION

Profit shifting—whereby multinational firms redirect taxable profit to low- or no-tax jurisdictions—presents significant challenges to state sovereignty, fiscal capacity, and public legitimacy. Political economists emphasise that profit shifting is not merely an economic calculus but a political contest: states compete for investment by offering tax concessions, while domestic electorates and institutions evaluate and resist revenue erosion. For instance, Shin (2017) finds that partisan dynamics influence the stringency of anti-avoidance measures, while Osterloh (2013) analyses the political factors shaping support for minimum corporate tax rates among European politicians. Other studies have highlighted how governance quality, institutional strength, and international cooperation (or its absence) modulate the effectiveness of anti-avoidance

frameworks (Sugathan & George, 2015) or used a theoretical gravity model of capital tax competition in order to check how institutional frameworks like EU membership fundamentally alter the dynamics of tax competition, providing essential context for understanding profit shifting incentives (Redoano, 2014).

Although recent scholarship, including Horodnic (2018), increasingly recognises the influence of informal institutions on taxpayer behaviour, research on profit shifting continues to be dominated by analyses of formal institutions, with legal instruments remaining central to the field. This study presents a comprehensive framework for evaluating the impact of institutional variations on profit-shifting mechanisms over time, with a focus on recently implemented General Anti-Avoidance Rules (GAARs) and consideration of the effects of country-specific blocklists and bilateral tax treaties.

The institutional perspective offers crucial analytical advantages for understanding profit-shifting mechanisms. Unlike purely economic approaches that focus primarily on tax rate differentials, institutional theory highlights how governance quality, legal frameworks, and political systems create varying incentives for multinational corporations to engage in profit-shifting activities. This theoretical lens reveals that profit shifting is not merely a response to tax arbitrage opportunities but reflects deeper institutional asymmetries between countries that create differential costs and benefits for tax avoidance strategies.

This study aims to identify how double treaty treaties and the general anti-avoidance rule affect profit shifting from service and manufacturing companies to countries engaged in harmful tax competition. We compare countries' participation in made transfers between states with harmful tax competition, as listed in the 2017 Ministry of Finance Regulation, with those identified by the European Union Commission.

"Profit shifting" refers to cross-border tax avoidance by multinational enterprises (MNEs), mainly through the use of related-party debt, royalties linked to intangibles and management fees, or other immaterial services related to transfer pricing (Dharmapala, 2014). Although paid out from profits after tax, dividends are reported in the IFT-2R form of payments to non-residents with passive income, such as interest, royalties, immaterial and performance services, marine and air transport, and foreign establishment income. Countries that engage in harmful tax competition and utilise tax havens have been widely employed in tax planning by multinational business group

members, providing an opportunity to conceal income from taxation (Dharmapala, 2014; Dyreng et al., 2017; Gumpert, Hines, & Schnitzer, 2016; Elemes, Blaylock, & Spence, 2021). Tax havens are typically small, well-managed countries with low or zero tax rates for foreign investors (Dharmapala & Hines, 2009). They are often non-transparent and non-engaged in exchanging information on entities registered within them, thereby facilitating transactions that are not subject to rigorous reporting oversight (Novib, 2016).

In Poland, the Ministry of Finance's blacklist pertaining to countries with harmful tax competition has been amended three times since 2012. It includes Andorra, Virgin Islands, Cook Islands, Hong Kong, Dominica, Grenada, Livery, Maldives, Monaco, Panama, Anguilla, Antigua & Barbuda, Sint-Maarten, Kingdom of Bahrain, Sark, Macau, Marshall Islands, Mauritius, Nauru, Niue, Samoa, Seychelles, Saint Lucia, Tonga, Vanuatu. Since 2005, the following have been excluded from this list: Bahamas, Barbados, Liechtenstein, Saint Kitts and Nevis, Saint Vincent and the Grenadines, Belize, Gibraltar, Montserrat, Turks and Caicos Islands, Aruba, Jersey, Isle of Man, and the Netherlands Antilles. No EU member states have been included on this ministerial list for diplomatic and political reasons. However, passive income transfers directed to the EU tax haven list are five times larger than those offshored to the non-cooperative jurisdictions listed by the Polish Ministry of Finance. The main ones are Cyprus, Bermuda, Luxembourg, Malta and Switzerland. EU tax havens can avail of the withholding tax exemption. Hence, passive income transfers primarily go to countries with preferential tax rates. Firms can then adjust their operations using aggressive tax planning systems to minimise their tax burden. For example, they could place their intangibles in a low-tax country in order to reduce taxes on royalty income (Dischinger & Riedel, 2011) or may take out intercompany borrowings and transfer debt to high-tax jurisdictions to maximise tax deductions on interest payments and thereby reduce their worldwide tax liabilities (Mintz & Smart, 2004; Hines & Hubbard, 1990; Collins & Shackelford, 1992; Froot & Hines, 1992; Grubert, 1998). Besides fiscal incentives, companies may be motivated to operate in tax havens due to less stringent regulatory oversight (Balakina et al., 2017). Reporting profits decrease in countries with high regulatory quality because opaque regulatory frameworks, increased secrecy (i.e., less transparency), and information-sharing barriers with other countries facilitate profit shifting (Fatic & Wildmer, 2018).

Our study looks at the issue of profit shifting (to countries with harmful tax competition) from the perspective of the recipients of payments (transfers) of passive income for their foreign direct investments (FDI) in the form of equity (dividends that measure the rate of return from equity) or debt (interests constitute a price for debt capital). In this scenario, one non-resident may have received transfers (dividend payments, royalties and interests) from several Polish payers. Therefore, we aggregated (summed) payments by payer, obtaining the total sum of passive income payments received in a given year by a non-resident from a given country. Hence, the panel is estimated at the level of the non-resident beneficiary of passive income payments (including dividends, royalties, interest on internal debt, management fees, and fees for other immaterial services) whose name and country of residence are known. Therefore, the explanatory variables used in the model are country-level variables. Over twice as many passive income transfers are made from the service industry as from manufacturing, although the latter requires more foreign investment and capital injections. Therefore, our paper aims to identify the differences in the determinants of profit-shifting activity between manufacturing and service industries and to assess their sensitivity to Double Tax Treaties (DTTs) in Base Erosion and Profit Shifting (BEPS) instruments. We adopt the Knowledge-Capital (KC) model framework to test whether transfers to non-residents are explained by international trade theory, specifically in the context of foreign direct investment (FDI).

The estimated specification is derived from the model, which includes two types of capital: human and physical. In this part of the model, we follow Cieślik (2019) and Białek-Jaworska and Klapkiv (2021), focusing on passive income outflows abroad as a return on FDI inflows to Poland. Following the KC model, we explain passive flows by the KC's explanatory variables, i.e. the similarities in economic size (measured by the Helpman's size dispersion index) and the relative physical and human capital factor endowments between the payer and the recipient countries (based on the Penn World Table 9.1 (Freenstra et al., 2019)). By assessing the statistical significance and signs of the estimated coefficients of these variables, we may check whether theoretical investment motives explain the cross-country pattern of passive income as a return on FDI. Therefore, our prediction of profit shifting depends on the ability to provide evidence that either the market access motive or the efficiency-seeking motive is relevant.

The research problem is still relevant because it contributes to the ongoing discussion on the need to introduce a global minimum tax in countries with a standard nominal corporate income tax rate of over 15% (Gschossmann et al., 2025; Boye, 2025; Dutt et al., 2019; Müller et al., 2024; Schjelderup & Stähler, 2024; Amendolagine et al., 2023; Gómez-Cram & Olbert, 2023; Nabavi & Nordström, 2023). Due to the decrease in Poland's income tax rate for small businesses to 9% in 2019 and the introduction of a 5% preferential IP box rate for income from qualifying intellectual property rights (5%), we are ending our analysis in 2019 to cover only the period in which CIT rate in Poland was at least 15%, i.e. at the level of at least the global minimum income tax. Moreover, our study exploits a dataset of tax data on single transactions between a payer and a non-resident to whom passive income was paid. The breakdown into industries - service and manufacturing - was made based on the PKD codes (the Polish equivalent of NACE codes) of the activities of passive income payers, which are entities (legal or natural persons) registered in Poland. In addition, following Sitkiewicz and Bialek-Jawoska's (2024) study, there remains a lack of studies in the literature that use tax data and analyse the impact of introduced regulations on profit transfers, considering the channels of payments made.

Furthermore, the majority of research has concentrated on US companies. Therefore, examining Polish passive income payments to non-residents could offer valuable insights for other European governments and financial institutions. In turn, analysing the effect of legal changes can have significant implications for policymakers.

The remainder of the paper is structured as follows. Section 2 presents the literature review on profit shifting to tax havens, its motivation and direction, and formulates the research hypotheses. Additionally, Section 2 presents the theoretical framework of double taxation treaties and their implications for profit shifting. Section 3 describes the data, variables used, and the research design, and then presents the empirical results and their interpretation. The last section provides a summary and discussion of the results obtained.

2. LITERATURE REVIEW

The General Anti-Avoidance Rule (GAAR), as enshrined in Article 6 of the Anti-Tax Avoidance Directive(ATAD), constitutes the single most important anti-avoidance

provision under EU law, aiming generally to prevent abuses of tax law in EU Member States.

In force in Poland since July 15, 2016. (and amended as of January 1, 2019), the regulations allowing the Head of the National Revenue Administration to apply GAAR primarily define the limits of legal tax optimisation.

GAAR indicates (Kuzniacki, 2021) that:

1. To calculate the corporate tax liability, the EU Member State shall ignore an arrangement to obtain a tax advantage that defeats the applicable tax law and is not genuine regarding all relevant facts and circumstances.
2. For the purposes of paragraph 1, an arrangement shall be regarded as non-genuine to the extent that it is not put into place for valid commercial reasons that reflect economic reality.
3. Where arrangements are ignored following paragraph 1, the tax liability shall be calculated under national law.

