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Determinants of net FDI inflow to a cluster of Central and Eastern European countries

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Abstract

Foreign direct investment (FDI) can provide necessary capital to enhance economic growth in transition economies and support stabilization efforts. Net FDI inflows into Czech Republic, Estonia, Hungary, Latvia and Poland from their respective 15 major investment-countries during 1996-2012, were analysed by constructing a panel data set and employing a Hausman-Taylor estimation method, treating the countries' GDP and Wage as endogenous variables. In an attempt to create a proxy of an *average* Central and Eastern European country (CEEC), there was also conducted an analysis on the five countries as a *cluster,* using the aggregated average of their respective variables. Disaggregated sector-specific FDI inflows also allowed for a LSDV model in the search of patterns of comparative advantages through sector-preferential foreign investments. Host country GDP, or market size, proved to have a negative effect on FDI for Czech Republic (CZ) and Poland, but a positive effect for the cluster. Source country GDP was presented as positive for CZ, Estonia, Hungary, Poland, and for the cluster. Latvian FDI inflows were positively affected by its governance indicator and that the source country is a member of the EU. CZ FDI inflows are affected positively by wages, the level of domestic investment and if the partner is a EU member, it was however affected negatively if the partner has a high level of domestic investment at home. Estonian FDI inflows are decreased if the source country is located far away and, in that, positively affected if the source country is a member of the EU. The cluster results suggest that the average CEECs would attract more FDI inflows by improving infrastructure and their openness to trade.
Based on the theory of rational investors seeking higher rate of returns in the most efficient and profitable sectors, the sector-preferential FDI inflows suggest that CZ and Poland could display patterns of comparative advantage in the *Manufacturing* sector.

Key words: FDI, market size, panel data, Hausman-Taylor estimation, comparative advantages, Central and Eastern European countries, Czech Republic, Estonia, Hungary, Poland, Latvia.

Sammendrag

Utenlandske direkteinvesteringer (UDI) kan tilføre nødvendig kapital for å forsterke økonomisk vekst i overgangsøkonomier, og understøtte stabiliserende tiltak. Netto tilstrømning av UDI til Tsjekkia, Estland, Ungarn, Latvia og Polen fra deres respektive 15 største investeringskilde-land i perioden 1996-2012 er analysert ved å konstruere et panel datasett og benytte en Hausman-Taylor estimeringsmetode som behandler landenes BNP and Lønn som endogene variabler. I et forsøk på å konstruere en *proxy* på et gjennomsnittlig Sentral- og Østeuropeisk land (SØEL), ble det også utført analyser på de fem landene som én *klynge*, ved å bruke et aggregert gjennomsnitt av landenes respektive variabler. Disaggregerte sektorspesifikke UDI tilstrømninger tillot bruken av en LSDV-modell i søken etter mønstre som kan indikere komparative fortrinn gjennom sektor-preferansene de utenlandske investeringene representerte.
Vertslandenes markedsstørrelse, angitt ved BNP, viste seg å ha en negativ effekt på UDI tilstrømninger for Tsjekkia og Polen, men en positiv effekt på *klyngen*. Kildelandets BNP ble presentert som positiv for Tsjekkia, Estland, Ungarn, Polen og for *klyngen*. Latvias UDI tilstrømninger ble positivt påvirket av dets styresettindikatorer og at kildelandet var medlem av EU. Tsjekkiske UDI tilstrømninger ble positivt påvirket av innenlandske lønninger og investeringsnivå, og at kildelandet var medlem av EU. Det ble derimot negativt påvirket av om kildelandet hadde et høyere nivå av innenlandske investeringer. UDI tilstrømninger til Estland ble redusert hvis kildelandet var lokalisert langt unna, og dermed, positivt påvirket dersom det var medlem EU. *Klynge*-resultatene antyder at et gjennomsnittlig SØEL ville tiltrukket seg ytterligere UDI tilstrømninger ved å forbedre infrastruktur og deres handelsåpenhet.
Basert på teorien om at investorer er rasjonelle og søker seg til høyest mulig avkastning i de mest effektive og profitable sektorer, kan mønstrene i sektor-preferansene i UDI tilstrømninger antyde at Tsjekkia og Polen kan inneha komparative fortrinn i produksjonssektoren.

Nøkkelord: UDI, markedsstørrelse, panel data, Hausman-Taylor estimering, komparative fortrinn, Sentral- og Østeuropeiske land, Tsjekkia, Estland, Ungarn, Polen, Latvia.

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Abbreviations

CEEC: Central and Eastern European country

CMEA/COMECON: Council of Mutual Economic Assistance

CZ: Czech Republic

DI: Domestic Investment

EU: European Union

FDI: Foreign Direct Investment

FPI: Foreign Portfolio Investment

GDP: Gross Domestic Product

IMF: International Monetary Fund

NMP: Net material product

OECD: The Organisation for Economic Co-Operation and Development

R&D: Research and development

SSA: Sub-Saharan Africa

TNC: Transnational Corporation

UNCTAD: The United Nations Conference on Trade and Development

WB: World Bank

WIIW: The Vienna Institute for International Economic Studies

WWII: World War II

1 Introduction

1.1 Prologue

Since the mid 1980s, the world has experienced an increasing wave of financial globalization. The globalization was spurred by liberalization of capital controls in many countries, resulting in rising cross-border financial flows among industrial economies, and especially between industrial and developing economies. Economists has yet to find a consensus on the economical impact international capital flows has on a country, but some empirical evidence suggests that these flows have a direct impact on GDP growth. For instance, by looking at the fastest- and slowest-growing economies during 1980-2000 and their status on capital account liberalization, financial openness is the common denominator for the countries that experienced the biggest growth in per capita GDP. Thailand, Singapore, South Korea and China, characterized by full or at least some degree of capital account liberalization, all presented with a total percentage change of more than 150% during this period (China reaching a staggering 391,6%). On the other side, the slowest-growing economies, the common denominator is that they were not particularly financially integrated. Haiti, Niger, Nicaragua and Togo all experienced a negative total percentage change in per capita GDP of 30% and more (Prasad, 2003). There were instances of other countries on the top ten list that where not particularly financially integrated, suggesting that financial integration is not a necessary condition for high GDP growth. However, the result by Prasad (2003) is noteworthy, suggesting that the degree of financial openness had an impact on GDP but *"… not a sufficient condition for a fast economic growth rate".*

While there are different types of international capital flows, each representing a different set of impacts on the economies, that is one that stands out both in terms of impact and size, namely foreign direct investment (FDI). From 1970 until 1998, gross FDI amounted to more than 50% of gross capital flows to financially integrating countries, proving to be the most substantial linkage in financial globalization. In 1998, net FDI inflows alone represented 10% of world gross capital formation. Prasad (2003)

argue that FDI is one of the most important instruments to which financial globalization benefits the economy and that financial integration could lead to increasing specialization of production based on comparative-advantage considerations. Kose (2006) found in their study that FDI inflow has a significantly positive effect on growth, especially through spillovers. Many countries focus on attracting FDI as an important component for economic development, due to the fact that it is the least volatile form of capital flows, and thereby increasing the possibility of sustainable growth. Still in 2012, net FDI inflows represented 9% of world gross capital formation and 67% of total foreign investment flows (i.e., portfolio equity flows represented the remaining 33%), amounting to $ 1 562 277 million (World Bank, 2013).

1.2 Determinants of attracting FDI inflow

Although there is contention among economists on whether the effects of FDI inflow are clearly beneficial or contain negative side effects for an economy, the majority of studies indicate that there are direct and/or indirect effects that have a positive effect on economic performance and stabilization (Krugman and Obstfeld 2003, Prasad 2003, Bevan, Estrin et al. 2004, Kekic 2005, Medve-Bálint 2014). Since 1990 and till 2012, total world gross capital formation experienced a total percentage increase of 225%. In the same period, total world net FDI inflow had increased from $ 196 279 million to $ 1 562 277 million, a total percentage increase of 696% (World Bank, 2013). The tremendous increase in FDI inflows relative to gross capital formation, tells us that FDI has become substantially more important since the beginning of the 1990s. With this high activity of foreign investments, what country-specific characteristics influence investors' decision making?

As with the effects of FDI, there is also a lack of consensus among researchers on what actually attracts FDI. Even though there have been conducted several studies, their results seem to differ depending on location-, time-, and variable specifications (Cheng and Kwan 2000, Chakrabarti 2001, Asiedu 2002, Bengoa and Sanchez-Robles 2003, Estrin 2013). A majority of these studies have concluded that market mass and distance are significant, but there are also studies suggesting otherwise. For that reason, different time periods and geographical locations of the subjects have been suggested as an

explanation for these differences. However, the lack of theory and consensus on the determinants makes it an interesting subject of further research and investigation. Clearly the recent ever-increasing amount of FDI flows in the world suggests that further studies are relevant and useful for policy makers in the case of attracting FDI inflows.

1.3 Specification of the objectives

The passage from the 1980s to 1990s was characterized, and often well remembered, with the dissolution of the Union of Soviet Socialist Republics (USSR). December 21st 1991 marked the beginning of a new era for the 15 states that had been under the socialist regime of the Union for several years. One of the characteristics of the USSR and the socialist regime was that it prohibited international capital flows and thereby disallowing foreign direct investments into the Union. Thus, the member states in USSR did not participate in the flourishing financial globalization and integration that spurred in the mid-1980s. Upon the dissolution and independency, many of the interdependent countries of the former union sought to reintegrate with the West by initiating reforms towards a more market-based economy (Blanchard 1993).

The USSR economical system is characterized as a *centrally planned economy* (CPE). For the countries that belonged to USSR, this meant that all economic decisions were made in Moscow and thereby followed through in the whole union. In the socialistic regime, companies were state-owned and the central authority in Moscow decided the production of goods and services. International trade was at a bare minimum, and intraunion trade accounted for 71% of the republics' total trade. The authority body also dictated prices, wages and to which extent trade outside the union that the republics could undertake (and to whom). The years as a CPE left many of these countries interdependent of the intraunion trade and state-funded investments, some more than others. After the dissolution, there was a massive fall of trade within the region. Before new trade patterns emerged, many of the countries were left with big trade deficits. Since government bodies in Moscow had dictated most aspects of the economy, the countries were left with the choice of either reform and reintegrate with Europe and the West, or subordinate themselves to Moscow, again (Blanchard 1993).

Privatization-, price- and exchange rate reforms were initiated rapidly after the dissolution (before, in some cases). With these new reforms, followed a liberalization of the capital account as a means of supporting economic growth by receiving foreign capital flows (Åslund 2007).

These relatively *recent* events also spiked the interest and motivation behind this thesis. The sovereign states emerging from under the communist rule might tell another story in terms of their determinants of attracting FDI inflows, both because of their ties to USSR and *recent* capital liberalization schemes. This study includes Czech Republic, Estonia, Hungary, Latvia and Poland. The countries will be studied separately and as an average entity, hereby known as *the cluster*. The motivation behind the construction of this *cluster*, is an attempt to create a proxy of an *average* Central and Eastern European (CEE) country, based on the variation in size and economic progress these five chosen economies represents.

Inspired by the existing research that has been done on the determinants of attracting FDI inflows and the theory imposed by Prasad (2003) that financial integration could lead to increasing specialization of production based on comparative-advantage considerations, I have constructed two research questions that will be answered through this thesis:

1) What are the potential push and pull determinants of attracting net FDI inflows into these five previously centrally planned economies, both separately and as a *cluster*?
2) Is there any evidence of sector-preferential FDI inflows suggesting patterns of comparative advantages?

In order to address these questions, I have constructed a panel data set ranging for the time period 1996-2012. The time period is mainly determined by data availability, but does also constitute a period that has been of importance to these five countries after initiating reforms and gaining confidence from more developed economies.

1.4 Organization of the thesis

The thesis is divided into six sections. Section I is the introduction to the problem and statement of objectives. Section II reviews recent macroeconomic developments and the structural reforms of the six countries for 1989-2012. Section III presents some theoretical background for factors related to FDI decisions and reviews the literature related to "push" and "pull" factors of FDI, and previous studies that have modelled and analysed FDI inflows. Section IV defines the variables to be used, lists the data sources, and describes the econometric model, methods and framework. Section V reports the results from the analysis, before providing a summary and conclusion in Section VI.

2 Background

The purpose of this chapter is to provide a historical and economic reminder of Czech Republic, Estonia, Hungary, Latvia, Poland, and the five countries as a *cluster*, and the issues they where faced with as the USSR dissolution became a fact. It will shed light on the reforms, economic development and their progress from 1989 to 2012. For the benefit of this study, extended information on key economic policies and indicators on foreign direct investments and capital flows will be emphasized.

2.1 Country introductions

The Czech Republic, Estonia, Hungary, Latvia and Poland are all included in what the OECD has defined as the *CEECs* (Central and Eastern European countries). In addition to these five countries, the CEECs also comprise Albania, Bulgaria, Croatia, Romania, the Slovak Republic, Slovenia, and Lithuania. The term CEEC was coined to "*describe the former communists states in Europe"* (Transition 1993). The five countries in this study constitute a majority of the size in this region, both in terms of land coverage and population. With their total of 594 557 km^2 they cover more than 51% of the regions land area, and the 62 million inhabitants account for more than 56% of the total regional population. Of the *cluster* these five countries constitute, Poland is the largest with 62% of the total population and 53% land coverage. On the other side, Estonia and Latvia are the smallest with only 2 and 3% of the population, respectively. Combined, however, they cover more than 19% of the *cluster* area (CIA 2013).

Today, this *cluster* also represents the majority of GDP among the CEECs. Poland's GDP alone constitute 37% of the total regional GDP, making the clusters total share more than 65%. Latvia and Estonia represent a combined 4%, while Czech Republic's GDP amounts to 15% of the share (WorldBank 2013). There is little doubt that these countries represent the region from the smallest (Latvia and Estonia) to the biggest (Poland) economies.

Now, we turn to the historical reminder of when the countries gained their independence in the late 1980s and beginning of 1990s, to see what structural reforms

were performed to succeed in changing from centrally planned- to market-orientated economies, enabling them to get this influential.

2.2 *Perestroika* and the fall of communism

Perestroika is a term that refers to the restructuring of the Soviet and East European economies during the 1980s and 1990s. Another way to think of the *perestroika* is to consider it as a reform of the economies.

