This is an Accepted Manuscript of an article published by Taylor & Francis in Post-Communist Economies, Volume 35, 2023 – Issue 4 on 24 Jan 2023, available online: https://doi.org/10.1080/14631377.2023.2169522

Taxation as a Factor of Investment Attractiveness in the Visegrád Countries

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Managers take into account the tax burden when they decide about a new investment; therefore, they seek countries with lower tax rates. Governments respond to these requirements and battle for new investments by lowering tax rates as part of tax competition. This study focuses on the Visegrád countries as a region of new foreign investments from other OECD countries, and analyses the determinants of a bilateral FDI position of equity. As a model, it uses dynamic panel regression with GMM estimation. Results show that FDIs are affected by the level of difference in corporate taxation and the size of both countries. Every other potential determinant has no effect on the level of investment. These results show that foreign investors care about tax burdens more when investing within the Visegrád Group. Visegrád countries are relatively close when considering conditions for business; therefore, the most important difference becomes the taxation of profits.

Keywords: tax competition; multinational companies; foreign direct investment; tax burden; Visegrád countries

Subject classification codes: F21; F23; H25; H26

1. Introduction

Paying taxes is one of the most hated obligations of both companies and citizens, and each tries to minimize its tax liability if it has the tools to do so. However, not every possible tool is legal, and some lead to tax evasion. Every responsible manager (or person) avoids tax evasion, but there are also legal tools consisting of possible ways to use tax legislation to lower the tax burden of a company. Company managers tend to use tax havens with lower tax burdens via specific tax planning schemes to help them reach their goals in this area (Davies et al., 2018).

Whereas the economy of almost every country is strictly connected to those of others, preferences for lower tax burdens affect all countries, and governments face

pressure to decrease corporate tax rates (or overall corporate taxation). This tax competition has been ongoing for a long time, and one can observe a long-term decrease in corporate tax rates (Dyreng et al., 2017; Slemrod, 2004). Tax competition represents a battle for foreign investments, and governments, especially of open economies, have to react and offer relevant tax conditions. Naturally, when it comes to new investments, managers tend to select locations with better taxation conditions to help them reach their goals—in some cases, even, without extensive tax planning. This is a reason why many countries offer special tax regimes for companies even if they are not typical tax havens; IP (intellectual property) boxes are especially popular (Evers et al., 2015). Naturally, the tax burden is not the only factor that impacts the decision of investment location. Investment can attract higher-quality institutions (Buchanan, 2012; Peres et al., 2018) or more infrastructure (Paul and Jadhav, 2019).

This article focuses on the determinants of inward FDIs (foreign direct investments), with an emphasis on tax determinants. Many studies include a large group of countries with very different historical development and current economic situations. It is obvious that large differences in infrastructure lead to significant differences in the level of FDI. One question then arises: how will the situation change when one considers similar countries? This article focuses on the Visegrád countries (the Czech Republic, Hungary, Poland and Slovakia) as investment locations, as they compete for FDIs from other OECD (Organisation for Economic Co-operation and Development) countries, taking into account all significant variables from previous studies.

After this introduction, there follows a literature review. This part of the study presents relevant studies on tax competition, the use of tax havens and FDI determinants. The third part of the article is dedicated to methodology. It describes the

data used within this study and the dynamic panel model itself. The fourth part consists of results and discussion. Finally, the last part of this article is the conclusion.

2. Literature Review

Globalisation brings higher importance to FDI in world economics, and governments want to attract as many investors as possible. Companies, or more specifically their managers are in a comfortable position: they can choose an investment location based on their criteria. Naturally, these criteria can be transformed into determinants of FDI that governments address.

From investors' perspective, the quality of institutions can be seen as one factor determining the location of investments (Buchanan, 2012; Peres et al., 2018). Peres et al. (2018) show that institutional quality seems more important in developed countries, a category in which the authors include all EU countries but also, e.g. Ukraine. Paul and Jadhav (2019) also show the importance of institutional determinants of FDI, which they study across emerging markets from all parts of the world. Their results suggest that overall infrastructure, institutional quality, political stability and the level of corruption are determinants of FDI. Brada et al. (2019) show that corruption and corruption differentials at the bilateral level hurt the level of FDI. Bayar et al. (2020) also revealed human capital and corruption as essential determinants in their study of post-transition countries.

Ramasamy and Yeung (2010) reveal several FDI determinants in the service sector, such as GDP, labour costs, education level, and infrastructure index. Interestingly, they do not include any variable connected to tax issues. Boateng et al. (2015) study the determinants of inward FDI in Norway, and they also do not insert any tax variables. On the other hand, they show the importance, e.g., of exchange rate or

real GDP. Multinational companies also appreciate social stability in a country, as confirmed by Görg et al. (2009).

Saini and Singhania (2018) show that FDI has different determinants depending on a country's level of development. In developed countries, variables connected to the policy were identified as more critical. On the other hand, economic determinants were more important across developing countries. Developing countries also face a higher level of tax avoidance, so they tend to keep corporate tax rates low to gain at least some tax profits (Johannesen et al., 2020). As far as developing countries are concerned, Kheng et al. (2017) studied FDI, its connection to human capital, and their results show a significant positive relationship between human capital and FDI. When comparing investments in tax havens, the motives also differ based on the group of countries: technological intensity is one of the critical determinants for companies from OECD (Jones and Temouri, 2016) and vice versa for companies from emerging economies, the low corporate tax rate seems to be the most important (Makni-Fourati et al., 2019). These studies demonstrate that studying countries in homogeneous groups is beneficial.