GAAR is an enforcement mechanism that gives a country's taxing authority broad power to deny taxpayers tax benefits associated with any transaction (Cowyx & Kerr, 2024). When analysing tax avoidance, the tax authority evaluates whether the taxpayer's action was artificial (i.e., if it was, such action does not result in a tax benefit). During the evaluation, the following factors are taken into account, among others[1]:

- unjustified splitting of operations,
- involvement of intermediaries despite the lack of economic or business justification,
- the occurrence of a pre-tax profit that is insignificant compared to the tax advantage not directly attributable to the economic loss actually incurred,
- involvement of an entity that does not pursue a genuine economic activity or does not fulfil an important economic function, or is established in a country or territory applying harmful tax competitive measures.

Based on the above analysis and the higher flexibility in transactions, we expect the service sector to be more sensitive to legislative changes than the manufacturing sector. Thus, we may state the following hypotheses:

H1A: *Passive income transfers from the services industry are sensitive to applying a General Anti-Avoidance Rule (GAAR).*

[1] Ministry of Finance' page: https://www.podatki.gov.pl/en/general-anti-avoidance-rule/ (access on 08.05.2025).

H1B: *Passive income transfers from the manufacturing sector are not sensitive to applying a General Anti-Avoidance Rule (GAAR)*.

Multinational firms in both developed and emerging markets have increasingly embraced the practice of tax optimisation by tapping into countries with competitive tax systems (Beugelsdijk et al., 2010; Chari & Acikgoz, 2016; Jones & Temouri, 2016; Jones et al., 2018; Pereira et al., 2019; Kemme et al., 2020). In addition, Torslow et al. (2020) indicate that nearly 40% of multinational corporate profits are transferred to tax havens annually. According to estimates by Cobham, Jansky, and Meinzer (2015), losses in global tax revenues from profit shifting could be as high as $130 billion annually.

Defining and distinguishing countries with harmful tax competition is still ambiguous for policymakers and the literature. The OECD presented the first list of tax havens in 2000. In subsequent years, many exclusions were made, i.e. Ireland and Switzerland, which are members of the OECD and are considered by many to be tax havens (indeed, these countries had been included in Hines and Rice's (1994) study on tax havens). The classification of tax havens continues to generate considerable controversy and criticism. Many countries are tax havens or exhibit tax haven characteristics, yet they are not included on the official list of tax havens. These jurisdictions include large countries such as the United States, the United Kingdom, the Netherlands, Denmark, Hungary, Iceland, Israel, Portugal, and Canada. Attention was also given to three US states: Delaware, Nevada and Wyoming. In addition, several smaller countries or areas, such as Campione d'Italia, an Italian city and those located in Switzerland, have been recognised as tax havens (Gravelle, 2009). Our study classifies tax havens and countries that engage in harmful tax competition, following the approach of Sitkiewicz and Białek-Jaworska (2024). Some countries were successively removed from the list; nevertheless, payments to them accounted for a marginal percentage (less than 0.1%).

Because the extracted lists differ significantly, to obtain more accurate conclusions, the study employs two explanatory dummy variables related to profit shifting: *tax_haven_MF*, which refers to countries listed according to the Polish Ministry of Finance's Regulations, and *tax_haven*, which refers to the EU tax-haven list.

Increasing tax competition has been observed to shift the tax burden from mobile capital to immobile workers and domestic small and medium-sized enterprises that are

less likely to relocate due to tax changes (Peralta et al., 2006). Similar to the study by Gumpert et al. (2016), our research sample was split into manufacturing and service sectors due to differences in the flexibility of affiliates' locations used to transfer profits in response to regulatory changes. Gumpert et al. (2016) results for German firms indicate that larger and more efficient manufacturing firms are most likely to have affiliates in tax havens, especially if they are located in high-tax countries. However, in the service sector, tax havens are less associated with higher tax rates. Hebous and Johannesen (2016) find that trade in services from tax havens partly reflects real specialisation in service industries, suggesting that institutional features such as low tax rates, secrecy and regulatory standards create a comparative advantage in service production. On the other hand, the structure of the holdings can influence the movement of profits between the two industries. In the manufacturing industry, fixed assets (such as machinery, equipment, factories, warehouses, and land) account for the majority, so profit shifting is expected to be lower than in the service industry, as it is difficult to change geographical locations. This is due to the dominance of human capital and intangible assets, which enable flexible location selection and change.
Souillard (2022) points out that companies tend to follow the profit-shifting schemes of their competitors, wherein when a company takes steps to avoid taxation in a tax haven, it is more likely that other corporations operating in the same sector will seek to take advantage of that same tax haven. Reforms against profit shifting could be more effective in the long run by focusing efforts on certain industries and offshore financial centres (OFCs). The fact that profit shifting is more prevalent in services and finance, as evident in the case of very aggressive offshore financial centres (OFCs), suggests that policymakers may want to pay closer attention to these industries and jurisdictions. Thus, we assume that

H2: *Service companies are engaged in aggressive (frequent) profit-shifting more than manufacturing.*

2.1. Double taxation treaties (DTTs) and their implications for profit shifting

International double taxation is when two or more tax sovereignties hold taxing authority over the same subject of taxation. This occurs when a country claims jurisdiction over income or capital based on its origin, and the other country claims jurisdiction based on the taxpayer's residence (Dumiter & Jimon, 2016). Therefore,

international legal double taxation involves comparable taxes imposed on the same taxpayer for the same title and period in two countries. Taxpayers risk a higher tax burden when operating abroad than entities concentrating their activities in only one country. The primary objective of double taxation treaties is to eliminate international double taxation through the legal norms established by the parties to the treaty.

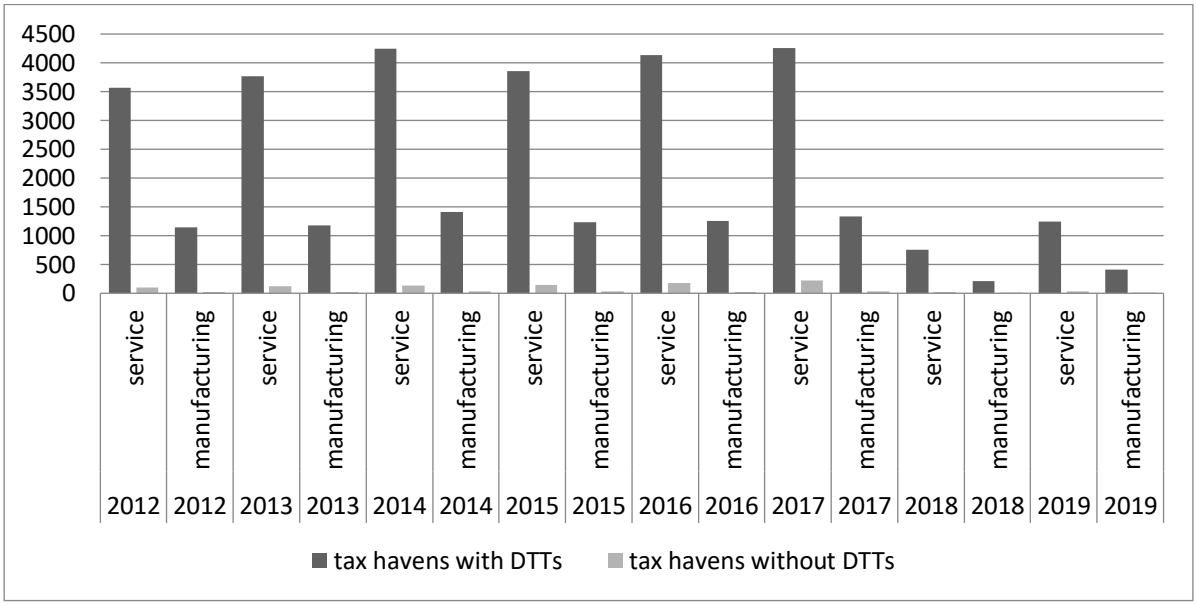
Due to the globalisation of the world economy and the liberalisation of international trade, the importance of tax treaties has increased significantly in recent years. Currently, the number of tax treaty agreements exceeds 2.500. Poland's treaty base currently includes as many as 87 existing DTTs. The purpose of bilateral tax treaties is typically expressed in their preamble to be "the avoidance of double taxation and the prevention of fiscal evasion". Bert (2011) emphasises that DTTs have as main objectives to *"reduce or eliminate the burden of double taxation on the same income, establish cooperation between the taxing authorities of the contracting states, promote trade and investment between contracting states through clauses that permit the establishment of a tax burden that does not hamper the normal flow of capital, provide a fair division of tax revenues between contracting states and combat tax evasion and fiscal fraud."*

Actually, there are measures in place to prevent situations of double taxation, where the same income of the same taxpayer is taxed twice—that is, by each tax jurisdiction. Parties to such an agreement must agree on how to fairly 'split' tax revenues, determine where the taxpayer must pay the tax and what mechanisms the taxpayer must use to eliminate double taxation. For example, double tax treaties contain tie-breaker rules that determine a taxpayer's residency in only one of the countries in which they are a resident. They also limit or exclude source-country tax on some types of income and require countries of residence to provide source-country tax benefits in the form of a tax deduction or exemption on foreign-sourced income (Uckmar, 2006). Most tax treaties have another equally important operational goal, i.e. preventing tax evasion. This goal is a counterbalance to the elimination of double taxation. Prevention of tax evasion primarily refers to cases in which taxpayers deceptively hide income in an international environment and rely on the inability of tax administrations to obtain information abroad (Uckmar, 2006). Nevertheless, an analysis of our data shows (Figure 1) that most transfers are directed to tax havens with double tax treaties.

