

Are there any top FDI performers among EU-15 and CEE countries? A comparative panel data analysis

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Abstract

This paper examines the major determinants of foreign direct investment (FDI) inflows in 26 European Union (EU) countries using panel data. Our empirical study takes a different approach by separating European countries into two groups: Western (EU-15) countries and Central and Eastern European (CEE) countries. The results from the panel data analysis of FDI inflows to 26 EU countries for the period 1994-2012 show that: (1) traditional location variables such as market size, trade openness, unemployment, infrastructure, tax rate and unit labour costs are able, to a large extent, to explain FDI flows to both groups of countries; (2) there are country-specific factors such as economic growth, unit labour costs and credit risk that contribute to the differences in FDI patterns across EU-15 and CEECs; and (3) policy and institutional quality factors are found to play an important role for both groups of countries. When analyzing host countries based on their relative level of performance, we find that the top ten FDI performers are able to attract a significant amount of FDI because of their macroeconomic stability and high level of institutional development, while for EU countries with low FDI dominance, policy and institutional risk factors play a more important role.

Keywords: foreign direct investment, transition economy, gravity model, institutional quality

1 INTRODUCTION

This paper investigates the relative importance of different macroeconomic, policy and institutional factors as determinants of FDI inflows into the transition economies in Central and Eastern Europe (CEE) and compares them with the more developed Western European countries. All of the CEE countries have undergone significant changes in their political regimes in the last twenty years. They transformed themselves within a short period of time from planned and government-controlled economies to ones where private business is encouraged and competition accepted. The need for extensive enterprise restructuring and modernization in view of limited domestic resources created environments where the potential benefits of foreign direct investment (FDI) are especially valuable. Also, transition economies are well placed to benefit from the technology and knowledge transfer associated with FDI (Demekas et al., 2005; Torlak, 2004). It is widely believed that these benefits outweigh any possible drawbacks – such as a loss of economic independence or increasing industrial concentration when a single multinational firm achieves a dominant position in an industry (Johnson, 2006).¹

Almost non-existent at the beginning of the 1990s, the FDI inflow to the Central and Eastern European countries (CEECs) has exploded in the last ten years (Hen-

¹ Some researchers (Blomstrom and Kokko, 1998; Schoors and Van der Tol, 2002) argue that at least in the initial stages of development or transition, FDI could have a negative impact on the recipient economy. If domestic firms are so unproductive in comparison with foreign-owned firms, the former may be driven out of business leading to a so-called “market stealing” effect.

riot, 2005). More recent data show that the Central and Eastern Europe region experienced a five-fold increase in foreign direct investment inflows between 2003 and 2008, rising from US\$30 billion to US\$155 billion (PricewaterhouseCoopers, 2010). Russia was the destination which attracted much of this additional investment as its inflows rose from less than US\$8 billion in 2003 to more than US\$70 billion in 2008. The credit crunch and recession that followed coincided with a collapse of FDI inflows to the CEE countries. According to the same report, FDI inflows in the region as a whole were 50% lower in 2009 than in 2008. The year 2012 saw the re-emergence of CEE FDI flows on the back of large job-intensive projects, notably in Poland, Russia, Serbia and Turkey (Ernst & Young, 2013). As a consequence, CEE overtook Western Europe to become the leading destination for FDI jobs in Europe.²

Simultaneously, the more developed Western European countries have received much larger FDI flows than transition economies (World Bank, 2014a). Most of these countries offer incentives to foreign investors in the form of preferential tax rates, tax holidays, special depreciation schemes, social security relief, special tax deductible items and exemptions from tariff payments. These are all intended to encourage FDI, although the empirical evidence for such an impact is limited. The existence of incentives can be justified by the externalities that accompany FDI.³ Geographical differences within Europe became more pronounced in the last two years (2012-2013). Ernst & Young's attractiveness survey (2013) shows that Western Europe drew three-quarters of all FDI projects in 2012, yet more than half of the FDI jobs were created in Central and Eastern Europe. CEE is reaping the benefits of an affordable and capable labour force and its cost base remains competitive compared with Western Europe.

The forces driving the FDI flows into the CEE countries have been intensely analysed in the economics literature. There are numerous empirical studies which describe the specific role of different groups of factors like transition-specific factors (Carstensen and Toubal, 2004; Mateev, 2012), economic development (Henriot, 2005), economic reforms (Stoian and Vickerman, 2005), exchange rate regime (Aubin et al., 2006), wage differentials (Dupuch and Milan, 2003), and announcements related to EU accession (Bevan and Estrin, 2004). At the same time the theoretical foundations and evidence from other regions can offer little insight into the impact of certain factors specific to the transition process on FDI flows. Taken

² Europe is still the world's top destination, with 22.4% of global FDI value, although its share has diminished by 6 points since 2011. This is partly due to a prolonged Eurozone crisis impacting investors' confidence and risk appetite, but is also in line with a broader shift of focus toward developing and transition economies, which, according to the United Nations Conference on Trade and Development (UNCTAD), secured in 2012 more FDI (52.1%) than the developed world.

³ There is a widespread belief that foreign direct investment enhances the productivity of host countries and promotes economic development. This notion stems from the fact that FDI may not only provide direct capital financing but also create positive externalities via the adoption of foreign technology and know-how. Positive productivity spillover effects are found only for the developed countries (see Gorg and Strobl, 2002 for Ireland; Haskel et al., 2002 for the UK, etc.).

from the behavioural and institutional points of view, CEE countries are very different from both developing countries and industrially advanced countries. The speed with which market-oriented policies and legal reforms conducive to foreign firms were introduced proved to have an important role in explaining FDI. The significance of the privatization process in the early FDI flows should also be taken into account. The financial system stability represents an attractive factor for foreign investors and can also be considered an important FDI determinant.

Our research has two goals. First, we analyze the relative importance of FDI determinants that may explain the different sizes of foreign investment flows into more and less developed European countries (EU-15 and CEE countries). Second, we compare the 26 EU countries based on their relative FDI performance in order to find important macroeconomic, policy and institutional quality factors that may explain the differences in the level of FDI performance among European countries. Thus, our main findings reinforce the argument that the traditional location factors are able to explain the differences in FDI patterns across European countries but when the level of FDI performance is compared, a number of specific determining factors are expected to play a more important role. To the best of our knowledge this is the only paper to address this issue in the empirical literature on FDI.

In this paper we use a unique panel dataset covering 26 EU countries between 1994 and 2012. The results show that the main determinants of FDI inflows to these countries when taken as a homogenous group are market size, trade openness, unemployment rate, infrastructure endowment, unit labour costs and tax burden. Political and institutional risk factors also play a significant role in explaining FDI in Europe. When investigating FDI patterns across different groups of European countries (EU-15 and CEE countries), we find that country-specific factors such as growth in GDP, unit labour costs and credit risk seem to contribute to the differences in FDI flows attracted by each group of countries. The results also show that the top ten FDI performers are able to attract significant amounts of FDI because of their macroeconomic stability and high level of institutional development. In contrast, for the group of countries with low FDI dominance, we find that policy and institutional quality factors do play a more important role in explaining FDI; credit risk and quality of institutions are significant determinants of FDI.

The rest of the paper is organized as follows: the next section outlines our conceptual framework and summarises the theory on the determinants of FDI. The econometric model and data analysis are presented in section three. Section four presents econometric results from FDI panel regressions. Some concluding remarks are offered in the final section.

2 LITERATURE REVIEW: DETERMINANTS OF FDI

It has long been recognized that the benefits of FDI for the host country can be significant, including knowledge and technology transfer to domestic firms and the labour force, productivity spillovers, enhanced competition and improved access for

exports abroad, notably in the source country. The impact of FDI on the host economy depends on the type of FDI. Three different types of FDI were identified: market-seeking FDI (horizontal FDI), resource-asset seeking FDI, and finally, efficiency-seeking FDI (vertical FDI). The purpose of *market-seeking* FDI is to serve local and regional markets. It is also called horizontal FDI, as it involves the replication of production facilities in the host country. Tariff-jumping or export-substituting FDI is a variant of this type of FDI. Because the reason for horizontal FDI is to serve a local market better by local production, market size and market growth of the host economy are the main drivers. Impediments to accessing local markets, such as tariffs and transport costs, also encourage this type of FDI.