Socialism lasted for over 70 years and reached its peak after the World War II (WWII) until the 1980s. Although the word *communism* make people shake their head and frown today, many shared the belief that it was the only sustainable economic system up until the 1980s (Sachs, Woo et al. 1994). When Gorbachev became head of the union in 1985, declining growth rates, slumping capital productivity and investment, and a drop in private consumption had characterized the recent years. Although his predecessors had attempted reforms, none had been successful. The whole nation was aware of the systems shortcomings and there was no room for mini-moves, as Gorbachev set out to restructure the USSR. His slogans for the restructurings were *Glasnost, Uskorenie* and *Perestroika.* The phrase *Glasnost* addressed the lack of transparency in the former Administrations and appealed for a more open discussion of the economic situation and of the crisis in the party by reduce government controls and to improve access to information. The term *Uskorenie* meant that they would speed up the economic development by continuous reforms, and *Perestroika* was a call to restructure just about everything (Gros and Steinherr 1995).

While Moscow and Gorbachev was planning the framework and execution of reforms, movements had started in what were previously sovereign states in the USSR. Anti-communist popular fronts were rising in the Baltics, student demonstrations were taking place in Czechoslovakia and Poland and Hungary were appealing Moscow for their independence (Åslund 2013). Russia was particularly hesitant in granting Estonia and Latvia independence, due their sophisticated productivity and efficiency. Output levels in 1987 reveal a significantly higher productivity in Estonia and Latvia than it was in the case of the USSR as a whole, measured in net material product (NMP) per head.

The USSR had an NMP per head at 2 129 Rb[1], while both Estonia and Latvia exceeded 2 600 Rb (EIU 1990).

Table 2.1: Real GDP growth 1983 - 1989, (1984=100)

	1983	1984	1985	1986	1987	1988	1989
Czechoslovakia*	100	103,5	106,6	109,4	111,8	115,0	117,1
Hungary	100	102,7	102,4	103,9	108,1	108,5	106,9
Poland*	100	105,6	109,2	114,5	116,7	122,2	-
USSR*	100	102,6	105,8	109,6	111,9	116,7	119,6

Source: EIU Regional Reference Series, 1990
* NMP produced

Table 2.1 presents the real GDP growth for Czechoslovakia, Hungary, Poland and the USSR as a whole, indexed in 1983 at 100. Czechoslovakia is included because of the difficulty of finding separate growth rates for the Czech and Slovak Republic in this period. The same needs to be said about the including of the USSR, because of the trouble finding separate data for the Baltic countries. One can assume that the Baltic countries and Czech Republic experienced approximately the same growth as their denominator. Although the countries experienced growth in GDP, there was still a common consensus that they wanted to break out of the chains of socialism and become independent, sovereign states.

A landmark in 1989 was the onset of liberalisation of Eastern Europe. Gorbachev realized that the Soviet Union faced too many difficulties domestically to maintain its iron grip on Eastern Europe and that it would be better to focus on internal reforms. Poland's appeal for independence was heard and accepted, bringing them to an early democratization with their first multiparty elections in June 1989. Hungary, who has had the most liberal ruling communist party, the Hungarian Socialist Workers' Party, had been undertaking more reforms than any other socialist state, followed in the footsteps of Poland. Roundtable negotiations in 1989 agreed full democratization of Hungary, allowing them to have their first multiparty elections in March 1990. Latvia and Estonia declared their independence in 1990, but was not recognized by the Soviet Union until the coup in 1991, in which their independence became *de facto* recognized

[1] Rb denotes Russian rubles = $ 0,627 in 1987

by the USSR. Latvia had already completed their first round of multiparty elections in 1990, but their independence was not in full force until 1991 (Åslund 2013).

In table 2.2, the first year of multiparty elections for these countries is presented among other significant events that took place in the years after independence.

Table 2.2: Selected Political, Legislative and Economic Indicators of Reform, 1989-95

Events	Czechoslovakia	Estonia	Hungary	Latvia	Poland
Multiparty elections	1990	1991	1990	1990	1989
Country credit rating*	58,4	26,3	45,0	23,4	37,6
Economic freedom index	MF	MF	MU	MU	MU
General privatization law					
year passed	1990	1990	1990	1990	1990
progress	fast	fast	fast	slow	slow
Land reform legislation	1991	1990	1990	1990	1990
Price liberalization					
year started	1991	1990	1990	1990	1990
year inflation peaked	1991	1992	1991	1992	1990
IMF-stabilization loan	1991	1992	1990	1992	1990
Gross Domestic Product					
largest annual reduction	1991	1992	1991	1992	1990
first year of growth	1994	1993	1994	1994	1992
Budget deficit					
deficit > 5% of GDP	1990	1992	1993	DNO**	1989
deficit as % of GDP	7 %	6%*	7,5%	DNO**	7 %
Convertible currency	1991	1992	1990	1992	1990
Trade liberalization	1991	1991	1991	1991	1991

* 1995 for Czech Republic. ** Did Not Occur. Sources: Economist Intelligence Unit, *Country Report* and *Country Profile*; Holmes; *Institutional Investor; IMF, International Financial Statistics* and *World Economic Outlook*; Rembisz and Rosati; Heritage Foundation

The country credit ratings are risk ratings on the probability of a country to default on their sovereign debt, provided by the Institutional Investor. Low values imply greater risk and a high value the opposite. In the first years of independence, the years under the USSR had made the countries dependent on intratrade. As much as 70% of total USSR trade was intratrade. Restrictions on international capital flows and limited international trade had made capital scarce and in much need of reforms and liberalization (EIU 1990). The countries experienced drops in GDP as their previous trade-relations were discontinued because of the parting from The Council for Mutual Economic Assistance (COMECON), and it took time for new trade patterns to emerge.

Most of them, however, started presenting themselves with positive growth soon after. Latvia was the only country that did not experience a budget deficit of more than 5% in the first year, having -3,5% as their biggest recorded deficit from 1989 to 1995. The other events that especially concern reforms will be covered in the next sub-section.

2.2.1 Transitioning to a market-oriented economy

The first truly market economic program to propose large-scale reforms was presented in Poland in 1988. Leszek Balcerowicz, the Polish minister of Finance, drafted the original reform program - The "Balcerowicz program", which became the standard for a radical, comprehensive reform. Its prescriptions also applied to other countries in similar predicaments. The program was lucid and is easy to summarize:

1. *Macroeconomic stabilization.* The immediate concern was to halt hyperinflation. Fiscal policy had to be centralized and brought under control by a reinforced ministry of finance, which had to swiftly reduce the large budget deficit. The central bank had to be independent and focus on low inflation. Therefore, it needed to tighten monetary policies and introduce positive real interest rates. The exchange rate should be unified and adjusted to the market. The currency needed to be convertible on the current account to be freely available for foreign trade.
2. *Deregulation.* The government had to deregulate prices and eliminate most price controls to let demand and supply determine prices. It also needed to liberalize domestic trade and break up monopolies to avoid monopolistic pricing. A regime of relatively free foreign trade had to be established. It would eliminate rents in exports as well as imports, and a realistic price structure would be imported. Free trade would alleviate the rampant shortages, facilitate production, and boost living standards.
3. *Privatization.* The government should abolish restrictions on private enterprise and offer new private entrepreneurs a maximum of freedom. It also needed to initiate small-scale privatization early on and start the privatization of large and medium-sized enterprises as soon as possible, but everybody understood that it would take time, and no agreement existed on how to do it.

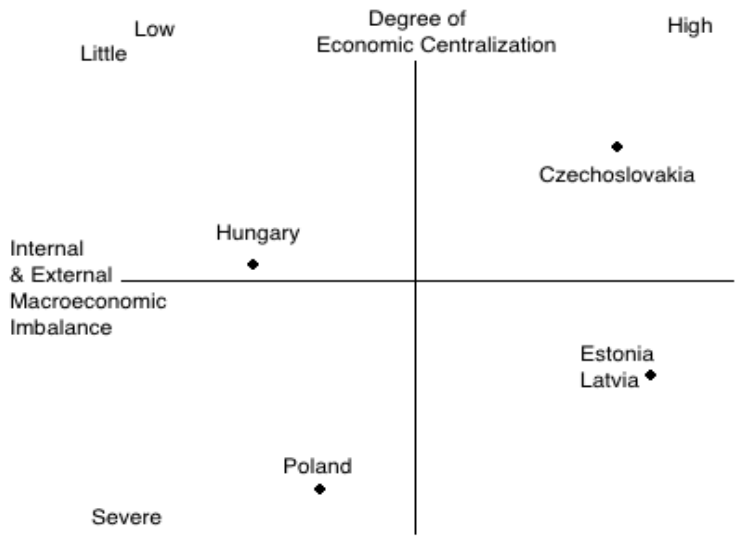
4. *Reinforcing the social safety net*. The ardours of restructuring required the introduction of a social safety net targeted at new groups in need, especially the unemployed, and an increase of pensions (Åslund 2013).

Radical reformers wanted to change the role of the state, eliminating the harmful parts of the old state apparatus while building a new democratic government. Sachs (1994, p. 150) summarized the radicals' view of the state in transition.

> *"A government facing political and economic collapse (the case at hand) must give up responsibility for market prices in order to focus on the core functions of government that are not being met: law and order, public security, a stable monetary system, and basic social welfare. Governments that have reached hyperinflation cannot, self-evidently, be expected to develop complex industrial policies or structural policies. After all, they aren't even carrying out their most fundamental tasks."*

Table 2.2 displays the progress of the general privatization law and is graded "slow" or "fast". Although the plan was to implement radical reforms, both Poland and Latvia are graded "slow" in the table. This rating is set relative to its plan, suggesting that Poland and Latvia's reform progress in privatization was *slower* than originally planned. An important determinant of the success that was related to these reforms was their initial conditions in terms of economic centralization and macroeconomic imbalance, depicted by Figure 2.1.

Figure 2.1: Initial conditions for Socialist Reforms Process



Source: (Fischer and Gelb 1991)

The countries that were closer to macroeconomic equilibrium (i.e., Czechoslovakia and Hungary) could concentrate on the structural reforms leading to a market system. Poland, on the other hand, struggling with macroeconomic imbalances in need of urgent stabilization, faced a difficult task of combining these reforms with stabilization. The structural reforms would not be effective unless aggregate demand and inflation were brought under control. At the beginning of reforms, Czechoslovakia, Estonia and Latvia had relatively centralized economies (given by the horizontal axis in Figure 2.1), much relying on a planned-materials supply system and frequent intervention of ministries. The level of decentralization for a socialist economy was decisive for the economies embarking on the transition to a market-oriented economy. Hungary and Poland, who had become increasingly decentralized since the 1960s and 80s, respectively, was at great advantage compared to CZ, Estonia and the *Balts*[2]. The decentralization had rendered their firms more familiar with markets and had a larger share of exports to the West, allowing them to increase exports faster (Fischer and Gelb 1991).

Macroeconomic stabilization and deregulations hand-in-hand

The reforms for macroeconomic stabilization and deregulations went hand-in-hand and where closely related to the initial conditions of macroeconomic imbalances. With deregulation reforms, which meant eliminating price controls and trade restrictions, could have a big impact on the on-going stabilization reforms. The purpose of price reforms was to allow the market to determine prices. This led to high inflation rates among the countries, in all terms destabilizing the macroeconomic imbalances that were prior. Table 2.3 shows the *consumer price index* that measures the inflation level in the countries, from 1989 to 1993 when the reforms were initiated. Poland experienced inflations rates up to 245% in 1989 and 555% in 1990. Fortunately, stricter monetary policy calmed the inflations and brought in down to bellow 50% in 1992. The other countries also experience high inflation rates due to the price liberalization, but it was also put to ease a couple of year after it peak.

The GDP growth rate in table 2.3 is measured as annual real growth (i.e., adjusted for inflation). Still, the negative growth rates are evident. All five countries experienced

[2] *The Balts* refers to the Baltic region comprising Estonia, Latvia and Lithuania. For the benefit of this thesis, *The Balts* refer to Estonia and Latvia, only.

negative growth of more than 5%, and Latvia even dropped more than 30% in 1993. It is easy to assume that these growth rates were mainly caused by the high inflation rates and macroeconomic imbalances, but there was actually something else causing these recessions (Gros and Steinherr 1995).

Table 2.3: Annual growth in GDP and CPI (%) and Balance of Trade ($), 1989-93

		1989	1990	1991	1992	1993
Czecho-slovakia	GDP growth%	0,39	-0,81	-11,18	-3,16	-0,30
	CPI%	1,38	10,02	57,71	10,76	20,81
	BOT $mln	-18	-2 226	2 519	-4 599	-488
Estonia*	GDP growth%	6,80	8,41	-5,90	N/A	-5,74
	CPI%	2,30**	N/A	N/A	N/A	89,81
	BOT $mln	N/A	N/A	N/A	98	-287
Hungary	GDP growth%	0,74	-3,50	-11,89	-3,06	-0,58
	CPI%	16,95	28,97	34,23	22,95	22,45
	BOT $mln	2 731	2 712	-3 664	-1 272	-11 846
Latvia	GDP growth%	5,69	-7,94	-12,60	-32,12	-14,87
	CPI%	2,30	N/A	N/A	243,27	108,77
	BOT $mln	N/A	N/A	N/A	133	170
Poland	GDP growth%	0,16	-11,55	-7,02	2,51	3,74
	CPI%	244,55	555,38	76,71	45,33	36,87
	BOT $mln	10 753	13 999	-1 853	-8 467	-14 492

Source: UNCTADstats, Latvian Central Bank and authors own calculations.
Note: *GDP% is USSR until 1991, ** CPI% for USSR

The COMECON, or CMEA system, initiated reforms in 1991 towards a multilateral, market-based system (in opposite of the intratrade-focus it previously inhabited), which created high short-term costs for the CEECs involved. This caused trade divergence and huge losses in the countries balance of trade, in that causing recessions and negative GDP growth rates. With the collapse of trade among CMEA countries in 1991 and the collapse of trade among the republic of the ex-Soviet Union in 1992, new, fruitful relations were imminent. With deregulations, the countries introduced their own currencies, turning away from the Russian ruble. Liberalizing capital accounts and allowing international capital flows in an attempt to support both their capital scarcity and newly re-established currencies were initiated as a part of the deregulation reforms. This could also help the macroeconomic stabilization process (Gros and Steinherr 1995).

Coming out of the socialist regime, most firms were run by ministries and most also state-owned enterprises. The first stage of the reforms were to move the firms out of the control of ministries and set up as corporations with their own boards of directors.