In addition to several benefits (encouraging foreign direct investment by investors, reducing investor uncertainty about the foreign tax system, combating tax evasion, and

avoiding double taxation), signing DTT also incurs certain costs. This is because adapting various provisions requires hard work. Additionally, some provisions may conflict with domestic legislation, potentially compromising state independence. Furthermore, given that taxation is applied according to the taxpayer's residence, there is a possibility of losing some fiscal revenue (Barthel et al., 2010).

Figure 1. Number of beneficiaries in tax havens*



** Due to the difference in the number of payers by sector, the average number of beneficiaries per payer was calculated, i.e. for the service sector: 0.1622 and for the manufacturing sector: 0.1230 beneficiary/payer*

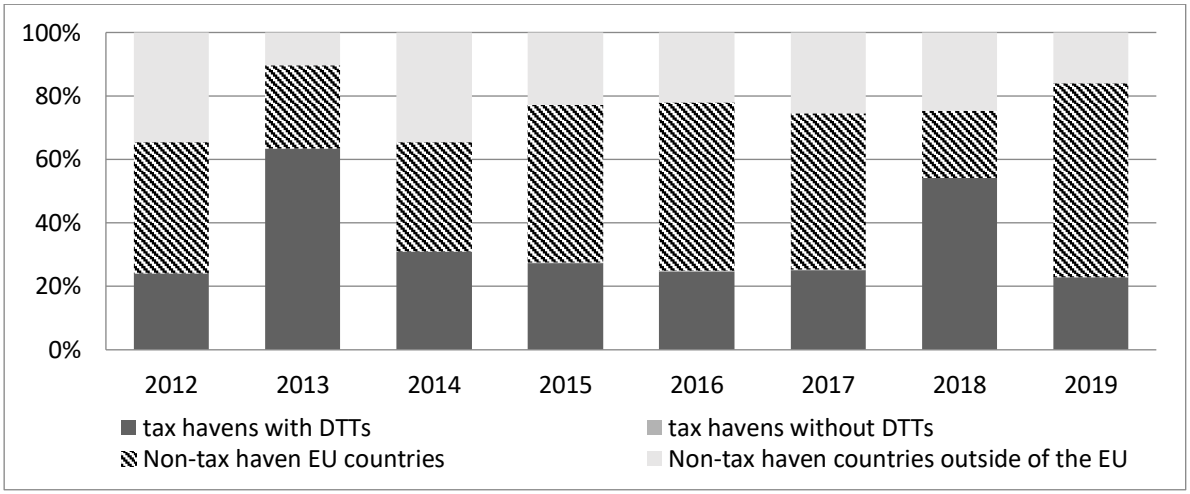
Source: Own elaboration based on IFT-2R returns.

Because double taxation is a significant barrier to international trade and mutual investment, DTTs are one of the most important and fundamental elements of economic cooperation between countries. International regulations, such as DTTs, on exchanging tax information between countries' tax administrations. The EU and the OECD are also involved in issues of mutual administrative cooperation in tax matters. The exchange of tax information is a crucial instrument for the effective taxation of foreign income, the proper application of DTTs, and, in a broader context, the prevention of income concealment abroad, i.e., tax evasion.

Figure 2 illustrates the distributions of transfers made by recipients' location, while Figure 3 shows these payments by sector. In addition to the transfers made to tax havens with DTTs, a large portion are payments made to EU countries not classified as tax havens (Fig. 2), i.e. those not on the list of countries considered to use harmful

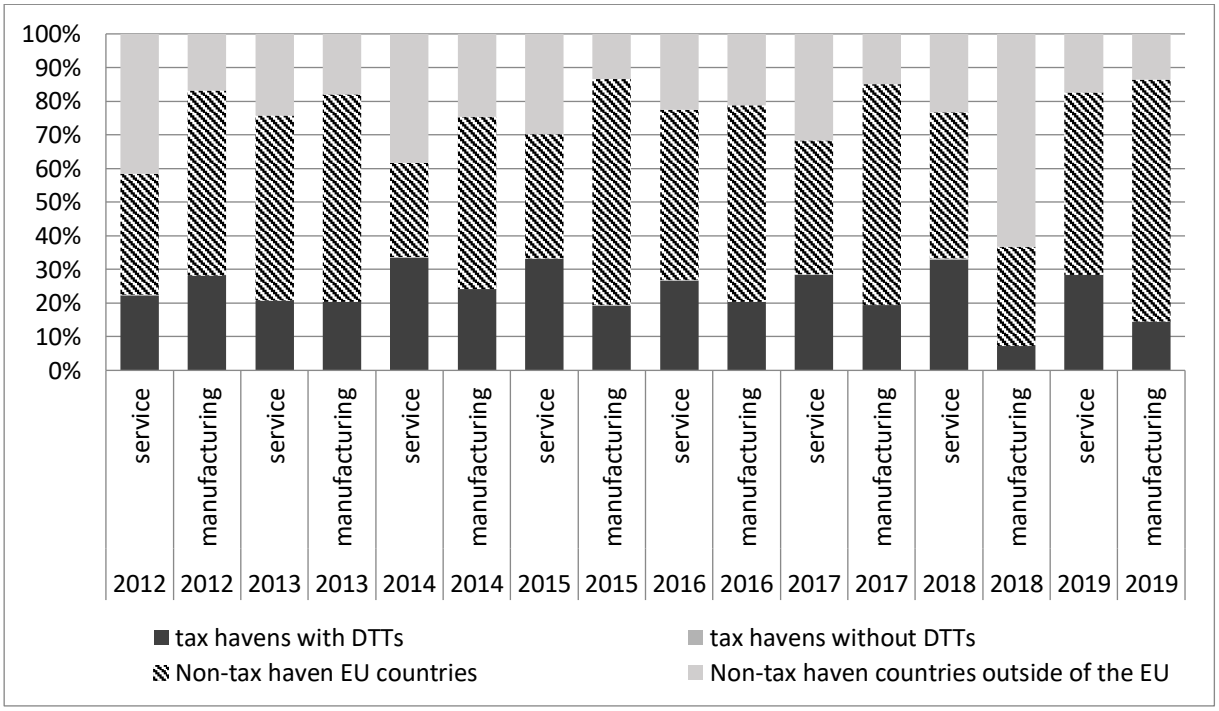
tax competition, such as the Netherlands. The main direction of transfers is to tax havens that have signed DTTs, and EU countries are not listed as tax havens. Figure 3 shows that from both the service and manufacturing sectors, most payments are directed to EU countries that are not classified as tax havens.

Figure 2. Structure of transfers by destinations



Source: Own elaboration based on IFT-2R returns.

Figure 3. Structure of transfers by location and by sector



Source: Own elaboration based on IFT-2R returns.

For the services sector, the second destination is non-EU countries, whereas the manufacturing sector channels payments to tax havens through DTTs. Since 2018, as a likely consequence of GAAR implementation, the direction of payments has shifted - fewer payments are made to tax havens with DTTs. However, this effect is more visible in the manufacturing sector than in services. Furthermore, service firms have decreased payouts outside the EU.

2.2. Impact of double tax treaties (DTTs) on tax base erosion and profit shifting

According to the OECD, profit shifting to tax havens is a significant source of tax base erosion (OECD, 2013). Fifteen actions under the "OECD/G20 BEPS" project, a set of principles and instruments, have been developed to prevent tax avoidance by ensuring that profits are taxed where the economic activities generating those profits are carried out. One of the activities is a project aimed at combating the unauthorised use of double taxation treaty agreements (OECD, Action 6, 2015).

The OECD acknowledges that abusive practices and treaty shopping (the acquisition of double tax treaty benefits) are among the most significant causes of BEPS (OECD, 2015). The action recommends the adoption of a three-step strategy to combat treaty shopping and abuse (Grant Thornton, 2015):

1. Double tax treaties should undoubtedly indicate that they do not create opportunities for double non-taxation or tax reduction through tax evasion or avoidance (including treaty shopping).
2. The Limitation on Benefit scheme should be applied to limit the availability of treaty benefits so that only entities that comply with strict conditions benefit from them, ensuring a strong connection between the entity and the country of residence.
3. A more general anti-abuse rule should be implemented based on the underlying purposes of the transaction or arrangement or the implementation of the Principal Purpose Test.

In addition, it also recommends the use of other tools to combat specific forms of fraud, such as (Grant Thornton, 2015):

- dividend transactions aimed at artificially reducing the withholding tax burden,
- avoidance of withholding tax on shares whose value is mainly based on real estate,
- cases of companies that may potentially have dual residency,
- tax avoidance through the use of establishments in third countries.

Consequently, some DTTs have been amended recently to eliminate certain tax planning opportunities or introduce mechanisms to prevent their avoidance (e.g., agreement with Luxembourg or Cyprus). There are ongoing procedures to renegotiate the terms of agreements with the Netherlands and the United States, among others (KPMG, 2015). Thus, based on the review of the literature on the role of double tax treaties, we hypothesise that:

H3: *More profits are transferred to the countries on the EU tax havens list with double tax treaties than without DTTs.*

3. RESEARCH DESIGN

We analyse the factors affecting profit shifting using country-level data following the Knowledge Capital model specification adopted in the literature to investigate a profit-shifting phenomenon (Białek-Jaworska & Klapkiv, 2021; Fatica & Gregori, 2020). The dependent variable in the model is *profit_shifting*, defined as the logarithm of the sum of all individual passive flow types reported in the IFT-2R return. Hence, the dependent variable aggregates passive income from (1) dividends, (2) interests, (3) immaterial services like advisory, accounting and legal services, (4) royalties, (5) charges for the export of cargo and passengers accepted for transportation in Polish ports by foreign enterprises, (6) air navigation, (7) show business and (8) royalties and dividends from a foreign branch situated in Poland under Art. 21 and 22 of the CIT Act and capital gains. The research sample comprises 110,907 beneficiaries from 134 countries who received passive income transferred by Polish taxpayers (both legal entities and individuals), as reported in the IFT-2R returns for 2012-2019. The models were estimated for the dependent variable, profit_shifting, which was counted jointly for the whole sample as well as for the service and manufacturing sectors separately.

