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Does withholding tax on interest limit international profit-shifting by FDI?

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Keywords: withholding tax; foreign direct investments; inter-company loans; profit shifting

Abstract

Research background: Poland is a significant recipient of intercompany loans as a part of foreign direct investment (FDI) debt instruments reported in the Balance of Payments. Most of them come from the developed West European countries — Netherlands, Luxembourg, France, Germany, and Belgium. Igan *et al.* (2020) confirm debt-based FDI inflows to emerging markets had a higher impact on the industries' growth in the pre-crisis period 1998–2007 than after (till 2010).

Purpose of the article: We aim to identify withholding tax (WHT) impact on intercorporate loans inflow to Poland and analyse the relationship between trade credit and intercompany loans to assess the importance of the profit-shifting role of FDI after 2010.

Methods: To reflect the impact of withholding tax and trade credit on inter-company loans (inward debt-based FDI) in 2011–2017 to Poland, we use Arellano-Bond and random effects panel model estimators. The estimated specification is derived from the knowledge-capital model and includes two types of capital: human and physical.

Findings & value added: We show that WHT on interests reduces profit-shifting by multinational companies' intercompany lending to Poland. But intercompany loans are positively related to foreign trade credit. Unlike in the case of total FDI inward to Poland (Cieślík, 2019), we identified that vertically integrated multinational enterprises are more likely to provide loans to Polish firms. This study is the first to confirm that withholding tax of interests reduces international profit-shifting by FDI and to provide evidence on the relationship between foreign trade credit and intercompany loans provided by multi-national companies.

Introduction

This paper aims to identify withholding tax impact on intercorporate loan inflow to Poland and analyse relationships between trade credit and intercompany loans to assess the significance of the profit-shifting role of foreign direct investment (FDI).

FDI is an integral part of cross-border capital flows and forms a part of the financial account in the country's balance of payments. FDIs are an instrument of the multinational enterprise' (MNE's) global activity based on equity or debt investments. Igan *et al.* (2020) analysed these data from 1998 to 2010, and we started our analysis in 2011. Igan *et al.* (2020) showed that debt-based FDI financing played a significant role in industries' growth in emerging markets, including Poland. Both intercompany loans and trade credit are components of debt-based FDI instruments. According to the National Bank of Poland data, Polish enterprises use these sources to finance their activity.

But along with trading, MNE found the scheme to shift the profits from affiliates in countries with higher taxes through intercompany loans, in which interests are deducted from taxable income (and allow to benefit from interest tax shield). This problem is widely announced in the academic and non-academic literature. Governments are looking for instruments to limit such unfair practices. Several initiatives at the EU level were made: Base Erosion and Profit Shifting by OECD (2015), Anti-Tax Avoidance Directive by European Commission, and an allowance for corporate equity (ACE) rule in European countries (European Committee, 2018). However, the problem of profit-shifting is still actual and unsolved (Kudła, 2018; Shimanski, 2018; Polish Economic Institute, 2020), as it is well seen in Poland's case (Polish Economic Institute, 2020).

Among different economic factors that influence the FDI inflow into the host country, a significant role is played by comparative advantages described in trade theories (Gudowski & Piasecki, 2020) and tax competition (Kudła *et al.*, 2015). After 1989, a financial capital movement liberalisation led to implementation of the withholding tax (WHT) rate for foreign investments related to profit-shifting (royalties, dividends, and interests). This instrument's effectiveness is broadly discussed in the literature, but it gives a background for a new research question about its influence on the profit-shifting function of FDI. Based on this, our paper aims to analyse the impact of WHT on profit-shifting by FDI. Poland is the chosen setting.

We analyse the determinants of intercompany loans as a component of debt inward FDI in 2011–2017 to Poland using Arellano-Bond and random effects panel model estimators. The estimated specification is derived from

the knowledge-capital (KC) model. It includes two types of capital: human and physical, analysed by Cieřlik (2019) for total FDI inflow to Poland from 15 EU members till 2015. We focus on the impact of WHT and trade credit on intercompany loans as debt instruments of FDI. We use data from the Central Bank of Poland (*Narodowy Bank Polski*, NBP) about FDI debt instruments (in position, not flows) which allow us to separate intercompany loans from trade credit and other debts. Therefore, our paper uses unique data and is the first to shed light on the role of intercompany loans in Poland. We use data on debt-based FDI inflow to Poland (available on the NBP's website) for the robustness check.

The remainder of this paper is structured as follows. Section 2 provides a literature review on foreign direct investments focusing on intercompany loans and trade credit, profit shifting, and WHT taxation. Next, we describe the data and research design in Part 3, show the empirical analysis results with interpretation in Section 4, and discuss them based on the previous selected studies in Part 5. The article is completed with conclusions.

Literature review

FDI in the trade theory

There are two alternative dimensions of multinational activity that combine ownership and location advantages with technology and country characteristics in the new trade theory: horizontal and vertical. The former is directing to overcome distance and use lower costs of foreign markets access, while, according to the latter, — companies integrate vertically to decrease production costs. In theory, horizontally integrated multinational enterprises (MNEs) dominate when countries are similar in economic size, humane and physical capital factor proportions, and when trade costs are high (Faeth, 2009). Cieřlik (2019) showed that the horizontal dimension explains FDI inflow to Poland from 15 EU members.

Analysis of integration processes globally shows that globalisation is still mainly exploiting relatively cheap labour resources in developing countries (Makhavikova, 2018). Intense competition forces companies to enter international markets to minimise their costs, especially in high-tech industries. Human resources play the most critical role in variable expenses rather than natural resources.

Based on the theory developed by Dunning (2000), neoclassical economists proposed several models of transnational companies' behaviour based on the idea of public welfare. Vernon (1966) proposed a “product life cycle

model”, explaining the increase in companies entering the world market and opening foreign branches. According to this theory, FDI flows begin to emerge when a product enters the “stage of maturity”, when both the demand for it in emerging markets and the competition level increases (the monopolistic advantage of a new product disappears). Porter (1998) proposed a model of internationalisation considering the competitive advantages of countries-recipients of FDI. In line with the imperfect market theory and competitive advantages, Moosa (2002) presented three FDI hypotheses: the differential return rates, the diversification, and the output and market size. Large market size and low entry barriers strongly positively affect FDI inflow to Central Eastern European countries (Neuhaus, 2006).

Public policy and political conditions influence FDI because the government can create a suitable environment for competitiveness or decide to implement trade tariffs and barriers. Moosa (2002) underlined government-initiated FDI that can be triggered when a government offers incentives to foreign investors to eliminate a balance of payment deficit. The influence of public policy (sociopolitical factor) on FDI was studied, also focusing on the environmental effect (pollution reduction) (Dang, 2019).

Next, the institutional environment for multinational companies determines *taxation and access to capital in the host country*. Countries with high economic stability, often reflected by tight monetary and sustainable fiscal policies, are more attractive for FDI. For example, government restrictions have reduced the FDI inflow to Canada, negatively influencing employment and productivity (Hejazi & Trefler, 2019). Camarero *et al.* (2018) showed that monetary policy positively affects international trade and FDI by creating the currency union inside the EU. On the contrary, Duboz *et al.* (2019) proved that implementing uniform economic policies across sectors and places among EU countries does not attract FDI in service sectors. Jovanovic and Jovanovic (2018) analysed the influence of the business environment on FDI by using the Doing Business Indicator for 27 ex-socialist countries. They found a weak significance, except for trading across borders.

Trade credit is more frequently used than bank loans (i.e., Białek-Jaworska & Nehrebecka, 2016). According to the Balance of Payments' methodology, *trade credit* and advances arise when payment for goods or services (other than financial intermediation services measured indirectly or prepayment of insurance services) is not made simultaneously with the change in ownership of a good or provision of a service. If payment is made before the change of ownership, there is an advance (IMF, 2009). In 2011–2018 Polish companies were recipients of trade credit from foreign

companies from Germany, Switzerland, France, Belgium, Italy, and the Netherlands (see Fig. 1 that ranks countries in descending order by volume of trade credit liabilities). The share of debt-based FDI financing in total FDI measured by positions (as liabilities at the end of the fiscal year) over 60 % is observed in Honk Kong, Ireland, Turkey, Slovak Rep., Czech Rep., Israel, and Belgium (see Fig. 2). There is redistribution of bank loans via the trade credit channel described in the literature (Guariglia & Mateut, 2006; Taketa & Udell, 2007) in case of supply limitation when banks restrict their credit policy. Polish firms have problems accessing bank loans. As a result, Poland has the lowest nonfinancial enterprises' debt to GDP ratio in the EU, next to Romania (Białek-Jaworska, 2018). It equals approximately 46%.

Profit-shifting via debt-based FDI

Instead of debt in banks, Polish companies use *intercompany loans* that are a constituent part of FDI debt instruments, particularly from the Netherlands, Luxembourg, France, Germany, and Belgium (see Fig. 1). Fig. 1 ranks countries in descending order by volume of payables due to intercompany loans at the end of the fiscal year. After the 2007–2008 global financial crisis, followed by bank lending constraints, the influence of such sources of alternative financing also increased for European small and medium-sized enterprises (Casey & O'Toole, 2014; Durovic, 2017).