Camarero et al. (2019) focus on German FDI, more concretely on outward FDI. However, their study is also relevant for the Central and Eastern European countries that receive these investments. According to the study, market-seeking motives are most important for FDI in countries as developed as Germany (also Visegrád countries). On the other hand, a study focusing on Poland shows that FDI is mainly driven by seeking efficiency, not by seeking a Polish market (Cieślik, 2020).

Taxation as a factor of FDI level only appears in some studies dealing with determinants of investments, but some have been created. Feld and Heckemeyer (2011) provide critical views of several other studies and evaluate the different models and variables these latter studies use. They see the bilateral effective tax rate (BEATR) as a

tax variable that can explain the variability of FDI. Egger et al. (2009) use BEATR as the primary explanatory variable in the analysis of FDI, and results show that the introduction of bilateral levels can help illuminate how FDI is determined. Bailey and Warby (2019) also demonstrate that tax rates are essential determinants of manufacturing FDI in Costa Rica.

Since taxation impacts the location of investments, globalisation puts pressure on countries to reduce companies' tax burden, and this reduction has been present over several last decades (Dyreng et al., 2017). This pressure resulted in tax competition and, especially in the EU, countries' close relations force governments to reduce corporate tax rates (Banociova and Tahlova, 2019; Genschel & Schwarz, 2011; Leibrecht & Hochgatterer, 2012; Podviezko et al., 2019). Current studies show that countries react to changes in each other's tax systems (Cassette & Paty, 2008; Devereux et al., 2008), and reactions within the EU are even more frequent (Redoano, 2014). Overesch and Rincke (2011) show that statutory corporate tax rates would be more than ten per cent higher if countries did not adopt tax competition policies. Leibrecht and Hochgatterer (2012) mention that corporate tax reduction is caused by the competition of governments for FDI.

Tax competition offers a significant opportunity for companies to reduce their tax burden using tax planning and investments in more tax-friendly locations. Companies use different tax legislation via tax planning schemes that shift profits to countries with lower tax burdens (Elexa et al., 2022; Godar & Janský, 2021; Khouri et al., 2019). Known schemes can be divided into three groups, according to which transactions transfer the profits: transfer pricing (Davies et al., 2018), interest payments connected with intra-group loans (Buettner & Wamser, 2013; Ištok & Kanderová, 2019), and royalties for the use of IP assets (Auerbach et al., 2017). In connection with

investments, Mukherjee et al. (2017) show that companies decrease their R&D investments when the tax burden is higher. Also, companies from the Information and communications technology sector in the Czech Republic face a lower tax burden than companies from other sectors (Jedlička, 2021). Moreover, several countries use IP boxes with a lower tax rate for R&D profits within the tax competition (Evers et al., 2015), and current evidence shows that the use of an IP box attracts patents (Alstadsæter et al., 2018) because of the high mobility of IP assets (Griffith et al., 2014; Karkinsky & Riedel, 2012). High capital mobility also pressures governments to lower tax rates for companies (Swank, 2016) to attract more investments.

On the other hand, a second part of the tax competition consists of countries' lower tax revenues because of companies' tax planning. As one of the CEE countries, the Czech Republic suffers from tax planning through lower tax revenues: according to Janský (2018), the loss is around 20 billion Czech korun (CZK). Another study estimates about CZK 10 billion tax revenue loss in the Czech Republic (Moravec et al., 2019). On the other hand, countries from Africa or Latin America suffer more from international tax planning (Cobham & Janský, 2018). Overall, tax competition can lead to fiscal deficits (Arcalean, 2017), and eliminating tax havens can increase welfare in other countries (Slemrod & Wilson, 2009).

Podviezko et al. (2019) show that tax competitiveness is determined by more than taxation conditions. They emphasise the roles of labour costs and conditions for the business overall, adding that a low statutory corporate tax rate in Bulgaria does not help it achieve a better position within the tax competition. Sanz-Cordóba (2020) shows that tax policy is closely connected with non-tax policies. When a country has worse infrastructure than its direct tax competitors, the government tends to lower the tax rate more. Mentioned studies show that the effects of tax competition are closely related to

non-tax factors. Overall, investments are attracted by a group of factors, including tax conditions.

Naturally, governments mostly care about the positive effects of tax competition which gained investments can express. Moreover, tax competition threatens also gained domestic FDI, so governments tend to lower corporate tax rates to maintain their positions (Azémar et al., 2020). Tax competition between US states and FDI is also affected by the level of taxation (Brülhart & Schmidheiny, 2015).

When the tax competition and investments are assessed, one of the critical elements is the location of the investments. This article is focused on the investment within the Visegrád Group (the Czech Republic, Hungary, Poland and Slovakia). Concerning Visegrád countries, Reurink and Garcia-Bernardo (2020) show that they all belong to a cluster which attracts manufacturing FDI and that most countries in this cluster offer lower corporate taxation than others. Based on these results, corporate taxation plays a significant role in investments in the Visegrád Group. According to Bellak and Leibrecht (2005), a lower tax burden was an excellent choice to attract FDI in the past, but Paun (2019) highlights taxation as one of the most critical determinants of the level of FDI in CEE countries even in these days.

The purpose of tax competition is to gain more investments and therefore, the best way to characterise tax competitiveness is by how efficiently a country attracts foreign investments. This article uses FDI as the main highlight of tax competition and focuses on one homogeneous group of countries as an investment location – the Visegrád Group. Current evidence shows that taxation significance in Central Europe is higher than in other parts of the world. This study aims not to find general FDI determinants but to determine which determinants seem more significant when investing in Central Europe and the position of taxation as an FDI determinant. The

investor countries (from the perspective of FDI; for these countries, they are providing outward FDI) are the most important OECD investors in this region. This study has selected the level of outward FDI in the Visegrád group as a measure.