The explanatory variables in the Knowledge Capital model are similarities in economic size and terms of physical and human capital endowment between Poland and the country with passive income benefits. The variable sdi_{ij} measures countries' similarity in relative economic size using the bilateral Helpman Dispersion Index. It is calculated using real GDP at chained purchasing power parity (PPP) data expressed in 2011 US dollars for Poland and each passive income payment recipient country:

$$sd_{ij} = 1 - gdp^2_{i_{sum}} - gdp^2_{j_{sum}}$$

where the $gdp_{i_{sum}}$ variable is the share of country *i* in the sum of the GDP of the beneficiary and contributor countries.

The difference in physical capital (fixed assets) between Poland and the beneficiary country is defined as the logarithm (*ln_kdiff*) of the difference in fixed assets per worker between the country receiving payments and the country making the payments (Poland). Physical capital was calculated based on the national capital stock expressed in PPP and the number of employed workers. Similarly, an index of the human capital endowment of a pair of countries (*hdiff*) was used based on the average number of schooling years and the returns to education. The *sum* is the sum of Poland's GDP and the beneficiary country's GDP. Therefore, we expect a positive coefficient for the total market size, assuming that higher transfers are allocated to larger economies, as predicted by the gravity model. The source of this data was Penn World Table 10.0 (www.ggdc.net/pwt). The *distance* variable defines the distance between Warsaw (Poland's capital city) and the beneficiary country's capital city. We expect a negative impact on profit shifting due to the transportation cost barrier (as in Cieślik, 2019), i.e., the greater the distance between the parties, the lower trade and, therefore, less passive income when treated like the cost of capital. The www.indo.com/distance website was used to find the latitude and longitude of two places and then calculate the distance between the capitals (as the crow flies).

The explanatory variables are the determinants of profit-shifting to tax havens, selected based on the literature review in Section 2. The main test variable is *gaar*, which is used as a dummy variable to indicate the effect of GAAR introduced in Poland on 15 July 2016 on testing **hypotheses** that p*assive income transfers from the services industry are sensitive to applying GAAR* (H1A) and *that manufacturers are insensitive to these changes* (H1B). The other test variables, *tax_haven_MF* and *tax_haven_DTT/ tax_haven_noDTT*, are used to test hypothesis H2 that s*ervice companies are engaged in aggressive (frequent) profit-shifting more than manufacturing* and H3 regarding the significance of profit transfers to countries classified as tax havens in the EU list, with consideration to countries with DTTs. In addition, the model includes control variables used in previous empirical studies (Gumpert et al., 2016; Białek-Jaworska & Klapkiv, 2021; Fatica & Gregori, 2020), such as institutional factors and governance quality, measured by the Kaufmann Global Governance Indices, to capture differences in the macroeconomic development of beneficiaries. We control institutional settings using *tax burden* (in the payment beneficiary country), *labour*

freedom, trade freedom, *financial freedom* (indicating freedom of labour movement, trade, and financial transactions), and *market capitalisation* of the stock exchange in the beneficiary country. The values of these indicators were obtained from the Heritage Foundation (www.heritage.org). Kaufmann's Worldwide Governance Indicators (including *regulatory quality*, *voice and accountability*, *political stability and the absence of violence*, *government effectiveness*, *the rule of law*, and anti-corruption instruments) (www.govindicators.org) influence the institutional environment and governance. We also control for the *ln_wht* variable, which reflects the logarithm of total withholding tax paid by Polish payers for all types of passive payments and is reported in the IFT-2R return. Due to the reduced benefit of tax avoidance resulting from the WHT burden, we expect a negative impact on profit shifting. However, WHT taxed less than 7% of passive income transfers from 2012 to 2019.

Three test dummy variables, *gaar*, *tax_haven_MF*, and *tax_haven_EU* (split into *tax_haven_DTT* and *tax_haven_noDTT*), are defined in Table 1. Only 2.1% of transactions are shifted to countries that engage in harmful tax competition, as listed by the Polish Ministry of Finance, while almost 10.5% of transactions go to tax havens from the EU list. Over twice as many passive income transfers are made from the service industry than manufacturing, although the latter requires more foreign capital injections. The entire sample is divided into subsamples of manufacturing (29%) and service payers (71%) of passive flows to non-residents to determine whether the amount of profit shifting varies due to the group members' ability to relocate their factories or service providers in response to the introduction of GAAR. We anticipate that the service sector will have greater critical connectivity to tax havens due to the manufacturing industry's infrastructure being generally "rigid" (difficult to modify). This relates to the two main forms of capital that both sectors have access to: human and physical (or fixed assets). However, unlike physical assets such as manufacturing facilities and warehouses, the services industry relies more on owning intangible assets, which enable flexible movement and operation. We apply a two-stage Arellano-Bover/Blundell-Bond system GMM estimator for dynamic panel data analysis (Blundell & Bond, 1998) and the Difference-in-Differences method. The baseline model to be estimated has the following form:

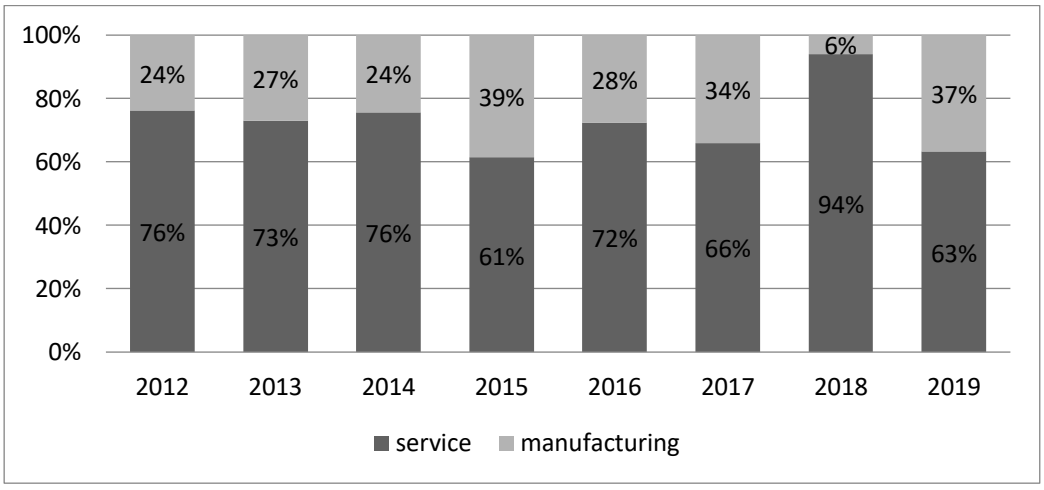
$$ln\_profit\_shifting_{it} = \beta_0 ln\_profit\_shifting_{it-1} + \boldsymbol{\beta_1 gaar}_{it} + \boldsymbol{\beta_2 tax\_haven\_MF}_{it} + \boldsymbol{\beta_3 tax\_haven\_DTT(tax\_haven\_noDTT)}_{it} + \beta_4 institutional\ variables_{it} + \beta_5 Knowledge\ Capital\ model_{it} + \beta_6 ln\_wht_{it} + \beta_7 wgi_{it} + u_{it} \quad (1)$$

where:

- institutional variables that capture differences in the macroeconomic development of the payment beneficiaries include tax burden, labour freedom, trade freedom, financial freedom, and market capitalisation used together;
- the *Knowledge Capital model* covers variables from the specification of this model, i.e., *distance, sd$_{ij}$, ln_kdiff, hdiff, sum* used together;
- *wgi* states for one of six Worldwide Governance Indicators of governance quality: *voice_and_accountability, control_of_corruption, rule_of_law, regulatory_quality, political_stability, government_effectiveness*;
- index *i* denotes the recipient, index *t* represents years from 2012 to 2019;
- u_{it} means the random component.

The profit-shifting distribution by sectors and time is shown in Figure 4. On average, the service sector accounts for 75% of passive income. This supports hypothesis H2, indicating that the service sector is more frequently engaged in profit shifting.