In tax avoidance and tax planning literature, intercompany lending is *an instrument for profit-shifting* from high-tax to low-tax countries. This phenomenon is discussed in the literature review provided by Fonseca and Juca (2020). Borrowing from affiliates in business groups located in low-tax countries and lending to affiliates in high-tax locations will allow the latter to deduct interest payments from taxable income and save taxes (Mintz & Smart, 2004). It is essential to admit that the difference in tax rates between countries stimulates vertical integration due to transfer pricing for multinational companies (Egger & Seidel, 2013). However, there are different opinions about such a tax-planning strategy. As shown by Buttner and Wamser (2007), the tax-revenue effects for German multinationals were minor. The costs related to adjusting the capital structure for profit shifting purposes were substantial. Damgaard *et al.* (2019) pointed out that the possibility of tax payment reduction guides FDI, and parts of the investments are channelled to tax havens.

Buettner *et al.* (2018) suggested that multinational companies may use foreign operations' financial structure to shift taxable profits. Intercompany loans may be used to create interest payments, which are deducted in coun-

tries with high taxes (Fuest *et al.*, 2011; Dischinger *et al.*, 2014; Hansson & Olofsdotter, 2014; Devereux *et al.*, 2018). In our opinion, in Poland's case, interest capitalisation also results in a debt increase. Multinational entities operating in a developed capital market optimise their tax payments by managing loans inside their business groups, from parent to subsidiary and among subsidiaries (Desai *et al.*, 2004; Bénassy-Quéré *et al.*, 2005; Azémar, 2010; Barrios *et al.*, 2012; Egger *et al.*, 2014; Hebous & Ruf, 2017).

Governments try to prevent debt financing by intercompany loans and limit the possibility for subsidiaries to transfer profit abroad through thin-capitalisation rules with an ambivalent effect (positive in curbing tax planning and negative on investment (Merlo *et al.*, 2020)). The introduction of an allowance for corporate equity (ACE) to achieve tax neutrality in some EU countries decreased debt financing. Still, it generated an increase in intra-group lending within multinational companies for tax planning purposes (Hebous & Ruf, 2017). Furthermore, empirical evidence shows that anti-profit-shifting legislation intensifies the adverse tax effects on FDI if imposed by host countries with relatively high tax rates (Buettner *et al.*, 2018).

In Poland, the problem with profit-shifting is also widely discussed. In the report based on national accounts from 2018, Polish Economic Institute (PEI) shows that PLN 17 billion of corporate profit was transferred abroad, causing the corporate income tax (CIT) gap (Polish Economic Institute, 2020). Among the receiving countries were Ireland, the Netherlands, Luxembourg, Switzerland, Cyprus, Belgium, and Malta. But PEI analyses this problem only through the CIT gap's perspective, without taking WHT on interests of intercompany loans into consideration, which limited conclusions. Our analysis sheds light on this issue by focusing on the WHT. Fig. 3 illustrates the basis for the profit-shifting, that is, twelve countries with the highest amounts of Poland's liabilities due to intercompany borrowings: the Netherlands, Luxembourg, France, Germany, Belgium, Spain, Austria, the UK, the United States, Cyprus, Switzerland, and Ireland. Fig. 4 presents the volume of profits transferred abroad through interest payments in the case of those countries. The interest payments transferred in 2018 totalled over PLN 9.5 billion for the analysed countries.

Taxation of FDI

In the late 20th century, the liberalisation process in the international movement of capital in the EU and concerns about tax evasion led to bringing up an idea of a wide WHT on interest payment. According to double taxation conventions, the proposed minimum rate of WHT was 15%, with

further diversification between WHT on interests and dividends (Table 1). The idea of tax heavens is broadly discussed in the literature. Previous articles such as Yaniv (1988), Huizinga and Nielsen (2000), and Huizinga *et al.* (2008) have studied the effect of taxes on international business capital movement. The rights to tax active income at the source are almost universally granted when such income is attributable to a permanent establishment of a foreign enterprise in the source country (Zee, 1998). Comparing two approaches to taxation: a residence-based one and a pure source-based one, Zee (1998) argued that the latter could require net capital importing (usually emerging) countries to give up their rights to tax a significant share of income generated from operations carried out within their national borders. Huizinga *et al.* (2008) suggested that source-level taxation affects leverage more significantly than the residence-level taxation levied by a multinational's parent country. Therefore they argue that corporate tax rates, rather than non-resident dividend WHT, appear to matter for leverage. However, they overlook WHT on interests paid for loans granted by MNEs, which is our paper's subject. Thus, our study covers this research gap and contributes to the literature.

Zee (1998) argues that capital flow in FDI is less prone to tax arbitrage considerations than portfolio investments because it deals with higher transaction costs, is more sensitive to nontax factors, and faces stricter regulatory requirements. Arena and Roper (2010) explain the influence of WHT rates on dividends and interest. MNEs issue debt through subsidiaries located in countries with high WHT on dividends. At the same time, MNEs issue larger debt in foreign countries with low or non-existing WHT on interests.

In contrast to previous studies, our paper checks whether WHT is a tool to reduce the profit-shifting function of FDI. We contribute to the state of the art of FDI by a separate analysis of trade credit and intercompany loans as components of FDI debt instruments and an extension of the knowledge-capital (KC) model analysed for Poland by Cieřlik (2019). The usage of Kaufmann's indices, which measure the institutional environment, adds value to the literature.

Research methodology

We analyse factors that determine intercompany loans as a component of debt inward FDI in 2011–2017 to Poland. We use data received from the Central Bank of Poland (*Narodowy Bank Polski*, NBP) about FDI debt instruments (in position, not flows), which allow us to separate intercom-

pany loans from trade credit and other debts. For the robustness check, we use data on debt-based FDI inflow to Poland in 2010–2018, available on the website of NBP. Previously, debt-based FDI data (a component of the Balance of Payments) was used in the research of Igan *et al.* (2020) to study the debt-based FDI inflow impact on the industries' growth in the emerging markets (including Poland) in 1998–2010.

Table 2 presents the definitions of variables and data sources describing the material selection for our study. Polish liabilities due to intercompany loans are used as a dependent variable. *Intercompany loans* represent direct investment debt positions between affiliated enterprises (IMF, 2014). They are identified separately from other debt instruments for debt analysis because this lending has different implications for risk and vulnerability compared with debt between unrelated parties. In general, intercompany lending has three components: debt liabilities of parents to their affiliates, debt liabilities of affiliates to their parents, and debt liabilities between related affiliates. Based on the Balance of Payments' methodology, *trade credit* and advances rise when payment for goods or services (other than financial intermediation services indirectly measured and prepayment of insurance services) is not made simultaneously with the change in ownership of a good or provision of a service. If payment is made before the change of ownership, there is an advance (IMF, 2009).

We focus on the impact of WHT (on interests of foreign loans) and trade credit on intercompany loans as debt instruments of FDI. We suppose that:

H1: *Withholding tax of interests reduces international profit-shifting by FDI debt instruments, intercompany loans in particular.*

H2: *Foreign trade credit is positively related to intercompany loans provided by multinational companies to Poland.*

The estimated specification is derived from the knowledge-capital (KC) model and includes two types of capital: human and physical. In this part of the model, we follow Cieřlik (2019), but we use intercompany loans as a component of FDI debt instruments (in positions), contrary to FDI inflow to Poland (used in his paper). In the KC model, the explanatory variables are the similarity in economic size and relative physical and human capital factor endowments between Poland and the country-lenders. We measure the similarity in relative economic size (sd_{ij}) by a bilateral style of the Helpman's size dispersion index. This Helpman's index is calculated using data on output-side real GDP at chained purchasing power parity (PPP)

rates and expressed in constant 2011 US dollars for Poland and the particular country that provides loans:

$$sdi_{ij} = 1 - gdp_{i_{sum}}^2 - gdp_{j_{sum}}^2 \quad (1)$$

where the $gdp_{i_{sum}}$ variable is an i country's share of countries: lender's and borrower's GDPs calculated as described above.

The relative physical capital factor endowment between Poland and the country-lender (ln_kdifff) is proxied by the logarithm of physical capital (infrastructure) per worker difference between country-lender and country-borrower. The physical capital is calculated using the national capital stocks expressed in PPPs in constant 2011 USD and the number of workers employed. At the same time, we use the logarithm of the differences in human capital endowments calculated using the human capital indexes for the source and host countries to calculate relative human capital factor endowments between Poland and each country-lender (ln_hdifff). The human capital indexes are based on the average years of schooling and return to education.

