This paper investigates the impact of corporate tax rate on foreign direct investment inflows from Germany into five Central and Eastern European countries from 2000 to 2012. We used forward-looking or statutory tax rate to measure the tax burden and found that corporate tax rate has a significant negative impact of FDI inflows in Central and Eastern European countries. This finding is in contrast with findings from most previous research where backward-looking tax rates extracted from corporate balance sheets were used as a measure of tax burden and showed that corporate tax rate has no impact on FDI inflows.

Keywords: Foreign Direct Investments, Corporate Tax Rate, Central and Eastern Europe
1. Introduction

Since the collapse of communism in 1989, Central and Eastern European (CEE) countries have undergone a dramatic transformation from centrally planned economic systems to free market economies. During the transformation process, these countries faced many challenges not only in the economics arena but also in social and political fronts (Kudriavceva 2011). In the economic front, extremely low or non-existent domestic savings coupled with highly inefficient financial markets hampered economic development and creation of competitive markets (Tondel 2001). In response, CEE governments introduced several incentives to attract foreign direct investment (FDI) (Brenton and Lucke 1999; Meyer 2004). These incentives coupled with skilled workforce, low labor costs, and central locations in Europe, made these countries favorable destinations for FDI. However, the pace of FDI inflows has slowed since the 2008 financial crisis. In addition, some CEE countries’ relative advantage (e.g., Hungary) compared to other countries vying for FDI in the region has declined in recent years.

Some have argued that changes in tax policies have contributed to a sharp decline in FDI inflows in CEEs. For example, in April 2014, Financial Times branded Hungary a nightmare for foreign businesses (Buckely 2014) claiming Viktor Orban’s tax policies on energy and banking sectors may put the country’s investment image at risk and potentially harm foreign investment inflow into Hungary. However, a number of research studies have suggested that corporate income tax rate is not a significant determinant of FDI in CEE countries. These studies point out that FDI inflow in CEE region is mainly driven by traditional determinants such as labor costs, market size, transition-specific factors, such as the level and method of privatization, as well as riskiness of investment in a country (Carstensen and Toubal 2004).

A recent study, however, argues that the reason corporate income tax rate has not emerged as a significant determinant of FDI inflow in CEE countries in previous studies is largely due to using tax measures extracted from corporate balance sheets. Such rates, also known as backward-looking tax rates, include statutory tax rates as well as tax base allowances such as depreciation, investment allowances, and inventory valuation. Therefore, they produce biased estimates of company’s tax burden (Egger, et al. 2009). These authors argue that at the aggregate country-level tax rate, i.e., forward-looking tax rates should be used as a measure of tax burden because such rates are independent of firm’s tax planning and management activities. At least one recent study has shown that forward-looking tax rate has a significant impact on FDI inflows (Bellak and Leibrecht 2009).

To address this apparent contradictory evidence in the literature, this study examines determinants of FDI in CEE region with a particular emphasis on the extent to which corporate income tax rates impact FDI inflows in CEE countries. Since Germany is among the top investors in the region (Euro Monitor 2014), we will analyze the determinants of FDI from Germany in five CEE countries (Bulgaria, Czech Republic, Hungary, Poland, and Romania) over a period of 13 years from 2000 to 2012. Other most active investors in CEE region include Italy and Austria followed by France, the United Kingdom and the Netherlands. In the recent years, the United States and China have also increased their capital investment in the region.

The rest of this paper is structured as follows. We begin by reviewing the relevant literature focusing on determinants of FDI, followed by specification of the model and description of the data and variables we used in the empirical phase of our research. The next section of the paper presents the results of our analysis and discusses our findings. Finally, we develop a number of conclusions based on our study.
2. Literature Review

Foreign direct investment is the outcome of a complex decision process by multinational corporations (MNCs), currently accounting for 50% of international trade and more than 90% of world FDI stock (Rugman and Verbeke 2009). MNCs may seek one of four broad objectives in making FDI decisions: market seeking, efficiency seeking, natural resource seeking, and strategic asset seeking.