Privatization reforms were set out at rapid pace. The idea was the it was less important how large-scale privatizations were undertaken out than that it was carried out. By the end of 1990, Poland had privatized most of the small commercial and industrial firms. By 1992 they had privatized 500 of the largest firms. The privatization of small and medium-sized firms is possibly one of the biggest contributors to Poland's following economic development, due to the upside potential of smaller firms. Czechoslovakia estimates having sold more than 100 000 small firms in 1991 through auctions and Hungary had privatized most of retail trade in 1991 (Clague and Rausser 1992). However, Poland's privatization law progress is still ranked "slow" in table 2.2. The first delay in privatization was due to the comprehensive framework that needed time to put in place. Second, disputes and disagreements on the general principles slowed the passage of the law, with a big turnover in the Ministry of Privatization and with each minister having his own ideas for the *best* approach. Other issues that delayed progress in Poland was valuation difficulties and heterogeneity within firms, to sum up.

The more centralized countries, Estonia and Latvia, had barely started privatization to some extent before the dissolution and their acknowledged independence. Though, with the lack of detailed data on the progress, one must just assume that their privatization reforms were successful based on the prosperous development they had.

2.2.2 Capital scarcity

There was one more crucial factor that put privatization to a halt in these countries. Although the domestic demand was high for state-owned enterprises, the opportunity to buy them was constrained by the availability of domestic savings. The governments were looking to innovate financial mechanisms and thereby attract foreign capital as a means to compensate for scarce domestic capital. But, in the absence of domestic capital, there was a fear that foreigners would acquire a large part of the state-owned enterprises at fire-sale prices. Czechoslovakia went so far as to not allow foreigners to bid in the first round of auctions. However, these *innovative* financial mechanisms relied on governments encouraging privatization joint ventures, in that way combining foreign and domestic capital in ownership. Although foreign participation was not as high as

expected, mainly due to uncertainty during transition period, there was capital crossing Central and Eastern European borders (Clague and Rausser 1992).

Foreign direct investments (FDI) were crossing borders, bringing new technologies, know-how and managerial skills. Hungary proved most successful by early encouraging foreign investments by allowing foreigners to participate in auctions and sales to a larger degree than the others. Hungary's cumulative flows in 1991-92 amounted to more than US$ 3,5 billion, followed by the Czech Republic with close to US$ 2 billion. The Baltic States experienced a bit more conservative amounts, but Estonia and Latvia had accumulated roughly US$ 500 million by 1993. Poland had a slow start in attracting foreign investments, supposedly due to their implementations of restrictions on foreign investor, cumulated about US$ 1,5 billion. The success of Hungary, almost receiving more than the other countries combined, was attributed to their traditional openness to foreigners, and to the integration of foreigners by including foreign accounting and management consulting firms into the privatization process. In the end of 1992, almost 18% of the total number of Hungarian enterprises had foreign participation (Gros and Steinherr 1995).

2.3 Towards prosperity, 1994-2000

The reforms were well on their way and a liberalized capital account enabled for foreign investments into the economy, compensating the domestic capital scarcity and allowing the CEECs to part-take in the financial globalization and integration they had been missing out on.

Table 2.4 presents the growth of GDP and FDI stock from 1994 until year 2000, and the share of GDP that the FDI stock constituted. The years of negative growth following the dissolution had come to an end, and the emerging trade relations and financial integration gave growth in both GDP and their accumulated foreign investments. Bevan and Estrin (2000) stated in their paper that FDI inflows played a crucial role in accelerating growth, technical innovation and enterprise restructuring, as well as capital account relief.

Table 2.4: Percentage growth in GDP, FDI, and FDI share of GDP (%), 1994-00

		1994	1995	1996	1997	1998	1999	2000
Czech Rep.	GDP growth%	2,91	6,22	4,54	-0,85	-0,24	1,68	4,19
	FDI stock %	32,83	61,65	16,63	7,71	55,68	22,10	23,31
	FDI/GDP %	10	13	13	16	23	28	37
Estonia	GDP growth%	-1,99	4,27	5,67	11,10	4,44	-0,30	9,97
	FDI stock %	85,07	42,73	22,37	39,21	58,70	35,33	7,31
	FDI/GDP %	11	15	17	23	33	43	47
Hungary	GDP growth%	2,95	1,49	0,16	3,13	4,07	3,20	4,23
	FDI stock %	27,10	59,50	17,50	35,28	15,39	12,19	-1,68
	FDI/GDP %	17	25	29	39	43	48	49
Latvia	GDP growth%	0,65	-0,81	3,98	9,63	5,62	2,90	5,69
	FDI stock %	96,87	41,21	52,11	35,79	22,49	15,33	16,03
	FDI/GDP %	9	12	17	20	23	24	27
Poland	GDP growth%	5,29	6,95	6,24	7,09	4,98	4,52	4,26
	FDI stock %	64,24	106,99	46,16	27,25	53,98	16,09	31,26
	FDI/GDP %	3	6	7	9	13	16	20

Source: UNCTADstats and authors own calculations

One of the most important aspects of this period, after the reforms were initiated, was that the countries strived to reintegrate with Europe and the West, turning their backs on what was left of the former Soviet Union. The transition from communism to democracy in Central and Eastern Europe has often been compared with the "return to Europe", which refers to integration into Western organizations such as the European Union (EU), OECD, and the North Atlantic Treaty Organization (NATO), and to the implementation of policies that would make the region more "European" – richer and freer – via democratic and market-oriented reforms (Fisher 2006).

The FDI stock in the countries grew at enormous pace at the beginning, attracted by *"cheap"* state-owned enterprises being auctioned and cheap labour. In 1995, after loosening on restrictions, FDI stock in Poland doubled with a percentage growth of more than 106%, increasing its share of GDP from 3 to 6%. Fuelled with foreign capital, annual GDP growth rates averaged close to 6% in this period. Hungarian FDI inflow has eased, but, in 1994, FDI stocks already constituted 17% of GDP – only to grow to nearly 50% of GDP in 2000. In Estonia, with more volatile GDP growth, FDI also amounted to nearly 50% of GDP in 2000, having started at 11% in 1994. Even though there were

some instances of negative growth rates and slow-downs, probably as an effect of the Asian Crisis in 1997-98, the success of the reforms were eminent.

While open borders facilitated the incoming capital flows, new trade patterns started emerging. Estonia experienced a total percentage increase in total trade of 222%, the biggest increase among the five countries. Hungary followed right behind them with a total increase of 206%, an increase of nearly US$ 72,5 billion. Poland and Latvia experienced an increase of 167 and 191%, respectively, and Czech Republic saw the total trade increase 135%. In comparison, from 1989 to 1994, CZ, Hungary and Poland had a total percentage change of 27, 10 and 31%, respectively. The reforms and transition to a market-oriented economy had a huge impact on the countries economic development and the *return to Europe* (WIIW 2014).

2.4 Economic integration, 2000-2007

Bevan and Estrin (2000) stated that the reintegration to Europe symbolised a prospective membership to the European Union (EU). The reforms that had been conducted had left the countries more integrated to the world economy through increased relations in trade and capital flows, a crucial element of a prospective membership. They studied if the relationship of announcements concerning accession to the EU had an impact on the net FDI inflows for the countries. The results were that EU announcements had a significant and positive effect on the amount of FDI inflows. Table 2.5 depicts the economic growth, FDI stock growth and total trade growth, as well as what share of GDP FDI constituted. All numbers are given in per cent.

The table shows that GDP and FDI stocks continued to grow after the Millennium. FDI usually grew systematically more than GDP, in time constituting an even more substantial share of GDP. The countries' total trade also increased, expect for a slow-down in 2002-03 due to the financial crisis, also called the *"IT-bubble"*. However, international trade picked up again and started increasing only 1-2 years later. Even with international financial turmoil, FDI stock continued to increase with the exception of Czech Republic and Poland, to some extent.

Table 2.5: Percentage growth GDP, FDI and total trade, FDI/GDP (%), 2001-07

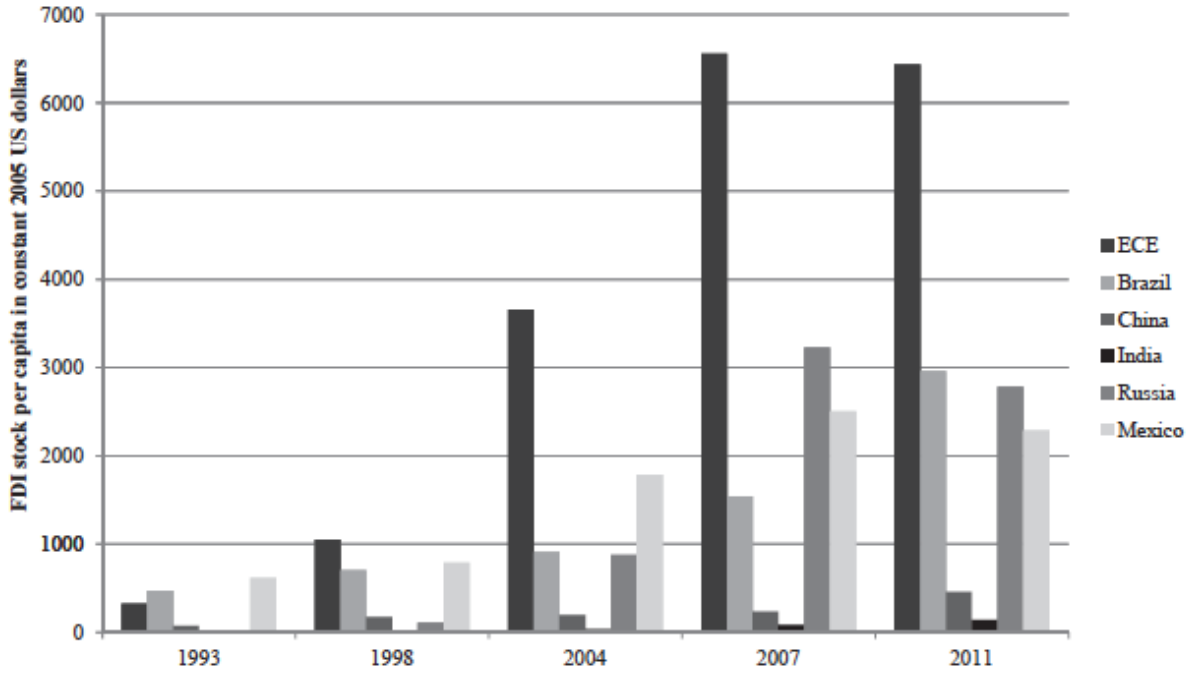
		2001	2002	2003	2004	2005	2006	2007
Czech Rep.	GDP growth %	3,10	2,15	3,77	4,74	6,75	7,02	5,74
	FDI stock%	25,17	42,73	17,11	26,44	5,94	31,62	40,79
	FDI/GDP %	42,08	49,31	47,52	50,24	46,64	53,81	62,28
	Total trade %	17,57	7,67	6,07	25,82	11,26	20,55	17,21
Estonia	GDP growth %	6,28	6,56	7,77	6,34	8,85	10,10	7,49
	FDI stock%	19,03	34,37	65,77	43,21	12,29	12,61	31,97
	FDI/GDP %	50,46	57,77	71,24	83,49	81,12	75,56	76,23
	Total trade %	5,38	2,68	11,43	18,04	25,80	27,71	5,66
Hungary	GDP growth %	3,71	4,51	3,85	4,80	3,96	3,89	0,11
	FDI stock%	19,84	32,17	33,45	27,36	-0,74	31,16	19,11
	FDI/GDP %	51,99	54,57	57,87	60,40	55,39	71,23	70,15
	Total trade %	9,43	6,87	5,14	16,15	11,51	17,47	13,96
Latvia	GDP growth %	7,35	7,13	7,66	8,83	10,10	10,99	9,99
	FDI stock%	11,73	18,18	19,10	38,21	8,84	51,67	45,02
	FDI/GDP %	28,32	29,82	29,40	32,97	30,93	37,65	37,84
	Total trade %	12,01	8,89	7,30	24,27	24,78	26,52	22,34
Poland	GDP growth %	1,21	1,44	3,87	5,34	3,62	6,23	6,79
	FDI stock%	20,51	17,15	19,77	49,91	4,75	38,41	41,84
	FDI/GDP %	21,66	24,38	26,69	34,32	29,90	36,82	41,97
	Total trade %	10,03	5,98	5,79	22,77	15,97	23,30	17,85

Source: UNCTADstats and authors own calculations

The prospective EU accession was close, and by many assumed to be one of the main determinants for why these five CEECs were recipients of these substantial levels of FDI inflow (Bevan and Estrin 2000, Estrin 2013, Medve-Bálint 2014). From 1998 until 2004, the average total percentage increase of FDI stock in these countries had been 285%, close to tripled stocks. Estonia's FDI stock had an increase of more than 450%. These high numbers raised questions of what suddenly made these former-Soviet economies so attractive to foreign investors? Medve-Bálint (2014) raised this question and compared the CEECs to other emerging markets that were attracting foreign investors interest, but apparently not as much as the CEECs.

Figure 2.2 illustrates the cumulated FDI stock per capita in the CEECs compared to other emerging markets from 1993 until 2011, collected from Medve-Bálint's paper. Evidently, the CEECs were a *favoured* investment object for foreign investors.

Figure 2.2: FDI stock per capita in CEECs and in other emerging markets



Source: (Medve-Bálint 2014)

The suggested reasons for this development were cheap labour, well-trained workforce and a growing domestic market. In 2004, all five countries became official member states of the European Union. Researchers will have us believe that the preceding announcements and speculations were one of the big reasons for the substantial amounts of FDI passing CEE borders, but stocks continued to grow even more after accession. In 2007, FDI stocks constituted more than 70% in both Hungary and Estonia. Recall table 2.4, in 1994, when FDI amounted to 17 and 11%, respectively. Also in Poland, the share of FDI stock was closing in on 50% in 2007, starting at 3% in 1994 with restrictions on foreign participation. The accession to the EU could have improved risk perceptions and in there attract further capital inflow, since the momentum characterizing the increase from 1998 to 2004 did not stop after accession.

The ever so increasing economic development was a fairy tale considering the years under communist regime and the reforms they had to go through with hyperinflation and macroeconomic imbalances. Table 2.5 ends in 2007, which also mark the end of an *era* in terms of non-stop economic development for these five countries.

2.5 Financial globalization catches up, 2008-12

In 2008, the world experienced the other side of the medal that financial globalization and integrations brought with it. The financial crisis in 2008 gave a whole new meaning to what it meant to be finically integrated – it was not only beneficial. The recent integration and foreign capital flows to the CEECs had made them vulnerable to external shocks, especially sensitive towards downturns in West European markets. The crisis shed light on public debt issues in many countries within, and outside, the European Union, that had been accumulated over many years. Risk of defaults and increasing interest rates that increased the risk further, was only one of the things worrying the minds of investors. Stock markets dropped all over the world and even though most of them recuperated already in 2009, a second drop followed in 2011 when sovereign debt issues in Europe and in the U.S. once again became eminent[3].