The second type, *resource or asset seeking* FDI, is observed when firms invest abroad to acquire resources not available in the home country, such as natural resources, raw materials, or low-cost labour. Especially in the manufacturing sector, when multinational firms directly invest in order to export, factor-cost considerations become important. In contrast to horizontal FDI, vertical or export-oriented FDI involves relocating parts of the production chain to the host country. Availability of low-cost labour is a prime driver for export-oriented FDI. Moreover, FDI in the resource sector, such as oil and natural gas, is attracted to countries with abundant natural endowments. The third type of FDI, called *efficiency-seeking*, occurs when the firm can gain from the common governance of geographically dispersed activities in the presence of economies of scale and scope. In this case, prior to making a decision, foreign investors consider the price of the factors of production (adjusted for productivity differences) and the membership in regional integration agreements. Prospective membership in the EU, which is conducive to the establishment of regional corporate networks, seems to have attracted more efficiency-seeking FDI to transition economies after the initial announcement of the progress of EU accession.⁴

Foreign direct investment represents an important source of finance for both developed and developing countries but most of FDI inflows and outflows are concentrated within the developed countries. Empirical research on foreign investment finds that FDI inflows to less developed countries are usually associated with vertical investments (Carr et al., 1998; Marakusen et al., 1996). Vertical FDI takes place when a firm relocates only a part of its production process, and not the whole production. In many cases, it is the relocation of the labour-intensive activities in low wage countries. This process tends to reduce the labour intensity of the home country domestic production. FDI inflows to developed (industrially advanced) countries are usually horizontal investments driven by market-seeking strategies, and they tend to increase the labour intensity of the home country domestic production (Mariotti et al., 2003). Therefore, horizontal investments replicate the

⁴ It must be said that market-seeking and efficiency-seeking FDI do not exclude each other. If the market-seeking FDI has a penetration logic (it looks for the market size and market parts), the efficiency-seeking FDI and resource-asset seeking FDI may be considered as delocalisation investments (Aubin et al., 2006).

complete production process of the home country in a foreign country. Horizontal FDI seeks to take advantage of a new large market, which is considered a traditional motive for FDI. In recent years, the determinants of and motivation for FDI in developing countries (including transition economies) have changed in the process of globalization.⁵

FDI is a rather complex economic phenomenon which depends on many factors whose relative importance may change as the economic environment evolves over time; so it is possible that as the economy of the host country changes and the international environment evolves, the factors motivating FDI also change. Even though the traditional determinants and the types of FDI associated with them have not disappeared with globalization, their importance is declining (Nunnenkamp, 2002). For example, one of the most important traditional FDI determinants, market size, has decreased in importance, while at the same time new determinants have emerged. Cost differences between locations, the quality of infrastructure, the ease of doing business and the availability of skills have increased in importance (Botrić and Škuflić, 2006). This reveals that investors' motives are changing, and consequently countries must seek new ways to attract FDI.

There is a growing body of research literature that provides empirical evidence about the factors determining the patterns of FDI in different countries and regions, including Europe.⁶ When it comes to the analysis of FDI directed to CEE countries, the two main approaches that have been used are survey-type studies and formal quantitative analyses (Benacek et al., 2000). Quantitative studies on the determinants of FDI are based on a number of different models, but the gravity approach is the most commonly used in practice. According to Demekas et al. (2005) gravity factors consistently explain about 60 percent of aggregate FDI flows, regardless of the region.⁷ Policy and institutional environment also matter for FDI. For example, Janicki and Wunnava (2004) find that international trade is perhaps the most important determinant of foreign direct investment in the CEE region, while Carstensen and Toubal (2004) argue that comparative advantages like low relative unit labour costs, corporate tax rates and relative endowments

⁵ According to Dunning (2002), FDI in developing countries has shifted from market-seeking and resource-seeking FDI to more (vertical) efficiency-seeking FDI. Due to globalization-induced pressure on prices, multinational enterprises (MNEs) are expected to relocate some of their production facilities to low (real) cost developing countries. Nevertheless, and in contrast to FDI in industrial countries, FDI in developing countries still is directed predominantly to accessing natural resources and national or regional markets.

⁶ The majority of previous work in this area reports two groups of explanatory factors: gravity factors (proximity, market size) and factor endowments (infrastructure, human capital). Though there has been considerable theoretical work on foreign direct investment (for a literature review see Alfaro et al., 2006; Blonigen, 2005; Nonnemberg and Mendonça, 2004; and Vavilov, 2005), there is no agreed model providing the basis for empirical work. Rather, the eclectic paradigm, also known as OLI framework (Dunning, 1988, 1992), has been largely employed in research literature as a general tool of reference for explaining the FDI patterns of multinational enterprises.

⁷ Following LeSage and Pace (2008), Leibrecht and Riedi (2010) extend the frequently used gravity model via the inclusion of spatial interaction effects across home countries of FDI as well as across host countries. Moreover, they consider the host country's surrounding market potential as a determinant of FDI flows. This variable captures the possibility that the market size of proximate countries may impact on the volume of FDI a particular host country receives.

also exert a significant influence. In our paper, we undertake the second approach, based on a comparative panel data analysis.

The gravity model rests on the assumption that FDI flows are larger between large economies and even more if the countries are close neighbours. The GDP-related core gravity variables (GDP of home country and GDP of host country) capture size effects: the larger the home country of FDI, the more FDI should emerge from this country; the larger the market size of a host country, the more FDI it should receive. Thus, the two variables are positively correlated with FDI. Following previous empirical research into host country determinants of FDI (Altomononte and Guagliano, 2003; Demekas et al., 2005) we include two proxy variables for market size – gross domestic product and population – in the panel data analysis. Nominal (or real) GDP is traditionally used as a proxy for the market size of the host country, while growth rate in GDP is used as a measure of the quality of the market demand in the same country. The two variables will indicate the importance of market-seeking FDI in a host country. We expect a positive correlation between a host country's market size and FDI. As our analysis is based on FDI net inflows to the host country, we do not include source country's GDP as an explanatory variable.

Distance has long been used successfully as a variable in gravity models explaining international trade. In these models distance functions as a proxy for transportation costs but also as a proxy for the affinity between the trading economies. Affinity is determined by geographical proximity and similarities in culture and language. A high affinity implies that economic interaction between the countries (such as trade or FDI) can occur with reduced friction (Johansson and Westin, 1994). From a theoretical point of view, the sign on the distance variable is ambiguous *a priori* (Markusen and Maskus, 2002), depending on the motive for FDI.⁸ While large distance may encourage FDI due to an internalization advantage, it also may discourage FDI due to the lack of market know-how, higher communication and information costs, and differences in culture and institutions (Buch et al., 2004, 2005). However, if the investor's host-country affiliates are relatively new, as is often the case in the Central and Eastern European countries, they typically depend on headquarter services and intermediate inputs supplied by the parent firm. Therefore, even in the case of horizontal FDI to the CEE countries, a negative impact of distance on FDI is plausible.

Several previous studies (Altomonte, 1998; Bevan and Estrin, 2000; Bos and Van de Laar, 2004; Carstensen and Toubal, 2004) have suggested that trade limitations have

⁸ Johnson (2006) argues that distance should have a negative effect on market-seeking FDI. Increasing distance implies lower affinity, resulting in higher costs of investment and more costly adaptation of goods to local preferences. Efficiency-seeking FDI is likely to be affected negatively by distance for the case where the components produced in the host country are shipped back to the source country, since transportation costs increase with distance. Distance can be argued to be relatively unimportant for resource-seeking investment. Resource-seeking MNEs are attracted to a limited number of geographical locations where the needed resource is available, diminishing the importance of distance for the investment decision.

also had significant impact on the size of FDI flows. Factors such as trade openness are of major importance to investors who usually prefer countries with relatively liberal trade regimes. It is widely argued that FDI and openness of the economy should be positively related as the latter in part proxies the liberality of the trade regime in the host country, and in part – the higher propensity for multinational firms to export.⁹ Following Deichman (2001), Falk and Hake (2008), and Holland and Pain (1998) we include a proxy variable (import plus export as a percent of GDP) to assess the relative effect of trade openness on FDI flows. The expected effects may differ by the type of investment regarding local market or export orientation, the host country's foreign exchange control laws and applied capital taxation. However, for our sample of 26 EU countries, we should expect trade openness to indicate also the level of integration of the local economy into the regional economic flows. Therefore, trade openness will have a positive impact on FDI.

The prospects for political and macroeconomic stability together with the transparency of the legal regulations governing factors, such as foreign ownership of land and profit repatriation, all matter to potential investors and the risk must be compensated for by higher expected gains (Jun and Singh, 1996). Usually foreign companies look for resources availability, high productivity, reduced unit labour costs, but also for well-established financial institutions providing full banking services as well as well-developed security markets. Thus, financial system stability and the level of credit activities in a host country represent attractive factors for foreign investors and can be considered important determinants of FDI (Albulesku et al., 2010). In this study, we use the volume of domestic credits to the private sector as a share of GDP to proxy the credit activities in a host country. We expect a positive relationship between this variable and FDI.¹⁰

Furthermore, the existence of a developed and effective infrastructure is necessary for the operations of MNEs since it reduces costs of distribution, transportation and production, thereby affecting comparative and absolute advantage of the host country. Bellak et al. (2009) find evidence that FDI in CEE countries is attracted by increases in infrastructure endowment; information and telecommunication infrastructure as well as transport infrastructure impact positively on FDI. Different studies of FDI use different proxies for infrastructure.¹¹ For example, Demekas et al. (2007) include an indicator of infrastructure reform from the European Bank for Reconstruction and Development (EBRD). This index reflects the state of

⁹ Trade policies and, more broadly, trade costs (tariffs, non-tariff barriers, and transportation costs) are generally found to have a significant impact on FDI flows, but in aggregate regressions their sign is ambiguous. This is probably due to the different effect the barriers to trade can be expected to have on horizontal and vertical FDI; they tend to attract horizontal FDI, which aims at penetrating the domestic market, but repel vertical FDI.