These variables allow us to distinguish between horizontal and vertical theoretical models. By assessing the statistical significance and signs of the estimated coefficients on these variables, we identify which investment motive explains the cross-country pattern of intercompany loans as a part of debt-based FDI liabilities better. A positive coefficient at the similarity in pair countries' economic size supports horizontal integration and KC models (importance of the market access motive). In comparison, its insignificance confirms the vertical integration model. Negative coefficients at the differences in relative physical and human capital factor endowments favour the horizontal integration model. In contrast, the pure vertical and KC models assume a significant positive relationship (when the efficiency-seeking motive is of higher importance than the market access motive). We use the Penn World Table 9.1 (Freenstra *et al.*, 2019) to measure the differences in relative factor endowments between Poland and countries-lenders using both human and physical capital per worker. We use the summation of Poland's and the home (lender) country's GDPs (ln_sum) as a control variable. For this variable, we expect that the coefficient at the combined market size of investment partners is positive, similar to theoretical predictions for total FDI. To control trade costs, we use geographical distance and expect a negative effect, as in Cieřlik (2019). The Kaufmann's indices (including regulatory quality [*regulator*], voice and accountability [*voice*], political stability and absence of violence [*political*], government effectiveness [*govefec*], the rule of law [*ruleoflaw*], and control for corrup-

tion [*corruption*]) variables control institutional environment and governance. Financial freedom, trade freedom indicators, market capitalisation, and total FDI of home countries are control variables that catch differences in macroeconomic development. Because we focus on WHT on interests, we also control WHT on dividends on equity received from country-lender, amount of interests (potentially used for profit-shifting), dividends, and bonds as another component of FDI debt instruments. Table 2 describes in detail all test and control variables. Table 3 presents descriptive statistics for FDI data in positions (panel A) and inflows (panel B), while Table 4 provides their correlation matrix. Because of possible multicollinearity, we consider highly correlated control variables in separate models.

We estimate the relationships between intercompany loans and explanatory variables described above using a random-effects estimator for panel data. This approach allows us to include variables constant in time.

$$\begin{aligned} \ln borrow_{ijt} = & \beta_0 + \beta_1 wht_int_{ijt} + \beta_2 trade_credit_{ijt} \\ & + \beta_3 \ln sum_{ijt} + \beta_4 sdi_{ijt} + \beta_5 \ln kdif_{ijt} \\ & + \beta_6 \ln hdif_{ijt} + \beta_7 \ln distance_{ij} + \beta_8 controls + v_{ij} \\ & + \varepsilon_{ijt} \end{aligned} \quad (2)$$

For robustness check, we first control for Kaufmann's governance indicators measured not only by estimates but also by ranks. Second, we use GMM Arellano-Bond dynamic panel-data estimator to focus on the impact of withholding tax and trade credit on intercompany loans. This approach uses instruments for the differenced equation but eliminates data constant in time. However, the generalised method of moment (GMM) approach unifies the estimators and eliminates the disadvantages of reduced sample size (Arellano & Bond, 1991). The dynamic panel-data approach allows a better understanding of the adjustment dynamics, especially when current behaviour depends on past behaviour. Third, for the robustness check, we control the explained variable's measure using data on debt instruments of FDI inflow to Poland instead of positions on unpaid liabilities due to intercompany loans. For this purpose, we use data publicly available on the website of the Central Bank of Poland.

Results

Table 5 presents results obtained from the estimations of models using random-effects estimator with WHT on dividends, bonds, amounts of interests, and dividends to foreign investors (incl. parent companies) used as control

variables. Our study's findings in Table 4 show a negative correlation between WHT on interests and intercompany loans borrowed by Polish firms, which is in line with H1. This outcome confirms that WHT on interests reduces profit-shifting by intercompany lending. Positive coefficients at the trade credit variable follow our expectations and support hypothesis H2. We show that intercompany lending increases with the combined market size in both lending and borrowing countries (*ln_sum*). The results indicate that the market access matters based on positive significant coefficients at the similarity in the economic size of pair-countries *sdi* variable. However, the efficiency-seeking motive is more important than the market access motive because of positive coefficients at the differences in relative factor endowments (*ln_kdiff*, *ln_hdiff*). Thus, our findings support the pure vertical and KC models in intercompany lending as a component of FDI. The estimated significant coefficients at the *distance* variable in columns (2) and (3) are negative. This finding supports the model of vertically integrated multinational firms to be more likely to provide intercompany loans. Regarding control variables, parameters aside *bond* and *wht_div* variables are insignificant, while intercompany loans increase with both amounts of interests and dividends paid.

Table 6 provides results of model estimations where we control for governance and institutional environment. Considering Kaufmann's Governance Indicators (estimates) allows us to identify that countries with lower WHT on dividends grant higher loans (models presented in columns (3)–(6) that control for governance efficiency, regulatory quality, the rule of law, as well as control for corruption). Conversely, coefficients at the voice and accountability and political stability, and absence of violence variables appear insignificant when we use these governance indicators' estimates. For robustness checks, we use an alternative measure of Kaufmann's Governance Indicators in the form of ranks instead of estimates. Table 7 presents the outcomes of these models, which are stronger; all parameters at the Kaufmann's Governance Indicators measured by ranks are significantly and positively related to intercompany loans. These findings allow us to show that countries with higher governance and better institutional environment provide higher intercompany loans to Poland. Results of these models delivered in Tables 6 and 7 are in consistent with results presented in Table 5, which strongly confirms hypothesis H1 for the WHT on interests impact on reducing profit-shifting with intercompany loans. However, a positive relationship between trade credit and intercompany loans is weaker (insignificant in models presented in columns (4)–(6) in Table 6 and columns (3)–(6) in Table 7).

Table 8 provides the results of model estimations with the use of the GMM Arellano-Bond dynamic panel-data estimator. This approach uses instruments for a differentiated equation. Our findings confirm the negative impact of withholding tax on intercompany loans, in line with the H1 hypothesis. The positive relationship between trade credit and intercompany loans (H2) is confirmed by the model (5) when we control market capitalisation. In the other models, such relation is visible for the lagged trade credit. When we control for financial freedom and trade freedom, the relationship between trade credit and borrowings from foreign MNEs is the least significant (models (2) and (3) in Table 8). Countries with higher financial freedom and trade freedom provide fewer loans to Poland, similar to host countries that benefit more from total FDI inflow. Conversely, MNEs from countries with higher market capitalisation and higher governance (measured by an arithmetic average of the Kaufmann's Worldwide Governance Indicators' ranks: *regulator*, *voice*, *political*, *govfec*, *ruleoflaw* and *corruption*) provide more loans to Polish firms.

Negative coefficients at the differences in relative human capital factor endowments (*ln_hdiff*) favor the horizontal integration model of intercompany lending as a component of FDI. In contrast, a significant positive relationship between the differences in relative physical capital factor endowments (*ln_kdiff*) and the dependent variable supports the vertical integration between lenders and borrowers from Poland (Table 8). We can explain this by the different work-intensive and capital-intensive industries' debt financing practices. Besides, parameters at the combined market's size of both lender and borrower countries (*ln_sum*) seem insignificant. We overlook the *sdi* variable because its coefficient is insignificant as well.

Next, for the robustness check, we control for the alternative measure of the explained variable. For this purpose, we use data on debt-based FDI inflow to Poland instead of positions on unpaid liabilities due to intercompany loans. We provide results of these models' estimations with controls for Kaufmann's Governance Indicators, measured by both estimates and ranks, in Table 9. Despite the usage of data on debt-based FDI inflow to Poland, our results presented in Table 9 still confirm the significant negative relationships between WHT on interests and debt-based FDI inflow to Poland. These outcomes support hypothesis H1 and shed light on reducing profit-shifting with FDI by WHT on interests. Moreover, all Kaufmann's Governance Indicators, measured by both estimates and ranks, are significantly and positively related to debt-based FDI inflow to Poland.

The research problem is original not only in the case of Poland but also on the European level. Our results are a kind of novelty and contribute to the literature on the profit-shifting role of debt-based FDI instruments and

FDI taxation. Our research also adds value to the discussion on the effects of debt-based FDI inflow to emerging markets opened by Igan *et al.* (2020).

Discussion

Contrary to the outcomes of the Cieřlik (2019) study for the total FDI inward to Poland until 2015, we identify that vertically integrated MNEs are more likely to provide loans to Polish firms. Using the dynamic panel-data approach proposed by Arellano and Bond (1991), we find evidence to confirm the difference between work-intensive and capital-intensive industries in shaping intercompany debt relationships or choosing a lender from abroad. The horizontal integration motive of intercompany lending is more familiar among work-intensive industries, that is, service industries. In the case of physical capital, our results support the vertical integration of intercompany lending as a component of FDI. When we use a less statistically robust standard panel-data model, findings support the vertical integration motive.

Conversely, Cieřlik (2019) pointed out the horizontal integration motives as the primary reason for total FDI inward to Poland. Unlike Jovanovic and Jovanovic (2018), we find that a better institutional environment of home countries has a significant positive impact on the debt-based FDI inflow to Poland as a host country. However, home countries with less financial freedom, less trade freedom, and lower FDI provide more intercompany loans to Poland. These results are achieved with the use of the Arellano-Bond estimator.

Our results support statements of Fuest *et al.* (2011), Dischinger *et al.* (2014), Hansson and Olofsdotter (2014), and Devereux *et al.* (2018) that MNEs optimise their tax payment by managing intercompany loans. However, we prove that governments can limit these practices by increasing WHT on interest income.