3. Methodology

3.1. Data

Data were obtained from public sources, mainly the OECD database (OECD, 2021) and Worldbank database (Worldbank, 2021); the Transparency International web page was the source for the corruption index (Transparency International, 2021) and values of effective average tax rates were obtained from the study by Spengel et al. (2020). The data collection covers the years 2010–2019. Table 1 shows selected countries (both investor countries and investment countries).

[Table 1 near here]

3.2. Model and variables

This study is based on the dynamic panel data model because FDIs show a certain degree of continuity. Dynamic panel models use lagged dependent variables as independent ones, so they can better cover changes connected with different years. Naturally, FDI (especially when expressed by FDI position) depends on previous years' values, and the dynamic panel data model is the best solution to cover the situations of previous years.

The dynamic model can be expressed by the following equation:

$$FDI_{it} = \alpha FDI_{i,t-1} + \sum_{j=1}^{J} \beta_j X_{it}^{j} + \varepsilon_{it}, \quad (1)$$

where FDI_{it} is the natural logarithm of the bilateral FDI position of equity for country *i*

in year *t*; $FDI_{i,t-1}$ is the lagged FDI position of equity from one year earlier; α represents the coefficient of the lagged variable; X_{it}^{j} is the matrix of explanatory variables used in the model and ε_{it} is the error of the model, which consists of the individual fixed effects of every country and idiosyncratic shocks (Roodman, 2009a, 2009b).

Dynamic panel data models have one important disadvantage: they shorten the dataset. More precisely, the first year of observations is always used as lagged variable, and for the first year, there is no data for the previous values. On the other hand, the model should be more accurate than a non-dynamic panel data model because the lagged variable includes observation-specific error (in the case of this study, the error connected to the bilateral FDI position).

[Table 2 near here]

Table 2 presents all the variables used, with descriptions. The dependent variable is based on the bilateral FDI position of equity reported by OECD. This FDI position is defined as the value of the stock of foreign direct investment at the end of the year and contains all types of shares, common shares, preferred shares, capital contributions, reserves, and reinvestment of earnings and is connected with all immediate investors (OECD, 2021). The data used in this study include information about FDI related to the immediate investing country. Based on the bilateral view in this study, the differences between the immediate partner country and Visegrád country are the subject of investigation. This study assumed the situation when an investor in a selected country has decided to invest in the Visegrád country. Naturally, they could stay in their home country and invest there, but they have selected to invest elsewhere. The managers of companies have faced a comparison of the investment environment of two countries, and this study aims to find what is the role of taxation in this decision-

making. Selection of FDI position is the best option to observe changes in FDI activity in the dynamic panel data model.

GDP data for both countries is obtained from World Bank, and GDP is expressed in US$ at current purchaser's prices (World Bank, 2021). GDP is calculated as the sum of gross value created by residents of the economy with the addition of all product taxes minus subsidies (World Bank, 2021). In the model, the natural logarithm of GDP is included. There were not selected GDP differences because GDP is used as a control variable. Both sizes of economies should affect the absolute value of FDI.

Differences in wages can also be an important FDI determinant. This study uses value comparing average wages in both countries. Data were obtained from OECD, and the average annual wages in 2019 constant prices at 2019 USD PPPs were selected (OECD, 2021). Obviously, it is assumed that a greater wage difference implies higher inward FDI in Visegrád country.

According to infrastructure, there were not bilateral measures used because it can be assumed that infrastructure in Western countries has already been built and only maintenance expenditures are not so high. This variable is expressed only by the spending of Visegrád country (as an investment location) on transport infrastructure as a share of GDP (OECD, 2021). Transport infrastructure is selected as one of the most important infrastructure highlights overall. Naturally, it is complicated to select only one measure for infrastructure. As Visegrád countries attract mainly manufacturing FDI, transport infrastructure is the key part of these investments, which can convince managers to invest in the location.

The difference in corruption index is another variable, and as a measure, Corruption Perceptions Index from Transparency International was selected. This index is focused on the level of public sector corruption and has been calculated regularly for

several years (Transparency international, 2021). Different types of institutions widely use this index, and harmonised methodology across countries makes it the measure for comparison of the situation in different countries.

The most important variable for this study is one expressing the taxation difference between countries. The selected measure consists of the EATR (effective average tax rate) for domestic investment as a measure of the taxation in the home country; and the EATR for cross-border investment (or BEATR – bilateral) as a measure of taxation in Visegrád countries. These rates were introduced by Devereux and Griffith (1998, 2003) and are widely used in numerous analyses. The data were obtained from Spengel et al. (2020). The calculated metric compares taxation in the case of investment in the home country with the case of investment in Visegrád country from the home country, and the study aims to determine this taxation difference affects the value of FDI. It is worth mentioning that taxation across Visegrád countries is very different and also has different trends (decrease in Hungary, increase in Slovakia).

As a measure of the difference in personal taxation, the values based on the average tax wedge of a single person with no child and average wage were selected (OECD, 2021). Lower wages should attract more investments, therefore greater differences should contribute to the increase of FDI.

[Table 3 near here]

Table 3 presents basic descriptive statistics connected with each variable.

This study selected the system GMM (generalized method of moments), introduced by Arellano and Bond (1991), as an estimator and gretl as calculation software. Hwang and Sun (2018) recommend using a one-step rather than two-step procedure and this study follows their advice.

The most important additional test is the Sargan/Hansen test for overidentifying restrictions (Roodman, 2009b). Roodman (2009a, 2009b) shows that this test is associated with inaccuracies when researchers use large sets of instruments. Interpretation of results should take these problems into account, and the best way to do so is to only implement a reasonable number of instruments in each model. This study uses Sargan test, and there is a preference for non-rejection of the null hypothesis, that all used instruments in the model are valid (Blundell & Bond, 1998). Except for the Sargan test, the Wald test is also used as a measure of the quality of the model. The null hypothesis associated with this test is that the independent variables with such estimated parameters as a whole are not significant. As for the Wald test, the appropriate model should generate a rejection of the null hypothesis. The last tests relate to autocorrelation. Whereas the panel data model is used, first-order autocorrelation usually appears. The problem occurs when for second-order autocorrelation does not refuse the null hypothesis of no autocorrelation (Arellano & Bond, 1991).