¹⁰ Our preliminary tests find this variable to be a weak proxy for credit activities (and financial stability) in a host country. The variable shows insignificant in all model specifications.

¹¹ Goodspeed et al. (2006) explain FDI in a broad range of countries and include the consumption of electric power, the number of mainline telephone connections and a composite infrastructure index in their regressions. In a related paper Goodspeed et al. (2010) find that a favourable infrastructure endowment attracts FDI to developed as well as less developed countries. Thereby the impact is larger in the latter country group.

regulation of infrastructure services (EBRD, 2004). The study finds that, for the less developed economies in their sample, infrastructure is an important determinant of FDI, while it becomes insignificant for the more developed countries. Campos and Kinoshita (2003) use the number of mainline telephone connections as a proxy for infrastructure. A positive impact on FDI is found only for the former Soviet Union countries. In this study we use total telephone lines per 100 people to account for the quality and availability of infrastructure services in a host country. As favourable infrastructure endowment attracts FDI to both developed and less developed countries, we expect a positive influence on FDI.

Empirical research finds that the choice of an investment location is driven by total labour costs as well as labour productivity. The indicators of labour costs used in empirical studies can be classified into three major groups: total labour costs, gross wages and unit labour costs (see Bellak et al., 2008 for a comprehensive survey of existing studies in the field).¹² Although the various measures can be classified into these three groups, the exact definition of the measures applied differs widely within each category. Consequently, the empirical studies show a wide variety of results with respect to the size and significance of the coefficient of the labour cost proxy used. Most of them report a negative impact of labour costs on FDI, while Boudier-Bensebaa (2005) finds a significant positive sign for the unit labour cost variable in a study on regional FDI in Hungary.

Since our sample includes both well-developed and developing (transition) economies we expect the difference between gross wages and total labour costs to vary substantially in different European countries. If foreign investors are seeking low labour costs, the availability of cheap labour will be an important factor affecting FDI. However, firms only prefer low wage locations if the reduced labour costs are not compensated by lower labour productivity, or an overvalued currency. Following Carstensen and Toubal (2004) we use monthly average gross wages as a share of GDP per employment to proxy the unit labour costs in a host country. A rise in wages increases, *ceteris paribus*, unit production costs, and therefore, decreases FDI. Therefore, we may expect a negative relationship between this variable and FDI, although a positive-signed coefficient is plausible.¹³

Previous studies of FDI in developing countries have put particular stress on the indicators of economic and political risk (Lucas, 1993; Singh and Jun, 1996). This

¹² The literature using unit labour costs is heterogenous concerning the operationalisation of labour costs. For example, Bevan and Estrin (2004) use annual average wages in the manufacturing sector as a proxy for total labour costs and nominal GDP per capita as a proxy for labour productivity. In contrast, Carstensen and Toubal (2004) employ differences in unit labour costs between home and host countries calculated as monthly average gross wages over nominal GDP per employment.

¹³ Since labour costs in the transition economies appear to be very low, it is likely that they would generate efficiency-seeking FDI from MNEs in countries that have higher labour costs. At the same time one should recognize the fact that low wages do not necessarily reflect low production costs because labour productivity may be low. Taking this into account, the location decision of a multinational enterprise depends on the relative productivity-adjusted labour cost in the host country.

comprises three main elements: (a) macroeconomic stability, e.g., growth, inflation, exchange rate risk; (b) institutional stability such as policies towards FDI, tax regimes, the transparency of legal regulations and the scale of corruption; and (c) political stability, ranging from indicators of political freedom to measures of surveillance and revolutions. In general, it might be expected that FDI is more likely to flow from developed countries into developing economies that are politically stable and have access to large, regional markets. In this study the institutional stability is proxied by corruption and a composite variable for the quality of institutions. Previous studies of the relationship between corruption and FDI (Demekas et al., 2005; Smarzynska and Wei, 2000; Stoian and Filippaios, 2007) indicate that a high level of corruption can have a negative effect on the volume of FDI flows since it increases the costs of operation in the host country for foreign investors and reduces the profitability of investment. Following Pournarakis and Varsakelis (2004) we use the Transparency International's Corruption Perceptions Index (TI) as a proxy for the severity of corruption. Pursuant to previous empirical findings, we expect a negative correlation of this variable with FDI.

To account for the institutional quality effects we use the World Bank's Worldwide Governance Indicators (WGI), which include six measures: political stability, government effectiveness, regulatory quality, rule of law, control of corruption, and voice and accountability. The perception of political stability (and risk) is measured through Moody's Sovereign Credit Rating, which *inter alia* captures the likelihood of expropriation of assets and other forms in which a weak institutional environment is manifested. Less political risk should lead to more FDI. Due to the particular definition of the measure of risk (see appendix A) we expect a positive correlation with FDI, that is, the higher the country risk index, or the less risky the investment environment, the more attractive a country is for FDI. Following previous empirical studies we introduce a second proxy for credit risk – a country's credit default swap (CDS) spread – which is found to be negatively correlated with FDI.

We use two additional variables (unemployment rate and statutory corporate income tax rate) to capture the effect of any economic changes that might influence overall economic activity, and FDI in particular. Less unemployment should imply larger investment flows; thus, we expect negative correlation with FDI.¹⁴ Previous empirical studies (see Bellak and Leibrecht, 2009) show that low (effective average) corporate tax rates indeed attract FDI in general, and FDI in CEE countries, in particular. Thus, a negative relationship between the tax rate and FDI is expected.¹⁵

¹⁴ It's axiomatic that a higher unemployment rate should discourage FDI. One might consider that a high unemployment rate might mean that a unit labour cost advantage of the host country might be long-lasting, since the labour demand would have to expand tremendously before any pressure for wage inflation would be present.

¹⁵ From an empirical viewpoint, corporate income taxes do indeed matter for investment location decisions of MNEs. For example, De Mooij and Ederveen (2008) carry out a meta-analysis of 35 empirical studies and find a median tax-rate elasticity (semi-elasticity) of FDI of about -2.9. However, the typical tax-rate elasticity crucially depends on the tax measure used and the operationalisation of FDI applied. Concerning tax rates, various measures are proposed in the literature (see e.g., Devereux, 2004).

3 EMPIRICAL SPECIFICATION

This study aims to reveal whether the traditional (location) characteristics can explain the differences in FDI in different groups of EU countries. Therefore, the central research question to be answered can be formulated as follows: Can the traditional factors – identified by the existing empirical literature – be applied to less developed transition economies, or are there other determinants (e.g., policy and institutional risk factors) that explain the different attractiveness of the two groups of European countries? This question will be investigated by analyzing FDI to a group of 26 EU countries covering the period 1994-2012. In this study we take a different approach – the whole sample of European countries is divided into two groups, Western European countries (EU-15) and Central and Eastern European countries¹⁶, and they are analyzed separately. Then, we rank the host countries in our sample based on their relative FDI performance and investigate the marginal effect of different macroeconomic, policy and institutional quality factors on FDI in each group of countries. To explain the differences in FDI across Western and Eastern European countries we test two research hypotheses:

Hypothesis 1: Since the two groups of European countries – the more developed Western countries and the CEE countries – are geographically close and share similar market features, there should be a group of common factors that explain FDI inflows to these two regions.

Hypothesis 2: Since the differences in FDI pattern across the two groups of countries may be due to different macroeconomic, policy and institutional factors, the more developed the institutional and policy environment in a host country is, the larger the FDI dominance of this country over the countries with less-developed environments.

3.1 DEPENDENT VARIABLE

The dependent variable is FDI net inflows per year (in current U.S. dollars). A sample of 26 European host countries, including 15 Western countries (Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden and United Kingdom¹⁷) and 11 Central and Eastern European countries (Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Poland, Latvia, Lithuania, Romania, Slovakia and Slovenia) is examined to empirically test the determinants of FDI flows. The analysis uses logarithm of FDI inflows to adjust for the skewed nature of the data; other studies of FDI determinants in transition economies undertake similar treatments of the dependent variable (see Demekas et al., 2005). The analysis also incorporates FDI inflow for the previous year as an independent variable. Substantively, the lagged dependent variable accounts for the path-dependent nature of FDI flows; that is, coun-

¹⁶ According to UNCTAD statistics, CEE countries include 19 ex-centrally planned economies and cover also the group of Southeastern European countries included in our sample.

¹⁷ Malta and Cyprus are excluded from the group of Western countries as they do not belong to the original EU-15 formation and there is scarce information for most of the country-specific variables.

tries that have received FDI in the past may be more likely to receive it in the present year. Methodologically, the lagged dependent variable helps to control for serial correlation.

3.2 EXPLANATORY VARIABLES

Two main assumptions for the choice of explanatory variables to be used in the empirical analysis emerge from the preceding discussions (see section 2). First, in order to better understand the determinants of FDI, it is crucial to specify an empirical model that allows for a combination of traditional (market size, distance, trade costs, and relative factor endowments), and more country-specific determining factors (risk, corruption and quality of institutions). All of these variables are closely related to the theoretical models that explain the attractiveness of a country as an FDI destination. Second, European countries are far from being homogeneous. Both the level of economic development and the size of FDI differ across different groups of countries (EU-15 and CEECs). Hence, the key question we address in this paper is how important the traditional determinants are in explaining the FDI pattern into more and less developed EU countries, and what specific factors contribute to the FDI dominance of EU-15 over CEE countries.