Simultaneously, we extend the discussion on the profit-shifting causing income tax gap in Poland conducted in a report of the Polish Economic Institute (2020) by adding the WHT on interest impact on reducing this tax avoidance practice. Furthermore, analysis of the unpaid liabilities due to foreign borrowings at the end of the fiscal year identifies a different list of top country-lenders — the Netherlands, Luxembourg, France, Germany, and Belgium compared to Polish Economic Institute (2020). Furthermore, we support the conclusion of Arena and Roper (2010) that MNEs issue more debt through subsidiaries located in countries that have lower with-

holding taxes on interest income and higher withholding taxes on dividends with the state where the parent company resides.

Conclusions

The causes and role of FDI in the development of emerging markets, including the Polish economy, have been studied extensively in the literature. The previous empirical analyses show that in the investment decisions, MNEs are motivated by different advantages (market access motive, efficiency-seeking by vertical or horizontal integration of business groups) of home and host countries. However, FDI can also be used to profit-shifting and tax avoidance studied in depth from a different perspective by Kałdoński (2016). Therefore, in our paper, we focus on withholding tax to check if WHT reduces the profit-shifting role of debt-based FDI, and in particular intercorporate loans, inflow to Poland.

Our results can raise policymakers' attention as intercompany loans are used as a tool for profit-shifting between firms located in high taxes and low taxes countries. We show that to limit profit-shifting, the government can effectively use WHT on interests, not only on dividends. Our findings confirm that WHT on interests reduces profit-shifting by intercompany loans provided to Poland by MNEs.

Besides WHT, our paper analyses trade credit (as a debt-based FDI instrument) impact on intercompany loans inflow to Poland in 2011–2017. The estimated specification is derived from the knowledge-capital model and includes two types of capital: human and physical. Using the Arellano-Bond next to random effects panel model estimators, we find that foreign intercompany loans are positively related to and even caused by trade credits abroad. Unlike in the case of total FDI inward to Poland (Cieślik, 2019), we find that vertically integrated MNEs are more likely to provide loans to Polish firms. A better institutional environment of home countries has a significant positive impact on the debt-based FDI inflow to Poland as a host country. MNEs from home countries with higher market capitalisation and higher governance (measured by Kaufmann's Worldwide Governance Indicators) provide more loans to Polish firms. However, MNEs from home countries with more financial freedom, greater trade freedom, and higher FDI beneficiaries provide fewer intercompany loans to Poland.

Our paper contributes to the discussion on the profit-shifting causing income tax gap in Poland conducted by Polish Economic Institute (2020). Policymakers and governments can use the results to limit profit-shifting practices via intercompany lending by increasing WHT on interest income.

The research limitations deal with the availability of the Penn World data only until 2017. Future studies can focus on equity FDI and reinvestments of MNE's profits in Poland. The comparative analysis of the impact of WHT on dividends and interest income on the capital inflows to Poland and other emerging markets is still an open question. The study of multinational firms' investment decisions from selected industries comparing debt-based FDI to equity FDI inflow is also a possible future research direction.

References

- Arena, M. P., & Roper, A. H. (2010). The effect of taxes on multinational debt location. *Journal of Corporate Finance*, 16(5), 637–654. doi: 10.1016/j.jcorpfin.2010.07.006.
- Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *Review of Economic Studies*, 58(2), 277–297. doi: 10.2307/2297968.
- Azémar, C. (2010). International corporate taxation and U.S. multinationals' behaviour: an integrated approach. *Canadian Journal of Economics/Revue Canadienne D'économie*, 43(1), 232–253. doi: 10.1111/j.1540-5982.2009.01570.x.
- Barrios, S., Huizinga, H., Laeven, L., & Nicodème, G. (2012). International taxation and multinational firm location decisions. *Journal of Public Economics*, 96(11-12), 946–958. doi: 10.1016/j.jpubeco.2012.06.004.
- Bénassy-Quéré, A., Fontagné, L., & Lahrière-Révil, A. (2005). How does FDI react to corporate taxation? *International Tax and Public Finance*, 12(5), 583–603. doi: 10.1007/s10797-005-2652-4.
- Białek-Jaworska, A. (2018). *Uwarunkowania, mechanizmy i efekty udzielania pożyczek przez przedsiębiorstwa niefinansowe*. Warszawa: CeDeWu.
- Białek-Jaworska, A., & Nehrebecka, N. (2016). The role of trade credit in business operations. *Argumenta Oeconomica*, 2(37), 189–231. doi: 10.15611/aoe.2016.2.08.
- Buettner, T., Overesch, M., & Wamser, G. (2018). Anti profit-shifting rules and foreign direct investment. *International Tax and Public Finance*, 25(3), 553–580. doi: 10.1007/s10797-017-9457-0.
- Buettner, T., & Wamser, G. (2007). Intercompany loans and profit shifting – evidence from company-level data. *CESifo Working Paper Series*, 1959.
- Camarero, M., Gómez-Herrera, E., & Tamarit, C. (2018). New evidence on trade and FDI: how large is the Euro effect? *Open Economies Review*, 29(2), 451–467. doi: 10.1007/s11079-018-9479-y.
- Casey, E., & O'toole, C. M. (2014). Bank lending constraints, trade credit and alternative financing during the financial crisis: evidence from European SMEs. *Journal of Corporate Finance*, 27, 173–193. doi: 10.1016/j.jcorpfin.2014.05.001.

- Central Bank of Poland (2020). Retrieved from <https://www.nbp.pl/home.aspx?f=/publikacje/zib/zib.html> (01.07.2020).
- Cieślak, A. (2019). Determinants of foreign direct investment from EU-15 Countries in Poland. *Central European Economic Journal*, 6(53), 39–52. doi: 10.2478/ceej-2019-0007.
- Damgaard, J., Elkjaer, T., & Johannesen, N. (2019). The rise of phantom investments. Retrieved from <https://www.imf.org/external/pubs/ft/fandd/2019/09/pdf/the-rise-of-phantom-FDI-in-tax-havens-damgaard.pdf> (01.07. 2020).
- Dang, P. T. (2019). Sustainability comes from within: carbon dioxide emissions, FDI origin factor and institutional qualities in developing countries. *Economia Politica: Journal of Analytical and Institutional Economics*, 36(2), 439–471. doi: 10.1007/s40888-019-00151-x.
- Desai, M. A., Foley, C., & Hines, J. R. (2004). Foreign direct investment in a world of multiple taxes. *Journal of Public Economics*, 88(12), 2727–2744. doi: 10.1016/j.jpubeco.2003.08.004.
- Devereux, M. P., Maffini, G., & Xing, J. (2018). Corporate tax incentives and capital structure: new evidence from UK firm-level tax returns. *Journal of Banking & Finance*, 88, 250–266. doi: 10.1016/j.jbankfin.2017.12.004.
- Dischinger, M., Knoll, B., & Riedel, N. (2014). The role of headquarters in multinational profit shifting strategies. *International Tax and Public Finance*, 21(2), 248–271. doi:10.1007/s10797-012-9265-5.
- Distance calculator. Retrieved from <http://www.indo.com/distance/> (01.07.2020).
- Duboz, M., Kroichvili, N., & Gallo, J. L. (2019). What matters most for FDI attraction in services: country or region performance? An empirical analysis of EU for 1997–2012. *Annals of Regional Science*, 63(3), 601–638. doi: 10.1007/s00168-019-00949-4.
- Dunning, J. H. (2000). The eclectic paradigm as an envelope for economic and business theories of MNE activity. *International Business Review*, 9(2), 163–190. doi: 10.1016/s0969-5931(99)00035-9.
- Durovic, I. (2017). The effects of intercompany lending on the current account balances of selected economies in the Western Balkans. *Public Sector Economics*, 41(4), 421–441. doi: 10.3326/pse.41.4.2.
- Egger, P., & Seidler, T. (2013). Corporate taxes and intra-firm trade. *European Economic Review*, 63(C), 225–242. doi: 10.1016/j.euroecorev.2013.07.007.
- Egger, P., Keuschnigg, C., Merlo, V., & Wamser, G. (2014). Corporate taxes and internal borrowing within multinational firms. *American Economic Journal: Economic Policy*, 6(2), 54–93. doi: 10.1257/pol.6.2.54.
- European Committee. Tax policies in the European Union. 2018 Survey. Retrieved from https://ec.europa.eu/taxation_customs/sites/taxation/files/tax_policies_survey_2018.pdf (05.07.2020).
- Faeth, I. (2009). Determinants of foreign direct investment – a tale of nine theoretical models. *Journal of Economic Surveys*, 23(1), 165–196. doi: 10.1111/j.1467-6419.2008.00560.x.