Figure 4. Structure of profit-shifting by sector and time

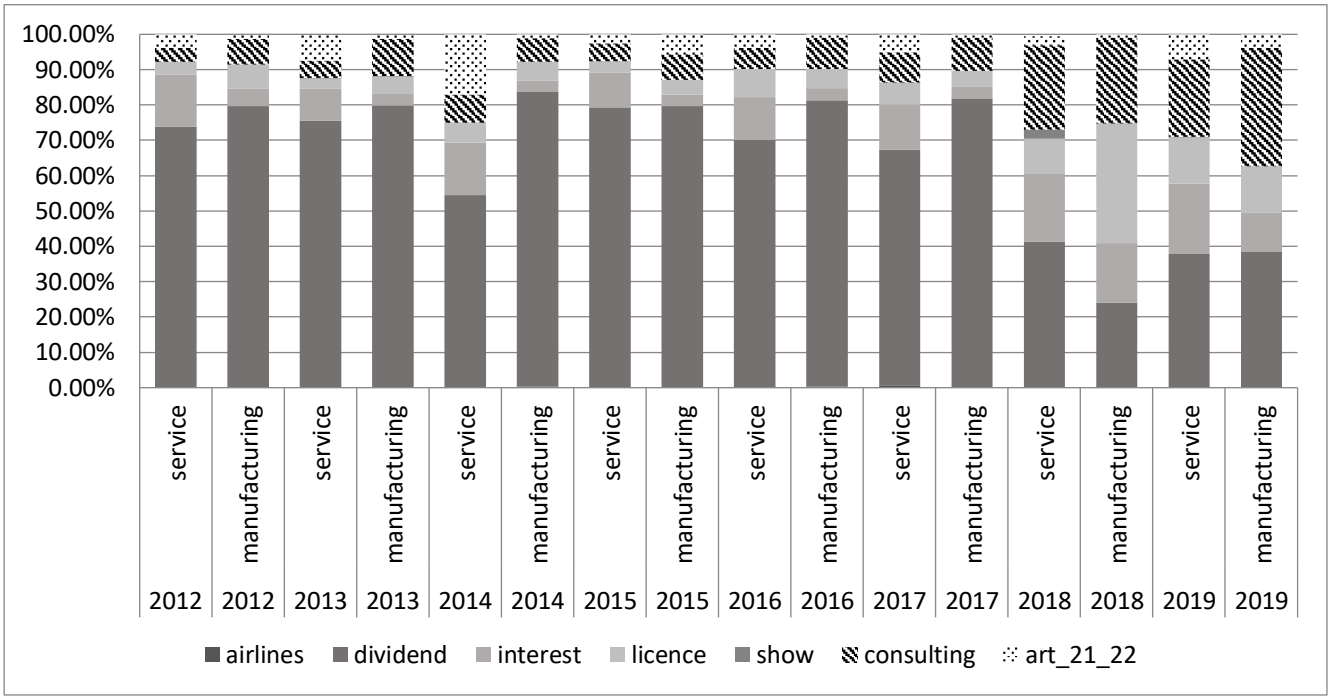


Source: Own elaboration based on IFT-2R returns.

The type structure of the aggregate *profit_shifting* variable by sector and year analysed is shown in Figure 5. Based on this, we observe that the channels through which

payments were made have changed, especially since 2018, which may reflect the legal changes being introduced, including the GAAR.

Figure 5. Structure of the *profit_shifting* variable by channels



Source: Own elaboration based on IFT-2R returns.

Table 1 presents the definitions of the test variables and explains the signs of the coefficients associated with them that we expect to support the hypotheses. Table 2 presents the descriptive statistics of control variables that address institutional factors, the macroeconomic environment, and the Knowledge-Capital framework.

Table 1. Definitions of test variables and the expected signs of their parameters

	Test variables	Definition	Sign	Source
H1A H1B	gaar	a dummy variable indicating the General Anti-Avoidance Rule in force in Poland that takes the value of one for 2018-2019 and zero otherwise Since 15 July 2016, legislation has been in force that allows the Head of the National Revenue Administration to apply a general anti-avoidance rule (GAAR). These provisions, amended as of 1 January 2019, define the limits of tax optimisation that are legal.	-	General Anti-Avoidance Rule www.podatki.gov.pl
H2	tax_haven_MF	a binary variable taking the value of one for countries listed in the Polish Ministry of Finance Regulation applying harmful tax competition, amended in 2017, and zero otherwise	+	Regulation MF 17.05.2017 Journal of Laws 2017 item 997
	tax_haven_EU	a binary variable taking the value of one for countries on the EU list of tax havens		EU Commission list of tax havens

H3	tax_haven_DTT	a binary variable taking the value of one for countries on the EU list of tax havens with DTTs and zero otherwise	+	MF list of DTTs www.podatki.gov.pl
H3	tax_haven_noDTT	a dummy variable taking the value of one for countries on the EU list of tax havens without DTTs and zero otherwise	-	MF list of DTTs www.podatki.gov.pl

Source: own elaboration.

Table 2. Descriptive statistics of control variables

	Obs	**Mean**	**Std.Dev.**	**Min**	**Max**
tax_burden	232,995	64.124	12.437	0.00	99.90
labour_freedom	232,995	64.851	16.852	0.00	98.50
trade_freedom	232,995	86.359	3.6061	0.00	95.00
financial_freedm	232,995	46.324	24.083	0.00	90.00
market_capitalisation	232,995	60.922	56.671	0.00	303.52
distance	226,294	2230.001	2714.53	393	17695
sdij	231,489	0.3205	0.1362	0.0025	0.499
ln_kdiff	226,118	12.582	0.5761	6.819	13.59
hdiff	231,489	0.7593	2.2174	-0.215	26.29
sum	231,489	14.941	0.8725	13.794	16.89
ln_wht	233,146	3.555	4.2853	0.00	20.72
voice_and_accountability	229,773	1.164	0.4626	-2.25	1.74
control_of_corruption	229,773	1.357	0.731	-1.53	2.41
rule_of_law	229,773	1.405	0.597	-1.82	2.13
regulatory_quality	229,773	1.3727	0.514	-2.07	2.26
political_stability	229,773	0.633	0.481	-2.7	1.64
government_effectiveness	229,773	1.3661	0.517	-2.08	2.24

Source: own elaboration.

4. RESULTS

Regression equations in Table 3 were estimated using a two-stage Arellano-Bover/Blundell-Bond system GMM estimators with instrumental variables appropriate for dynamic panel data analysis of the model described in section 3 differing in the countries classified as tax havens listed in the 2017 Ministry of Finance Regulation (*tax_haven_MF*), compared to those identified by the EU Commission concerning countries with DTTs (*tax_haven_DTT*) and without them (*tax_haven_noDTTs*).

Table 4 presents estimates of profits shifted to non-residents by a subsample of passive income payers, separated by sector (services and manufacturing). Separate models include test variables for tax havens, as classified by the Ministry of Finance and the EU list, due to their similarity.

Negative coefficients at the lag variable *profit_shifting* for the entire sample (Table 3) and the manufacturing and service sectors separately (Table 4) show a declining trend in the scope of this phenomenon over time. The negative coefficient estimates for the *gaar* variable indicate that GAAR decreased profit shifting in all analysed countries, including when examining the service and manufacturing sectors separately. The new regulations have defined the limits of legal tax optimisation. There has also been an increase in the control of tax authorities over business transactions with foreign entities. Thus, the estimation results are as expected and do not provide grounds to reject hypothesis **H1A,** which states that the GAAR regulations have reduced profit shifting for the entire sample and the services. However, for the manufacturing sector, we also received a significant negative estimate for the parameter at the *gaar* variable. This implies that the sector also experienced a decline in profit shifting due to the introduction of GAAR regulations, leading to the rejection of hypothesis **H1B**. Contrary to the H1B hypothesis, our findings indicate that the manufacturing sector is sensitive to these changes.

The results for the entire sample (Table 3) and the service companies (Table 4) suggest that more profits are allocated to the countries listed in the Polish Ministry of Finance's Decree of May 2017, while less is transferred from manufacturing firms. Taking into account that models (6)-(7) for the service subsample include a three-year lagged dependent variable, this positive estimation of a coefficient at this test variable does not provide grounds to reject hypothesis **H2** that the service companies are more engaged in aggressive (frequent) profit-shifting than manufacturing.

Table 3. GMM results for profit-shifting in the entire sample

	(1)	**(2)**	**(3)**
L1.ln_profit_shifting	-0.1011***	-0.2397***	-0.2400***
	(0.0163)	(0.0119)	(0.0119)
L2.ln_profit_shifting		-0.1852***	-0.1890***
		(0.0091)	(0.0090)
L3.ln_profit_shifting	-0.0728***		
	(0.0101)		
gaar	**-0.9037*** **	**-0.7694*** **	**-0.8092*** **
	(0.0821)	(0.0650)	(0.0633)
tax_haven_MF	**2.2273*** **		
	(0.8030)		
tax_haven_DTT		**-2.3365*** **	
		(0.5886)	
tax_haven_noDTT			**0.5621** **
			(0.2994)
tax_burden	-0.0208*	0.0271**	0.0212**

	(0.0125)	(0.0100)	(0.0096)
labour_freedom	0.0132***	0.0091***	0.0077***
	(0.0042)	(0.0027)	(0.0027)
trade_freedom	0.1140***	0.0474***	0.0446***
	(0.0234)	(0.0131)	(0.0131)
financial_freedom	-0.0154**	-0.0057	-0.0058
	(0.0056)	(0.0041)	(0.0039)
market_capitalisation	0.0026*	0.0038***	0.0035***
	(0.0015)	(0.0008)	(0.0007)
distance	-0.0001	-0.0001	-0.0001
	(0.0001)	(0.0001)	(0.0001)
sd_{ij}	-0.7008	-4.2912***	-4.5895***
	(1.5930)	(1.1315)	(1.1500)
ln_kdiff	0.5757*	2.0301***	1.9985***
	(0.3431)	(0.2049)	(0.2050)
hdiff	-0.9391***	-0.5427***	-0.7230***
	(0.1636)	(0.1321)	(0.1317)
sum	-0.2697	-0.9119***	-0.8472***
	(0.2464)	(0.1561)	(0.1538)
ln_wht	0.1679***	0.1577***	0.1572***
	(0.0087)	(0.0066)	(0.0066)
DID (gaar × tax_haven_MF × WHT_paid)	-1.1874**		
	(0.3447)		
DID (gaar × tax_haven_DTT × WHT_paid)		-0.5933**	
		(0.2629)	
DID (gaar × tax_haven_noDTT × WHT_paid)			1.1951
			(0.2638)
wgi* control of corruption	1.3519***	1.0946***	-0.2071***
	(0.4871)	(0.2521)	(0.2450)
Number of observations	34,840	56,028	56,028
Number of groups	17,435	24,126	24,126
Number of instruments	39	42	42
Wald test	3,861.82***	7,028.36***	7,049.57***
Arellano-Bond test AR(2)	-0.2677	1.8223	1.9722
p-value	0.7889	0.0684	0.0486

* p < 0.1, ** p < 0.05, *** p < 0.01, in parentheses deviations of estimators (standard errors).
* significant coefficients at almost all *Kaufmann indicators*, except for *regulatory_quality*

Source: Own elaboration.