As noted earlier, market-seeking FDI is to serve the host country market. Market size is a measure of market demand in the country. We expect FDI flows to be greater in countries with a larger domestic market. Following previous research on FDI we use real GDP rather than nominal GDP as a proxy for market size, as the large fall in output that characterised the first years of transition (1994-1997) could result in a strange relationship between GDP and FDI inflows. We use population (POP) as a second proxy for the market size of a host country. We expect both variables to have a strong positive influence on FDI. We also use annual real growth rate in GDP (GDP_G) as a proxy for the market potential of a host country.¹⁸ In line with previous empirical studies this variable should be positively correlated with FDI. It is a stylized fact in the empirical literature that trade volumes between two countries are a function of both income levels of the two countries (GDP) and the distance between them. In a gravity model, the smaller the distance between two countries, the more they are expected to trade. Distance is a proxy for transportation costs, or (economic) barriers to trade. Following Demekas et al. (2005), we compute weighted distance (W_DISTANCE) as the sum of bilateral distance to all source countries multiplied by the ratio of GDP of source country to all source countries' GDP. In line with their study, we expect a negative correlation with FDI.

We also introduce a number of control variables, which capture the impact of global and country-specific effects on FDI. Our choice of control variables is led by FDI theory and it is based on well-established findings in the empirical litera-

¹⁸ We used general secondary education enrolment rate (EDUC) as an alternative proxy for the market demand in a host country. We find this variable insignificant in all model specifications.

ture (see section 2). These are real world GDP growth rate (WORLD_GDP), credit default swap spread (CDS), trade openness (import plus export as a percent of host country's gross domestic product, TRADE), unemployment rate (UNEMPL), telecommunication (total telephone lines per 100 people, TELE), corporate tax burden (statutory corporate income tax rate, TAX), unit labour costs (ratio of monthly average gross wages to GDP per employment, ULC), corruption index (Transparency International's Corruption Perceptions Index, COR), and credit risk (Moody's Sovereign Credit Rating, CR_RISK).

In addition to the macroeconomic and political risk effects we introduce a group of factors that measure the level of the institutional quality in a host country. To summarize the information contained in these factors, we utilized principal component analysis (PCA). PCA permits the reduction of the number of variables used in the estimation and yet retains a substantial part of the information contained in the various variables. This strategy has been widely used in previous empirical studies (Calderón and Servén, 2004; Kumar, 2006). A detailed explanation and the expected sign of each proxy variable included in the composite index (INSTIT) are presented in appendix B. Following Sinha (2012), we created a second composite (socio-economic) variable (NAT_RES); this variable is used as a proxy for the availability of natural resources and the ability of the country to process these resources using technology and skill. It includes the following variables: gross fixed capital formation, gross domestic product, gross domestic product per capita, gross domestic savings, and total natural resources rents (see appendix B).

To summarize our discussions on model variables and data sources, appendix A displays both dependent and explanatory variables and their expected impact on FDI. We use the correlation matrix of dependent and explanatory variables (available upon request) to examine the possible degree of collinearity among these variables. The explanatory variables used as proxies for policy and institutional risk effects (COR, CR_RISK and INSTIT) are highly correlated with the rest of the variables used in our regression analysis. Thus, we may expect that multicollinearity will be present in our model. To mitigate this problem these variables are included in the model specifications one at a time.

Table 1 displays the differences in the level of macroeconomic and institutional development between the group of top ten FDI performers and the rest of the countries in our sample. The data show that countries with large FDI dominance are characterized with well-developed macroeconomic, policy and institutional environment, while most of the countries in the second group are transition economies. This may explain the larger FDI flows to the first group of (more developed) EU countries and the relatively low FDI performance of the second group. We also run a simple t-test on the mean differences between the characteristics of the two groups of countries and find that for all but two variables the mean difference is statistically significant.

TABLE 1
T-tests on mean-differences

Mean	Top 10	Others	Difference (t-test)
FDI	4.19E+10	5.16E+09	9.79***
GDP_REAL	1.12E+12	1.13E+11	15.24***
POP	3.80E+07	7.10E+06	15.96***
W_DISTAN	5.28E+03	4.62E+03	6.02***
GDP_G	0.0232	0.0296	-2.17**
W_GDP	0.028	0.028	0.00
CDS	69.363	283.34	-2.75***
TRADE	0.989	1.035	-0.86
UNEMPL	0.087	0.092	-1.24
TELE	0.497	0.368	11.68***
TAX	0.337	0.25	12.31***
ULC	0.868	0.227	10.12***
COR	3.808	5.208	-7.85***
CR_RISK	18.772	14.718	14.08***
INSTIT	1.078	-0.688	9.85***
NAT_RES	1.496	-0.938	15.66***

Note: *, **, and *** represent significance at 10, 5, and 1 percent, respectively.

Data in table 1 represent the mean values of the dependant and explanatory variables for the sample of top 10 countries in terms of FDI inflows and the rest of the sample, for the period of 1994-2012. Total number of observations is 272. For some variables there are missing observations. The dependent variable is total FDI net inflows. The explanatory variables are Real GDP (GDP_R), Population (POP), Weighted distance (W_DISTAN), Growth in real GDP (GDP_G), Real world GDP growth rate (W_GDP), CDS spread (CDS), Trade openness (TRADE), Unemployment rate (UNEMPL), Infrastructure endowment (TELE), Corporate income tax rate (TAX), Unit labour costs (ULC), Corruption index (COR), Sovereign credit rating (CR_RISK), Institutional quality index (INSTIT), and Natural resources (NAT_RES). Time dummies for different major events (Eurozone and EU membership) are not included in the table. The table shows also the t-statistics of the mean-differences between the characteristics of the two country groupings.

Source: Authors' calculation.

4 MODEL AND ECONOMETRIC RESULTS

The use of panel regressions with both a time-series and a cross-country dimension, as opposed to a simple cross-section regression, allows a more sophisticated examination of country-specific effects. This study uses the following specification:

$$\begin{aligned} \ln(FDI_{jt}) &= \ln(FDI_{j,t-1}) + \beta_1 Y_{jt} + \beta_2 X_{jt} + \varepsilon_{jt}, \\ \varepsilon_{jt} &= \eta_{jt} + \gamma_t + u_{jt}, \end{aligned} \quad (1)$$

where FDI_{jt} denotes FDI inflows to host country j at time t , $FDI_{j,t-1}$ is the lagged value of dependent variable, Y_{jt} is a vector of traditional location variables, and X_{jt} is a vector of control (macroeconomic, policy and institutional) variables. Here ε_{jt} is an error term that includes the country-specific as well as time-specific effects.

Time effects, γ_p , are usually modelled as fixed parameters as they are correlated with the gravity model variables. Including time fixed effects in the empirical model is one way to consider spatial autocorrelation in disturbances (Hansson and Olofsdotter, 2010). In order to explore the cross-sectional dimension of the panel we assume that the country-specific effects η_{jt} are random and *i.i.d* with $(0; \sigma_\mu^2)$. As this assumption requires the country-specific effects to be uncorrelated with the considered regressors, we will verify the latter condition by means of a Hausman test.¹⁹ Finally, u_{jt} denotes the stochastic remainder disturbance term which we allow to suffer from heteroskedasticity and serial correlation of unknown forms. All regressions include year dummy (TIME) to control for time variation from changes in external economic environment common across sample countries.

The results for panel data regressions are presented in tables 2 through 6. The benchmark model is run for six different specifications. Table 2 shows the results for the total dataset of 26 EU countries (EU-15 and 11 CEE countries). The first column in table 2 displays the estimation results for our core model. In line with some recent studies on FDI in transition economies (Bellak et al., 2009; Hansson and Olofsdotter, 2010) we find that the coefficient of GDP variable is statistically significant and positive.²⁰ With respect to other gravity variables in Model 1, the estimated coefficients of POP and DIST carry the expected signs but only the POP variable is marginally statistically significant at the 10 percent level. One possible explanation of why the distance variable enters the model insignificantly is that the main source countries of FDI to our sample countries are from Europe.²¹ Growth in GDP used as a proxy for market demand also shows no significance in our analysis (see Model 1). Although the results of our pre-estimation tests indicate there is no causality in the FDI-GDP relationship we decided to omit the GDP_G variable from the rest of our model specifications.

The control variables enter the empirical model statistically significantly except real world GDP growth rate. This variable proves to be insignificant in all model specifications and drops from models 2 through 6. The estimated coefficients of the rest of the control variables carry the expected signs. A positive estimate of the TRADE variable implies that countries with relatively liberal trade regimes capture disproportionately more FDI. It also indicates that a higher level of integration of the local economy into the regional economic flows impacts the FDI attracted by this country positively. The positive and significant coefficient of the TELE variable signifies that, in general, countries with more favourable infra-

¹⁹ Hausman's (1978) specification test enable us to test the hypothesis regarding the absence of correlation between the unobservable specific effects and the explanatory variables, and thereby, to consider the individual effects as random or fixed. The null hypothesis for the Hausman test is that the difference in coefficients between fixed effects and random effects specifications is not systematic. Thus a small p-value (<0.05) suggests the rejection of the random effects specification.