- Fonseca, P., & Juca, M. (2020). The influence of taxes on foreign direct investment: systematic literature review and bibliometric analysis. *European Research Studies Journal*, 23 (2), 55–77. doi: 10.35808/ersj/1580.
- Freenstra, C., Inklaar, R., & Timmer, M. (2019). Penn World Table 9.0. Retrieved from www.ggd.net/pwt (01.07.2020).
- Fuest, C., Hebous, S., & Riedel, N. (2011). International debt shifting and multinational firms in developing economies. *Economics Letters*, 113(2), 135–138. doi: 10.1016/j.econlet.2011.06.012.
- Guariglia, A., & Mateut, S. (2006). Credit channel, trade credit channel, and inventory investment: evidence from a panel of UK firms. *Journal of Banking & Finance*, 30(10), 2835–2856. doi: 10.1016/j.jbankfin.2005.11.002.
- Gudowski, J., & Piasecki, R. (2020). Foreign direct investment from emerging markets. Theory and practice. *Comparative Economic Research. Central and Eastern Europe*, 23(2), 7–19. doi: 10.18778/1508-2008.23.09.
- Hansson, Å., & Olofsdotter, K. (2014). Labor taxation and FDI decisions in the European Union. *Open Economies Review*, 25(2), 263–287. doi: 10.1007/s11079-013-9282-8.
- Hebous, S., & Ruf, M. (2017). Evaluating the effects of ACE systems on multinational debt financing and investment. *Journal of Public Economics*, 156, 131–149. doi: 10.1016/j.jpubeco.2017.02.011.
- Hejazi, W., & Treffer, D. (2019). Implications of Canada's restrictive FDI policies on employment and productivity. *Journal of International Business Policy*, 2(2), 142–166. doi: 10.1057/s42214-019-00023-y.
- Huizinga, H., & Nielsen, S. (2000). The taxation of interest in Europe: a minimum withholding tax. In C. Sijbren (Ed.), *Taxing capital income in the European Union: issues and options for reform*. London: Oxford University Press.
- Huizinga, H., Laeven, L., & Nicodeme, G. (2008). Capital structure and international debt shifting. *Journal of Financial Economics*, 88(1), 80–118. doi: 10.1016/j.jfineco.2007.05.006.
- IMF (2009). *Balance of payments and international investment position manual: Sixth Edition (BPM6)*. Washington, DC. Retrieved from <https://www.imf.org/external/pubs/ft/bop/2007/pdf/bpm6.pdf>.
- IMF (2014). *External debt statistics. Guide for compilers and users*. Washington, DC. Retrieved from <http://tffs.org/pdf/edsg/ft2014.pdf>.
- Igan, D., Kutan, A. M., & Mirzaei, A. (2020). The real effects of capital inflows in emerging markets. *Journal of Banking & Finance*, 119, 105933. doi: 10.1016/j.jbankfin.2020.105933.
- Jovanovic, B., & Jovanovic, B. (2018). Ease of doing business and FDI in the ex-socialist countries. *International Economics and Economic Policy*, 15(3), 587–627. doi: 10.1007/s10368-017-0377-3.
- Kałośński, M. (2016). *Unikanie opodatkowania z perspektywy nadzoru korporacyjnego. Badania nad odrębnością zjawiska w firmach rodzinnych*. Poznań: Wydawnictwo UEP.

- Kudła, J. (2018). Anti-avoidance regulatory policy for international transfer pricing and excess debt financing. *SSRN Electronic Journal*. doi: 10.2139/ssrn.3169976.
- Kudła, J., Kocia, A., Kopczewska, K., Kruszewski, R., & Walczyk, K. (2015). Optimal fiscal policy in an open economy with capital income shifting and consumer cross-border purchases. *Equilibrium. Quarterly Journal of Economics and Economic Policy*, 10(2), 9–30. doi: 10.12775/equil.2015.011.
- Makhavikova, H. (2018). *Determinants of FDI in Central and Eastern Europe: the effects of integration into the European Union*. Cham: Springer.
- Merlo, V., Riedel, N., & Wamser, G. (2020). The impact of thin-capitalization rules on the location of multinational firms' foreign affiliates. *Review of International Economics*, 28(1), 35–61. doi: 10.1111/roie.12440.
- 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.
- Moosa, I. A. (2002). *Foreign direct investment: theory, evidence, and practice*. Hampshire: Palgrave.
- Neuhaus, M. (2006). *The impact of FDI on economic growth: an analysis for the transition countries of Central and Eastern Europe*. Heilderberg: Physica-Verlag.
- OECD (2015). Measuring and monitoring BEPS, Action 11 ... (n.d.). Retrieved from https://www.oecd-ilibrary.org/taxation/measuring-and-monitoring-beps-action-11-2015-final-report_9789264241343-en (30.06.2020).
- Polish Economic Institute (2020). *The CIT gap in Poland in 2004-2018*. Warsaw: Polish Economic Institute.
- Porter, M. E. (1998). *The competitive advantage of nations*. Basingstoke: Palgrave.
- Taketa, K., & Udell, G. F. (2007). Lending channels and financial shocks: the case of small and medium-sized enterprise trade credit and the Japanese banking crisis. *Monetary and Economic Studies*, 25(2), 1–44.
- The Worldwide Governance Indicators (2019). Retrieved from <http://info.worldbank.org/governance/wgi/#home> (01.08.2020).
- Vernon, R. (1966). International investment and international trade in the product cycle. *Quarterly Journal of Economics*, 80(2), 190–207. doi: 10.1002/tie.5060080409.
- Withholding tax rates. Deloitte. Retrieved from <https://www2.deloitte.com/content/dam/Deloitte/global/Documents/Tax/dttl-tax-withholding-tax-rates.pdf> (20.06.2020).
- World Development Indicators. Retrieved from <https://databank.worldbank.org/source/world-development-indicators> (20.06.2020).
- Yaniv, G. (1988). Withholding and non-withheld tax evasion. *Journal of Public Economics*, 35(2), 183–204. doi: 10.1016/0047-2727(88)90053-9.
- Zee, H. (1998). Taxation of financial capital in a global environment: the role of withholding taxes. *National Tax Journal*, 51(3), 587–599.

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Annex

Table 1. Comparison on Polish withholding tax on interests and dividends on payments to countries-lenders in 2011–2017

[illegible]

Table 1. Continued

code	PL WHT* non-Treaty /Treaty	2017		2016		2016		2016		2015		2015		2014		2014		2013		2012		2012		2011	
		Div	Int	Div	Int	Div	Int	Div	Int	Div	Int	Div	Int	Div	Int	Div	Int	Div	Int	Div	Int	Div	Int	Div	Int
SG	Singapore	10	5	10	5	10	5	10	5	10	5	10	5	10	5	10	5	10	5	10	5	10	5	10	5
SK	Slovak Rep	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
ES	Spain	15	0	15	0	15	0	15	0	15	0	15	0	15	0	15	0	15	0	15	0	15	0	15	0
SE	Sweden	15	0	15	0	15	0	15	0	15	0	15	0	15	0	15	0	15	0	15	0	15	0	15	0
CH	Switzerland	15	5	15	5	15	5	15	5	15	5	15	5	15	5	15	5	15	5	15	5	15	5	15	5
TR	Turkey	15	10	15	10	15	10	15	10	15	10	15	10	15	10	15	10	15	10	15	10	15	10	15	10
GB	UK	10	5	10	5	10	5	10	5	10	5	10	5	10	5	10	5	10	5	10	5	10	5	10	5
US	US	15	0	15	0	15	0	15	0	15	0	15	0	15	0	15	0	15	0	15	0	15	0	15	0

Source: Withholding tax rates. Deloitte, 2011–2017.

Table 2. Definition of variables

variable	Definition
<i>borrow</i>	the logarithm of intercompany loans as a part of debt instruments of Foreign Direct Investments included in the Balance of Payments
<i>debtFDI</i>	logarithm of net debt foreign direct investment (FDI) inflow from country <i>i</i> to Poland in year <i>t</i>
<i>trade_credit</i>	the logarithm of trade credit and advances as a part of debt instruments of Foreign Direct Investments included in the Balance of Payments
<i>wht_int</i>	withholding tax rate on interests on loans received from country <i>i</i> in year <i>t</i>
<i>ln_sum</i>	the logarithm of the sum of country-lender's and Poland's GDPs
<i>sdi</i>	Helpman's size dispersion index that is calculated using data on output-side real GDP at chained purchasing power parity (PPP) rates and expressed in constant 2011 US dollars for Poland and particular country that provides loans $sdi_{ij} = 1 - gdp_{i_sum}^2 - gdp_{j_sum}^2$
<i>gdp_{i_sum}</i>	is country <i>i</i> 's share of a group of country-lender's and Poland's GDPs calculated using data on output-side real GDP at chained purchasing power parity (PPP) rates and expressed in constant 2011 US dollars
<i>gdp_{j_sum}</i>	is country <i>j</i> 's share of a group of country-lender's and Poland's GDPs calculated using data on output-side real GDP at chained purchasing power parity (PPP) rates and expressed in constant 2011 US dollars
<i>ln_kdiff</i>	the logarithm of capital per worker difference that is calculated using the national capital stocks expressed in PPPs in constant 2011 USD and the number of workers employed.
<i>ln_hdiff</i>	the logarithm of the differences in human capital endowments calculated using the human capital indexes for the source and host countries that are based on the average years of schooling and return to education
<i>ln_distance</i>	A proxy for trade costs is a logarithm of geographical distance of each parent country's (lender's) capital city from Warsaw that is measured "as the crow flies" distance between the capitals of the country-lender and the capital city of Poland (Warsaw), and it is expressed in kilometers. (Distance calculator, http://www.indo.com/distance)
<i>wht_div</i>	withholding tax rate on dividends on equity received from country <i>i</i> in year <i>t</i>
<i>bond</i>	the logarithm of bonds as a part of debt instruments of Foreign Direct Investments included in the Balance of Payments
<i>ln_interests</i>	the logarithm of interests on debt instruments of FDI
<i>ln_dividend</i>	the logarithm of dividends on equity instruments of FDI
<i>financialfreedom</i>	is a measure of banking efficiency and independence from government control and interference in the financial sector. Data are measured on a 0–100 scale.
<i>trade-freedom</i>	is a measure of the constraints on individuals and firms to move their resources into and out of specific activities, both internally and across the country's borders, without restriction. Data are measured on a 0–100 scale.
<i>ln_fdi_usd</i>	natural logarithm of total foreign direct investment (World Development Indicators)
<i>marketcap</i>	the logarithm of the market capitalization of listed domestic companies, measured in current USD
<i>kaufmann</i>	an arithmetic average of the Kaufmann's Worldwide Governance Indicators' ranks (The Worldwide Governance Indicators, 2019): <i>regulator</i> , <i>voice</i> , <i>political_govefec</i> , <i>ruleoflaw</i> , and <i>corruption</i> .
<i>regulator</i>	regulatory quality captures perceptions of the government's ability to formulate and implement sound policies and regulations that permit and promote private sector development, measured by estimate (<i>regulatore</i>) or rank (<i>regulatorr</i>).