*Market-seeking*, or horizontal FDI, is primarily intended to serve local and adjacent markets with local production of goods and services. Therefore, host country's market size, economic growth potential and the distance to adjacent markets factor heavily in deciding to invest in the host country (Kinoshita and Campos 2006; Kudriavceva 2011; Vijayakumar et al. 2010).

Multinational corporations engage in *efficiency-seeking* FDI, or vertical investment, when they “can gain from common governance of geographically dispersed activities in the presence of economies of scale and scope” (Kinoshita and Campos 2006). Previous research has found that the prospects of CEE countries joining the European Union and the EU's commitment to establish regional corporate networks seems to have attracted more efficiency-seeking FDI to CEE countries (Bevan and Estrin 2000).

The third motivation behind FDI is *resource-seeking* where MNCs invest in countries with rich natural resources, raw materials, or cheap labor in order to gain a competitive advantage vis-à-vis their competitors (Kinoshita and Campos 2003). This is particularly true in the manufacturing sector where the underlying objective for FDI is to export. In contrast to market-seeking and efficiency-seeking, resource-seeking FDI involves relocating parts of the value chain to the host country where availability of resources at low cost provides the firm with a significant competitive advantage in export markets.

Finally, the primary motivation for *strategic asset-seeking* FDI is to gain access to strategic resources such as market intelligence, technological capabilities and management expertise in a foreign market (Deng 2007). In contrast to traditional investment motivation to transfer firm’s resources to a host country (Caves 1996), *strategic-asset seeking* FDI is intended to upgrade firm’s capabilities by exploiting complementary resources that exist in a foreign market. A substantial body of research supporting strategic-asset seeking FDI exists in the literature (see Mutinelli and Piscitello, 1998; Belderbos 2003; Kumar 1998; Makino, Lau, and Yeh 2002).

In addition to traditional determinants of FDI, some have argued that perhaps transition processes from a command economy to a free market system and the specifics of the privatization process in CEE countries ought to be considered as potential determinants of FDI (Marinova and Marinov 2003). Consequently, several transition-specific factors, such as the scope and method of privatization, riskiness of investment in a country, existence of favorable investment environment and tax regime have been examined and judged to be important factors in MNCs decision to invest in CEE countries (Carstensen and Toubal 2004).

Corporate income taxation, as an important determinant of FDI in CEE countries, has also been studied extensively. As an example, Mintz and Tsiopoulos (1992), argued that *backward-looking tax rates*, are usually not the deal-making factors; however, there are two important exceptions. First, extremely high tax rates tend to deter foreign direct investment. Second, to attract investment in labor-intensive industries such as assembly of garments, electronics, and toys which can be made in many satisfactory locations, a highly competitive corporate tax regime is necessary. The reason behind the negative relationship between
tax burden and FDI inflows is that the high corporate income taxes will reduce the potential profit margin of MNCs, therefore, harm FDI inflows, as the ultimate motivation to make capital investment is to earn profits. These exceptions notwithstanding, it is important to consider effective or forward looking tax rates as they reflect tax incentives such as lower tax base or lack of enforcement by tax authorities. (Nicodème 2001).

Devereux and Griffith (1998) proposed an alternative measure of tax burden and argued that the proposed measure, namely forward-looking tax rate as opposed to statutory tax rate, can have significant impacts on FDI and provide evidence that forward-looking tax burden is negatively related to FDI inflow in CEE countries (Bellak and Leibrecht, 2009).

Two main conclusions can be drawn from the previous discussion. First, the traditional FDI determinants and transitional factors can be easily observed and expected to be either positively (e.g., market size) or negatively (e.g., labor cost) related to FDI inflows. We expect these relationships to hold in the CEE region. However, research evidence regarding the impact of tax rate is not clear cut. It depends on how the tax rate is measured. Extant research suggests that statutory tax rate or, backward-looking tax rate, extracted from corporate balance sheets is not a significant predictor of FDI inflows. On the other hand, limited research evidence has emerged that forward-looking tax rate is negatively related to FDI inflows. For example, in a study of effective corporate tax rates and FDI inflows in 30 OECD countries from 1985 through 2007, Sato (2012) found that a 1% reduction in effective corporate rate increased FDI by 2.4%. The present research is intended to shed light on this issue in the context of CEE region.