²⁰ If the GDP coefficient is positive and significant this implies that foreign investors are indeed attracted to a large domestic market (market-seeking FDI). We also use GDP per capita as a proxy for the quality of the market demand in a host country and do find this variable significant in all model specifications.

²¹ When the GMM estimator is used (not reported here), the DIST variable proves to be marginally statistically significant and negative.

structure endowment attract more FDI. As expected, the unemployment rate and corporate income tax rate have negative impacts on FDI but only UNEMPL is strongly statistically significant at the 1 percent level. The coefficient on corporate tax rate displays a tax-rate elasticity of about -1.5. This result is in line with the meta-analysis of De Mooij and Everdeen (2008) who find a median tax-rate elasticity of about -2.9 but this should be treated with caution because they use the effective average tax rate rather than the statutory tax rate. Finally, in line with Demekas et al. (2005), our analysis shows a marginally significant (and negative) impact of unit labour cost on FDI.

We also introduce a number of control variables that proxy for different political and institutional risk effects (see Model specifications 2 through 5). The estimated coefficients of COR, CR_RISK and INSTITUTE are statistically significant and with the expected signs. The NAT_RES variable used as a proxy for the availability of natural resources in a host country enters the model as insignificant. These findings are not unexpected. The data in table 1 show that the largest amount of FDI is attracted by EU-15 countries (see also appendix C for the top 10 FDI performers), which are well developed economies with low levels of macroeconomic and political risk, and limited natural resources. At the same time CEE countries are characterized with a low degree of transparency and high bureaucratic risk that defer FDI. For these countries we expect variables such as corruption, credit risk and quality of institutions to play a significant role in explaining FDI. When country risk level is measured by the credit default swap spread (CDS), the results show a strong negative impact on FDI (see Model 1).

TABLE 2

FDI net inflows panel regressions (1994-2012), total sample

Explanatory variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
	FE	FE	FE	FE	FE	FE
GDP_REAL	3.513** (0.010)	2.064*** (0.000)	2.464*** (0.000)	2.341*** (0.000)	1.929*** (0.004)	2.079*** (0.000)
POP	2.093 (0.537)	1.222 (0.441)	2.893* (0.068)	2.843* (0.081)	0.098 (0.960)	1.477 (0.332)
WEIGHTED_DISTANCE	-0.036 (0.880)	-0.089 (0.558)	-0.047 (0.754)	-0.108 (0.473)	-0.098 (0.522)	-0.094 (0.536)
GDP_G	1.944 (0.445)					
WORLD_GDP	0.045 (0.992)					
CDS	-0.165** (0.015)					
TRADE	0.357 (0.211)	0.553* (0.060)	0.426* (0.105)	0.340 (0.196)	0.886* (0.087)	0.351 (0.184)
UNEMPL	-3.325 (0.288)	-2.091 (0.258)	-6.075*** (0.003)	-4.037** (0.028)	-5.327*** (0.010)	-2.932* (0.100)
TELE	2.757 (0.188)	3.322*** (0.001)	3.723*** (0.000)	3.391*** (0.001)	2.924** (0.011)	3.329*** (0.002)

Explanatory variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
	FE	FE	FE	FE	FE	FE
TAX	-1.460 (0.608)	-1.206 (0.348)	-1.271 (0.312)	-1.153 (0.364)	-2.147 (0.120)	-1.514 (0.234)
ULC	-0.719 (0.505)	-1.102* (0.087)	-1.058* (0.097)	-0.464 (0.487)	-0.993* (0.103)	-0.918 (0.153)
COR		-0.201* (0.083)				
CR_RISK			0.089*** (0.004)			
INSTIT				0.269** (0.022)		
NAT_RES					0.090 (0.345)	
Lag(FDI)	0.006 (0.945)	0.117* (0.052)	0.105* (0.077)	0.123** (0.038)	0.088 (0.160)	0.131** (0.028)
TIME(2008)	0.570*** (0.007)	0.170 (0.344)	0.146 (0.412)	0.119 (0.510)	0.102 (0.579)	0.158 (0.382)
R-squared (overall)	0.288	0.274	0.299	0.292	0.310	0.280
Number of observations	183	342	347	347	324	347

Notes: Model 1 includes gravity variables (GDP, POP and WEIGHTED DISTANCE), world and country-specific macroeconomic variables (GDP_G, WORLD_GDP, CDS, TRADE, UNEMPL, TELE, TAX and ULC). Models 2 through 5 include policy and institutional risk variables (COR, CR_RISK, INSTIT and NAT_RES). Models 1 through 6 include also lagged value of the dependent variable (FDI). Table 2 shows FE specification for each model based on Hausman's test results. All variables (except FDI, GDP and POP) are taken as ratios or in percent.

*, **, and *** represent significance at 10, 5, and 1 percent, respectively.

P-values are shown in brackets. The null hypothesis for the Hausman test is that the difference in coefficients between fixed effects and random effects specifications is not systematic. Thus a small p-value (<0.05) suggests the rejection of the random effects specification.

Source: Authors' calculation.

We also introduce the lagged value of the dependent variable (FDI) in all model specifications. The positive sign of this variable shows that countries with a larger stock of FDI will also, *ceteris paribus*, have an advantage in attracting new investment compared to countries with a smaller stock. All model specifications include a time dummy to control for different time periods (before the financial crisis of 2008 and after that); the estimated coefficient is positive and statistically significant only in Model 1.

The results achieved so far show that there is a set of gravity and traditional (location) factors common across different groups of European countries (EU-15 and CEE countries) that explain FDI flows to these countries. Thus, we find strong evidence in support of our first hypothesis. Although the two groups of countries are geographically closer and share similar market features, one may expect them to have different kinds of attractiveness to foreign investors. Looking at them as a homogeneous group of economies makes it difficult to disentangle institutional

and other effects on FDI that are cross-correlated to these same factors. Thus, using separate samples makes it possible to analyze whether the motives for FDI differ across EU-15 and CEE countries. Another advantage of using separate samples is that it reduces the correlation between the explanatory variables. Basically, the same specifications as for the total sample are used. The results for the groups of EU-15 and CEE countries are presented in tables 3 and 4.

Model 1 in table 3 shows that the gravity variables (except distance) enter the model statistically significantly. While GDP and POP variables show strong positive impact on FDI in all model specifications, the DISTANCE variable remains insignificant. Similarly to the total sample GDP_G variable and real world GDP growth rate are not statistically significant. Including macroeconomic factors as control variables yields results similar to those for the total sample. All but two variables (unemployment and tax rates) show a significant impact on FDI flows into the group of EU-15. In the next few models we control for different political and institutional risk effects. COR, CR_RISK and NAT_RES variables are all found to have a statistically significant impact on FDI. The results in table 3 show that more developed European countries with a larger stock of FDI will have no advantage in attracting new investments compared to countries with a smaller stock; the estimated coefficient is positive but statistically insignificant. All model specifications in table 3 include time dummies for the years 1999 and 2002 to control for Eurozone membership effect.²² The estimated coefficients for year 2002 are statistically significant, which confirms our expectation that, in general, Eurozone membership plays an important role in attracting more FDI into the group of EU-15 countries but its immediate effect may be negative for some EU countries (year 2002 dummy is negative).²³

TABLE 3

FDI net inflows panel regressions (1994-2012), EU-15 sub-sample

Explanatory variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
	FE	FE	FE	FE	FE	FE
GDP_REAL	8.341** (0.029)	5.559*** (0.000)	5.540*** (0.000)	5.217*** (0.000)	4.669*** (0.002)	5.300*** (0.000)
POP	2.564 (0.801)	8.543** (0.019)	9.168** (0.012)	8.611** (0.020)	3.995 (0.351)	8.418** (0.023)
WEIGHTED_ DISTANCE	-0.723 (0.276)	-0.164 (0.498)	-0.143 (0.552)	-0.145 (0.556)	-0.148 (0.543)	-0.140 (0.567)
GDP_G	10.151 (0.182)					
WORLD_ GDP	0.169 (0.985)					

²² The euro currency was launched alongside EU national currencies in 1999 but physical notes and coins that replaced all national currencies came into existence in 2002. For more details see: http://en.wikipedia.org/wiki/Eurozone#Member_states.

²³ There is no way of saying whether the 2002 dummy is negative due to Eurozone membership or maybe there are other factors that affect FDI flows in that particular year (2002).