4. Results and discussion

Table 4 shows the results of the dynamic panel data models. Expected dependencies were individually inserted into a model to find which variable shifts the model toward better results. Model 1 is based only on lagged FDI, and the values of GDP for both the investor country and the country of investment. All the variables are significant, and even this model brings relatively high explanatory power. Additional tests show that the instruments are valid (Sargan test) and model as a whole is significant (Wald test). Also, autocorrelation tests provide wanted results (presence of first-order but no second-order autocorrelation).

[Table 4 near here]

The second model introduces the first new variable: difference in wages—the cost of labour should be an important determinant when investment locations are selected. Model 2 shows that within the Visegrád group, average wage does not play any significant role. There is one obvious reason for this: average wage is similar in all four countries. Companies classify the countries into the same group when the cost of labour is considered; therefore, these costs are not the main drivers influencing the decision to select one from the Visegrád countries as an investment location. Results show that the inclusion of wage variable does not help the model's effectiveness. Moreover, based on the Sargan test, it can be stated that this variable is redundant. Every other additional test provides the expected results.

The infrastructure of the country of investment is another attribute which can impact FDI. The results of model 3 demonstrate that the level of infrastructure expenditure does not affect the level of investment. Even though all additional tests show positive values for the valuation of the quality of the model, the inclusion of infrastructure does not improve the model.

The fourth model implements the difference in corruption index as an additional variable. Even this implementation does not seem to be the best for the model, and the variable was not identified as statistically significant. On the other hand, the Sargan test p-value is above the level of significance. In this case, the study by Roodman (2009a), which demonstrates that higher p-values are not always the results of better variable selection, should be considered. Roodman argues that p-values above 0.25 should raise doubts about the quality of a model, and the results of model 4 show why. Post-tests for GMM do not reveal any significant problem and implementing corruption increases the p-value of the Sargan test, but the variable itself is not statistically significant. Given

these two facts, this fourth model is not adequate, and corruption seems not to be a good variable to clarify the model.

Model 5 implements differences in EATR, and the results of this model show this variable to be significant. In this case, the Sargan test p-value is above the level of significance and below 0.25. A difference in corporate tax rates between the home country and investment country is an important determinant when considering investment in the Visegrád Group. The positive coefficient of this variable means that lower corporate taxation in Visegrád country attracts more investment. Moreover, other additional tests provide satisfying results, and this model can be marked as appropriate. Wald test does not reveal the insignificance of variables and autocorrelation is present only in the case of first-order case.

The last model implements personal tax burden difference, and the results show that this variable is not significant. Overall, it can be stated that FDI position is mainly influenced by previous years' FDI levels, by the GDP of both countries and by taxation. Additional tests show expected results, and the model is formulated correctly, but the overall inclusion of personal tax burden difference does not improve the model to provide better results.

The finding of zero significance for labour costs contrasts with a study by Ramasamy and Yeung (2010) that demonstrate wage to be one of the most important determinants of FDI, in the sense that companies seek lower labour costs. The insignificance of wages indicates that the wage-sensitive part of FDI is not larger than the non-sensitive part, so there should be a cancelling-out effect. Moreover, it suggests that efficiency-seeking FDI is not leading in CEE countries which is in line with a study by Camarero et al. (2019), whose results demonstrate the significance of market-seeking FDI (where labour costs do not play such a critical role) in this region.

Model 3 demonstrates that differences in infrastructure expenditure between Visegrád countries are not significant drivers of the level of FDI. This result differs from previous studies that confirmed infrastructure's importance (Paul and Jadhav, 2019; Ramasamy and Yeung, 2010). Based on this, companies from developed countries do not distinguish between Visegrád countries in terms of infrastructure. Of course, different results occur when considering only one investor country. From the perspectives of investors in specific locations, one of the Visegrád countries may offer the best conditions among the four (better road connections, more direct flights, etc.). This may be an opportunity for further research, concentrating on only one country and on the preferences of its investors.

Several studies show the importance of institutions and their quality; investors prefer to invest in countries with quality institutions and without corruption (Brada et al., 2019; Buchanan, 2012; Peres et al., 2018). This study does not confirm that corruption matters when companies invest in Visegrád countries. It seems to be at similar levels in all four countries, or perhaps companies do not take into account this attribute of investment location.

The results of Model 5 demonstrate the importance of corporate tax burdens in attracting foreign investments—or more precisely, the importance of differences in corporate tax burden. This result is in line with the findings of several previous studies (Azémar et al., 2020; Brülhart & Schmidheiny, 2015; Egger et al., 2009; Feld and Heckemeyer, 2011). Reurink and Garcia-Bernardo (2020) show that the Visegrád countries have a lower corporate tax burden, and this helps them gain foreign investments. The Visegrád countries use tax competition as a tool for attracting FDI, and within the Visegrád Group, the most successful countries are those with lower corporate tax rates. The dataset using this study is in this sense very interesting, because

in two countries (the Czech Republic and Poland), the corporate tax rate remained the same in all years. On the other hand, the corporate tax rate in Hungary decreased significantly, while the Slovak tax burden has risen. Taking into account these changes in legislation, these results are even more important. Changes in corporate taxation can (dis)attract foreign investments, so tax competition plays a key role in gaining investments. Companies from other OECD countries seek lower tax burdens and locate investments mainly based on taxation conditions. Moreover, whereas the Visegrád countries are similar in many ways, their key distinguishing factor is the level of corporate tax burden. This result inspires recommendations for further research: researchers should focus on similar multi-country regions. Clearly, investors want countries with better infrastructure and lower corruption, but when these factors are similar, it seems taxation begins to play a significant role. Further research should verify if similar results occur in regions other than the Visegrád Group.