Although the CEECs were not directly affected, the stock of foreign affiliates in the domestic economy had proven disadvantageous in terms of brining the economic crisis to their doorstep and inside. Trade soared as the overall economic activity had an abrupt slowdown in their biggest trade partners in the West, and elsewhere. For the first time since breaking out of the USSR, the countries experienced negative growth rates in total trade. With the exception of Poland, all the countries presented negative GDP growth rates and all of them suffered setbacks in the FDI stock. Estonia and Hungary, in great part comprised of foreign affiliates, suffered negative GDP growth rates of 14,1 and 6,8% in 2009, respectively. Their high share of FDI relative to GDP made them more sensitive to the economic crisis than of the other countries. The Latvian economy suffered a setback of 17,7% in GDP, mainly caused by the slump in total trade of 29,8%. Hungary had the highest level of repatriation of FDI, with the stock decreasing 8,1% in 2010. Still, with all the economic turmoil, GDP growth rates below -17,8%, and total trade decreasing 29%, the decline in FDI stock was relatively marginal (UNCTAD 2014).

[3] Keeping information on the financial crisis short for the purpose of emphasizing the subject of this thesis

Table 2.6: Percentage growth GDP, FDI, and total trade, FDI/GDP (%), 2008-12

		2008	2009	2010	2011	2012
Czech Rep.	GDP growth %	3,10	-4,51	2,47	1,82	-1,02
	FDI stock%	0,68	11,18	2,13	-6,17	13,17
	FDI/GDP %	50,20	63,81	64,74	55,80	69,46
	Total trade %	11,83	-20,41	25,30	15,57	2,63
Estonia	GDP growth %	-4,15	-14,10	2,56	9,56	3,94
	FDI stock%	-2,24	2,60	-0,69	1,59	14,09
	FDI/GDP %	68,99	86,59	87,67	75,24	86,48
	Total trade %	-0,55	-28,97	30,93	36,28	6,21
Hungary	GDP growth %	0,89	-6,77	1,05	1,57	-1,66
	FDI stock%	-7,82	12,27	-8,13	-5,89	21,13
	FDI/GDP %	57,06	78,01	71,20	62,15	83,05
	Total trade %	6,10	-22,04	20,19	11,36	0,27
Latvia	GDP growth %	-2,77	-17,70	-1,31	5,31	5,03
	FDI stock%	6,42	0,56	-7,34	12,48	12,28
	FDI/GDP %	34,49	44,88	44,61	42,46	47,84
	Total trade %	3,66	-29,75	27,50	32,02	15,40
Poland	GDP growth %	5,13	1,63	3,87	4,52	1,94
	FDI stock%	-7,90	12,72	16,43	-5,81	15,76
	FDI/GDP %	31,04	42,98	45,90	39,38	48,00
	Total trade %	15,54	-20,49	24,27	12,58	4,31

Source: UNCTADstats and authors own calculations

Their turning point differs, with Estonia and Latvia presenting positive FDI stock growth in 2011 and CZ, Hungary, and Poland in 2012. At the same time, and earlier, trade picked up again, though not so resilient as earlier. FDI stock as a share of GDP remains high and continues to comprise a substantial part of their economy. There is at least no doubt, that the reforms conducted in the beginning of the 1990s were successful, and that FDI has played a vigorous part in the transformation into a market-based economy.

It does, however, raise the question: "*What did make these countries so attractive to foreign investors?*"

3 Theory and literature review

As the determinants of net FDI inflow is emphasized in this study, this chapter goes deeper into the theory and debate on the importance of FDI, potential push and pull factors in the Home and Host economy, and reviews of relevant research and similar studies conducted in the past.

3.1 Importance of FDI

3.1.1 The definition of FDI and net FDI inflows

To better understand what FDI is and what net FDI inflows consist of, two definitions are chosen. The OECD (2013) definition of FDI is:

> *"FDI is defined as cross-border investment by a resident entity in one economy with the objective of obtaining a lasting interest in an enterprise resident in another country. The lasting interest implies the existence of a long-term relationship between the direct investor and the enterprise and a significant degree of influence by the direct investor on the management of the enterprise. Ownership of at least 10% of the voting power, representing the influence by the investor…"*

In others words, to qualify as foreign direct investment, the investment needs to acquire a lasting interest in or effective control over an enterprise operating outside of the economy of the investor, hereby an ownership of at least 10%.

The World Bank (2013) defines net FDI inflows are:

> *"… the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments …[where] net inflows [are] new investments inflows less disinvestment in the reporting economy…", or*

$$Net\ FDI\ inflow = New\ FDI\ inflow - Disinvestment, \qquad (3.1)$$

New investments include inward direct investment made by non-residents, which qualifies with OECD's definition above, reinvested earnings and intra-company loans. Disinvestments include repatriation of capital and repayment of loans.

The usefulness of studying FDI is because it serves as an indicator of external financing resources in the reporting economy from foreign investors. A negative value of net FDI inflow in a particular year means that the value of disinvestment by foreign investor was more than the value of new capital invested in the reporting economy – the existing stock of FDI experienced repatriation of capital and/or repayment of loans. A positive value, on the other hand, means that the level of gross FDI inflow surpasses the level of repatriation of capital and loan repayment in a given year (IMF 2013).

3.1.2 Why capital moves across borders

When addressing the subject of international capital movements, it is important to distinguish between two types of capital flow: *foreign direct investment* and *foreign portfolio investment*. Foreign direct investment is defined in Section 3.1.1 and is the main subject of this thesis. Foreign portfolio investment (FPI), on the other hand, is not a matter of ownership or control. FPI is a financial flow which affects a country's balance-of-payments and/or exchange rates immediately, rather than on production or income generation like FDI does. A typical example of FPI is when a company in Country A buys a bond issued by a company in Country B (Appleyard and Field 2014).

Appleyard and Field (2014, p.237) state that: *"It should be clear that there is considerable mobility of capital across country borders in the world economy today".* They support this by claiming that the main reason for capital movements is the expectations of a higher rate of return in the new location compared to the old location. They mention eight possible reasons for capital movements that have found empirical support and conclude that the prospects of a higher rate of return is the red line through them all:

i. Large and rapidly growing markets
ii. Exploit *high per capita income* or market size
iii. Secure access to resources
iv. Avoid tariffs and nontariff barriers

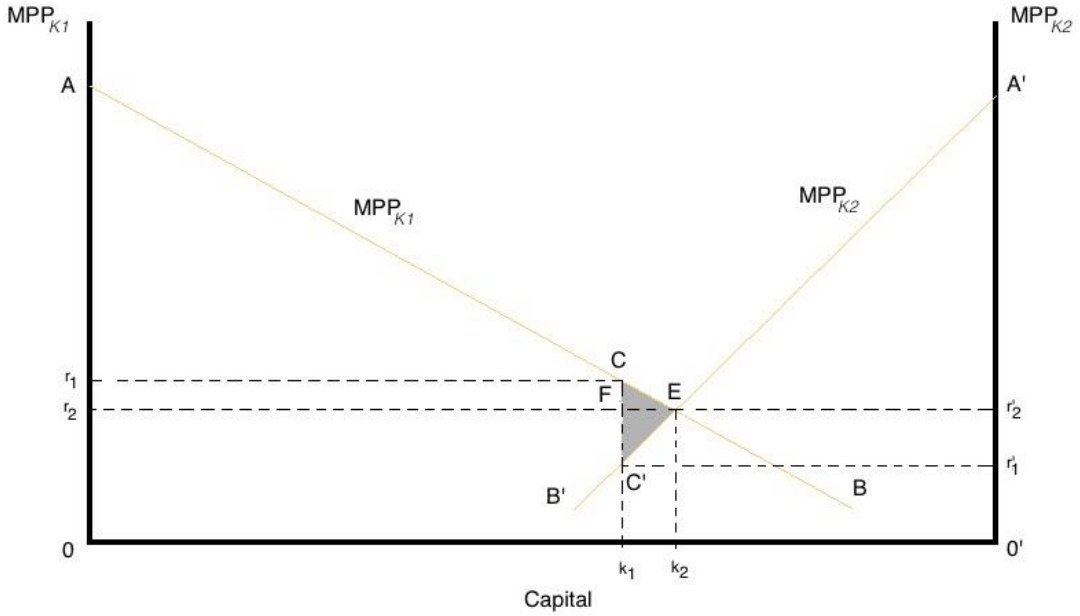
v. Cheaper labour in the recipient country
vi. Protect foreign market share
vii. Risk diversification
viii. Opportunistic investment due to firm-specific advantages

In the end, they conclude that there is need for further empirical research on the causes of capital movement, and that the reasons will apply differently to industrial-, periodical- and investor differences (Appleyard and Field 2014).

To illustrate a situation where cross-border capital movement occur and affects output for the countries involved, I refer to Figure 3.1. The figure shows the marginal physical product of capital (MPP_K) schedules for countries 1 and 2. This analysis assumes that there are only two factors of production – capital and labour – and that both countries produce a single, homogenous good that represents the aggregate of all goods produced in the countries. The MPP_K schedules plots the effects on output that result from adding one more unit of capital to production when all other inputs are held constant. The curve AB, MPP_{K1}, shows the MPP_K for country 1 for different levels of capital stock measured in a rightward direction from origin 0. On the opposite, measured in a leftward direction from 0', MPP_K for country 2 is given by the schedule A'B' (MPP_{K2}). The total world capital stock is fixed and equal to the distance 00'. In the pre-international-capital-flow situation, the distance $0k_1$ measures the capital stock in country 1, and the vertical axis measures the rate of return. This being a perfect competition, capital in country 1 will be paid with the rate equal to its marginal product, $0r_1$, which is at point C. In the leftward direction, $0'k_1$ measures the capital stock in country 2. Capital is paid by the rate $0'r'_1$, illustrated by C'. Total output is equal to area $0ACk_1$ and $0'A'C'k_1$ for country 1 and country 2, respectively.

The area k2k1CE is the total return on capital, which is the amount of capital flowing in times the MPPk, and k2k1FE is the interest paid to foreign investors. If capital is permitted to move across borders, the situation will change due to the fact that the rate of return to capital is higher in country 1, $0r_1$, than in country 2, $0'r'_1$. In this situation, capital will move from country 2 to country 1 as long as the rate of return to capital is higher in country 1. This, of course, assumes that the risk related to investing in the two countries are the same or the rate of return is risk-adjusted. It is assumed that there is no movement of labour between the countries.

Figure 3.1: Capital market equilibrium - Two-country case.



Source: (Appleyard and Field 2014)

The amount of capital k_2k_1 moves from country 2 to country 1 in attempt to exploit the higher rate of return. This increase in capital stock in country 1 decreases the rate of return in country 1 from $0r_1$ to $0r_2$, at the same time as the decreased capital stock in country II increases its rate of return from $0'r'_1$ to $0'r'_2$. Since $0r_2=0'r'_2$, given by point E, the MPP_K in the two countries intersect and there is no further incentive for capital to move between the countries.

Now, country 1's output has increased by k_1CEk_2 and country 2's output has decreased by $k_1C'Ek_2$. Since k_1CEk_2 is greater than $k_1C'Ek_2$, total world output has increased by the triangle CEC' illustrated by the shaded area. In the before-capital-flow situation, this shaded triangle represented a *dead weight loss*. Now country 1 picks up this triangle, thus making the after-capital-flow output and resource use more efficient due to the free movement of capital.

While this graph is useful, it omits quite a bit because it merely accounts for partial equilibrium analysis while ignoring potential side effects and spill-overs in both countries and complicating the underlying welfare analysis. The case for free capital movements can still be made on efficiency and welfare grounds, however it is more complex and rests on empirical analysis on the importance of the side effects, spill-overs, general equilibrium analysis implications and risk (Appleyard, 2014).

3.1.3 A general understanding of FDI

FDI inflows provide an important means of implementation of sustainable development goals and growth of the private sector in developing countries, being a source of external financing in situations where capital is scarce. Sustained increases of FDI inflows are often a sign of an improved investment and business climate. Flows to developing countries are important in helping to support sustainable development (IMF, UNCTAD). Studies suggest that FDI also has spill-over effects, in terms of transference of technology and improvement of labour and management skills resulting from foreign ownership by residents in more developed countries (Bengoa and Sanchez-Robles 2003, Åslund 2013).

Figure 3.1 suggests that the world economy benefits from free capital movement and foreign direct investments. However, there are also effects on the individual countries participating, and in this case, the host economies. Appleyard and Field (2014) provide a list of expected benefits and costs as a consequence of receiving FDI. These effects are summarized in Table 3.1:

Table 3.1: Alleged benefits and costs of attracting FDI

Benefits	***Costs***
Increased output	Adverse impact on host country's commodity terms of trade
Increased wages	Decreased domestic saving
Increased employment	Increased unemployment
Increased exports	Decreased domestic investment
Increased tax revenues	Instability in the balance of payments and the exchange rate
Realization of scale economies	Loss of control over domestic policy
Provision of technical and managerial skills and of new technology	Inadequate attention to the development of local education and skills
Weakening of power of domestic monopoly	Establishment of local monopoly

Source: (Appleyard and Field 2014)

All of these effects are different in each investment situation, depending on both country- and firm-specifics. This makes it impossible to make a general assessment, but one must examine the effects individually by each investment. It is possible for a country to impose policies that may attract certain types of investment that result in overweight of benefits, but these restrictions might have their own *costs* as a side effect – e.g. restrictions on capital flow can create distortions and efficiency-loss both nationally and globally (Appleyard and Field 2014).

Although both individuals and business entities can undertake FDI, transnational corporations (TNCs) are a major contributor to global FDI and economic activity. Transnational, or multinational, corporations are defined by UNCTAD (2006) as:

"*TNCs are incorporated or unincorporated enterprises comprising parent enterprises and their foreign affiliates. A parent enterprise is defined as an enterprise that controls assets of other entities in countries other than its home country, usually by owning a certain equity capital stake … 10%".*

One of the most basic reasons for participating in foreign direct investment by firms in a global market economy is to increase or protect their profitability and/or capital value. Potential drivers triggering internationalization might be if a company's operations or ambitions are faced with a small home market, experiences competitive pressure, or are met with governmental policies encouraging foreign expansion. Two TNC strategies in which a firm can partake in FDI could be either *"asset exploiting"* or *"asset augmentation"*. Asset exploiting occurs to seek out new markets; raise efficiency (cost reduction); or to source better quality or cheaper factor inputs, e.g., skilled labour, raw materials and good quality infrastructure. Asset augmenting occurs through the acquisition of technology, brands, distribution networks, R&D facilities, and managerial competences. It is also normal for TNCs to combine these two strategies, i.e., buy a firm to get access to a market, which is then serviced by a combination of existing and acquired assets (UNCTAD 2006).