Explanatory variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
	FE	FE	FE	FE	FE	FE
CDS	-0.270** (0.015)					
TRADE	3.638** (0.019)	0.300 (0.661)	0.513 (0.453)	0.277 (0.694)	0.033 (0.964)	0.375 (0.587)
UNEMPL	-4.202 (0.407)	-3.040 (0.335)	-5.162 (0.168)	-0.347 (0.915)	-5.601 (0.129)	-0.626 (0.836)
TELE	8.292*** (0.005)	3.710*** (0.004)	3.912*** (0.002)	4.030*** (0.002)	3.248** (0.021)	3.948*** (0.003)
TAX	-2.774 (0.586)	-1.786 (0.256)	-1.085 (0.494)	-1.123 (0.522)	-3.662** (0.042)	-1.712 (0.283)
ULC	-0.935 (0.667)	-1.786 (0.144)	-2.058* (0.090)	-1.634 (0.225)	-1.836* (0.105)	-2.066* (0.094)
COR		-0.399** (0.018)				
CR_RISK			0.106** (0.011)			
INSTIT				0.155 (0.426)		
NAT_RES					0.208* (0.056)	
Lag(FDI)	0.170* (0.103)	0.068 (0.350)	0.043 (0.557)	0.065 (0.383)	0.003 (0.970)	0.068 (0.360)
TIME(1999)	omitted	0.399 (0.172)	0.415 (0.155)	0.428 (0.149)	0.430 (0.143)	0.425 (0.151)
TIME(2002)	omitted	-0.494** (0.029)	-0.573** (0.011)	-0.537** (0.019)	-0.643*** (0.006)	-0.544** (0.018)
R-squared (overall)	0.291	0.295	0.298	0.275	0.307	0.272
Number of observations	91	210	210	210	197	210

Notes: Model 1 includes gravity variables (GDP, POP and WEIGHTED DISTANCE), world and country-specific macroeconomic variables (GDP_G, WORLD_GDP, CDS, TRADE, UNEMPL, TELE, TAX and ULC). Models 2 through 5 include policy and institutional risk variables (COR, CR_RISK, INSTIT and NAT_RES). Models 1 through 6 include also lagged value of the dependent variable (FDI). Table 3 shows FE specification for each model based on Hausman's test results. All variables (except FDI, GDP and POP) are taken as ratios or in percent.

*, **, and *** represent significance at 10, 5, and 1 percent, respectively.

P-values are shown in brackets. The null hypothesis for the Hausman test is that the difference in coefficients between fixed effects and random effects specifications is not systematic. Thus a small p-value (<0.05) suggests the rejection of the random effects specification.

Source: Authors' calculation.

Next, the benchmark model (1) is run for the sub-sample of CEE countries (see table 4). The results support our first hypothesis that there is a set of traditional factors (market size, trade openness, unemployment and tax rate) that are common FDI determinants across different groups of European countries. At the same time we find a number of country-specific factors significant only for the group of CEE countries. For example, unlike the total and EU-15 samples, growth in real GDP enters the model strongly statistically significantly (see Model 1). This result sup-

ports Suder and Sohn (2010) finding that the fast economic growth of CEE countries during the last two decades plays an important role in increasing the attractiveness of this group of economies for foreign investors. Surprisingly, the unit labour cost (ULC) variable is not found to have a significant impact on FDI flows into the group of CEE countries; the estimated coefficient is negative but statistically insignificant. This result is inconsistent with previous empirical studies (see Bellak et al., 2008; Demekas et al., 2005) that consistently reveal negative significant effects of labour costs on FDI; yet this effect should be interpreted with caution, as a positive sign for unit labour costs is also possible, if they actually capture a higher skill level and higher per capita income.

TABLE 4
FDI net inflows panel regressions (1994-2012), CEECs sub-sample

Explanatory variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
	FE	FE	FE	FE	FE	FE
GDP_REAL	0.206 (0.911)	0.097 (0.933)	0.325 (0.755)	0.641 (0.536)	1.435 (0.299)	0.537 (0.607)
POP	1.252 (0.786)	5.825** (0.043)	5.470* (0.050)	5.398* (0.053)	5.475 (0.145)	5.050* (0.071)
WEIGHTED_DISTANCE	-0.261 (0.305)	-0.316* (0.087)	-0.155 (0.419)	-0.263 (0.147)	-0.277* (0.105)	-0.260 (0.155)
GDP_G	5.587** (0.047)					
WORLD_GDP	0.632 (0.931)					
CDS	0.018 (0.890)					
TRADE	0.355 (0.208)	0.672** (0.021)	0.582** (0.027)	0.407* (0.105)	2.054*** (0.003)	0.480* (0.062)
UNEMPL	-0.645 (0.898)	-3.929* (0.104)	-5.324* (0.061)	-4.737* (0.082)	-5.868** (0.041)	-3.667 (0.170)
TELE	2.272 (0.531)	0.647 (0.736)	2.070 (0.286)	0.696 (0.707)	2.952 (0.152)	1.060 (0.567)
TAX	-5.815 (0.125)	-2.278 (0.384)	-5.270** (0.035)	-5.315** (0.033)	-4.267* (0.080)	-3.906* (0.099)
ULC	-0.175 (0.891)	-0.188 (0.799)	-0.286 (0.687)	-0.612 (0.411)	-0.656 (0.385)	-0.207 (0.772)
COR		0.116 (0.487)				
CR_RISK			0.104* (0.094)			
INSTIT				0.283* (0.084)		
NAT_RES					0.034 (0.955)	
Lag(FDI)	0.276** (0.024)	0.227** (0.017)	0.246*** (0.008)	0.249*** (0.007)	0.265*** (0.005)	0.259*** (0.005)
PRIV	omitted	omitted	omitted	omitted	omitted	omitted
TIME(2004)	0.062 (0.850)	0.117 (0.618)	0.165 (0.483)	0.131 (0.575)	0.097 (0.682)	0.124 (0.599)

Explanatory variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
	FE	FE	FE	FE	FE	FE
TIME(2007)	0.605** (0.049)	0.726*** (0.002)	0.702*** (0.003)	0.689*** (0.004)	0.664*** (0.005)	0.731*** (0.002)
R-squared (overall)	0.458	0.456	0.485	0.486	0.525	0.472
Number of observations	92	132	137	137	127	137

Notes: Model 1 includes gravity variables (GDP, POP and WEIGHTED DISTANCE), world and country-specific macroeconomic variables (GDP_G, WORLD_GDP, CDS, TRADE, UNEMPL, TELE, TAX and ULC). Models 2 through 5 include policy and institutional risk variables (COR, CR_RISK, INSTIT and NAT_RES). Models 1 through 6 include also lagged value of the dependent variable (FDI). Table 4 shows FE specification for each model based on Hausman's test results. The PRIV variable is automatically omitted from the FE model specifications. By construction, the FE estimator drops variables which are time invariant. With the RE estimator, the PRIV variable is positive and statistically significant in model specifications 1, 3 and 6. All variables (except FDI, GDP and POP) are taken as ratios or in percent.

*, **, and *** represent significance at 10, 5, and 1 percent, respectively.

P-values are shown in brackets. The null hypothesis for the Hausman test is that the difference in coefficients between fixed effects and random effects specifications is not systematic. Thus a small p-value (<0.05) suggests the rejection of the random effects specification.

Source: Authors' calculation.

One may expect that unlike the EU-15 sample, variables such as corruption and quality of institutions will have a significant impact on FDI in transition economies. We do find that two of the control variables that proxy political and institutional risk effects (CR_RISK and INSTIT) enter the model statistically significantly. Thus, we provide evidence in support of the hypothesis that policy and institutional quality factors are indeed able to explain the differences in attractiveness among CEE countries for foreign investors. We may expect that transition effects will be more pronounced at the level of business entities (through privatization or other phenomena) than on a country-specific level. To confirm or reject this hypothesis we also run the model with a dummy variable (PRIV) indicating the perceived quality of the method of privatization followed by the recipient (host) country.²⁴ In line with previous research (see Carstensen and Toubal, 2004; Holland and Pain, 1998), we do find evidence that the method of privatization has a strong impact on the level of foreign investment in the transition economies in Central and Eastern Europe.²⁵ The estimated coefficient for lagged value of FDI also proves to be positive and statistically significant. All model specifications include time dummies for the years 2004 and 2007 to control for EU membership effects. Of the two variables only the 2007 dummy shows a strong positive impact

²⁴ The variable is constructed on the same basis as Holland and Pain (1998), where sales to outside owners receive the highest quality rating, while voucher distribution and management-employee buyouts receive the lowest rating.

²⁵ The PRIV variable is automatically omitted from the FE model specifications. By construction, the FE estimator drops variables which are time invariant. With the RE estimator, the PRIV variable is positive and statistically significant in model specifications 1, 3 and 6. These results are available upon request.

on FDI. We may conclude that the announcement effect of EU membership of Bulgaria and Romania in 2007 did play a positive role in attracting more foreign investments in this region.

In the previous section, we asked the question if there are top FDI performers among the European countries, and if this is the case, what factors may explain the FDI dominance of this group of countries over the rest of the countries in our sample. To answer this question, we rank all the countries in our sample based on the index of relative dominance of FDI flows (Sinha, 2012) and split them into two groups – top ten FDI performers and the rest of the countries (see appendix C). Then, we run the benchmark model (1) for each of these two sub-samples to investigate if FDI determinants are similar across the two groups. The results are reported in tables 5 and 6. As expected, we find that traditional (location) factors such as gross domestic product, credit default risk, telecommunications, and tax rate have similar effects on FDI across the two groups of performers. In contrast, the unit labour costs (ULC) variable shows significant impact on FDI only in the group of countries with low FDI dominance (most of these countries are transition economies), while variables such as UNEMPL and TELE are found to have larger effect in the group of top ten FDI performers. For this group of more developed EU economies the world GDP growth rate also plays a significant role in attracting more FDI, especially in periods of strong economic development.