3. Methodology

As stated earlier, the primary focus of this research was to examine the impact of forward-looking tax rates on FDI inflows in CEE countries. However, we also included a number of traditional determinants of FDI as control variables in our model. To achieve the objective of the research, we compiled necessary data and then undertook an empirical analysis of the data as detailed below.

3.1 Data

Data from five countries (Bulgaria, Czech Republic, Hungary, Poland, and Romania) were compiled for the empirical portion of this research. These countries were selected because the level and growth of FDI vary widely among them. While Czech Republic, Hungary and Poland have attracted substantial foreign capital, Bulgaria and Romania lag far behind (Carstensen and Toubal, 2004) making the selected countries excellent test cases to study FDI determinants in the region.

The period covered in this study is from 2000-2012. As a result, the research provides a panel set with 65 observations (5x13). The time period is chosen because earlier studies point out that these countries experienced an extremely volatile economic situation and unstable investment environment during the early 1990s (Tondel, 2001; Carstensen and Toubal, 2004), but entered a period of relative stability beginning in 2000.

3.2 Variables

3.2.1 FDI Inflows. Since the dynamics of the FDI environment can be best measured by FDI inflows (Kudriavceva 2011) we used the annual FDI inflows in billions of US dollars at current prices and current exchange rates as reported by UNCTAD as the measure of the dependent variable in this study.
3.2.2 Market Size. As stated earlier, one of the most important determinants of FDI is market size which is included in almost all FDI studies in CEE region. According to Resmini (1999), GDP, GDP per capita and population size are the most commonly used in operationalizing market size. In this study, we used annual GDP at current prices and exchange rates in billions of US dollars to measure market size. Based on previous research, a positive relationship between FDI inflows and market size is expected.

3.2.3 Market Distance. The distance between host country and source country is also believed to be an important determinant of FDI inflow (Bevan and Estrin 2000). Since Germany is among the most active investors in CEE region we used the distance between the German capital, Berlin, and the capital of each country in this study as a measure of market distance. This variable not only measures geographic proximity, but also language and cultural similarities between the source host countries. Based on the literature, we expect a negative relationship between market distance and FDI inflows.

3.2.4 Labor Cost. Previous studies have shown that when MNCs aim to reduce production costs, labor cost serves as an important incentive in making FDI decision in CEE region (Carstensen and Toubal 2004). Therefore, we used gross average monthly wages measured in US dollars at current exchange rates to measure labor cost. We expect a negative relationship between labor cost and FDI inflows.

3.2.5 Skill Level. In addition to low-cost labor, well-educated and skilled workforce is an important consideration in making FDI decisions as low wages alone do not necessarily reflect low production costs” (Carstensen and Toubal 2004). Since CEE countries are known for their impressive productivity and highly skilled labor, especially in the manufacturing sector, we used the ratio of tertiary school enrollment as a percentage of total population to measure skill level in host countries included in this study.

3.2.6 Host Country Openness. MNCs engage in FDI not only to serve the domestic market, but also to gain access to neighboring country markets. Therefore, host country openness to international trade, i.e., unimpeded exporting of goods and service from the host country, serves as an important determinant of FDI investment (Resmini 1999). Since a common measure of a country’s openness to International trade is goods and services exports as a percentage of GDP, we used this measure as a proxy for host country openness in this study. Based on the literature, a positive relationship between total exports as a percentage of GDP and FDI inflows is expected.

3.2.7 Level of Privatization. The level of privatization implies the effectiveness of corporate governance and restructuring of the former state-owned enterprises in CEE countries (Carstensen and Toubal 2004). Therefore, the size of the private sector relative to the total economy indicates the extent of host country’s market orientation. Most of the previous research has used total annual revenue from private sector to measure the size of the private sector. Since this data is not available for public use, we used domestic credit to private sector as a percentage of GDP to measure the level of privatization. According to the World Bank, domestic credit to private sector refers to financial resources provided to the private sector by financial institutions through loans, securities, debts, and credit. While this it is not a perfect measure, it does provide an approximate measure of the level of privatization in host countries. Based on literature, we expect a positive relationship between the level of privatization and FDI inflows.