Table 2. Continued

variable	Definition
<i>voice</i>	voice and accountability captures perceptions of the extent to which a country's citizens can participate in selecting their government, as well as freedom of expression, freedom of association, and a free media, measured by estimate (<i>voicee</i>) or rank (<i>voicer</i>)
<i>political</i>	political stability and absence of violence/terrorism measure perceptions of the likelihood of political instability and/or politically motivated violence, including terrorism, measured by estimate (<i>politicale</i>) or rank (<i>politicalr</i>).
<i>govefec</i>	government effectiveness captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies, measured by estimate (<i>govefece</i>) or rank (<i>govefecr</i>).
<i>ruleoflaw</i>	the rule of law captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence, measured by estimate (<i>ruleoflawe</i>) or rank (<i>ruleoflawr</i>).
<i>corruption</i>	control of corruption captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests, measured by estimate (<i>corruptione</i>) or rank (<i>corruptionr</i>).

Table 3. Descriptive statistics on FDI positions (panel A) and inflows (panel B)

Panel A – FDI positions at the end of the fiscal year, in years 2011–2018						
Variable	Obs	Mean	Std. Dev.	Min	Max	
borrow	288	6.851	2.268	0	10.773	
wht_int	265	0.069	0.037	0	0.15	
trade_credit	299	5.822	2.185	0	9.523	
ln_sum	245	14.360	0.758	13.665	16.781	
sdi	245	0.288	0.151	0	0.499	
<i>gdp_{i sum}</i>	245	0.649	0.290	0.051	1	
<i>gdp_{j sum}</i>	245	0.351	0.290	0	0.949	
ln_kdiff	238	12.181	0.668	10.059	12.955	
ln_hdiff	237	-0.612	1.520	-4.981	2.873	
ln_distance	287	7.383	0.953	5.852	9.148	
wht_div	265	0.128	0.031	0.05	0.19	
bond	288	0.468	1.772	0	8.923	
ln_interests	280	3.650	2.307	0	7.655	
ln_dividendd	280	4.356	2.866	0	9.481	
financialfreedom	227	68.282	14.938	20	90	
tradefreedom	227	86.203	4.524	63	90	
ln_fdi_usd	245	19.176	13.591	-24	27	
marketcap	172	4.109	1.007	1.585	7.150	
kaufmann	279	1.116	1.088	-0.758	16.377	
voicee	280	1.207	5.364	-1.66	89.7	
voicer	280	76.804	24.038	1.5	100	
politicale	287	0.667	0.610	-1.25	1.62	
politicalr	287	71.424	21.815	10.9	99.05	
govfece	288	1.199	0.640	-0.68	2.24	
govfecr	288	85.805	12.349	43.27	100	
regulatore	288	1.258	0.563	-0.54	2.26	
regulatorr	288	84.992	13.535	31.73	100	
ruleoflawe	288	1.177	0.703	-0.82	2.1	
ruleoflawr	288	83.002	16.466	20.67	100	
corruptione	288	1.137	0.845	-1.01	2.4	
corruptionr	288	80.802	17.768	15.38	100	
Panel B for robustness check – debt-based FDI inflow to Poland in 2010–2018						
Variable	Obs	Mean	Std. Dev.	Min	Max	
<i>debtFDI</i>	1,310	1.30	2.22	0.00	10.30	
<i>wht_div</i>	568	0.13	0.04	0.00	0.20	
<i>wht_int</i>	568	0.09	0.04	0.00	0.20	
<i>regulatore</i>	3,717	0.00	1.00	-2.65	2.26	
<i>regulatorr</i>	3,717	50.02	29.04	0.00	100.00	
<i>voicee</i>	3,728	0.00	1.00	-2.31	1.80	
<i>voicer</i>	3,728	50.00	29.03	0.00	100.00	
<i>politicale</i>	3,729	0.00	1.00	-3.31	1.97	
<i>politicalr</i>	3,730	50.04	29.06	0.00	100.00	
<i>govfece</i>	3,706	0.00	1.00	-2.48	2.44	
<i>govfecr</i>	3,706	50.02	29.04	0.00	100.00	
<i>ruleoflawe</i>	3,764	0.00	1.00	-2.61	2.10	
<i>ruleoflawr</i>	3,764	50.01	29.04	0.00	100.00	
<i>corruptione</i>	3,731	0.00	1.00	-1.87	2.47	
<i>corruptionr</i>	3,731	50.03	29.07	0.00	100.00	

Table 4. Correlation matrix

variable	borrow	tradedcredit	bond	sdi	ln_kdiff	ln_bdiff	ln_sum	ln_distance	wht_int	wht_div	interests	dividend	kaufmann
borrow	1												
trade_credit	0.4733*	1											
bond	0.4811*	0.1577*	1										
sdi	0.2458*	0.5248*	-0.1774*	1									
ln_kdiff	0.3632*	0.3954*	0.1789*	0.4707*	1								
ln_bdiff	-0.2247*	-0.4281*	0.1659	-0.6587*	-0.1045	1							
ln_sum	0.2086*	0.3845*	0.0019	0.0749	-0.1318	-0.6168*	1						
ln_distance	-0.1848*	-0.1683*	-0.1103	-0.1866*	0.004	-0.2432*	0.3412*	1					
wht_int	-0.5331*	-0.3945*	-0.1561	-0.1990*	-0.3654*	0.0607	-0.1750*	0.1157	1				
wht_div	0.2961*	0.0676	0.0643	0.2653*	0.3716*	-0.1208	-0.0264	-0.1212	-0.1431	1			
ln_interests	0.7316*	0.5479*	0.3673*	0.2624*	0.5662*	-0.1246	0.1609	-0.2130*	-0.6599*	0.2831*	1		
ln_dividendd	0.6591*	0.6150*	0.3276*	0.2982*	0.5875*	-0.2183*	0.1926*	-0.2398*	-0.5302*	0.2323*	0.8046*	1	
kaufmann	0.1378	0.0241	0.08	0.1754*	0.3470*	-0.0755	-0.1199	0.0486	-0.0878	0.2428*	0.2243*	0.2702*	1
financialfreedom	0.2236*	0.1216	0.0554	0.2304*	0.4424*	0.0903	-0.3796*	-0.0911	-0.2906*	0.3779*	0.2710*	0.2331*	0.3903*
tradedfreedom	0.0413	-0.0234	0.0097	0.1438	0.3943*	0.1858*	-0.4381*	-0.0665	-0.1376	0.2827*	0.1375	0.1750*	0.3104*
ln_fdi_usd	0.0514	-0.024	0.0993	-0.0262	-0.1089	-0.1828*	0.1919*	0.2095*	-0.0021	-0.0005	-0.0672	-0.0592	-0.0264
marketcap	0.1098	0.2463*	0.0037	0.1987*	0.2704*	-0.1683	0.1298	0.5373*	-0.1879	0.2875*	-0.0507	-0.0855	0.2170*
voice	0.0076	-0.0729	0.0089	0.0886	0.073	-0.1453	-0.0098	0.0651	0.0895	0.0852	0.0133	0.104	0.8916*
politicalc	0.0624	0.0156	0.1344	0.0296	0.5114*	0.2291*	-0.3353*	-0.1403	-0.0624	0.1912*	0.2425*	0.3107*	0.4326*
govefece	0.2577*	0.092	0.1272	0.1246	0.5001*	0.0172	-0.0998	0.1445	-0.3630*	0.2380*	0.3528*	0.2572*	0.5057*
regulator	0.2413*	0.2433*	0.1057	0.2633*	0.5216*	0.1464	-0.3114*	-0.0642	-0.2895*	0.3135*	0.3510*	0.2852*	0.5363*
ruleoflaw	0.3470*	0.2515*	0.1494	0.3049*	0.6814*	0.0945	-0.2517*	-0.0919	-0.4416*	0.4645*	0.5322*	0.4442*	0.5412*
corruptione	0.3406*	0.2665*	0.1804*	0.3154*	0.6679*	0.026	-0.1221	0.0079	-0.3874*	0.4358*	0.5287*	0.4454*	0.5394*