Model 6 does not show any significance of personal taxation on the level of FDI. Naturally, it is employees that primarily face the taxation of personal income, but usually, part of this taxation is paid by employers; overall, it increases labour costs. On the other hand, these costs are included in expected costs overall, and they seem to be a small portion compared to profits; therefore, corporate taxes are more important, which also mean higher tax expenses.

It is important to mention that the results of this study do not provide guidance for governments on how to make fiscal policy. Estimated models only show that taxation plays a significant role in attracting FDI. Governments are also responsible for other parts of the economy and lowering corporate tax rates can be undesirable even if it attracts new investments. Lower taxation can result in fiscal deficit in most cases, and it can create pressure to reduce government spending in key areas of economic

development. Overall, governments face the challenge of whether they are ready to pay relevant costs to gain new investments.

The area of taxation has become more of a global problem these days because managers of companies use tax havens and try to minimize their tax liabilities. From the perspective of tax competition, the introduction of a global minimum tax is a very important breakpoint. If the companies will face the minimum corporate tax rate, it brings a change in the tax competitiveness of countries, especially for those with a corporate tax rate below the agreed 15%. In such cases, tax competition can be reduced but only in attracting large companies. Naturally, large multinational companies are the ones with the largest FDI, but it is worth mentioning that global minimum tax is planned only for large multinational companies. On the other hand, many countries have corporate tax rate above 15%, so there will still be significant place for tax competition between countries. On the other hand, such a rate can eliminate aggressive tax policies of tax havens, from which other countries' tax revenues suffer.

In addition to corporate taxation, governments also have other tax instruments which can play a significant role for multinational companies. Taxation of dividends and interests is also an important part of tax competition and affects the net income of companies. Moreover, tax base determination is also different across countries, e.g., depreciation is important for manufacturing companies but also for technological companies with intangible assets. The introduction of a global minimum tax can move attention to other important attributes of tax systems, and friendly governments' policies in these parts of legislation may come to the fore in the future.

5. Conclusion

This study examines the important topic of international tax competition. Tax competition is widely used by governments (even if a country is not a true tax haven)

and companies (or more precisely, their managers) to take advantage of better tax legislation in a different country.

This study uses FDI as a dependent variable and implements several variables which should affect the level of investment in order to compare tax impact and the impact of other features of the investment environment. Only one additional variable is significant in the presented dynamic panel model: corporate tax rate difference. Every other variable assumed, based on current studies, to be important is not statistically significant. This study shows that within the Visegrád Group, corporate taxation plays a key role in attracting foreign investments.

An unexpected result can be seen in the insignificance of the wage variable, which means there is no important impact of labour costs on the level of investment. This result indicates that there can be a cancelling-out effect of wage-sensitive FDI and non-sensitive ones. Nor is any significance connected with infrastructure expenditures, which numerous studies report as an important determinant. Zero influence on the level of FDI was also identified for levels of corruption and personal taxation.

The limitations of this study lie in focusing only on specific group of countries as investment locations. On the one hand, this approach can bring new knowledge about investing when the situation in other countries is similar. On the other, it makes the results of this study less applicable to other groups of countries. Therefore, further studies should focus on other groups of similar countries as investment locations and find determinants in other parts of the world. Also, monitoring only FDI from OECD countries can be seen as another limitation because companies from less-developed countries can behave differently on the market.

This study provides evidence that, when considering similar countries, tax burden becomes a key factor. Future studies can also include other tax determinants

connected to corporate taxation, though some of them can be difficult to express in numbers, and selected model may also be accompanied by overidentifying restrictions. Experts can also try to handle how much the effects are delayed. It is obvious that changes in taxation will cause changes in FDI, but it is not so clear how much time managers need to react to this.

Disclosure statement

The author report there are no competing interests to declare.

Funding

This work was supported by the Student Grant Competition of University of Pardubice in 2021 (SGS_2021_012, grant no. 12).

Acknowledgement

I would like to thank Jana Slavíčková for her help with the text editing.

Data availability statement

The data that support the findings of this study are openly available in OECD.stat at https://stats.oecd.org/; in Worldbank database at https://data.worldbank.org/indicator/NY.GDP.MKTP.CD; and in Transparency International – CORRUPTION PERCEPTIONS INDEX at https://www.transparency.org/en/cpi/.

References

Alstadsæter, A., Barrios, S., Nicodème, G., Skonieczna, A. M., & Vezzani, A. (2018). Patent boxes design, patents location, and local R&D. *Economic Policy, 33*(93), 131–177. https://doi.org/10.1093/epolic/eix021

Arcalean, C. (2017). International tax competition and the deficit bias. *Economic Inquiry, 55*(1), 51–72. https://doi.org/10.1111/ecin.12358

Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *The review of economic studies, 58*(2), 277–297. https://doi.org/10.2307/2297968

Auerbach, A. J., Devereux, M. P., Keen, M., & Vella, J. (2017). International Tax Planning under the Destination-Based Cash Flow Tax. *National Tax Journal, 70*(4). https://doi.org/10.17310/ntj.2017.4.04

Azémar, C., Desbordes, R., & Wooton, I. (2020). Is international tax competition only about taxes? A market-based perspective. *Journal of Comparative Economics, 48*(4), 891–912. https://doi.org/10.1016/j.jce.2020.05.002