3.2.8 Inflation. Inflation is an important indicator of the host country’s macroeconomic stability. In addition, inflation can also have significant impacts on the host country’s ability to export goods and services as well as cost of production. Therefore, we included annual consumer price index during the
period under study, as reported by the World Bank, as the measure of inflation in our model (Kinoshita, 2003). As might be expected, inflation rate is negatively related to FDI inflows.

3.2.9 Tax Rate. While most previous research have used backward-looking tax rate, we used forward-looking tax rates proposed by Devereux and Griffith (1999) to measure firm's tax burden. More specifically, we used forward-looking tax rates based on Spengel, Elschner, and Endres's (2012) calculation applying the Devereux and Griffith methodology. Based on the literature, we expect forward-looking tax rate to be negatively related to FDI inflows as it reduces the firm's profit margin (Bellak and Leibrecht 2009). Table 1 below provides a summary of the variables included in this study.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Label</th>
<th>Measurement</th>
<th>Expected Impact on FDI</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foreign Direct Investment</td>
<td>In_FDI</td>
<td>Annual foreign direct investment inflows at current prices and exchange rates in billions of USD</td>
<td>N/A</td>
<td>UNCTAD</td>
</tr>
<tr>
<td>Market Size</td>
<td>In_GDP</td>
<td>Annual GDP at current prices and exchange rates in billions of USD</td>
<td>Positive</td>
<td>UNCTAD</td>
</tr>
<tr>
<td>Market Distance</td>
<td>DIST</td>
<td>Physical distance from Berlin to host country’s capital city</td>
<td>Negative</td>
<td>Google Map</td>
</tr>
<tr>
<td>Labor Cost</td>
<td>WAGE</td>
<td>Gross average monthly wages at current exchange rates in USD</td>
<td>Negative</td>
<td>UNECE</td>
</tr>
<tr>
<td>Skill Level</td>
<td>EDU</td>
<td>The % of tertiary school enrollment</td>
<td>Positive</td>
<td>World Bank</td>
</tr>
<tr>
<td>Country’s Openness</td>
<td>OPEN</td>
<td>Export of goods and services as a % of GDP</td>
<td>Positive</td>
<td>World Bank</td>
</tr>
<tr>
<td>Level of privatization</td>
<td>PRIV</td>
<td>Domestic credit to private sector as a % of GDP</td>
<td>Positive</td>
<td>World Bank</td>
</tr>
<tr>
<td>Inflation</td>
<td>INF</td>
<td>Consumer price index (annual %)</td>
<td>Negative</td>
<td>World Bank</td>
</tr>
<tr>
<td>Tax Rate</td>
<td>TAX</td>
<td>Effective statutory tax rate*</td>
<td>Negative</td>
<td>Center for European Economic Research</td>
</tr>
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*Effective tax rate using Devereux/Griffith methodology

Table 1. Variables, Labels, Measurement, Expected Impact on FDI and Source of Data
4. Analysis

To analyze determinants of FDI, we performed a standard multivariate linear regression model. Regression coefficients were estimated with ordinary least squares and standard errors were calculated using standard asymptotic approximations. As shown in Table 2, the regression model is highly significant at 0.01 level explaining 84% of the variation in the dependent variable (adjusted \( R^2 = .84 \)). All variables, except market distance (DIS) and level of privatization (PRIV) are also highly significant at 0.05 level. The fact that DIS was not significant in our model, contrary to previous research, could be attributed to the fact that the capital cities of host countries included in our study are relatively equidistant from Berlin compared with other capital cities in Europe, United States, China and Japan. Thus, lack of variability likely distorted full impact of distance. As for PRIV, due to lack of data, we used domestic credit to the private sector which may be an imperfect proxy for the level of privatization. A better proxy would have been the share of the private sector of the total GDP which has been most commonly used in previous studies (Holland and Pain 1998; Lansbury et al. 1996). Therefore, we removed these two variables and performed a second regression model. As we will show later, removing these variables from the model did not affect the significance of the model as a whole and significance of the predictors retained in the model. Finally, all coefficients carry the expected signs except for the inflation variable (INF). This is likely due to the fact that CEE countries experienced deflationary pressures in the period under study.