3.2 Potential push and pull determinants of Home and Host countries

Home-country drivers, or push factors, refers to the conditions that influence home residents to invest abroad. These conditions are roughly divided into four main types: market and trade conditions, costs of production (including scarce input factors), local business conditions and home government policies.
In terms of market and trade conditions, limited home markets with respect to scale and opportunities to expand characterize many developing economies. The existence of trade barriers and a lack of international linkages will intensify the company's incentives to move production abroad – e.g. closer to their actual or potential markets.

A common push factor is labour costs and scarcity of resources. Both create rising production costs and the possibility of cheaper labour and input abundance abroad will increase the incentives for expansion overseas. In cases where a company experience competition in the Home market, it could drive the company to move into a foreign market to increase its customer base. The local business climate often appears as a driver of FDI, and could be triggered by either competition from other local companies or TNCs invested in the Home market. As mentioned earlier in *asset augmentation*, international operations could be used as a strategy to restructure a company and help boost its competitiveness and performance.

Pull factors are the characteristics of the Host country, which makes it more or less attractive in terms of another country. These are the drivers that attract foreign investment. The push determinants *market conditions* and *production costs* clearly identify some of the characteristics the Host economy should contain: large markets, cheaper labour costs and plentiful resources. Developed economies often have market integration agreements, making them more attractive in terms of market size and accessibility to other markets within the agreement. A major pull driver for developing countries, on the other hand, is cheap labour costs and non-exploited resources. Developing countries also have large and/or growing markets that increase their demand for both normal and luxury goods. A combination of cheaper production costs and the relative scarcity of capital and a large Host economy makes developing countries a popular FDI destination.

The business climate and government policy framework are also important pull factors. Regulations and inducements that encourage, and facilitate for, inward FDI, are important determinants in attracting FDI. Privatization policies, multilateral- and bilateral agreements, and investment treaties are examples of governmental policies that serve as pull factors for TNCs (UNCTAD WIR 2006).

In the literature review in section 3.3, empirical evidence on the drivers of FDI is presented from a variety of earlier studies.

3.3 Literature review

There have been several previous studies on the general determinants of FDI. Some have researched push factors, some on pull factors, and some have researched both drivers. The geographical coverage in the earlier studies has varied all over the world and there have been a wide range of results. This section reviews the empirical results on the drivers of FDI from previous studies.

- *Empirical research*

These empirical studies have been the inspiration for the framework of this thesis and research. Their findings create the foundation for the models and variables constructed in chapter 4 on methods and data.

- *European studies*

Bevan and Estrin (2004) conducted a study on the determinants of foreign direct investment in transition economies. They used a panel dataset containing information on FDI flows from 18 market economies to 11 transition economies located in Central and Eastern Europe for 1994-98. They found that FDI inflows are significantly influenced by risk, unit labour costs, Host-market size and gravity factors, such as market mass and distance. These findings acknowledge UNCTADs (2006) potential pull determinants in Section 3.2. Bevan and Estrin also found that announcements on potential EU accession directly affected FDI itself in a positive manner. EU accession implies bilateral and multilateral trade agreements, which support UNCTADs report on

the importance of governmental policy framework in attracting FDI. Their model also included one push factor, Home-market size (as measured by GDP), but this variable was not significant in their study (Bevan and Estrin 2000).

Estrin (2013) focused their framework on the OLI (ownership-location-internationalization) paradigm, which argues that firms will expand internationally where they can redeploy their internationally transferable proprietary resources and capabilities to exploit and explore their resource base. Firms engage in outward FDI when they have some resources that they can transfer and exploit, known as firm-specific advantages or ownership (O). And certain types of firms and products that is suitable for exploiting these advantages through internalisation (I). And finally, the choice of location (L) where the firm can optimally exploit these advantages (Dunning 1993).
Their study explored the determinants of FDI into eight transition economies in Southeast Europe, with a focus on the Western Balkans (WB). They conducted their analysis across 17 transition economies from more than 70 source economies over the 1990-2011 period, incorporating a dummy variable for the WB. Like Bevan and Estrin (2000), they also support that GDP of the host economy have a significant and positive effect on FDI inflow, and that EU announcements are highly significant and positive. Unlike Bevan and Estrin (2000), Estrin and Uvalic (2013) found that GDP of the source economy also had a significant, positive effect. This difference might be the result of conducting the studies in different time periods. High wages in the source economy and large-scale privatization schemes in the host economy provides incentive for FDI. The dummy variable capturing the effect of belonging to the WB was found to be significantly negative in terms of attracting FDI, as Estrin and Uvalic expected.

Resmini (2000) analysed a panel dataset for European FDI in ten countries in Central and Eastern Europe (CEEC) during the period 1991-95. Her focus was the distribution of FDI into the manufacturing sector, divided into four sub-sectors according to Pavitt (1984): scale-intensive (ES), high tech (HT), traditional (TR) sectors, and specialized producers (SP). In addition to gravity variables, she included labour costs, a transition process index, the degree of openness and a variable for the size of the manufacturing sector. Distance had an expected negative sign, but was not statistically significant.

Market size, population, transition index, and wage difference, had a positive effect on FDI flows and were the only significant variables in the unrestricted model. The size of the manufacturing sector and openness to trade were both estimated having the expected sign, but neither was statistically significant. Resmini concludes that FDI is driven by market considerations, even though it differs across sectors. The high R^2 value in this study, suggests that most of the explanatory variables are in fact determinants of FDI in Central and Eastern Europe (Resmini 2000).

- *Non-European studies*

Africa

Asiedu (2002) conducted a study on the determinants of foreign direct investment to developing countries to see whether African economies differ. She included 71 developing countries from 1988-1997 in the empirical analysis, in which 32 countries are located in sub-Saharan Africa (SSA). Asiedu does not include the more commonly used gravity variables in her model, namely *market mass*, as measured by GDP, and distance. She focuses on other variables like openness to trade, infrastructure and the return rate of capital. These three variables are found to be significant and with a positive relation to FDI in developing countries. However, openness to trade was not significant with respect to SSA countries, and negative terms for infrastructure and return rate for SSA countries suggests that their marginal effect on FDI is less than of non-SSA countries. Other variables like GDP growth, size of government, overall economic stability, financial depth, and political stability proved *not significant* at 1%, 5% and 10% levels for all developing countries, rejecting her hypothesis that financial depth, lower inflation, smaller government and higher growth rates fosters FDI. Her conclusion on African countries attractiveness amongst other developing countries was that investors consider Africa more risky than other developing economies (Asiedu 2002).

Asia

The Chinese experience by Cheng and Kwan (2000), analyses the determinants of FDI to 29 Chinese regions from 1985 to 1995. Their model did not include the gravity variables, but focused on cumulative per capita FDI, education, infrastructure, wage, and regional

income and different bilateral agreements. For education, they used primary, junior high and senior high education, to see which of them was significant in attracting FDI. Three different proxies for infrastructure were used: the total distance (mileage) of all roads, the mileage of high-grade paved roads, and railways. Their results showed that all variables had the expected sign, but education, though having the expected sign, was not statistically significant. Wage was significant and had a negative effect on FDI, while the regional per capita income had a positive effect. Infrastructure was statistically significant and positive, but only when the proxy variable was *"all roads"*. Surprisingly, the *railway*-proxy had a negative sign when combined with junior high education, but it was not statistically significant. Both the policy variables on investment agreements were significant and positive.

Cheng and Kwan (2000) introduced a rather new variable, the lagged FDI stock, to see whether the size previous investments attracted further investments. The variable turned out to be highly significant and positive, suggesting that previous flows of FDI had a self-reinforcing effect on attracting new FDI. Their conclusion was that their study supported earlier comparative statics on the location of FDI in the U.S., China, and other countries. They also provided support to existing studies that have empirically identified the self-reinforcing effect of FDI (Cheng and Kwan 2000).

North America

Biswas (2002) studied the outflow of FDI from the United States of America (U.S.) to 44 countries from 1983 to 1990. Biswas focused on traditional and non-traditional factors in determining the flows of foreign direct investment to a country. By traditional factors, she referred to demand factors such as wage, capital costs, market size, infrastructure, etc. And non-traditional factors could be regime type, regime duration, property rights' index, etc. Her results supported the theoretical ideas in establishing the importance of the traditional and non-traditional factors in explaining FDI. More specifically, better infrastructure, low wage, longer duration of a regime, and an environment with secured property right and contractual rights are capable of attracting investors to a country (Biswas 2002).

Latin America

Bengoa and Sanchez-Robles (2003) explored the interplay between economic freedom, FDI and economic growth using panel data analysis for 18 Latin American countries for the period 1970-1999. The economic freedom variable is collected from an index created by the Fraser Institute, which measures the degree of openness, government intervention, distortions in the economy and corruption. In addition, they have employed variables for market size, inflation, debt, and public investment – measured as the physical units of railways. The debt ratio to GDP proved to be significant and negative in terms of attracting FDI, as did inflation. The market size and economic freedom were also significant, but with a positive sign. In their study, public investment proved to be positive but not statistically significant. Since (Bengoa and Sanchez-Robles) also conducted a study on the effect of FDI on growth, they concluded that policymakers should encourage FDI. Since economic freedom proved highly significant, they suggest that policy makers should strive to increase it by achieving a sound degree of political and economic stability, and a market-oriented environment (Bengoa and Sanchez-Robles 2003).

There are many similarities in the studies reviewed in this section. Common for many of these, representing different countries and continents, is that the *gravity variables* are generally significant regardless of geographical location of the studied countries. Market size has a positive influence on the size of FDI flows while the distance between host and source affects the flows negatively. Biswas (2002) mentions wage and infrastructure as *traditional* factors and concludes that lower wages and better infrastructure attracts FDI. These findings are consistent with some of the reasons listed in section 3.1.2 for why capital moves across border. Lower wages implies cheaper labour and better infrastructure could indicate efficient transportation methods of labour-intensive production (i.e., manufacturing, construction). This thesis will focus on the wage level and infrastructure of the five host economies in attempt to predict whether FDI inflow is an attempt to exploit cheaper labour or to exploit a growing ability to consume (e.g., increased wages have a positive affect on FDI, bigger market). The Latin-American study by Bengoa and Sanchez-Robles (2003) includes an economic freedom index that measures different economical and political aspects of countries, which proved to have a significantly positive effect on FDI – a high value on the index indicate sound political

stability and a high degree of economic freedom. To complement their study and to further the research on the importance of these factors, this thesis will include variables for both host and source economy in attempt to see if it is the case for source economies as well – better political and economic stability facilitates FDI.

It is essential that host country characteristics are important in term of attracting FDI, but, as many of these empirical studies tell us, also source country characteristics are of importance. These findings has inspired this thesis to include factors of both Home and Host in attempt to analyse the determinants of FDI inflow to the set of countries in subject. The methods and variables will be closely defined in chapter 4.

4 Data and methods

This chapter is roughly divided into two parts: The first part consists of information on data identification, sources and model construction. The second part provides insight to the methods and a discussion on model specification. In an attempt to answer research question 1 and 2, different methods, models and variable specifications will be used.

4.1 Model identification

Cross-sectional analysis has frequently been used to analyse determinants of FDI flows (Resmini 2000, Bevan, Estrin et al. 2004, Kekic 2005, Estrin 2013). By applying panel data, I can study the flows between source and Host country over a period of time to address possible determinants of FDI flows. In order to model my research questions, I use a panel data set on FDI flows between source and host country at the national level for the period 1996–2012. Each observation constitutes a bilateral relation between a host country *j* (Czech Republic, Estonia, Hungary, Latvia, and Poland) and a Home country *i* (top 15 contributors of FDI measured by FDI stock in 2012 to each host country, see table 4.1). This amounts to 15 bilateral flows and the analysis will be conducted on the different host countries separately. In addition, I will conduct an analysis on the five host countries as a cluster to determine push- and pull factors of FDI to them as a region, and if there is evidence of sector-preferential FDI suggesting patterns of comparative advantages.

The aim of my first research question is to analyse the importance of home- and host characteristics in attracting FDI inflow. For that reason, my model consists of variables concerning both bilateral relations between Home and Host country, combined with country-specific factors. The bilateral relation variables are included to study if an existing relationship between Home and Host is significant in terms of attracting FDI flows as well (i.e., bilateral trade, distance, etc.). The country-specific variables will tell us if there are any country characteristics that continually stand out in terms of attracting FDI inflow in Host or provide incentive for FDI outflow in Home (i.e., GDP, domestic investment, etc.).

Table 4.1: Top 15 source countries measured by FDI stock 2012

Czech Republic	Estonia	Hungary	Latvia	Poland
Austria	Austria	Austria	Cyprus	Austria
Belgium	Cyprus	Belgium	Denmark	Belgium
Cyprus	Denmark	Cyprus	Estonia	Cyprus
France	Finland	France	Finland	Denmark
Germany	Germany	Germany	Germany	Finland
Korea Republic	Latvia	Italy	Ireland	France
Luxembourg	Lithuania	Japan	Lithuania	Germany
Netherlands	Luxembourg	Korea Republic	Luxembourg	Italy
Poland	Netherlands	Luxembourg	Malta	Luxembourg
Slovakia	Norway	Netherlands	Netherlands	Netherlands
Spain	Russia	Norway	Norway	Spain
Sweden	Sweden	Spain	Russia	Sweden
Switzerland	Switzerland	Switzerland	Sweden	Switzerland
United Kingdom	United Kingdom	United Kingdom	United Kingdom	United Kingdom
United States	United States	United States	United States	United States

Source: Author's own calculations based on FDI dataset from WIIW 2014.

In previous studies, *gravity variables* have proven to be empirically significant when studying bilateral FDI flows. The *gravity model* was first inspired by Isaac Newton's *law of gravity* as a social science model containing some elements of mass and distance. In economics, these variables have been interpreted as market mass (GDP) and bilateral distance, respectively. That is, GDP in Home and Host, and the distance between capital cities (De Benedictis and Taglioni 2011). This makes out the base of my model:

$$FDI_{ij} = Y_j, Y_i, DIST_{ij}, \tag{4.1}$$

where FDI_{ij} is the net flow of foreign direct investment from Home *i* to Host *j*. Y_j and Y_i are proxies for market size (GDP) in Host and Home, respectively, and $DIST_{ij}$ measures the distance between Home and Host's capital cities in kilometres. The base model (eqn. 4.1) consists of both a bilateral relation variable (DIST) and two country-specific variables (GDP).