Bailey, N., & Warby, B. (2019). Explaining the competition for FDI: Evidence from Costa Rica and cross-national industry-level FDI data. *Research in International Business and Finance, 47*, 67–77. https://doi.org/10.1016/j.ribaf.2018.07.002

Banociova, A., & Tahlova, S. (2019). European States in a Bout of Corporate Tax Competition. *Journal of Competitiveness, 11*(3), 19–34. https://doi.org/10.7441/joc.2019.03.02

Bayar, Y., Remeikiene, R., Androniceanu, A., Gaspareniene, L., & Jucevicius, R. (2020). The Shadow Economy, Human Development and Foreign Direct Investment Inflows. *Journal of Competitiveness, 12*(1), 5–21. https://doi.org/10.7441/joc.2020.01.01

Bellak, C., & Leibrecht, M. (2005). Effective tax rates as a determinant of Foreign Direct Investment in Central-and East European Countries. *SFB International Tax Coordination Discussion Paper*, (7).

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

Boateng, A., Hua, X., Nisar, S., & Wu, J. (2015). Examining the determinants of inward FDI: Evidence from Norway. *Economic Modelling, 47*, 118–127. https://doi.org/10.1016/j.econmod.2015.02.018

Brada, J. C., Drabek, Z., Mendez, J. A., & Perez, M. F. (2019). National levels of corruption and foreign direct investment. *Journal of Comparative Economics, 47*(1), 31–49. https://doi.org/10.1016/j.jce.2018.10.005

Brülhart, M., & Schmidheiny, K. (2015). Estimating the rivalness of state-level inward FDI. *Journal of Regional Science, 55*(1), 139–148. https://doi.org/10.1111/jors.12102

Buchanan, B. G., Le, Q. V., & Rishi, M. (2012). Foreign direct investment and institutional quality: Some empirical evidence. *International Review of financial analysis, 21*, 81–89. https://doi.org/10.1016/j.irfa.2011.10.001

Buettner, T., & Wamser, G. (2013). Internal Debt and Multinational Profit Shifting: Empirical Evidence from Firm-level Panel Data. *National Tax Journal, 66*(1), 63–96. http://dx.doi.org/10.17310/ntj.2013.1.03

Camarero, M., Montolio, L., & Tamarit, C. (2019). What drives German foreign direct investment? New evidence using Bayesian statistical techniques. *Economic Modelling, 83*, 326–345. https://doi.org/10.1016/j.econmod.2019.08.017

Cassette, A., & Paty, S. (2008). Tax competition among Eastern and Western European countries: With whom do countries compete?. *Economic Systems, 32*(4), 307–325. https://doi.org/10.1016/j.ecosys.2008.06.003

Cieślik, A. (2020). Determinants of foreign direct investment from OECD countries in Poland. *Eurasian Economic Review, 10*(1), 9–25. https://doi.org/10.1007/s40822-019-00136-y

Cobham, A., & Janský, P. (2018). Global distribution of revenue loss from corporate tax avoidance: re-estimation and country results. *Journal of International Development, 30*(2), 206–232. https://doi.org/10.1002/jid.3348

Davies, R. B., Martin, J., Parenti, M., & Toubal, F. (2018). Knocking on tax haven's door: Multinational firms and transfer pricing. *Review of Economics and Statistics, 100*(1), 120–134. https://doi.org/10.1162/REST_a_00673

Devereux, M., & Griffith, R. (1998). The taxation of discrete investment choices. *IFS Working Papers*, No. W98/16, Institute for Fiscal Studies (IFS), London. https://doi. org/10.1920/wp.ifs.1998.9816

Devereux, M. P., & Griffith, R. (2003). Evaluating tax policy for location decisions. *International Tax and Public Finance, 10*(2), 107–126. https://doi.org/10.1023/a:1023364421914

Devereux, M. P., Lockwood, B., & Redoano, M. (2008). Do countries compete over corporate tax rates?. *Journal of Public Economics, 92*(5–6), 1210–1235. https://doi.org/10.1016/j.jpubeco.2007.09.005

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*(3), 441–463. https://doi.org/10.1016/j.jfineco.2017.04.001

Egger, P., Loretz, S., Pfaffermayr, M., & Winner, H. (2009). Bilateral effective tax rates and foreign direct investment. *International Tax and Public Finance, 16*(6), 822–849. https://doi.org/10.1007/s10797-008-9092-x

Elexa, L., Ištok, M., & Šlampiaková, L. (2022). Do Links to Tax Havens Affect Companies' Financial Performance? The Case of Slovakia. *E&M Economics and Management, 25*(1), 60–76. https://doi.org/10.15240/tul/001/2022-1-004

Evers, L., Miller, H., & Spengel, C. (2015). Intellectual property box regimes: effective tax rates and tax policy considerations. *International Tax and Public Finance, 22*(3), 502–530. https://doi.org/10.1007/s10797-014-9328-x

Feld, L. P., & Heckemeyer, J. H. (2011). FDI and taxation: A meta-study. *Journal of economic surveys, 25*(2), 233–272. https://doi.org/10.1111/j.1467-6419.2010.00674.x

Genschel, P., & Schwarz, P. (2011). Tax competition: a literature review. *Socio-economic review, 9*(2), 339–370. https://doi.org/10.1093/ser/mwr004

Godar, S., & Janský, P. (2021). Corporate profit misalignment: evidence from German headquarter companies and their foreign affiliates. *Post-Communist Economies, 33*(6), 726–750. https://doi.org/10.1080/14631377.2020.1827201

Görg, H., Molana, H., & Montagna, C. (2009). Foreign direct investment, tax competition and social expenditure. *International Review of Economics & Finance, 18*(1), 31–37. https://doi.org/10.1016/j.iref.2008.02.009