Table 4. Continued

variable	financialfreedom	tradefreedom	ln_fdi_usd	marketcap	voice	politicale	govefece	ruleoflawe	corruptione
borrow									
trade_credit									
bond									
sdi									
ln_kdiff									
ln_hdiff									
ln_sum									
ln_distance									
wht_int									
wht_div									
ln_interests									
ln_dividendd									
kaufmann									
financialfreedom	1								
tradefreedom	0.7722*	1							
ln_fdi_usd	-0.0651	-0.1022	1						
marketcap	0.4488*	0.2061*	0.2164*	1					
voice	0.1097	0.0871	0.0069	0.0476	1				
politicale	0.4521*	0.4490*	-0.1359	0.2112*	0.1035	1			
govefece	0.4724*	0.3297*	-0.0361	0.3093*	0.1622*	0.4481*	1		
regulator	0.7614*	0.6289*	-0.0331	0.5182*	0.1397	0.6177*	0.6693*	1	
ruleoflawe	0.7237*	0.5563*	-0.0567	0.4359*	0.1319	0.6233*	0.6950*	0.8730*	1
corruptione	0.6671*	0.5057*	-0.0841	0.5097*	0.125	0.6231*	0.7350*	0.8599*	0.9108*

Table 5. Determinants of intercompany loans – results of random-effects GLS

variable	borrow		borrow		borrow	
	Coef.		Coef.		Coef.	
	Std. Err.		Std. Err.		Std. Err.	
wht_int	-8.74	**	-9.13	***	-9.16	***
	3.62		2.84		3.36	
trade_credit	0.20	*	0.15	*	0.20	**
	0.10		0.09		0.10	
ln_sum	1.85	***	1.14	***	1.34	***
	0.38		0.26		0.35	
sdi	7.04	***	3.56	**	4.89	**
	2.10		1.49		1.89	
ln_kdiff	1.54	***	1.18	***	1.33	***
	0.32		0.22		0.29	
ln_hdiff	0.82	***	0.44	***	0.60	***
	0.24		0.16		0.21	
ln_distance	-0.44	*	-0.29	*	-0.30	
	0.26		0.15		0.22	
wht_div	-2.85		-5.06		-3.19	
	4.89		3.50		4.40	
bond	0.02		0.02		0.01	
	0.03		0.03		0.03	
ln_interests			0.35	***		
			0.04			
ln_dividend					0.16	***
					0.04	
_cons	-37.08	***	-23.47	***	-28.29	***
	6.91		4.64		6.26	
Number of obs	230		230		230	
Number of groups	35		35		35	
R-sq between	0.71		0.89		0.82	
Wald Test chi2	118.04	***	387.04	***	180.82	***

Standard errors are given below the coefficients. Significance levels are *** $p < 0.01$, ** $p < 0.05$, and * $p < 0.1$.

Table 6. Determinants of intercompany loans – results of RE GLS with Kaufmann Governance Indicators (estimates)

variable	(1)		(2)		(3)		(4)		(5)		(6)	
wht_int	-9.08	***	-9.16	***	-7.43	***	-8.03	***	-5.54	*	-7.76	***
	2.81		2.85		2.88		2.88		2.92		2.85	
trade_credit	0.15	*	0.14	*	0.15	*	0.13		0.12		0.13	
	0.08		0.09		0.08		0.09		0.08		0.08	
ln_sum	1.12	***	1.21	***	1.26	***	1.26	***	1.35	***	1.18	***
	0.25		0.26		0.26		0.26		0.26		0.26	
sdi	3.47	**	3.83	**	3.90	***	3.48	**	3.50	**	2.95	**
	1.46		1.51		1.48		1.49		1.44		1.49	
ln_kdiff	1.17	***	1.08	***	1.05	***	1.07	***	0.88	***	0.99	***
	0.22		0.23		0.23		0.23		0.23		0.23	
ln_hdiff	0.43	***	0.45	***	0.47	***	0.42	**	0.41	***	0.37	**
	0.16		0.16		0.16		0.16		0.16		0.16	
ln_distance	-0.28	*	-0.28	*	-0.38	**	-0.34	**	-0.38	**	-0.39	**
	0.15		0.16		0.16		0.16		0.15		0.16	
wht_div	-5.10		-5.15		-6.56	*	-6.58	*	-9.55	***	-7.29	**
	3.43		3.53		3.52		3.58		3.60		3.56	
bond	0.03		0.02		0.03		0.02		0.03		0.02	
	0.03		0.03		0.03		0.03		0.03		0.03	
ln_interests	0.36	***	0.35	***	0.33	***	0.35	***	0.34	***	0.33	***
	0.04		0.04		0.04		0.04		0.04		0.04	
voicee	0.00											
	0.01											
politicale			0.23									
			0.16									
govefece					0.50	***						
					0.18							
regulatore							0.48	**				
							0.22					
ruleoflawe									0.77	***		
									0.21			
corruptione											0.46	***
											0.17	
_cons	-23.08	***	-23.35	***	-23.40	***	-23.77	***	-22.56	***	-20.91	***
	4.53		4.68		4.62		4.66		4.49		4.70	
No. of obs	230		230		230		230		230		230	
No. groups	35		35		35		35		35		35	
R ² between	0.89		0.89		0.89		0.89		0.90		0.90	
Wald Test	412.1	***	381.4	***	397.5	***	387.7	***	429.3	***	400.7	***

Standard errors are given below the coefficients. Significance levels are *** p < 0.01, ** p < 0.05, and * p < 0.1.

Table 7. Determinants of intercompany loans – results of RE GLS with Kaufmann Governance Indicators (ranks)

variable	(1)	(2)	(3)	(4)	(5)	(6)
wht_int	-7.65 *** 2.87	-9.46 *** 2.85	-7.72 *** 2.80	-8.25 *** 2.82	-6.98 ** 2.93	-7.64 *** 2.89
trade_credit	0.14 * 0.08	0.14 * 0.09	0.11 0.08	0.12 0.08	0.12 0.08	0.12 0.09
ln_sum	1.36 *** 0.27	1.21 *** 0.26	1.26 *** 0.25	1.32 *** 0.26	1.32 *** 0.26	1.24 *** 0.26
sdi	4.89 *** 1.56	3.63 ** 1.49	3.37 ** 1.45	3.83 *** 1.48	3.82 ** 1.48	3.48 ** 1.49
ln_kdiff	1.02 *** 0.23	1.03 *** 0.24	1.01 *** 0.22	0.97 *** 0.23	0.94 *** 0.24	1.00 *** 0.23
ln_hdiff	0.57 *** 0.17	0.42 ** 0.16	0.41 ** 0.16	0.44 *** 0.16	0.44 *** 0.16	0.41 ** 0.16
ln_distance	-0.23 0.16	-0.29 * 0.16	-0.39 ** 0.15	-0.31 ** 0.15	-0.36 ** 0.16	-0.37 ** 0.16
wht_div	-5.94 * 3.51	-5.13 3.52	-7.19 ** 3.47	-6.48 * 3.51	-7.57 ** 3.61	-6.86 * 3.57
bond	0.02 0.03	0.02 0.03	0.03 0.03	0.03 0.03	0.03 0.03	0.02 0.03
ln_interests	0.33 *** 0.04	0.34 *** 0.04	0.33 *** 0.04	0.34 *** 0.04	0.34 *** 0.04	0.33 *** 0.04
voicer	0.01 *** 0.00					
politicalr		0.01 * 0.01				
govfecr			0.03 *** 0.01			
regulatorr				0.03 *** 0.01		
ruleoflawr					0.02 *** 0.01	
corruptionr						0.02 ** 0.01
_cons	-26.18 4.72	-23.28 *** 4.67	-24.69 *** 4.54	-25.34 *** 4.64	-24.12 *** 4.61	-23.28 *** 4.64
No. of obs	230	230	230	230	230	230
No. groups	35	35	35	35	35	35
R ² between	0.89	0.89	0.90	0.89	0.90	0.89
Wald Test	394.3 ***	384.6 ***	419.9 ***	399.8 ***	399.1 ***	391.7 ***

Standard errors are given below the coefficients. Significance levels are *** p < 0.01, ** p < 0.05, and * p < 0.1.