Table 4. GMM results for profit-shifting in manufacturing and services

	manufacturing		**services**	
	(4)	**(5)**	**(6)**	**(7)**
L1.ln_profit_shifting	-0.2355***	-0.2391***	-0.0957***	-0.0909***
	(0.0119)	(0.0119)	(0.0200)	(0.0200)
L2.ln_profit_shifting	-0.1803***	-0.1870***		
	(0.0089)	(0.0088)		
L3.ln_profit_shifting			-0.0806***	-0.0793***
			(0.0122)	(0.0122)
gaar	**-0.7851*** **	**-0.7865*** **	**-0.9852*** **	**-0.9606*** **
	(0.0660)	(0.0667)	(0.1053)	(0.1084)
tax_haven_MF	**-0.2901** **		**2.3235** **	
	(0.4521)		(0.9130)	
tax_haven_EU		0.4098		0.4888
		(0.4729)		(0.8353)

tax_burden	0.0385***	0.0254**	-0.0205	-0.0165
	(0.0091)	(0.0086)	(0.0159)	(0.0170)
labour_freedom	0.0092***	0.0108***	0.0235***	0.0240***
	(0.0027)	(0.0028)	(0.0052)	(0.0052)
trade_freedom	0.0666***	0.0571***	0.1330***	0.1239***
	(0.0130)	(0.0131)	(0.0293)	(0.0279)
market_capitalisation	0.0023***	0.0021***	-0.0026	0.0003
	(0.0006)	(0.0006)	(0.0067)	(0.0017)
distance	-0.0001**	-0.0001***	0.0009	-0.0001**
	(0.0001)	(0.0001)	(0.0018)	(0.0001)
sd_{ij}	-3.1326**	-4.9272***	-0.0001**	-3.2183*
	(1.2843)	(1.3140)	(0.0001)	(1.9133)
ln_kdiff	1.5103***	1.9257***	-2.3257	0.4912
	(0.2182)	(0.2103)	(1.9248)	(0.3780)
hdiff	-0.5569***	-0.6592***	0.3444	-1.2426***
	(0.1145)	(0.1284)	(0.3923)	(0.2037)
sum	-0.6369***	-0.7941***	-1.1204***	-0.3246
	(0.1544)	(0.1490)	(0.2098)	(0.2785)
ln_wht	0.1615***	0.1645***	-0.2578	0.1877***
	(0.0066)	(0.0066)	(0.2851)	(0.0107)
DID (gaar × tax_haven_MF × WHT_paid)	**-1.2526****		**-1.5758***	
	(0.6261)		(0.9593)	
DID (gaar × tax_haven_EU × WHT_paid)		**-0.5890****		**-0.7256***
		(0.2396)		(0.3884)
wgi* rule of law	0.9386***	0.9334***	1.5055***	1.5038***
	(0.1528)	(0.1519)	(0.2343)	(0.2277)
Number of observations	16,434	16,434	24,229	24,229
Number of groups	6,913	6,913	12,288	12,288
Number of instruments	42	41	39	39
Wald test	2,506.61***	2,441.72***	2,204.73***	2,216.21***
Arellano-Bond test AR(2)	1.6819	1.7865	0.1790	0.3359
p-value	0.0926	0.0740	0.8579	0.7370

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

* significant coefficients at almost all Worldwide Governance Indicators (wgi), except for *regulatory_quality*

Source: Own elaboration.

On the other hand, for the manufacturing sector, the negative estimate of a coefficient at the *tax_haven_MF* variable (Table 4) indicates that profit shifting to tax havens included in the Polish list is smaller than to others. Therefore, the joint effects indicate that fewer transfers are directed from manufacturers to tax havens, suggesting that manufacturing companies are less likely to engage in profit shifting than service companies (as indicated by the positive coefficient estimate for services). The Knowledge-Capital (KC) framework's parameters and motives better explain payments made to non-residents by manufacturing than by service companies. Therefore, the former seems to be justified by incurring the cost of injections of foreign capital, such as dividends (for equity) or interest on intercompany loans. On the contrary, most

estimates of parameters of the KC model's variables in the service sector are statistically insignificant. Thus, international trade theory does not explain, and therefore does not justify, transfers from the service sector. This supports the **H2** hypothesis that service companies are more likely to engage in aggressive (frequent) profit shifting than manufacturing companies.

The outcome of analysing profit-shifting by destination countries shows that fewer profits are transferred to countries included on the EU list with DTTs, while the larger part is shifted to countries without DTTs (Table 3). Hence, there are grounds to reject hypothesis **H3** because we expect that more profits are transferred to countries on the EU tax haven list with double tax treaties than without. It is just the opposite.

The insignificant coefficients for the tax_haven_EU variable in the manufacturing and service sectors (Table 4) do not allow us to conclude whether more profits are transferred to countries on the EU tax-haven list than to others. Hence, we additionally used the *gaar*×*tax_haven_UE*×*WHT_paid* interaction, which shows the negative impact of the introduced GAAR on passive income flows to EU-listed tax havens on which withholding tax was paid (i.e., outside business groups). This means that the transfer of profits to tax havens from the EU list has decreased since 2018. Similarly, analogous interactions have also been introduced in Table 3 for tax havens with double tax treaties. The negative coefficient at the *gaar*×*tax_haven_DTT*×*WHT_paid* variable indicates that the GAAR introduced has contributed to a decline in the transfer of profits to tax havens from the EU list with double taxation treaties. The estimate of the parameter at the gaar×tax_haven_noDTT×WHT_paid variable is insignificant, so it does not allow us to conclude. An analogous interaction was applied to countries on the Finance Ministry's list (*gaar* × *tax_haven_MF* × *WHT_paid*). The results indicate that the introduction of GAAR has contributed to reduced profits shifted to countries on this list.

Manufacturing companies transfer higher profits to countries with higher tax burdens (Table 4). This confirms that payments from the manufacturing sector to non-residents reflect the cost of capital (i.e., dividends or interests) and are not motivated by the purpose of tax optimisation. It appears that lower tax burdens are not a top priority for manufacturers when selecting a business partner. On the other hand, in the model (1) in Table 3, when we control transfers to countries on the Polish Ministry of Finance's list, the coefficient estimate for the *tax_burden* variable for the entire sample is negative. This means that larger transfers go to countries with lower tax burdens,

indicating the nature of profit transfers to optimise taxation, as aggressive profit shifting is made to destinations with harmful tax competition. This also supports the validity of hypothesis **H2**, which states that aggressive profit shifting primarily occurs in the service sector.

Increased labour freedom for the entire sample, as well as for the manufacturing and service sectors, also led to an increase in the representative case of profit shifting. For manufacturing companies in particular, the liberalisation of labour mobility implies increased investment in human capital, reducing risk and uncertainty. Additionally, it leads to reduced transaction costs, which promotes entrepreneurship and business growth. This, therefore, facilitates international transactions, which supports increased profit transfer.

The distance between Warsaw and the capital of the beneficiary country is statistically insignificant for the entire sample (Table 3). The insignificance of transaction costs (transportation costs) suggests that the KC model does not fully explain passive transfers (passive income) made at least three times in eight years (every two years and eight months on average). In contrast, the *distance* variable is significant for both the manufacturing and service sectors (but only for payments to countries on the EU list) when estimated separately (Table 4). Thus, as expected, this result confirms that the distance between two countries may be an important factor in this sector due to trade costs (such as transportation). The negative coefficient implies that higher passive flows go to less distant economies. Hence, it is consistent with classical trade theory, indicating that transportation costs are a significant barrier to trade. Therefore, it could be expected that entities operating in the manufacturing sector would be guided by lower trade costs and closer location in choosing trading partners or forming a business group.

Coefficient estimates for variables from the Knowledge Capital model (*sdij, ln_kdiff, hdiff, sum)* are significant, especially in models estimated separately for the manufacturing sectors (Table 4), which confirms their connection to foreign direct investment and real trade transactions.

For the estimation on tax havens from the Polish Ministry of Finance list for the whole sample (Table 3) and service sector (Table 4), the coefficients of the variables from the KC model are statistically insignificant, which implies that it does not explain transfers to non-residents in the sample of beneficiaries of passive income (passive) transfers for at least 4 years in the studied period. This means that we can discuss

profit transfer when passive income payments are made at least every 4 years of the 2012-2019 period (8 years), i.e., every other year on average.

The positive coefficient between the logarithm of withholding tax (paid by the Polish payer in total from all types of passive income payments) and profit shifting indicates a linear relationship between profit shifting and withholding tax. Unfortunately, the results suggest that the amount of WHT does not counteract tax avoidance through profit shifting. This shows the need for changes in the regulation of passive flow taxation. However, in addition to the application of the General Anti-Tax Avoidance Rule in 2016, other regulations have been introduced over the following years, including an amendment to the pay-and-refund law, which was postponed several times. It was finally introduced in January 2023; the delay was due to public resistance to sealing the tax system against the transfer of funds indirectly to tax havens. Therefore, extending the sample to include the years forward would make it possible to estimate the impact of the new WHT regulations.

The Kaufmann indicators of institutional quality were also controlled separately as control variables. The regulatory quality index was statistically significant only for the manufacturing sector, which may be related to the relatively permanent nature of company locations in this industry. These same companies introduced regulations in the country of their residence, which are of great importance to them. The negative coefficient indicates that the better the quality of regulation, the more difficult it is to shift profits. On the other hand, voice and accountability, control of corruption, the rule of law, political stability, and government effectiveness positively correlate with profit shifting, meaning that a greater transfer of profits occurs in countries with stricter, better-enforced rules of law and greater political stability. These characteristics also describe the tax havens from the EU list. In fact, according to WGI data, the highest passive flows, with simultaneously high significant Kaufmann indicators, are recorded for Switzerland, Ireland, Luxembourg, Cyprus, Malta, and Singapore, i.e., countries with which Poland has double tax treaties. Exceptions are tax havens classified in the EU list but without double taxation treaties. For them, negative estimates were obtained for all Kaufmann indicators. This result is consistent with the results obtained earlier, that more profit transfer is taking place to tax havens without DTTs. Therefore, the lower the control of corruption, political stability, quality of law, and weaker law enforcement, the easier it is to engage in business transactions involving tax optimisation (profit shifting).