Griffith, R., Miller, H., & O'Connell, M. (2014). Ownership of intellectual property and corporate taxation. *Journal of Public Economics, 112*, 12–23. https://doi.org/10.1016/j.jpubeco.2014.01.009

Hwang, J., & Sun, Y. (2018). Should we go one step further? An accurate comparison of one-step and two-step procedures in a generalized method of moments

framework. *Journal of econometrics, 207*(2), 381–405. https://doi.org/10.1016/j.jeconom.2018.07.006

Ištok, M., & Kanderová, M. (2019). Debt/asset ratio as evidence of profit-shifting behaviour in the Slovak Republic. *Technological and Economic Development of Economy, 25*(6), 1293–1308. https://doi.org/10.3846/tede.2019.11338

Janský, P. (2018). Estimating the revenue losses of international corporate tax avoidance: the case of the Czech Republic. *Post-Communist Economies, 30*(5), 617–635. https://doi.org/10.1080/14631377.2018.1443243

Jedlička, V. (2021). The Use of International Tax Planning in Subsidiaries from the Financial and ICT Sectors in the Czech Republic. *E&M Economics and Management, 24*(1), 182–196. https://doi.org/10.15240/tul/001/2021-1-012

Johannesen, N., Tørsløv, T., & Wier, L. (2020). Are less developed countries more exposed to multinational tax avoidance? Method and evidence from micro-data. The *World Bank Economic Review, 34*(3), 790-809. https://doi.org/10.1093/wber/lhz002

Jones, C., & Temouri, Y. (2016). The determinants of tax haven FDI. *Journal of World Business, 51*(2), 237–250. https://doi.org/10.1016/j.jwb.2015.09.001

Karkinsky, T., & Riedel, N. (2012). Corporate taxation and the choice of patent location within multinational firms. *Journal of International Economics*, *88*(1), 176–185. https://doi.org/10.1016/j.jinteco.2012.04.002

Kheng, V., Sun, S., & Anwar, S. (2017). Foreign direct investment and human capital in developing countries: a panel data approach. *Econ Change Restruct 50*(4), 341–365. https://doi.org/10.1007/s10644-016-9191-0

Khouri, S., Elexa, L., Istok, M., & Rosova, A. (2019). A Study from Slovakia on the Transfer of Slovak Companies to Tax Havens and Their Impact on the Sustainability of the Status of a Business Entity. *Sustainability, 11*(10), 2803. doi: 10.3390/su11102803

Leibrecht, M., & Hochgatterer, C. (2012). Tax competition as a cause of falling corporate income tax rates: A survey of empirical literature. *Journal of Economic Surveys, 26*(4), 616–648. https://doi.org/10.1111/j.1467-6419.2010.00656.x

Makni-Fourati, Y., Madhi, R., & Alqatan, D. (2019). What drives emerging economies firms to invest in tax havens?. *Academy of Accounting and Financial Studies Journal*.

Moravec, L., Rohan, J., & Hinke, J. (2019). Estimation of international tax planning impact on corporate tax gap in the Czech Republic. *E&M Ekonomie a Management, 22*(1), 157–171. https://dx.doi.org/10.15240/tul/001/2019-1-011

Mukherjee, A., Singh, M., & Žaldokas, A. (2017). Do corporate taxes hinder innovation?. *Journal of Financial Economics, 124*(1), 195–221. https://doi.org/10.1016/j.jfineco.2017.01.004

OECD (2021). OECD.stat. https://stats.oecd.org/

Overesch, M., & Rincke, J. (2011). What drives corporate tax rates down? A reassessment of globalization, tax competition, and dynamic adjustment to shocks. *The Scandinavian Journal of Economics, 113*(3), 579–602. https://doi.org/10.1111/j.1467-9442.2011.01650.x

Paul, J., & Jadhav, P. (2019). Institutional determinants of foreign direct investment inflows: evidence from emerging markets. *International Journal of Emerging Markets, 15*(2), 245–261. https://doi.org/10.1108/IJOEM-11-2018-0590

Paun, D. (2019). Tax competition and factors influencing the gross domestic product and foreign direct investments of CEE countries. *Economic research-Ekonomska istraživanja, 32*(1), 876–893. https://doi.org/10.1080/1331677X.2019.1585896

Peres, M., Ameer, W., & Xu, H. (2018). The impact of institutional quality on foreign direct investment inflows: evidence for developed and developing countries. *Economic research-Ekonomska istraživanja, 31*(1), 626–644. https://doi.org/10.1080/1331677X.2018.1438906

Podviezko, A., Parfenova, L., & Pugachev, A. (2019). Tax competitiveness of the new EU member states. *Journal of Risk and Financial Management, 12*(1), 34. https://doi.org/10.3390/jrfm12010034

Ramasamy, B., & Yeung, M. (2010). The determinants of foreign direct investment in services. *World Economy, 33*(4), 573–596. https://doi.org/10.1111/j.1467-9701.2009.01256.x

Redoano, M. (2014). Tax competition among European countries. Does the EU matter?. *European Journal of Political Economy, 34*, 353–371. https://doi.org/10.1016/j.ejpoleco.2014.02.006

Reurink, A., & Garcia-Bernardo, J. (2020). Competing for capitals: the great fragmentation of the firm and varieties of FDI attraction profiles in the European

Union. *Review of International Political Economy*, 1–34. https://doi.org/10.1080/09692290.2020.1737564

Roodman, D. (2009a). A note on the theme of too many instruments. *Oxford Bulletin of Economics and statistics, 71*(1), 135–158. https://doi.org/10.1111/j.1468-0084.2008.00542.x

Roodman, D. (2009b). How to do xtabond2: An introduction to difference and system GMM in Stata. *The stata journal, 9*(1), 86–136. https://doi.org/10.1177/1536867X0900900106