<table>
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<th>Model Summary</th>
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\(^a\). Predictors: (Constant), TAX, In_GDP, OPEN, INF, DIST, PRIV, EDU, WAGE

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<th>ANOVA(^a)</th>
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<td>Model</td>
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<td>Regression</td>
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<td>Residual</td>
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<td>Total</td>
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\(^a\). Dependent Variable: In_FDI

\(^b\). Predictors: (Constant), TAX, In_GDP, OPEN, INF, DIST, PRIV, EDU, WAGE
Table 2. Regression Results (Model 1): Dependent Variable FDI Inflows from Germany

The results of the second regression model are reported in Table 3. As shown, removing the DIS and PRIV variables had minimal impact on the overall significance of the model and the remaining independent variables. The Tax variable, which is the main focus of this study, is highly significant at 0.01 level with a coefficient of -2.07 indicating that for one percent increase in the tax rate, the FDI inflow is expected to drop by two billion US dollars. Therefore, we conclude that forward-looking tax rate has a significant negative impact on FDI inflows.
Table 3. Regression Results (Model 2): Dependent Variable FDI Inflows from Germany

Since multi-collinearity is a common problem when estimating linear or generalized linear models and can lead to unreliable and unstable estimates of regression coefficients, we examined the correlation coefficients among the independent variable to determine if the regression coefficients we obtained are reliable and stable (see Table 4).
At first glance at Table 4, it appears that there are fairly high and significant correlations among the predictor variables. A closer look, however, reveals that multi-collinearity may not be as big a problem as it appears at first sight. To determine if multi-collinearity was a problem in our research, we examined the variance inflation factor (VIF), the most widely-used diagnostic for multi-collinearity. Typically, “the VIF is calculated for each predictor variable by conducting a linear regression of that predictor on all other predictors” (Allison 2012) and then using $R^2$ from that regression to calculate the VIF for each predictor using the formula: $1/(1-R^2)$. If the resulting VIF value is less than 2.5, multi-collinearity can be safely ignored.

To determine VIF values for the predictors included in our study, we ran multi-collinearity diagnostics and examined the corresponding VIF values. As shown in Table 5, the VIF value for the tax variable is 1.185. This means that the standard error of the Tax coefficient is 1.08 ($\sqrt{1.185} = 1.08$) as large as it would be if Tax were uncorrelated with the other predictor variables. Therefore, multi-collinearity among the predictor variables in this research can be safely ignored and that our regression coefficients can be judged to be reliable and stable.
Table 5. Regression Coefficients and Collinearity Statistics

5. Conclusions

This study examined the impact of several factors on FDI inflows from Germany into five Central and Eastern European Countries. Of particular interest was to investigate the impact of tax rates which had been shown in previous studies to have no influence on FDI inflows into CEE countries.

Based on data from five countries over a period of 13 years, our analysis demonstrated that forward-looking corporate tax rate has, in fact, a significant negative impact on FDI inflows into the CEE countries. Therefore, governments of CEE countries can use tax policy as an effective tool to attract FDI into their countries.

This study has a number of limitations. First, due to lack of data, this research focused on FDI from one country, Germany, into five Central and Eastern European countries. Therefore, one should exercise caution before making generalization to the region as a whole. This calls for a more comprehensive study covering larger number of host countries. Second, this research only covers FDI inflows from one home country, Germany, to five countries in the CEE region with a sample size of 65. Future research should include a wide range of home countries and larger sample size. In fact, a recent study found that European, American, Chinese and Japanese investors do not necessarily consider the same set of factors in making investment decisions in CEE region (Tintin 2013). Third, given the global financial crisis of 2008, future research should include measures of macroeconomic stability as an important determinant of FDI inflows. These limitations make it hard to draw definitive policy conclusions. Further research is needed to verify/complement the findings of this study.
References