TABLE 5
FDI net inflows panel regressions (1994-2012), Top 10 sub-sample

Explanatory variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
	FE	FE	FE	FE	FE	FE
GDP_REAL	3.007 (0.233)	1.555 (0.146)	2.512** (0.038)	1.865* (0.083)	1.179 (0.326)	1.632* (0.105)
POP	13.938 (0.145)	1.843 (0.466)	3.821 (0.172)	3.593 (0.196)	1.160 (0.722)	1.943 (0.441)
WEIGHTED_DISTANCE	-0.097 (0.920)	-0.041 (0.864)	-0.054 (0.821)	-0.021 (0.931)	-0.012 (0.961)	-0.023 (0.924)
GDP_G	13.256 (0.135)					
WORLD_GDP	18.964* (0.086)					
CDS	-0.279** (0.045)					
TRADE	0.588 (0.745)	0.499 (0.492)	0.597 (0.407)	0.351 (0.631)	0.053 (0.947)	0.542 (0.453)
UNEMPL	-6.617 (0.143)	-4.963* (0.100)	-7.259*** (0.007)	-7.236*** (0.008)	-8.189*** (0.005)	-6.275** (0.017)
TELE	8.338*** (0.003)	3.918** (0.016)	4.292*** (0.009)	4.193** (0.011)	3.174* (0.084)	3.907** (0.017)
TAX	-3.345* (0.073)	-1.069 (0.534)	-0.405 (0.814)	-0.015 (0.993)	-1.453 (0.457)	-0.902 (0.596)

Explanatory variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
	FE	FE	FE	FE	FE	FE
ULC	-1.871 (0.380)	-0.648 (0.525)	-0.818 (0.424)	-0.054 (0.961)	-0.638 (0.540)	-0.582 (0.567)
COR		-0.131 (0.431)				
CR_RISK			0.106 (0.124)			
INSTIT				0.269 (0.162)		
NAT_RES					0.011 (0.916)	
Lag(FDI)	0.088 (0.505)	0.227** (0.013)	0.203** (0.027)	0.214** (0.018)	0.192** (0.050)	0.227** (0.012)
TIME(2008)	0.537* (0.059)	0.124 (0.631)	0.100 (0.693)	0.051 (0.843)	0.007 (0.979)	0.097 (0.705)
R-squared (overall)	0.425	0.312	0.321	0.319	0.312	0.308
Number of observations	72	149	149	149	140	149

Notes: Model 1 includes gravity variables (GDP, POP and WEIGHTED DISTANCE), world and country-specific macroeconomic variables (GDP_G, WORLD GDP, CDS, TRADE, UNEMPL, TELE, TAX and ULC). Models 2 through 5 include policy and institutional risk variables (COR, CR_RISK, INSTIT and NAT_RES). Models 1 through 6 include also lagged value of the dependent variable (FDI). Table 5 shows FE specification for each model based on Hausman's test results. All variables (except FDI, GDP and POP) are taken as ratios or in percent.

*, **, and *** represent significance at 10, 5, and 1 percent, respectively.

P-values are shown in brackets. The null hypothesis for the Hausman test is that the difference in coefficients between fixed effects and random effects specifications is not systematic. Thus a small p-value (<0.05) suggests the rejection of the random effects specification.

Source: Authors' calculation.

When analyzing the impact of political and institutional risk factors on FDI we do find some differences between the two groups of countries. The top ten FDI performers are able to attract significant amount of FDI due to their political and macroeconomic stability, as well as the high transparency of their legal regulations. Thus, we do not find the variables that proxy these policy and institutional effects to have a significant influence on FDI. For the group of countries with low FDI dominance, both credit risk and quality of institutions are found to be significant determinants of FDI. These findings are not unexpected. The countries that belong to the second group are economies with less developed policy and institutional environments; as said before labour costs in these countries appear to be relatively low, so it is likely that they are able to attract predominantly efficiency-seeking FDI from MNEs in countries that have higher labour costs. Thus, our second hypothesis is confirmed. The time dummy variable used to control for the 2008 crisis effect proves to be statistically insignificant for both groups of FDI performers (except in Model 1).

TABLE 6

FDI net inflows panel regressions (1994-2012), others sub-sample

Explanatory variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
	FE	FE	FE	FE	FE	FE
GDP_REAL	4.005* (0.053)	3.081*** (0.000)	3.046*** (0.000)	3.309*** (0.000)	1.576 (0.161)	2.947*** (0.000)
POP	0.892 (0.850)	1.136 (0.616)	0.329 (0.882)	0.429 (0.842)	0.516 (0.860)	0.787 (0.712)
WEIGHTED_DISTANCE	-0.003 (0.991)	-0.108 (0.591)	-0.053 (0.790)	-0.109 (0.582)	-0.073 (0.723)	-0.101 (0.616)
GDP_G	3.402 (0.272)					
WORLD_GDP	4.939 (0.446)					
CDS	-0.229** (0.022)					
TRADE	0.340 (0.282)	0.768** (0.025)	0.546* (0.073)	0.445 (0.139)	2.064*** (0.007)	0.495* (0.104)
UNEMPL	-6.542 (0.213)	-0.733 (0.767)	-4.417 (0.167)	-3.089 (0.235)	-5.232* (0.087)	-0.934 (0.706)
TELE	2.189 (0.573)	3.274** (0.033)	3.838** (0.012)	3.778** (0.012)	5.307*** (0.008)	3.531** (0.021)
TAX	-1.740 (0.668)	-1.883 (0.355)	-2.772 (0.155)	-2.885 (0.136)	-3.505* (0.091)	-2.662 (0.174)
ULC	-0.813 (0.596)	-1.885** (0.043)	-1.621* (0.075)	-1.088 (0.233)	-1.429* (0.100)	-1.499* (0.101)
COR		-0.218 (0.216)				
CR_RISK			0.067* (0.086)			
INSTIT				0.384** (0.014)		
NAT_RES					0.646 (0.297)	
Lag(FDI)	0.083 (0.448)	0.009 (0.912)	0.000 (0.999)	0.006 (0.937)	0.017 (0.843)	0.014 (0.859)
TIME(2008)	0.655** (0.038)	0.223 (0.368)	0.222 (0.372)	0.187 (0.448)	0.107 (0.682)	0.244 (0.327)
R-squared (overall)	0.319	0.321	0.337	0.348	0.364	0.325
Number of observations	111	193	198	198	184	198

Notes: Model 1 includes gravity variables (GDP, POP and WEIGHTED DISTANCE), world and country-specific macroeconomic variables (GDP_G, WORLD_GDP, CDS, TRADE, UNEMPL, TELE, TAX and ULC). Models 2 through 5 include policy and institutional risk variables (COR, CR_RISK, INSTIT and NAT_RES). Models 1 through 6 include also lagged value of the dependent variable (FDI). Table 5 shows FE specification for each model based on Hausman's test results. All variables (except FDI, GDP and POP) are taken as ratios or in percent.

*, **, and *** represent significance at 10, 5, and 1 percent, respectively.

P-values are shown in brackets. The null hypothesis for the Hausman test is that the difference in coefficients between fixed effects and random effects specifications is not systematic. Thus a small p-value (<0.05) suggests the rejection of the random effects specification.

Source: Authors' calculation.

5 CONCLUSION

The analysis presented in this paper has enabled identification of several key determinants of FDI flows into Western and Eastern European countries, and highlighted the significance of different policy and institutional factors for the attractiveness of these countries for foreign investors. By using both traditional and more specific variables and a longer period (1994-2012), we extend the previous research work on FDI, which focuses mainly on European Union countries as a homogeneous group of economies. Our research provides additional support to the common view that the traditional location factors (GDP, population, trade openness, unemployment, infrastructure endowment, tax rate and unit labour costs) are important determinants of FDI into different European countries. At the same time we find that country-specific characteristics such as economic growth, unit labour costs, and credit risk contribute to the differences in the FDI pattern across EU-15 and CEE countries. Policy and institutional quality factors also play an important role in explaining the increasing attractiveness of both groups of countries for foreign investors.

The results of an analysis of indicate that market-seeking motives (proxied by GDP, population and trade openness) are important drivers of FDI to all European countries. Investigating the importance of FDI motives for EU-15 and CEE countries as separate groups shows that efficiency-seeking motives (proxied by infrastructure endowment) have significant effect on FDI in both regions, while growth in GDP, unemployment and tax rates seem to influence FDI only in the group of CEE countries. In line with previous empirical research (Bevan and Estrin, 2000; Carstensen and Toubal, 2004; Holland and Pain, 1998; Stoian and Filippaios, 2007), the explanatory variables that purport to measure the significance of policy and institutional environment such as corruption, credit risk, and quality of institutions are found to have a significant influence on FDI in Europe. When total sample is divided into two sub-samples (EU-15 and 11 CEE countries) this effect remains strong; while quality of institutions seems to be important FDI determinant only in the group of CEE countries, natural resource availability is a significant factor for more developed EU-15 countries.