For the robustness check, we employed the DID (difference-in-differences) method, which enables the estimation and identification of the causal direction of variables by comparing the difference in performance between two groups before and after the introduction of new withholding tax regulations. Model estimation was carried out by considering the interaction between the test group variable and the countries to which the largest number of payments were made. The withholding tax was paid on that transaction, and the new General Anti-Avoidance Rule (GAAR) was implemented in July 2016. We take into account the annual adjustment and analyse the change from 2018. Among the countries in the treated group were the United States, Germany, the United Kingdom, the Netherlands, Cyprus, France, Italy, Luxembourg, the Czech Republic, Switzerland, Austria, Belgium, and Spain.

The results of the DID (*difference-in-differences)* estimation are shown in Table 5. The obtained estimates with *treated#gaar* interactions indicate a negative coefficient for the total profit transfer and services sector, implying that the GAAR introduced on 15 July 2016 (assuming a delay in payers' response to the change) contributed to a decrease in total profit shifting in the *treated group*. Therefore, there is no basis to reject hypothesis H1A that services are sensitive to applying *GAAR,* and there was reduced profit shifting for this sector (and also for the entire sample), but only for countries with the largest number of payments (the *treated group*). For the manufacturing sector, the *treated GAAR interaction is significant only for the licence channel, which means that the regulations introduced contributed to a reduction of profit shifting from this sector to all countries analysed (GAAR coefficient obtained),* but no longer to the countries to which passive flows were most frequent. The exception is interest payment (*ln_profit_shifting_interest*), for which the obtained estimates with *treated#gaar* interactions indicate a positive coefficient for the total profits transfer and services sector. Hence, we do not find confirmation that applying GAAR has contributed to a reduction in profit shifting. This does not allow us to reject hypothesis H1B, which is that the manufacturing sector is insensitive to the legal changes introduced.
The United States is a frequent trading partner for the services sector, particularly for the license channel, so we have made a separate DID estimate for it (Table 6). Moreover, the United States is a non-EU country to which many more payments were made than to the others. The negative estimates obtained for the treated × gaar variable for the services sector indicate that the introduced regulations have

contributed to a reduced transfer of profits to the United States. A positive estimate with the treated × gaar variable for the manufacturing sector indicates that profit transfer increased after 2018. This differs from the results obtained for all countries, where GAAR regulation contributed to a decrease in transfers made only through the license channel (in the others, the results are statistically insignificant). This means that the introduction of the GAAR clause contributed to an increase in payments to the United States in the manufacturing sector. This allows us to infer that, as a result of the introduced regulations, manufacturers are seeking new trade partners outside the EU that are not affected by these regulations. Thus, the results also do not allow the rejection of hypotheses H1A and H1B.

Table 5. Difference-in-Differences FE regression results

	ln_profit_shifting Coeff. (St. Err.)			**ln_profit_shifting_licence** Coeff. (St. Err.)			**ln_profit_shifting_dividend** Coeff. (St. Err.)			**ln_profit_shifting_interest** Coeff. (St. Err.)		
	total	**manuf.**	**service**	**total**	**manuf.**	**service**	**total**	**manuf.**	**service**	**total**	**manuf.**	**service**
treated	0.17***	0.10***	0.22***	1.99***	2.51***	1.80***	0.01	-0.09**	0.07*	0.59***	0.93***	0.36***
	(0.02)	(0.036)	(0.025)	(0.03)	(0.06)	(0.03)	(0.03)	(0.05)	(0.04)	(0.03)	(0.05)	(0.04)
gaar	-0.31***	-0.31***	-0.32***	-0.17***	-0.14**	-0.21***	-0.05	-0.11**	-0.02	-0.23***	-0.19***	-0.25***
	(0.02)	(0.036)	(0.027)	(0.03)	(0.06)	(0.03)	(0.03)	(0.05)	(0.04)	(0.03)	(0.05)	(0.04)
DID (treated×gaar)	**-0.15*** **	-0.076	**-0.22*** **	**-0.44*** **	**-0.52*** **	**-0.11***	**-0.15*** **	0.05	**-0.29*** **	**0.10** **	-0.01	**0.22*** **
	(0.04)	(0.066)	(0.05)	(0.05)	(0.11)	(0.07)	(0.06)	(0.09)	(0.08)	(0.05)	(0.09)	(0.07)
cons	10.64***	11.11***	10.45***	1.83***	2.09***	1.81***	1.32***	1.17***	1.39***	1.34***	1.08***	1.52***
	(0.01)	(0.012)	(0.009)	(0.01)	(0.02)	(0.012)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)
Observations	233 144	68 022	165 122	233 147	68 022	164 114	233 147	68 022	164 114	233 147	68 022	164 114
F statistics	164.90***	44.81***	122.81***	1942.47***	644.74***	1137.82***	7.38***	2.51**	8.17***	195.74***	128.0***	56.62***
F test	8.21***	8.14***	8.17***	8.28***	7.17***	9.02***	6.26***	6.59***	6.14***	7.05***	7.20***	7.02***

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

Table 6. Difference-in-Differences FE regression results for profit shifting to the USA

	whole sample	**manufacturing**	**services**
treated	-0.3778***	-0.5410***	-0.2876***
	(0.0276)	(0.0585)	(0.0316)
gaar	-0.1999***	-0.2237***	-0.1599***
	(0.0167)	(0.0282)	(0.0213)
DID (treated×gaar)	-0.0893	**0.0351** **	**-0.2729** **
	(0.0786)	(0.1578)	(0.1016)
cons	10.2167***	10.6385***	10.0432***
	(0.009)	(0.10151)	(0.011)
Number of observations	233 144	68 022	164 114
Wald test	341.86***	141.81***	159.01***

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

4. CONCLUSIONS

Our study complements existing research that identifies the determinants of profit shifting to countries with harmful tax competition, as listed by the Polish Ministry of Finance Regulation, compared to those recognised by the European Commission (Sitkiewicz & Białek-Jaworska, 2024). In addition to the activity sector of passive income payers to non-residents, expecting significant differences between manufacturing and service payers, we also took into account the existence of DTT agreements between Poland and the country to which the transfer is made. Moreover, our consideration of applying the General Anti-Avoidance Rule (GAAR), particularly in relation to the blacklists, has enabled an assessment of the effectiveness of instruments designed to prevent profit shifting from the manufacturing and service sectors to non-residents.

Using unique data relating to the non-resident beneficiaries of passive flows from 134 countries made in the years 2012-2019 by Polish legal entities and individuals who are payers of WHT, we examined the profit-shifting sensitivity to WHT on passive income. The findings allowed us to conclude that the implementation of a GAAR in 2016 contributed to reducing profit shifting across the entire sample and the manufacturing and services sectors separately. The exception is the interest payment channel, for which the GAAR has not contributed to a decrease in profit shifting in the entire sample or the services sector, but rather the opposite. Next, the DID (*difference-in-differences)* estimation shows that the new regulation has not been impactful for passive income transfers to countries with the largest number of payments (treated group) made by the manufacturing sector (apart from the royalties). Moreover, regarding the situation outside the EU, the results show that applying a GAAR reduced profit shifting to the United States from the services sector, but not from the manufacturing sector. This indicates the sensitivity of profit shifting, independent of the sector of activity of the withholding payer, albeit only via an intangibles channel based on a licence. While we have noted lower total passive income flows to countries recognised on the EU blacklist, there have been higher total passive income flows to tax havens listed in the Polish Finance Ministry's regulations, especially from the service sector. Moreover, the inclusion of double taxation treaties in the analysis made it possible to assert that more profits are being transferred to countries included on the EU list without such agreements.

The analysis of applying a GAAR, considering double tax treaties, presents a new perspective on the problem of profit shifting to tax havens. Moreover, our results provide valuable guidance for addressing the issue of base erosion by identifying the underlying determinants of profit shifting, and as such, should prove insightful for policymakers.

REFERENCES

Amendolagine, V., Bruno, R. L., Cipollina, M., & De Pascale, G. (2023). Minimum Global Tax: Winners and Losers in the Race for Mergers and Acquisitions (No. 16144). IZA Discussion Papers.

Balakina, O., D'Andrea, A., Masciandaro, D. (2017). *Bank secrecy in Offshore* centres and capital flows: does blacklisting matter? Review of Financial Economics, *32*, 30–57.

Barthel, F., Busse, M., & Neumayer, E. (2010). *The impact of double taxation treaties on foreign direct investment: evidence from large dyadic panel data*. Contemporary Economic Policy, 28(3), 366-377.

Bert, J. Z. (2011). *Double Tax Treaties-The Basics and Benefits*. THE CPA JOURNAL, 50-53.

Beugelsdijk, S., Hennart, J. F., Slangen, A., Smeets, R. (2010). Why and how FDI stocks are a biased measure of MNE affiliate activity? *Journal of International Business Studies*, *41*(9), 1444–1459.

Białek-Jaworska, A., Klapkiv, L. (2021). *Does withholding tax on interest limit international profit-shifting by FDI?* Equilibrium, Quarterly Journal of Economics and Economic Policy, *16*(1), 11–44. doi: 10.24136/eq.2021.001

Blundell, R., & Bond, S. (1998). *Initial conditions and moment restrictions in dynamic panel data models.* Journal of Econometrics, *87*(1), 115–143. https://doi.org/10.1016/s0304- 4076(98)00009-8

Boye, G. R. (2025). *Determination of an Optimal Corporate Competition Tax Rate: An International Evidence.*

Chari, M., Acikgoz, S. (2016). *What drives emerging economy firm acquisitions in tax havens?* Journal of Business Research, *69*(2), 664–671.