Saini, N., & Singhania, M. (2018). Determinants of FDI in developed and developing countries: a quantitative analysis using GMM. *Journal of Economic Studies, 45*(2). 348–382. https://doi.org/10.1108/JES-07-2016-0138

Sanz-Córdoba, P. (2020). The role of infrastructure investment and factor productivity in international tax competition. *Economic Modelling, 85*, 30–38. https://doi.org/10.1016/j.econmod.2019.05.003

Slemrod, J., & Wilson, J. D. (2009). Tax competition with parasitic tax havens. *Journal of Public Economics, 93*(11–12), 1261–1270. https://doi.org/10.1016/j.jpubeco.2009.08.004

Slemrod, J. (2004). Are corporate tax rates, or countries, converging?. *Journal of Public Economics, 88*(6), 1169–1186. https://doi.org/10.1016/S0047-2727(03)00061-6.

Spengel, C., Schmidt, F., Heckemeyer, J. H., Nicolay, K., Bartholmeß, A., Ludwig, C., ... & Stage, B. (2020*). Effective tax levels using the Devereux/Griffith methodology*. ZEW-Gutachten und Forschungsberichte, ZEW - Leibniz-Zentrum für Europäische Wirtschaftsforschung, Mannheim.

Swank, D. (2016). Taxing choices: international competition, domestic institutions and the transformation of corporate tax policy. *Journal of European Public Policy, 23*(4), 571–603. https://doi.org/10.1080/13501763.2015.1053511

Transparency International (2021). Corruption Perceptions Index.

https://www.transparency.org/en/cpi/

World Bank (2021). Data. GDP.

https://data.worldbank.org/indicator/NY.GDP.MKTP.CD

Tables

Table 1. Countries included in the study.

Country of investor	Country of investment
Austria Belgium Denmark France Germany Italy Netherlands Spain Switzerland Sweden United Kingdom USA	Czech Republic Hungary Poland Slovakia

Source: author.

Table 2. Description of variables.

Variable	Description
FDI	Natural logarithm of bilateral FDI position of equity
GDP_VIS	Natural logarithm of a Visegrád country's GDP
GDP_INV	Natural logarithm of an investing country's GDP
WAG	The average wage of an investing country divided by the average wage of a Visegrád country
INF_VIS	Transport infrastructure investment and maintenance spending by a Visegrád country divided by country's GDP
COR	Corruption Perceptions Index of an investing country divided by Corruption Perceptions Index of a Visegrád country
EATR	The effective average tax rate for domestic investment in an investing country divided by the effective average tax rate for cross-border investment in case of investment in a Visegrád country
PTX	The average tax wedge of an investing country divided by the average tax wedge of a Visegrád country

Source: author.

Table 3. Description of variables.

Variable	Mean	Median	STD.dev	Minimum	Maximum
FDI	8.0326	8.2141	1.2216	4.9260	10.5002
GDP_VIS	26.0377	25.9599	0.6322	25.2059	27.1133
GDP_INV	27.8367	27.4644	1.0734	26.4359	30.6960
WAG	2.1093	2.0924	0.3985	1.2123	3.1707
INF_VIS	0.0090	0.0077	0.0040	0.0034	0.0194
COR	1.4727	1.4902	0.3114	0.6984	2.3500
EATR	1.4086	1.3533	0.3319	0.2896	3.0180
PTX	1.0068	1.0176	0.2596	0.4458	1.6349

Source: author.

Table 4. Regression results.

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
FDI(-1)	0.4973*** (0.1235)	0.5379*** (0.1184)	0.4893*** (0.1354)	0.4848*** (0.1283)	0.5288*** (0.1222)	0.5234*** (0.1246)
const	-13.7430*** (4.0967)	-14.1951*** (4.7858)	-13.7864*** (4.2557)	-13.5035*** (4.2621)	-12.6409*** (3.7788)	-12.2719*** (3.5936)
GDP_VIS	0.4781*** (0.1299)	0.4788*** (0.1530)	0.4805*** (0.1365)	0.47813*** (0.1315)	0.4415*** (0.1225)	0.4005*** (0.1118)
GDP_INV	0.1922*** (0.0731)	0.1837*** (0.0706)	0.1950** (0.0762)	0.1910** (0.0765)	0.1692** (0.0671)	0.1894*** (0.0716)
WAG		0.1647 (0.1137)				
INF_VIS			-3.5655 (5.6581)			
COR				-0.0710 (0.1864)		
EATR					0.1722** (0.0775)	
PTX						0.4168 (0.2876)
Number of observations	353	353	353	353	353	353
Number of instruments	47	48	48	48	48	48
Sargan test (p-value)	χ^2 = 50.7936 (0.1934)	χ^2 = 61.0810 (0.0361)	χ^2 = 48.8217 (0.2506)	χ^2 = 48.6567 (0.2558)	χ^2 = 56.4672 (0.0817)	χ^2 = 57.0187 (0.0745)
AR(1) (p-value)	-3.0066 (0.0026)	-3.0042 (0.0027)	-2.9673 (0.0030)	-2.8923 (0.0038)	-3,0574 (0.0022)	-2.9781 (0.0029)
AR(2) (p-value)	-1.1564 (0.2475)	-1.1283 (0.2592)	-1.0872 (0.2769)	-1.1452 (0.2521)	-1.1821 (0.2372)	-1.1491 (0.2505)
Wald test (p-value)	χ^2 = 139.236 (0.0000)	χ^2 = 180.239 (0.0000)	χ^2 = 139.981 (0.0000)	χ^2 = 135.657 (0.0000)	χ^2 = 175.596 (0.0000)	χ^2 = 183.268 (0.0000)

Source: author.