Table 8. Determinants of intercompany loans – results of one-step Arellano-Bond dynamic panel-data estimation

variable	(1) borrow	z	(2) borrow	z	(3) borrow	z	(4) borrow	z	(5) borrow	z
borrow	0.55 #	1.51	0.67 *	1.65	0.69 *	1.76	0.63 *	1.8	0.62 ***	2.84
lagged	0.36		0.40		0.39		0.35		0.22	
L2.	-0.32 ***	-2.56	-0.40 **	-2.04	-0.39 **	-2.03	-0.37 **	-2.36	-0.24	-1.61
	0.12		0.19		0.19		0.16		0.15	
wht_int	-3.92 ***	-3.44	-4.06 ***	-3.08	-3.65 **	-2.41	-3.07 **	-2.49	-7.34 **	-2.4
	1.14		1.32		1.52		1.23		3.06	
L1.	2.64	0.47	4.97	0.92	2.87	0.53	2.69	0.43	-3.47 **	-2.29
	5.67		5.40		5.37		6.23		1.52	
L2.	-4.05 **	-2.16	-5.85 **	-2.27	-5.50 **	-2.1	-4.79 **	-2.22	-0.78	-0.47
	1.88		2.58		2.61		2.16		1.65	
trade	0.05	0.18	0.23	0.8	0.22	0.77	0.11	0.42	0.28 *	1.88
credit	0.26		0.29		0.29		0.27		0.15	
L1.	0.25 **	2.04	0.24 #	1.44	0.22 ##	1.38	0.25 **	2.01	0.26 ***	2.75
	0.12		0.17		0.16		0.13		0.09	
ln_sum	-0.66	-0.3	0.03	0.01	-0.80	-0.35	-1.08	-0.48	0.03	0.02
	2.19		2.08		2.28		2.27		1.52	
ln_kdiff	3.26 *	1.82	3.30 *	1.65	3.07 #	1.59	2.90 *	1.77	1.96	1.25
	1.79		1.99		1.94		1.64		1.57	
L1.	-3.44	-1.24	-5.52 *	-1.89	-5.62 **	-1.98	-3.98	-1.6	-4.46	-1.56
	2.77		2.92		2.84		2.49		2.86	
L2.	1.80	0.95	4.20 *	1.85	4.09 *	1.84	2.47	1.43	4.52 **	2.23
	1.90		2.27		2.22		1.72		2.02	
ln_hdiff	-0.66	-0.54	-2.54 **	-2.56	-2.53 ***	-2.69	-2.17 ***	-2.84	-1.99 ***	-3.16
	1.21		0.99		0.94		0.77		0.63	
kaufmann	0.05 *	1.67								
	0.03									
financial			-0.01 **	-2.54						
freedom			0.00							
trade					-0.04 ***	-4.51				
freedom					0.01					
fdi							-0.01 *	-1.84		
							0.004			
market									0.65 **	2.18
capitalis									0.30	
year	0.04	0.65	0.00	0.07	0.03	0.4	0.04	0.64	-0.08	-1.38
	0.06		0.06		0.06		0.06		0.05	
Wald Test	161.1 ***		177.3 ***		212.9 ***		137.1 ***		140.7 ***	
N of obs	123		110		110		123		84	
N of groups	34		32		32		34		24	
instruments	26		26		26		26		26	
Sargan test of overidentifying restrictions										
	17.45		22.32		20.04		21.34		21.34	
p-value	0.13		0.03		0.07		0.05		0.05	
Arellano-Bond test for zero autocorrelation in first-differenced errors										
AR1	-3.14		-3.07		-2.99		-2.91		-2.91	
p-value	0.00		0.002		0.00		0.00		0.00	
AR2	-1.12		0.001		-0.004		0.96		0.96	
p-value	0.26		0.999		0.997		0.34		0.34	

Standard errors are given below the coefficients. Significance levels are *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$, # $p < 0.15$, and ## $p < 0.2$.

Table 9. Determinants of debt-based FDI inflow to Poland in years 2010–2018

	debtFDI	debtFDI	debtFDI	debtFDI	debtFDI	debtFDI	debtFDI	debtFDI	debtFDI	debtFDI	debtFDI	debtFDI
whit_	-13.4 **	-14.1 ***	-15.4 ***	-16.1 ***	-14.97 ***	-16.2 ***	-18.2 ***	-18.0 ***	-18.0 ***	-17.5 ***	-14.7 ***	-14.5 ***
int	5.46	5.47	5.40	5.46	5.44	5.47	5.44	5.43	5.10	5.00	5.56	5.51
rule	1.09 ***											
oflawe	0.21											
rule	0.04 ***											
oflawr	0.01											
regulat			1.06 ***									
ore			0.22									
regulat				0.04 ***								
orr				0.01								
gov					1.07 ***							
efece					0.22							
gov						0.04 ***						
efecr						0.01						
politic							0.81 ***					
ale							0.21					
politic								0.03 ***				
alr								0.01				
voicee									0.99 ***			
									0.18			
voicer										0.03 ***		
										0.01		
corrup											0.89 ***	
tionc											0.20	
corrup												0.03 ***
tionr												0.01
_cons	3.94 ***	2.06 ***	4.08 ***	2.38 ***	3.99 ***	2.30 ***	4.78 ***	3.38 ***	4.65 ***	3.12 ***	4.23 ***	2.47 ***
	0.56	0.83	0.56	0.84	0.57	0.88	0.52	0.72	0.49	0.61	0.55	0.80
No. obs	259	259	259	259	259	259	259	259	259	259	259	259
groups	78	78	78	78	78	78	78	78	78	78	78	78
R ²	43%	41%	42%	40%	42%	41%	37%	37%	43%	45%	40%	42%

Note: Standard errors are given below the coefficients. Significance levels are *** p < 0.01, ** p < 0.05, and * p < 0.1.

Figure 1. Structure of intercompany loans and trade credit, including in inward debt-based FDI to Poland in years 2011–2018

rank / year	actual 2018	intercompany loans						past		rank / year	actual 2018	trade credit						past	
		2017	2016	2015	2014	2013	2012	2011	2010			2017	2016	2015	2014	2013	2012	2011	
1	NL	FR	NL	FR	FR	FR	FR	FR	FR	1	DE	DE	DE	DE	DE	DE	DE		
2	LU	NL	NL	NL	NL	NL	DE	NL	NL	2	CH	CH	CH	CH	FR	FR	FR		
3	FR	LU	LU	LU	LU	DE	NL	LU	DE	3	FR	NL	FR	CH	IT	IT	IT		
4	DE	DE	DE	DE	DE	LU	LU	LU	LU	4	BE	BE	IT	IT	IT	CH	CH		
5	BE	ES	BE	ES	BE	ES	GB	SE	SE	5	IT	IT	NL	BE	BE	BE	BE		
6	AT	BE	ES	BE	ES	GB	US	GB	GB	6	NL	BE	BE	NL	NL	NL	JP		
7	CY	GB	GB	GB	GB	BE	ES	ES	ES	7	KR	GB	GB	KR	AT	JP	NL		
8	GB	AT	AT	IE	AT	US	SE	US	US	8	GB	KR	KR	GB	GB	KR	KR		
9	US	CY	US	AT	US	AT	BE	BE	BE	9	AT	AT	AT	AT	KR	GB	GB		
10	CH	CH	CY	US	IE	CH	AT	AT	AT	10	US	ES	HK	US	JP	AT	ES		
11	ES	US	CH	CY	SE	SE	CY	CH	CH	11	DK	US	AT	DK	US	ES	AT		
12	IE	US	CH	CY	SE	CY	CH	CY	CY	12	CN	IE	HK	US	SE	SE	CN		
...		IE	IE	SE	CY	CY	CH	CY	CY	13	IE	SE	DK	SE	ES	US	SE		
19	MT	MT	MT							14	JP	DK	SE	DK	IE	IE	HK		
20								MT	MT	15	CZ	CN	CN	IE	CZ	DK	LU		
21										16	ES	CZ	IE	CZ	SE	HK	US		
22			MT	MT	MT					17	SE	HK	JP	SK	HU	LU	IE		
23						MT	MT			18	HK	JP	LU	HU	LU	LU	DK		
										19	LU	LU							

Note: ranks according to the amount of the FDI positions at the end of the fiscal year; NL – the Netherlands, FR – France, LU – Luxembourg, DE – Germany, BE – Belgium, ES – Spain, GB – Great Britain, SE – Sweden, AT – Austria, US – the United States, CY – Cyprus, IE – Ireland, CH – Switzerland, MT – Malta, IT – Italy, JP – Japan, KR – Korea, Rep., HK – Hong Kong, DK – Denmark, CN – China, CZ – Czech Republic, SK – Slovak Republic, HU – Hungary, SG – Singapore

Source: own elaboration based on data of Central Bank of Poland (NBP) retrieved from debt instruments of Balance of Payments.

Figure 2. Liabilities due to debt-based FDI share in FDI positions in 2015–2018

Source: own elaboration based on data of Central Bank of Poland (NBP).

Figure 3. Liabilities due to intercompany loans positions in years 2011–2018

Source: own elaboration based on data of Central Bank of Poland (NBP).

Figure 4. Profits transferred abroad through interest payments in years 2011–2018

Source: own elaboration based on data of Central Bank of Poland (NBP).