To address the full extent of my first research question, I need to add other factors to see whether or not they affect FDI. My final model is specified as:

$$FDI_{ij} = Y_j^{\beta 1} Y_i^{\beta 2} DIST_{ij}^{\beta 3} GOV_j^{\beta 4} GOV_i^{\beta 5} INF_j^{\beta 6} W_j^{\beta 7} DI_j^{\beta 8} DI_i^{\beta 9} OT_{ij}^{\beta 10} EU_j^{\beta 11} EU_j^{\beta 12} \zeta_{ij}, \quad (4.2)$$

where β_1, β_2, and β_3 is the parameter estimates of my base model; GOV_j and GOV_i represent the aggregated average of the six governance indicators (see 4.1.1) for Host and Home countries, respectively; INF_j represents infrastructure in the host country, using annual government expenditure as the proxy for infrastructure; W_j is real wage in Host; DI_j and DI_i is gross fixed capital formation, used as a proxy to measure the flow of domestic investment; OT_{ij} refers to the openness to trade in the bilateral relation between Home and Host, using the bilateral sum of trade (exports and imports) and dividing it by Host's GDP as a proxy; EU_j and EU_i are dummy variables for whether or not the Host or Home country is a member of the EU, taking on the value of one from the year the country became a member and 0 otherwise; and ζ_{ij} is the error term which comprises two parts, an individual effects term and the usual error term.

Taking the log of equation (4.2) and decomposing the error term in its components forms the following model:

$$\begin{aligned} lnFDI_{ij} = {} & \beta_1 lnY_j + \beta_2 lnY_i + \beta_3 lnDIST_{ij} + \beta_4 GOV_j + \beta_5 GOV_i + \beta_6 lnINF_j + \beta_7 lnW_j + \\ & \beta_8 lnDI_j + \beta_9 lnDI_i + \beta_{10} lnOT_{ij} + \beta_{11} EU_j + \beta_{12} EU_i + \eta_i + \delta_{ij}, \end{aligned} \quad (4.3)$$

where η_i shows the individual country effects and δ_{ij} represents the usual error term. The individual country effects capture the unobserved heterogeneity among the investing countries. These are unobserved factors that may promote or hinder investment decisions in the home countries. The model displayed in equation (4.3) is also the model that will be used in the analysis for RQ1.

Research question 2 deals with sector-specific FDI inflow to the Hosts. Different variable specifications need to be altered, in order to conduct the analysis. The new variable specifications are modelled as:

$$lnFDI_{js} = \beta_1 lnY_j + \beta_2 ln\overline{Y}_m + \beta_3 ln\overline{DIST}_{jm} + \beta_4 GOV_j + \beta_5 \overline{GOV}_m + \beta_6 lnINF_j + \beta_7 lnW_j + \beta_8 lnDI_j + \beta_9 ln\overline{DI}_m + \beta_{10} ln\overline{OT}_{jm} + \beta_{11} EU_j + \beta_{s,1} D_{s,1} \dots \beta_{s,S} D_{s,S} + \gamma_s + \varepsilon_{js}, \quad (4.4)$$

where the new variables, FDI_{js}, is total net FDI inflows into sector *s* in country *j*; $\overline{Y_m}$ measures the average GDP of their market, *m*; $\overline{DIST}_{jm}$ is the average distance between Host *j* and their market *m*; $\overline{GOV}_m$ represents the average governance indicator of the market; $\overline{DI}_m$ is the average level of domestic investment in *m*; new dummy variables, $D_{s,1}$ .. $D_{s,S}$, are introduced taking on the value one for their respective sector s = 1, … , S; and, finally, γ_s and ε_{js} represents the individual sector effects and the usual error term, respectively. The newly introduced variable specifications, *s* and *m*, refer to *sector* and *market.* Since the 15 countries represented by *i* in eqn. 4.3, and depicted in table 4.1, amount to 80-90% of the total share of FDI to the Hosts, these countries represents the *world,* or the *market,* for the countries in this study, *j*. The averages that make these new variables are derived from the same variables as in the model created to estimate RQ1 (eqn. 4,3). Since not possible to calculate, the Home's dummy variable for EU membership, EU_i, is removed. When estimating equation 4.4, our focus is solely on the sector-specific dummy variables and sector-specific effects – the other variables are expected to exhibit similar results to those of equation 4.3.

4.1.1 Explanation and expected sign of the variables

Based on previous research and theory discussed in chapter 3, there are some expectations on how explanatory variables will affect the dependent variable. These expectations are presented in this section.

i) Gross domestic product

The country's GDP will be used as a proxy for market size, or *market mass* as stated in the gravity model, for both Home and Host. In general, the more an economy grows, the more attractive the country can be for investors in search of higher returns – recall chapter 3 on why capital moves across borders. Hence, expected sign of the coefficient 'Y_j' is positive. Previous studies conclude that also the market size of the investor is significantly positive, resulting in an expected sign for 'Y_i' in this analysis as positive. The

foundation of the expectations for market size is built on results in previous empirical studies (De Benedictis and Taglioni 2011).

ii) Distance

Distance makes the last variable of the gravity model. The distance between capital cities can be viewed as a proxy for cost of information, transportation of raw material and managing an affiliate in a foreign country. Bevan, Estrin et al. (2004) found in their study that distance is negatively related to FDI inflows because of increased costs for getting information and transportation, and an increased threshold for establishing a subsidiary due to travel costs, etc. Hence, the coefficient on $DIST_{ij}$ is expected to be negative.

iii) Governance indicators

The governance indicators are expected to have a positive relationship with the inflows of FDI into the host country. The governance variable in the model is an aggregated average of the six indicators of governance; Voice & Accountability, Rule of Law, Regulatory Quality, Political Stability, Government Efficiency, and Control of Corruption, published each year by the World Bank. The values of the indicators range from -2,5 to +2,5. A positive sign suggests good performance and negative sign poor performance of the respective governance indicator (WorldBank 2013). These governance indicators are incorporated in the model to ascertain whether institutional mechanisms played a role in attracting FDI and to determine the extent to which they may have played a role.

iv) Infrastructure

Government expenditure is used as a proxy for infrastructure, as government spending finance investments in infrastructure. Good infrastructure is expected to attract FDI as it facilitates the operation at high rates of capacity utilization. Hence, the coefficient is expected to be positive.

v) Real wage

The coefficient for wage, W_j, is expected to have a negative sign. From chapter 3, we know that incentives for FDI are exploiting cheap labour, etc. Hence, when the wages in

a country increases, we expect FDI to decrease. On the other hand, increasing wages builds the foundation for increased consumption and increased market size, which in turn can affect FDI in a positive manner. The net effect depends on what kind of FDI – asset exploiting or asset augmentation – the countries historically have received. In this analysis, we expect the coefficient to have a negative sign.

vi) Domestic investment

Gross fixed capital formation is employed as a proxy for domestic investment. This variable has not been used to the extent as the variables mentioned above, but it is used in this analysis to study whether or not the size of domestic investment in Home and Host have any explanatory power on the size of FDI inflow/outflow. Could a considerable amount of domestic investment at Home have drained domestic resources/market share and create incentives for foreign investment? And would a sizable share of domestic investment in Host cause reservations for investors? The expected sign for the coefficients DI_j, DI_i is undetermined (+/-), if at all significant.

vii) Openness to trade

The formula for the openness to trade indicator is constructed as:

$$OT_{ij} = \frac{X_{ji}+M_{ji}}{GDP_j}, \tag{4.4}$$

where X_{ji} represents the value of exports from country *j* to *i*, and M_{ji} is the value of imports to *j* from *i*. This amounts to the sum of trade for *j* with *i* divided by *j*'s GDP to get the indicator as the share of GDP. The purpose of this variable is to see if the size of an existing bilateral relation between Home and Host facilitate more FDI. My hypothesis is that familiarity between countries has a positive effect on FDI, hence a positive sign.

viii) EU membership

The dummy variables EU_j and EU_i are expected to have a positive sign due to the economic and financial requirements of becoming a member. Stability, common currency, and free capital mobility are factors that facilitate cross-border capital movements (FDI), if both countries are members. Still, accession to the EU for Host countries might appeal to non-member states in terms of becoming more attractive.

4.1.2 Sources of data

The dataset spans 15 investor countries that account for about 80-90% of total net FDI inflow into the five subject countries (see Table 4.1), during 1996-2012. The data on net FDI inflows to the Hosts (sector- and partner-specific), government expenditure and wages are collected from the Vienna Institute for International Economic Studies, which has a database consisting of economic indicators together with a database on FDI stocks and flows for Central and Eastern European (CEE) countries. For some countries, the data on net FDI inflows are available from 1998; hence, the dependent variable is an unbalanced panel.

The distance data between capital cities of Host and Home countries are collected from the "Travel Distance Calculator between cities" under the Chemical-ecology website (2014). Data on governance indicators are taken from the World Development Indicators' online database of the World Bank (2014). The data on governance indicators are available from 1996 to 2012 except for 1997 and 1999. For the years 1997 and 1999 an average of 1996 and 1998, and 1998 and 2000, were used, respectively. GDP and trade data are from UNCTADstat, available on the online database of UNCTAD (2014). Finally, information about EU accession was collected from the pages of the Central Intelligence Agency (CIA 2014). As there is variation in the years of observation, the data set is more likely to be a micro-panel and stationary tests are not of great importance and were not performed.

4.2 Methods

In this section, I will discuss the estimation methods used for testing the research questions. Potential problems such as correlation among regressors, endogeneity and omitted variables are discussed in order to avoid estimation bias.

4.2.1 Possible estimation methods

Panel data allows us to observe and analyse data for n different entities observed at T different time periods. In our case, n constitutes a bilateral flow of FDI between five receiving countries and fifteen different source countries. Equation 4.5 provides an example of denotation on a panel data set containing two variables, X and Y:

$$(X_{it}, Y_{it}),\ i = 1, \dots, n \text{ and } t = 1, \dots, T, \tag{4.5}$$

where subscript *i* refers to the entity being observed and the second subscript, *t*, refers to the year at which it is observed (Stock and Watson 2012). If the entities have a different number of observations over time, that is $T_i \neq T_j$, then we have an *unbalanced panel*. The total number of observations for *unbalanced* panel is $n = \sum_{i=1}^{N} Ti$. A panel data set is *balanced* if each entity has the similar number of observations, that is $T_i = T$ for i = 1, … , N. As mentioned in section 4.1.2, this data set is an *unbalanced* panel, missing some observations in some of the variables. Fortunately, panel data permits an *unbalanced* panel and there are estimation methods that will provide consistent and, hopefully, efficient coefficient estimates (Wooldridge 2013). The methods that will be conducted in this analysis are a pooled regression (POLS), a least-square dummy variable regression (LSDV), a fixed-effects model (FE), and a random-effects model (RE). A *LSDV* regression is constructed solely for the purpose of answering RQ2.

The following model estimates a pooled OLS regression:

$$Y_{it} = \beta_0 + \beta_1 X_{1it} + \cdots + \beta_k X_{kit} + \varepsilon_{it}, \tag{4.6}$$

where $i = 1, \ldots, N$ is the number of countries and $t = 1, \ldots, T$ is the number of time periods. A pooled regression is characterized by pooling all of the observations in the OLS regression. The model implicitly assumes a common intercept and identical coefficients for all countries. For these estimates to be unbiased and consistent, the regressors need to satisfy *weak* exogeneity (see 4.2.2). The dummy technique, *LSDV,* is simply the OLS estimator with plenty of dummy variables. This regression will primarily be used to answer RQ2 on sector-preferential foreign investment given by the model illustrated in equation 4.3 – notice the added dummy variables, D_S. A fixed-effects model is constructed to capture the time-invariant country-specific effects that are unobserved in the pooled regression. These effects can be measured indirectly in a FE model:

$$Y_{it} = \alpha_i + \beta_1 X_{1it} + \cdots + \beta_k X_{kit} + \varepsilon_{it} \tag{4.7}$$

where the intercept term α has subscript *i* to denote different intercepts for different countries. The model is time-invariant and does not allow for the intercept to vary over time, and is therefore called “fixed-effect”. In other words, it allows for the intercept to vary across countries, but it does not vary over time. For the coefficient estimates to be consistent, the FE model assumes strict exogeneity. The estimation of time-invariant variables in a fixed-effects model are estimated in a second-step regression with the

individual effects as the dependent variable and time-invariant variables as explanatory. This is estimated as:

$$IE_{ij} = \gamma_0 + \gamma_i D_{ij} + \nu_{ij} \quad (4.8)$$

where IE_{ij} denotes individual effects; D_{ij} are time-invariant variables; and ν_{ij} is an ordinary error term. Since there is reason to believe that there are differences across countries that have some influence on the dependent variable, a random-effects model is constructed:

$$Y_{it} = \beta X_{it} + \alpha_i + u_{it} + \varepsilon_{it} \quad (4.9)$$

where u_{it} is the between-country error, and μ_{it} is the within-country error. RE models assume that the variation across countries is random and uncorrelated with the predictor or independent variables in the model. This allows the time-invariant variables to have a *ceteris paribus* effect on the dependent variable. If the assumption of strict exogeneity is fulfilled, the coefficient estimates are consistent and efficient (Wooldridge 2010 and 2013).

4.2.2 Pre-estimation issues

When dealing with entities such as countries, a series of issues such as multicollinearity, endogeneity and omitted variables are very much present.

Multicollinearity

The multicollinearity problem arises when the predictor variables are highly correlated with each other. Assumption of no perfect linear relationship among independent variables in the regression models can be one way to deal with the problem. Even though violating this assumption does not affect the models' predictive power, individual effects of explanatory variables could be misled. In some cases, estimated parameters and standard errors are imprecise (Grewal, Cote et al. 2004). By generating a correlation matrix of the explanatory variables, it is possible to detect whether or not multicollinearity could be present. Table 4.2 and 4.3 depicts a correlation matrix of the variables included in equation 4.3 and 4.4 for the cluster as a whole. The country-specific correlation matrices can be found in Appendix 2. Table 4.3 shows some incidents of high correlation (corr. > 0,80), which could imply the presence of multicollinearity.