To the best of our knowledge this is the only paper that investigates the marginal effect of macroeconomic, policy and institutional quality factors on FDI in different European countries based on their relative performance. We ranked all the countries in our sample based on the index of relative dominance of FDI flows and investigated the factors that determine FDI in each group. Our results show that the top ten FDI performers are able to attract significant amount of FDI because of their macroeconomic stability and high level of institutional development. For the group of countries with low FDI dominance we find that policy and institutional quality factors have strong explanatory power; credit risk and quality of institutions are significant determinants of FDI. Our findings have strong policy implication for the group of less developed European countries where the governments'

efforts should be directed to creating stable political and institutional environments, as well as appropriate incentives for foreign investors.

Unfortunately, the research does have some limitations. In the first place, we were not able to differentiate the origin of FDI in our sample (in case of the EU-15). Thus, we have been limited in our analysis on the expected (negative) impact of distance (as a location factor) on FDI attractiveness for different groups of European countries. In addition, the empirical results are derived from a sample of transition economies, which include only new EU member states. Thus, the study will improve if candidate member states (e.g., Macedonia, Bosnia and Herzegovina, Albania, Serbia and Montenegro) are included in the analysis. This will help us investigate the role of different macroeconomic, policy and institutional factors in explaining FDI flows attracted by countries at different stages of transition process – the so-called “laggards” and “leaders”. This analysis is left for future research.

To summarize the discussions on model variables and data sources, the table below displays both dependent and explanatory variables and their expected impact on FDI. The observation period is 1994-2012. Time dummies for different major events (Eurozone and EU membership effects) are also included in the table.

TABLE A1
Dependent and explanatory variables

Variable	Explanation	Data source	Expected sign
Dependent variable			
FDI	Foreign direct investment, net inflows (BoP, current US\$). The data is annual and covers the period 1994-2012	World Bank (WDI Database, 2014)	
Explanatory variables			
GDP_REAL	Real gross domestic product (in 2005 US\$), proxy for market size	World Bank (WDI Database, 2014)	+
POP	Total population, proxy for market size	World Bank (WDI Database, 2014)	+
W_DISTANCE	Weighted distance calculated as the sum of bilateral distance to all source countries multiplied by the ratio of GDP of source country in year <i>t</i> to all source countries' GDP in year <i>t</i>	WIIW Database (2014), OECD (2014)	-
GDP_G	Annual real growth rate in GDP, proxy for market demand	World Bank (WDI Database, 2014)	+
WORLD_GDP	Historical World GDP Growth Rate	World Bank (WDI Database, 2014), International Financial Statistics of the IMF (2014)	+
CDS	5-year credit default swap spread	Bloomberg Professional Service (2014)	-
TRADE	Level of imports plus exports (in US\$) of the host country as a percentage of its GDP (in US\$), proxy for trade openness	World Bank (WDI Database, 2014)	+
UNEMPL	Unemployment rate, proxy for macroeconomic stability	World Bank (WDI Database, 2014)	-
TELE	Telephone lines (per 100 people), proxy for infrastructure endowment	World Bank (WDI Database, 2014), International Telecommunications Union (2014)	+
TAX	Statutory corporate income tax rates, proxy for macroeconomic stability	Mintz and Weichenrieder (2010), Edwards and Mitchell (2008), Keen, Kim, and Varsano (2006), KPMG's Corporate and Indirect Tax Surveys (2014)	-

Variable	Explanation	Data source	Expected sign
Explanatory variables			
ULC	Gross monthly wages in current US\$, as share of GDP per employment, proxy for unit labour costs	WIIW Database (2014), OECD (2014)	-/+
COR	Transparency International's Corruption Perceptions Index (TI), on a continuous scale from 0 (squeaky clean) to 10 (highly corrupt), proxy for institutional risk	Transparency International Annual Reports, 1995-2012	-
CR_RISK	Moody's Sovereign Credit Rating, on a continuous scale from 0 (the lowest possible rating) to 20 (maximum creditworthiness), proxy for political risk	Moody's (2014)	+
INSTIT	First principal component of control of corruption, political stability, government effectiveness, regulatory quality, rule of law, and voice and accountability	Worldwide Governance Indicators (WGI)	+
NAT_RES	First principal component of gross fixed capital formation, gross domestic product, gross domestic product per capita, gross domestic savings and total natural resources rents	World Bank (WDI Database, 2014)	+
TIME	Temporal (year) dummy	A dummy used to control for different time periods or announcement effects	+

Source: Authors' calculation.

In order to summarize the information contained in many socio-economic factors we use principal component analysis (PCA). This permits the reduction of the number of variables used in the estimation and yet still retains a substantial part of the information contained. We perform PCA using the World Bank’s Worldwide Governance Indicators (WGI) and several other variables used as proxies for natural resources availability following Sinha (2012). We estimate the first principal component using the component variables listed below and create two new independent variables – *INSTIT* and *NAT_RES*. The former is a proxy for the overall institutional quality in a host country and the latter is a proxy for the availability of natural resources and the ability of the country to process these resources using technology and skill.

TABLE B1
Component variables of INSTIT and NAT_RES

Component	Definition	Expected effect
INSTIT		
Control of corruption	Reflects 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.	+
Political stability	Reflects perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically-motivated violence and terrorism.	+
Government effectiveness	Reflects 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.	+
Regulatory quality	Reflects perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development.	+
Rule of law	Reflects 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.	+
Voice and accountability	Reflects perceptions of the extent to which a country’s citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media.	+
NAT_RES		
Gross fixed capital formation	Gross fixed capital formation (formerly gross domestic fixed investment) includes land improvements (fences, ditches, drains, and so on); plant, machinery, and equipment purchases; and the construction of roads, railways, and the like, including schools, offices, hospitals, private residential dwellings, and commercial and industrial buildings. According to the 1993 SNA, net acquisitions of valuables are also considered capital formation. Data are in current U.S. dollars.	+

Component	Definition	Expected effect
NAT_RES		
Gross domestic product	GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in current U.S. dollars.	+
Gross domestic product per capita	GDP per capita is gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in current U.S. dollars.	+
Gross domestic savings	Gross domestic savings are calculated as GDP less final consumption expenditure (total consumption). Data are in current U.S. dollars.	+
Total natural resources rents	Total natural resources rents are the sum of oil rents, natural gas rents, coal rents (hard and soft), mineral rents, and forest rents.	+

Source: [<http://info.worldbank.org/governance/wgi/index.asp>] and [<http://data.worldbank.org/indicator/all>].

To study FDI dominance among the countries in our sample we compute the Index of Rank Dominance (IRD) as outlined in Bhanu Murthy (2011). Based on this Index we separate the total sample into two sub-samples: Top 10 performers and others. The IRD is a measure of continuous dominance by ranks and is computed the following way:

Eq. (C1)

$$I_{RD} = \frac{\sum_{i=1994}^{2012} (Rank\ Score)_i}{Maximum\ Rank\ Score \times No.\ of\ years}$$

where:

I_{RD} is the Index of Rank Dominance;

Rank Score is 26, 25, 24, ..., 2, 1 (in decreasing order of rank);

No. of years is 19.

We also present the Relative Index of Rank Dominance (RIRD) which provides a measure for relative dominance and is computed as:

Eq. (C2)

$$RIRD = \frac{I_{RD_i}}{\sum_{i=1}^{26} I_{RD}}$$

TABLE C1

Index of Rank Dominance of FDI Inflows for the sample of 26 EU countries during the period 1994-2012

Rank	Country	Score	IRD	RIRD
1	United Kingdom	468	0.9853	0.0530
2	Luxembourg	456	0.9589	0.0516
3	France	445	0.9358	0.0503
4	Spain	390	0.8924	0.0480
5	Belgium	415	0.8737	0.0470
6	Germany	395	0.8662	0.0466
7	Poland	305	0.8449	0.0454
8	Italy	317	0.8342	0.0449
9	Netherlands	366	0.8026	0.0432
10	Sweden	338	0.7735	0.0416
11	Czech Republic	244	0.7625	0.0410
12	Portugal	221	0.7270	0.0391
13	Latvia	80	0.7018	0.0377
14	Ireland	267	0.6679	0.0359
15	Denmark	226	0.6608	0.0355

Rank	Country	Score	IRD	RIRD
16	Finland	213	0.6594	0.0355
17	Hungary	260	0.6516	0.0350
18	Greece	141	0.6184	0.0333
19	Austria	259	0.6184	0.0333
20	Croatia	139	0.6096	0.0328
21	Romania	196	0.6068	0.0326
22	Slovakia	137	0.6009	0.0323
23	Lithuania	79	0.5197	0.0279
24	Bulgaria	157	0.5164	0.0278
25	Estonia	94	0.4947	0.0266
26	Slovenia	63	0.4145	0.0223

Source: Authors' calculation.

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