Cobham, A., Janský, P., Meinzer, M. (2015). *The financial secrecy index: Shedding new light on the geography of secrecy.* Economic Geography, *91*(3), 281–303.

Collins, J.H., Shackelford, D.A., (1992). *Foreign tax credit limitations and preferred stock issuance.* Journal of Accounting Research, *30*, 103–124.

Corporate Income Tax Act dated 15 February 1992, The Polish Journal of Laws 1992 No. 21, item 86 with changes.

Cowx, M., & Kerr, J. N. (2024). *The general anti-avoidance rule.* Contemporary Accounting Research, *41*(3), 1851-1892.

Desai, M.A., Foley, C.F., Hines Jr., J.R. (2006). *The Demand for Tax Haven Operations.* Journal of Public Economics, *90*, 513–531.

Dharmapala D., Hines J., (2009). *Which Countries Become Tax Havens?* Journal of Public Economics, *93*, 1058–1068.

Dharmapala, D. (2014). *What Do We Know about Base Erosion and Profit Shifting A Review of the Empirical Literature*. Fiscal Studies, *35*(4), 421–48.

Dischinger, M., Riedel, N. (2011). *Corporate taxes and the location of intangible assets within multinational firms.* Journal of Public Economics, *95*(7), 691–707.

Dumiter, F., & Jimon, S. (2016). *Double taxation conventions in central and eastern European countries*. Journal of Legal Studies, *18*(32), 1-12.

Dutt, V. K., Ludwig, C. A., Nicolay, K., Vay, H., & Voget, J. (2019). *Increasing tax transparency: Investor reactions to the country-by-country reporting requirement for EU financial institutions.* International Tax and Public Finance, *26*, 1259-1290.

Dyreng, S.D., Hanlon, M., Maydew, E.L., Thornock, J.R. (2017). *Changes in corporate effective tax rates over the past 25 years.* Journal of Financial Economics, *124*, 441–463. https://doi.org/10.1016/J.JFINECO.2017.04.001

Elemes, A., Blaylock, B., Spence, C. (2021). *Tax-motivated profit shifting in big 4 networks: Evidence from Europe.* Accounting, Organisations and Society, *95*, 101267.

Fatica, S., Gregori, W.D. (2020). *How much profit shifting do European banks do?* Economic Modelling, *90*, 536-551.

Fatica, S., Wildmer, G. (2018). *Profit shifting by EU banks: evidence from country-by-country reporting* (No. 4). JRC Working Papers in Economics and Finance.

Froot, K.A., Hines, J.R. (1992). *Interest allocation rules, financing patterns, and the operations of US multinationals. The Effects of Taxation on Multinational Corporations.* University of Chicago Press, Chicago.

Gómez-Cram, R., & Olbert, M. (2023). *Measuring the expected effects of the global tax reform*. The Review of Financial Studies, *36*(12), 4965-5011.

Grant Thornton (2015). W obliczu BEPS: Działanie 6, Poznań, 1-2.

Gravelle, J.G. (2009). *Tax havens: International tax avoidance and evasion*. National Tax Journal, *62*(4), 727-753.

Grubert, H. (1998). *Taxes and the division of foreign operating income among royalties, interest, dividends and retained earnings*. Journal of Public Economics, *68*, 269–290.

Grubert, H., Mutti, J. (1991). *Taxes, Tariffs and Transfer Pricing in Multinational Corporate Decision Making.* Review of Economics and Statistics, *73*(3), 285–293.

Gschossmann, E., Heckemeyer, J. H., Müller, J. M., Spengel, C., Spix, J., Wickel, S. (2025). *The EU's new era of "fair company taxation": the impact of DEBRA and Pillar Two on the EU Member States' effective tax rates*, International Tax and Public Finance, 1-45.Gumpert, A., Hines Jr, J.R., Schnitzer, M. (2016). *Multinational firms and tax havens.* Review of Economics and Statistics, *98*(4), 713–727.

Hebous, S., Johannesen, N. (2016). At your service! The role of tax havens in international trade with services. In *Proceedings. Annual Conference on Taxation and Minutes of the Annual Meeting of the National Tax Association* (Vol. 109, pp. 1-24). National Tax Association.

Hines, J.R., Rice E.M. (1994). *Fiscal Paradise: Foreign Tax Havens and American Business*. Quarterly Journal of Economics, *109*(1), 149–182.

Hines, R. (1999). *Lessons from behavioral responses to international taxation.* National Tax Journal, *52*, 305–322.

Hines, R., Hubbard, R. (1990). *Coming home to America: dividend repatriation by U.S. multinationals. In: Razin, Assaf, Hubbard, R. Glenn (Eds.)*, Taxation in the Global Economy. University of Chicago, Chicago.

Horodnic, I. A. (2018). Tax morale and institutional theory: a systematic review. International Journal of Sociology and Social Policy, 38(9/10), 868-886.

Huizinga H., Laeven L. (2008). *International Profit Shifting within Multinationals: A Multi-Country Perspective.* Journal of Public Economics, *92*(5–6), 1164–1182.

Jones, C., Temouri, Y. (2016). *The determinants of tax haven FDI.* Journal of World Business, *51*(2), 237–250.

Jones, C., Temouri, Y., Cobham, A. (2018). *Tax haven networks and the role of the Big 4 accountancy firms*. Journal of World Business, *53*(2), 177–193.

Kemme, D.M., Parikh, B., Steigner, T. (2020). *Tax morale and international tax evasion*. Journal of World Business, *55*(3), Article 101052.

KPMG (2015). BEPS Nowa rzeczywistość podatkowa, Termometr BEPS, KPMG.pl

Kuzniacki, B. (2021). *Poland's implementation of EU GAAR compromises constitutional and EU principles*. Intertax, 49(3).

Ministry of Development and Finance Regulations dated 17 May 2017 on the determination of countries and territories applying harmful tax competition in corporate income tax, The Polish Journal of Laws dated 22.05.2017, item 997.

Ministry of Finance page: https://www.podatki.gov.pl/en/general-anti-avoidance-rule/ (accessed on 08.05.2025).

Ministry of Finance Regulations dated 16 May 2005 on the determination of countries and territories applying harmful tax competition in corporate income tax, The Polish Journal of Laws No. 94, item 791. 2013, and 2015.

Ministry of Finance Regulations dated 23 April 2015 on the determination of countries and territories applying harmful tax competition in corporate income tax, The Polish Journal of Laws dated 4 May 2015, item 600.

Ministry of Finance Regulations dated 9 April 2013 on the determination of countries and territories applying harmful tax competition in corporate income tax, The Polish Journal of Laws 2013 No. 94, item 494.

Mintz, J., Smart, M. (2004). *Income shifting, investment, and tax competition: theory and evidence from provincial taxation in Canada*. Journal of Public Economics, *88*(6), 1149–1168. doi: 10.1016/s0047-2727(03)00060-4.

Müller, R., Spengel, C., & Weck, S. (2024). *How do investors value the publication of tax information? Evidence from the European public country‐by‐country reporting*. Contemporary Accounting Research, 41(3), 1893-1924.

Nabavi, P., & Nordström, M. (2023). *The Impact Assessment of Implementing a Global Minimum Tax for MNEs in Sweden*. Nordic Tax Journal, 2023(1), 111-123.

OECD (2013). Action Plan on Base Erosion and Profit Shifting. OECD Publishing, Paris.

OECD (2015). *Preventing the Granting of Treaty Benefits in Inappropriate Circumstances.* Action 6 – 2015 Final Report, OECD, Paris.

Osterloh, S., & Heinemann, F. (2013). The political economy of corporate tax harmonization—Why do European politicians (dis) like minimum tax rates?. European Journal of Political Economy, 29, 18-37.

Oxfam Novib (2016). The Netherlands: a Tax Haven. Continuing its contribution to the corporate tax race to the bottom. [pdf]. [Accessed 14.03.2022] Available at: https://www.oxfam.org/sites/www.oxfam.org/files/file_attachments/netherlandstaxhaven.pdf

Peralta, S., Wauthy, X., Van Ypersele, T. (2006). *Should countries control international profit shifting?* Journal of International Economics, *68*(1), 24-37.

Pereira, V., Temouri, Y., Jones, C., Malik, A. (2019). *Identity of Asian Multinational Corporations: influence of tax havens.* Asian Business & Management, *18*, 325–336.

Redoano, M. (2014). Tax competition among European countries. Does the EU matter?. European Journal of Political Economy, 34, 353-371.

Schjelderup, G., & Stähler, F. (2024). *The economics of the global minimum tax*. International Tax and Public Finance, 31(4), 935-952.

Shin, M. J. (2017). Partisanship, Tax Policy, and Corporate Profit-Shifting in a Globalized World Economy. Comparative Political Studies, 50(14), 1998-2026. https://doi.org/10.1177/0010414016688007 (Original work published 2017)

Sitkiewicz, M., & Białek-Jaworska, A. (2024). *Profit shifting to tax havens: Withholding tax impact on passive flows from Poland*. Transnational Corporations Review, 16(2), 200059.

Souillard, B. (2022). Intra-industry spillovers of profit shifting and tax haven FDIs. *Available at SSRN 3796015*.

Sugathan, A., & George, R. (2015). The influence of governance infrastructure and corporate governance on profit shifting. Journal of International Business Studies, 46, 886-916.

Torslow, T.R., Weir, L.S., Zucman, G. (2020). The missing profits of corporations. Working paper.

Uckmar, V. (2006). Double taxation conventions. International tax law, 181420014, 150-81, ch. 4.