Table 4.2: Correlation matrix of utilized variables in equation (4.3)

var	mean	SD	GDP_j	GDP_i	$DIST_{ij}$	GOV_j	GOV_i	INF_j	W_j	DI_j	DI_i	OT_{ij}	EU_j	EU_i
GDP_j	10,865	1,354	1,000											
GDP_i	12,808	1,915	0,261	1,000										
$DIST_{ij}$	7,051	0,960	0,115	0,365	1,000									
GOV_j	0,756	0,192	0,139	0,159	0,006	1,000								
GOV_i	1,342	0,518	0,066	0,061	-0,153	-0,010	1,000							
INF_j	11,870	3,161	0,792	0,250	0,132	0,301	0,026	1,000						
W_j	9,579	4,955	-0,425	-0,026	-0,079	0,491	-0,013	-0,498	1,000					
DI_j	0,064	0,159	-0,259	-0,087	-0,014	-0,162	0,014	-0,261	0,039	1,000				
DI_i	0,030	0,108	-0,107	-0,231	-0,066	-0,043	-0,069	-0,084	-0,001	0,466	1,000			
OT_{ij}	0,046	0,069	-0,058	0,237	-0,461	0,136	-0,051	0,000	0,112	0,012	-0,006	1,000		
EU_j	0,529	0,499	(0,365)*	(0,173)*	(0,000)*	(0,242)*	(-0,027)*	(0,118)*	(0,196)*	(-0,207)*	(-0,075)*	(0,058)*	1,000	
EU_i	0,698	0,459	(0,182)*	(-0,022)*	(-0,360)*	(0,015)*	(0,355)*	(0,066)*	(-0,030)*	(-0,058)*	(-0,039)*	(0,207)*	(0,169)*	1,000

Note: (*) represent point biserial correlation coefficients

Table 4.3: Correlation matrix of variables utilized in equation (4.4)

var	mean	SD	GDP_j	GDP_m	$DIST_{jm}$	GOV_j	GOV_m	INF_j	W_j	DI_j	DI_m	OT_{jm}	EU_j
GDP_j	10,866	1,354	1,000										
GDP_m	14,222	0,275	0,668	1,000									
$DIST_{jm}$	7,526	0,202	0,657	0,484	1,000								
GOV_j	0,756	0,192	0,137	0,430	0,170	1,000							
GOV_m	1,342	0,068	0,473	-0,062	0,426	-0,150	1,000						
INF_j	11,871	3,161	0,792	0,587	0,866	0,294	0,195	1,000					
W_j	9,579	4,969	-0,425	0,000	-0,472	0,497	-0,191	-0,501	1,000				
DI_j	0,064	0,159	-0,261	-0,304	-0,157	-0,150	0,072	-0,267	0,061	1,000			
DI_m	26,466	0,253	0,670	0,964	0,572	0,414	-0,029	0,660	-0,071	-0,221	1,000		
OT_{jm}	0,984	0,311	-0,119	0,428	-0,053	0,638	-0,625	0,161	0,423	0,012	0,438	1,000	
EU_j	0,529	0,499	(0,364)*	(0,7956)*	(-0,017)*	(0,248)*	(-0,255)*	(0,115)*	(0,204)*	(-0,196)*	(0,724)*	(0,386)*	1,000

Note: (*) represent point biserial correlation coefficients

Omitted variables

Omitted variables in panel data estimation can cause unobserved heterogeneity, where the omitted factor correlates with the error term. As a result, the models' disturbance term is unequally distributed. There are many economic and political indicators that may have an effect on FDI inflow in addition to those of this analysis. Fortunately, one of the primary motivations for using panel data is to solve the omitted variables problem. Unobserved effects can be treated as random variables, but the key issue is whether the unobserved effect is uncorrelated with the explanatory variables (Wooldridge 2010).

Endogeneity

Endogeneity arises when the disturbance term of the model is correlated with a dependent variable, causing estimation bias. This can happen if the model has omitted variables, measurement errors, and/or simultaneity (Tabachnick and Fidell 2001). Variables like GDP and Wage are likely to be endogenous because FDI inflow are expected to enhance economic growth in the host countries through generating employment, increasing managerial skill and transfer of technology (recall table 3.1 on alleged benefits of attracting FDI).

4.2.3 Choice of methods

The methods presented in the last section inhabit different attributes depending on the data, and the final choice of method will be further discussed in chapter 5 when presenting the results. Since RQ2 will be estimated with an LSDV regression, this section is devoted to present different tests that enable us to make a choice between the three methods constructed to answer RQ1.

The pooled regression model assumes homogeneity across all countries and the country-specific effects gets picked up by the error term. If there are any individual effects present in our analysis, this will make the estimates from the POLS regression biased and inconsistent (explanatory variables are correlated with the error term). An F-test is performed to make a choice between the pooled regression and the fixed-effects

model, having the null hypothesis of a common intercept for all the cross sections versus an alternative hypothesis of the presence of individual effects.

$$H0: \alpha_2 = \alpha_3 = \cdots = \alpha_N = 0.$$

If the null hypothesis is rejected, the FE model is preferred to the POLS model (Tabachnick and Fidell 2001, Wooldridge 2010). To determine the choice between the POLS model and RE model, a Breusch-Pagan Lagrange Multiplier (LM) test is conducted. The null hypothesis is that the variance across all cross sections is zero, i.e., no panel effects. If the null hypothesis is rejected, the RE model is chosen over the POLS model (Breusch and Pagan 1980, Wooldridge 2010).

Hausman (1978) proposed a test based on the difference between the random effects and fixed effects estimates, since the key consideration in choosing between them is whether α_i and X_{it} are correlated. Both models are based on the assumption of strict exogeneity:

$$E(\varepsilon_{it} | X_{it}, \alpha_i) = 0, \tag{4.10}$$

with a null hypothesis stating that the difference is not systematic. If the null hypothesis is rejected then it means that coefficients of both models are significantly different. A rejection would imply that the estimates of the FE model are preferred, because the Hausman specification test suggests that there could be correlation between regressors and individual effects (Wooldridge 2010). Since we assume, in section 4.2.2, that the possibility of endogeneity could be present, it will not be consistent with the assumption of strict exogeneity (4.10). If that is the case, both the FE and RE models could be inconsistent and inefficient. For that reason, a new method is introduced: the Hausman-Taylor model. A Hausman-Taylor model is a hybrid of the FE and RE model, allowing correlation among regressors and individual effects, the estimation of time-invariant variables, and it can also treat some variables as endogenous (e.g., net FDI inflows, GDP and wage in Host country). The final choice of method will be presented and discussed more precise in chapter 5.

5 Results

This chapter is divided into three parts: The first part evolves around some of the post-estimation issues and how they are connected to the final choice of method in the second part. The third and last section is a presentation of the results and an interpretation that hopefully will lead us to a conclusion in chapter 6.

5.1 Post-estimation issues

Section 4.2.2 introduced some of the issues that may occur when dealing with panel data sets and economic variables. This section aims to shed light on how these issues might have affected the results of estimation in section 5.3.

Multicollinearity

In table 4.2 and 4.3 we could see that there were some instances of a high correlation among some of the variables. In table 4.2, there was one correlation coefficient that stood out, namely GDP_j vs. INF_j (=0,79), not surprisingly when using government expenditure as a proxy for infrastructure. Since the correlation coefficient did not surpass 0,80, this was neglected in the estimation rounds. When dealing with economic variables, it is given that there are natural links between almost all facets of economic activity within a given economy (Grewal, Cote et al. 2004). In practice, multicollinearity is often signalled when a regression has a high R squared value, but very low slope coefficient statistics. This is not the case in the results from the estimation on the variables in Table 4.2. Although a slightly high R squared, t-statistics suggest that we have significant variables with explanatory power on the dependent variable. These results will be presented more thoroughly in section 5.3.

Table 4.3 repeatedly displayed high correlation coefficients among variables. The variables in table 4.3 are constructed to answer research question 2 – patterns of comparative advantages based on the allocation of FDI inflow. The variables are constructed to make a general statement on the determinants of FDI between the cluster and its *average investor,* and their degree of multicollinearity will not affect the sector-specific estimates of the LSDV regression used to answer this research question. However, t-statistics of the analysis suggests that the presence of collinearity is limited.

Omitted variables

As mentioned in the paragraph on multicollinearity, economic variables have natural links in almost all facets of economic activity. Since equation 4.3 and 4.4 does not include all economic factors, there is a possibility of omitted variables. The unobserved heterogeneity can cause falsely high t-statistics for coefficients even though they don't have a statistical significant impact on the dependent variable. Simultaneously, the regression R squared is awarded an artificially low degree of explanatory power.
In terms of the results of the analysis, the regressions experience both high R squared (> 0,60) and sufficiently high t-statistics for coefficients (at 1, 5, and 10% level). These results contradict the presence of an omitted variable problem.

Endogeneity

In this analysis, there is a possibility of an endogeneity problem. Recall 4.2.2, when stating that endogeneity might occur if the model inhabits simultaneity. The variables GDP and Wage in Host countries are likely to be endogenous because of the expected benefits accompanied by FDI inflows. Since this might be the case, a Hausman-Taylor model was introduced in section 4.2.3 because it has the ability to treat a few variables as endogenous. This will be elaborated more in the next section on the final choice of method.

5.2 Final choice of method

In table 5.4, the results are reported for the cluster-estimation of equation 4.4 under a pooled model, a fixed-effects model, a random-effects model and a Hausman-Taylor model. In order to make a decision on which method yields the most consistent and unbiased estimates, a series of tests listed in section 4.2.3 will be presented in this section before we ultimately reach the final decision. These test results are also listed in table 5.4 below the coefficient estimates.

The pooled regression model assumes a common intercept for all cross section. An F-test was conducted to either reject or accept the null hypothesis of a common intercept. These results are presented in table 5.1 for both the country-specific regressions and the cluster. Robust standard errors were used for the estimation.

Table 5.1: F-test coefficients

Country	F-test	Stat. sig
Czech Republic	13,03	***
Estonia	13,53	***
Hungary	13,45	***
Latvia	32,22	***
Poland	12,13	***
Cluster	41,35	***

Note: *** statistical significant at 1%

F-test coefficients are statistical significant at 1% level for each country-specific regression and for the cluster as a whole. This suggests that we reject the null hypothesis of a common intercept and that the pooled regression model is not the most appropriate model for these estimations. The alternative hypothesis is that there are individual effects, which imply that the FE estimation method should yield more consistent estimations than the pooled regression.

Table 5.2: LM test coefficients

Country	LM	Stat. sig
Czech Republic	332,64	***
Estonia	431,87	***
Hungary	419,45	***
Latvia	277,70	***
Poland	796,44	***
Cluster	2555,85	***

Note: *** statistical significant at 1%

The Breusch-Pagan Lagrange Multiplier (LM) test was made to make the choice between the pooled regression and the RE model. The LM test coefficients in table 5.2 reject the null hypothesis of no panel effects with a statistical significance at 1% level. This supports the previous test results that the pooled regression is not the most appropriate method. Rejecting the null hypothesis suggest that the RE method is preferred over POLS due to the presence of panel effects.

Table 5.3 Hausman test coefficients

Country	HT	Stat. sig
Czech Republic	32,62	***
Estonia	16,36	**
Hungary	28,57	***
Latvia	16,73	**
Poland	21,95	***
Cluster	25,45	***

Note: *** /** statistical significant at 1 and 5%

Previous tests have excluded POLS regressions and a Hausman specification test is needed to make a choice between FE and RE regressions. The null hypothesis is that there are no systematic differences in the FE and RE estimates. The results from the Hausman test is listed in table 5.3 and they suggest that there are systematic differences in the estimates with a zero probability of accepting the null hypothesis at the 1 and 5% significance level. This rejection implies that the FE method is a better fit for estimation than RE.

However, FE estimates assume strict exogeneity and, due to variables such as GDP and Wage, we assume that there is a problem with endogeneity. This would make the estimates from FE regressions inconsistent and biased. Also, our time-invariant variable, DIST, is expected to be significant in determining FDI inflows and it needs to be included in the regressions. Since FE regressions do not include time-invariant variables, the final choice of method will be the Hausman-Taylor model. The Hausman-Taylor model includes time-invariant variables and allows certain variables to be treated endogenous, eliminating the potential problem of endogeneity. FDI inflows, GDP and Wage of the host economy are treated as endogenous variables as they possibly inhabit a degree of simultaneity.

5.3 Presentation and interpretations of results

The presentation and interpretations in this section are restricted to the output from the Hausman-Taylor model. The section is roughly divided into two parts, each representing the estimates related to answering research question 1 and 2, respectively.

In table 5.4, the results are reported for the estimation of equation 4.3 for the whole cluster under a pooled model, a FE and RE model, and a Hausman-Taylor model. The Hausman-Taylor estimates of all five host countries are reported in table 5.6, and their respective estimation results of POLS-, FE-, and RE models are listed in Appendix 4.

5.3.1 Determinants of foreign direct investment

As you can see from table 5.4, the results of the coefficients for the cluster estimation in the four models are presented with the same sign. This is an indication of consistency in the relationship between the dependent and independent variables. Most of the variables are presented with their expected sign, except for the clusters average governance indicator and the dummy variable for EU membership, although the latter is not statistically significant. The governance variable is significant at the 5% level, suggesting that a 1% increase in the clusters average governance index leads to a 0,49% decrease in net FDI inflows. The negative sign on the governance estimate is not consistent with empirical evidence in the literature and certainly make a special-case in this analysis. The investors governance coefficient, GOV_i, is positive, as expected, but not significant.

Table 5.4: Cluster estimation results: coefficients and test statistics, RQ1

	Pooled model		FE model		RE model		Hausman-Taylor	
	Coeff.	Stat. sig.	Coeff.	Stat. sig.	Coeff.	Stat. sig	Coeff.	Stat. sig.
GDP_j	0,55	*	0,15		0,54	***	0,48	**
GDP_i	0,34	***	1,08	***	0,44	***	0,54	***
$DIST_{ij}$	-0,45	***			-0,45	***	-0,52	**
GOV_j	-0,43		-0,43	*	-0,49	**	-0,49	**
GOV_i	0,42	***	0,14		0,29		0,25	
INF_j	1,70	***	1,74	***	1,70	***	1,71	***
W_j	-0,00	***	-0,00	***	-0,00	***	-0,00	***
DI_j	0,33		0,37	**	0,37	**	0,37	**
DI_i	-0,34		-0,34		-0,35		-0,35	
OT_{ij}	4,80	***	2,45		3,73	***	3,30	**
EU_j	-0,03		-0,21	*	-0,15		-0,17	
EU_i	0,18	**	0,84	***	0,84	***	0,90	***
Constant	7,88	***	5,76	***	7,35	***	7,91	***
Wald.chi					2517,33	***	2498,37	***
Numb. of obs.	1124		1124		1124		1124	
F-test	200,79	***	215,12	***				
R^2 within			0,69		0,69			
R^2 between			0,52		0,75			
R^2 overall	0,74		0,43		0,73			
LM					2555,85	***		
Hausman test					25,45	***		
F-test					41,35	***		

Note: ***, **, * represent statistical significant at 1%, 5% and 10%, respectively

The *gravity variables* (GDP_j GDP_i $DIST_{ij}$) proved to significant and with their expected sign for this cluster of Central- and Eastern European (CEE) countries. The average GDP in the cluster, indicating market size, is positive and significant at the 5% level. A 1% increase in the clusters average GDP attracts 0,45% net FDI inflow. This also accounts for the investors GDP, significant at 1% level, attracting 0,54% net FDI inflow by a 1% increase in GDP. The distance between the cluster and the FDI origin affects net flows negatively, decreasing by 0,52% for an increase of 1% in kilometres. These results are consistent with empirical evidence that market size and distance are significant determinants in terms of attracting FDI.

As expected, the coefficient for wage, W_j, is presented with a negative sign, and is significant on the 1% level of significance. However, the coefficient estimate is particularly low – a 1% increase in wage leads to a 0,1% decrease in FDI inflow. This could indicate that investors are attracted by cheaper labour, but since the coefficient is so remarkably low, it is difficult to make a final judgment call. A negative coefficient was still expected and it is supported by previous empirical studies. Later, when the country-specific results are presented, we might be able to see different results for the different countries.

The coefficient on infrastructure, which uses government expenditure as a proxy, is positive as expected and significant at the 1% level. The coefficient is relatively elastic, indicating that a 1% increase in government expenditure lead to a 1,71% increase in net FDI inflows into the cluster. By increasing government expenditure, and especially in infrastructural projects, proves to be an important means of attracting additional net FDI inflows.

Domestic investment variables for Home (DI_i) and Host (DI_j) were not appointed any expected signs, because of limited previous research and for being the *untraditional variables* of this analysis. The level of domestic investment at Home, using gross fixed capital formation, was presented with a negative coefficient but was not statistically significant. The coefficient, however, was presented with a negative sign in all four models, indicating a high level of consistency between FDI and Home's domestic investment. For investors, on the other hand, the level of domestic investment in the foreign country proved to be an important factor in deciding whether or not to set up an affiliate. The coefficient for Host domestic investment was positive and statistically significant at the 5% level of significance. Although relatively inelastic, a 1% increase in domestic investment leads to an addition 0,37% net FDI inflow.

For the cluster as a whole, the openness to trade proves positive and significant at the 5% level. This result suggests that a 1% increase in the size of their bilateral trade as a share of GDP attracts an additional 3,30% net FDI inflow. The elasticity of this result makes a strong case for an increased openness to trade to attract FDI, which supports the study of Bengoa and Sanchez-Robles (2003) that the degree of economic freedom and market-oriented reforms have a significantly positive effect on FDI.

The coefficient for Host EU membership, EU_j, presents a negative sign, but is not statistically significant. This is somewhat surprising, but the coefficient for Home EU

membership, EU_i, is both significant at the 1% level and positive. Since all five Host countries became members of the EU in 2004, 90% of the Home countries are located in Europe and 75% are EU members, this geographical and political relationship is proved significant.

These results show that the model have identified significant determinants for attracting FDI to the cluster as a whole. Still, there are country-specific variations in terms of the determinants. Adding dummy variables for Czech Republic, Estonia, Hungary and Latvia to the Hausman-Taylor yields the results in table 5.5:

Table 5.5: Country-specific effects, RQ1

Base: Poland	Coeff.	Stat. sig
Czech Republic	-2,13	***
Estonia	7,72	***
Hungary	-5,40	***
Latvia	6,60	***

Note: *** statistical significant at 1%

Individual effects are very much present and all the country-specific dummies presents with statistically significant coefficients at the 1% level. The coefficients speak of differences among the Host countries. With Poland used as a base, the results tell us that Latvia and Estonia positively differ from Poland in terms of attracting FDI, while Czech Republic and Hungary differ negatively. In practice, this indicates that we should be able to see differences among them in the country-specific estimations from the Hausman-Taylor model and equation 4.3.

Table 5.6 displays the estimates from the country-specific models and, by looking at the significant coefficients; we can immediately establish that there are differences between the countries themselves and the cluster. Czech Republic and Poland's GDP presents with a negative sign significant at the 5% level, which implies that an increase in GDP will decrease the level of net FDI inflow. This does not coincide with previous empirical findings or correspond with the expected sign. Estonia, Hungary and Latvia's GDP coefficients are also negative, but they are not statistically significant. However, common for all of them, except Latvia, GDP of the Home country is statistically significant at the 1% level and presents with the expected positive sign. In the case of Czech Republic, Hungary and Poland, these coefficients appear relatively elastic with a coefficient value of 2,14, 1,72, and 1,54%, respectively. For Estonia, if source country GDP increases by

1%, net FDI inflow to Estonia increased with 0,81%. In Latvia's case, this coefficient is positive, but not statistically significant.

Table 5.6: Hausman-Taylor estimation results: coefficients and test statistics, RQ1

	Czech R.		Estonia		Hungary		Latvia		Poland	
	Coeff.	Stat sig.	Coeff.	Stat sig.	Coeff.	Stat sig	Coeff.	Stat sig.	Coeff.	Stat sig
GDP_j	-1,67	**	-0,26		-0,62		-1,22		-0,89	**
GDP_i	2,14	***	0,81	***	1,72	***	0,07		1,54	***
$DIST_{ij}$	-1,73		-0,99	**	-1,51		-0,34		-1,08	
GOV_j	0,22		2,34		0,58		1,63	**	-0,53	
GOV_i	-0,93		-0,10		0,32		0,89		0,02	
INF_j	-0,45		1,64		1,04		2,69		1,14	
W_j	5,21	**	0,00		0,71		0,69		1,47	***
DI_j	2,80	***	0,13		-0,54		0,00		-0,05	
DI_i	-2,52	***	0,21		0,41		0,02		0,21	
OT_{ij}	-2,05		-0,92		3,87		5,01		-5,64	*
EU_j	-0,27		-0,05		-0,01		-0,75	**	0,13	
EU_i	0,75	**	1,32	***	0,03		1,29	***	0,35	
Cons.	18,36	**	10,78	***	17,88	**	6,39		15,10	**
Wald.ch	503,64	***	855,76	***	555,82	***	435,02	***	1290,28	***
Num. of obs.	230		230		195		220		250	

Note: ***, **, * represent statistical significant 1%, 5% and 10%, respective.

Estonia is the only country in which the *gravity variable* distance is significant. The coefficient has the expected negative sign and suggest that a 1% increase in the kilometres between Tallinn and source country capital city, it decreases net FDI inflow by 0,99%. This coefficient presents itself as negative in the case of the others countries as well, but is not statistically significant.

The Latvian governance indicator, GOV_j, is significant at the 5% level and proves vital in attracting FDI. With a relatively elastic coefficient value of 1,63, Latvian FDI inflow would increase 1,63% for each percentage increase in its aggregated governance indicator average. Czech Republic, Estonia and Hungary are also presented with a positive coefficient, but they are not significant.

The next significant variable on the list is wage. Real wage growth is statistically significant in attracting FDI to Czech Republic and Poland at the 5 and 1% level, respectively. Both coefficients are presented with a positive sign, which may imply that investors are drawn to Czech Republic and Poland due to an increasing middle-class and

consumption ability. This is interesting with respect to the sector-specific estimations and should suggest that sectors like wholesale and retail sale are significant receivers of FDI. For Estonia, Hungary and Latvia this coefficient was presented with a positive sign, but not of any statistical significance.

The domestic investment level significantly attracts FDI inflows to Czech Republic with a relatively elastic coefficient estimate of 2,80. If gross capital formation in CZ increases 1%, net FDI inflow increases 2,80%. On the other hand, if source country domestic investment increases by 1%, the flow of FDI to CZ decreases by 2,52%. The DI variable was not assigned any expected sign for this analysis, and it is very interesting to see that it has such an impact on FDI inflows to CZ. The coefficients for the other countries are presented with various signs but no statistical significance, making it impossible to determine their effect.

Openness to trade, which was significant and positive for the cluster as a whole, presents as significant at the 10% level and negative for Poland. If the openness-proxy increases by 1%, the coefficient estimates a 5,64% decrease in net FDI inflows. This result does not coincide with Bengoa's (2003) study and the overall cluster estimations. The coefficients for other countries are represented by a variety of signs, but are not statistically significant.

Regarding EU membership, Latvia is the only country that experiences a significant effect of being accession. The effect, however, is negative at the 5% level of significance with -0,75.These coefficients are not significant for Czech Republic, Estonia, Hungary and Poland. An important determinant for Czech Republic, Estonia and Latvia, however, is whether the source country is a member of the EU. The coefficients present themselves as significant at the 5, 1 and 1% level of significance, respectively. As mentioned when presenting the estimation result for the cluster, a majority of the top 15 investors are either members of the EU or geographically affiliated, making this result less surprising.

The estimation results of the cluster and country-specific models have provided multiple significant findings, both in line and out of line with our expectations. A few of them, especially infrastructure and wage, might provide us with the fundamentals to try and assess whether FDI inflows to these five CEE countries are aimed at exploiting cheap

labour or a growing consumption ability, when combined with the sector-specific estimations.

5.3.2 Sector-specific foreign direct investment

The variables related to the second research question is altered a bit and that changes their interpretation. The previous subscript *i*, referring to the source country origin, is now changed to *m*, referring to the aggregated average of the source country-specific variables. This is a means of creating a proxy that represents the *average investor* to this cluster of CEE countries to be able to make a statement on sector-preferential FDI: Which sector do foreign investors generally prefer? By asking this question, it makes it possible to ultimately answering RQ2.

In table 5.7, the results are reported for the estimation of equation 4.4 under a pooled model, a FE and RE model, and a Hausman-Taylor model. As mentioned in chapter 4 under methods for estimating RQ2, a LSDV model would be used, but equation 4.4 is also estimated on the cluster in order to make a general statement on the determinants of FDI from an *average investor.* This interpretation will be brief, but is used as a means of comparison to the more country-specific models in 5.3.1.

The choice of method is the same as for equation 4.3. The F-test suggests that the FE model is more appropriate than the pooled regression. A Breush-Pagan Lagrange Multiplier test indicates that the RE model is preferred over the pooled model as well. A Hausman test is conducted to make the choice between the FE and RE model. The test score coefficient of 76,56, significant at the 1% level of significance, rejects the null hypothesis of no systematic differences in model estimates, also advocating the use of a FE model. Variables GDP and Wage are not excluded from the model, which means that the endogeneity issue might still be present. Therefore, as the conclusion in 5.2, we use a Hausman-Taylor model because it has the means of treating the mentioned variables as endogenous. The presentation of the cluster estimation results is restricted to the output from the Hausman-Taylor model.

The output from the cluster estimation resulted in multiple significant coefficients, most of them at the 1% level of significance. Host country market size is estimated with an unexpected negative value of -1,68. This result is surprising, but does not affect the final

answer of RQ2, since the coefficients of the sector-specific dummies still are consistent in the LSDV model. The average source country GDP was measured with the expected positive sign and a coefficient value of 8,30, meaning that if source country GDP increased by 1% net FDI inflow to the cluster will increase 8,30%.

Table 5.7: Cluster estimation results: coefficients and test statistics, RQ2

		Pooled model		FE model		RE model		Hausman-Taylor	
		Coeff.	Stat sig.	Coeff.	Stat. sig.	Coeff.	Stat. sig	Coeff.	Stat. sig.
GDP_j		0,13		-2,84	***	-0,25	*	-1,68	***
GDP_m		4,82	***	10,07	***	5,92	***	8,30	***
$DIST_{jm}$		-4,07	***			-5,01	***	-5,63	***
GOV_j		-0,45	*	0,29		-0,54	***	-0,17	
GOV_m		7,82	***	5,94	***	7,92	***	6,87	***
INF_j		0,25	***	1,01	***	0,38	***	0,78	***
W_j		-0,00	**	-0,00	***	-0,00	***	-0,00	***
DI_j		-0,34	*	-0,15		-0,15		-0,07	
DI_m		-0,68		-0,01		-0,72	*	-0,37	
OT_{jm}		0,63	**	-0,82	**	0,06		-0,56	*
EU_j		-0,43	***	-0,40	***	-0,45	***	-0,43	***
Constant		35,28	***	6,42	***	42,42	***	47,08	***
Wald.chi						2752,27		1872,11	***
Num. of obs.		972		972		972		972	
F-test		436,32	***	180,45	***				
R-square	within			0,67		0,64			
	between			0,08		0,95			
	overall	0,91		0,11		0,90			
LM						726,76	***		
Hausman test						76,56	***		

Note: ***, **, * represent statistical significant at 1%, 5% and 10%, respectively

The distance variable also proves significant at the 1% level, which concludes that all three *gravity variables* are significant in this equation as well. The coefficient has its expected negative sign, suggesting that location is an important determinant. The

aggregated average governance indicator of investors has a positive value, imposing that a sound political and economical environment facilitate FDI outflow to this cluster.
Infrastructure and wage in the cluster proves to be significant yet again, with their expected positive and negative signs, respectively. The wage coefficient still remains very low, as in table 5.5, yielding a decrease of -0,1% in net FDI inflow if real wage increases by 1%. This result is consistent with the previous results depicted in section 5.3.1, which is also the case for infrastructure with the coefficient value 0,78. The coefficient on EU membership for the cluster is the last variable significant at the 1% level. EU membership is estimated to have a negative effect of attracting FDI, valued at -0,43 – a relatively inelastic coefficient value, but still proved as an important determinant for the level of FDI inflow from the *average investor.*
The coefficient OT_{jm}, representing the clusters degree of openness to trade, is presented with a negative sign and is the only coefficient significant at the 10% level. This result suggests that if their degree of openness increases with 1%, the level of net FDI inflow will decrease with 0,56%. This result is not consistent with the results in section 5.3.1 and will addressed further in chapter 6 under possible limitations of this study. The other variables in table 5.7 are not statistically significant and therefore not of interest in this brief summary of comparison.

Research question 2 is formulated in order to search for patterns that might suggest that sector-preferential FDI is an indication of comparative advantages. Assuming that investors are rationale and seek out investments with expectations of a higher rate of return, a sector receiving a higher rate of FDI could imply higher efficiency and possibly comparative advantages in this specific sector.
Table 5.8 lists the country-specific estimates from the LSDV regression on the cluster. "*Agriculture, forestry and fishing"* is chosen as the base and dummy variables were constructed for the other sectors. The coefficients of the sectors are interpreted as the sectors difference to the base sector. The coefficient of *Manufacturing* is statistically significant at the 1% level and exhibits a positive sign. This suggests that the *Manufacturing* sector differ from *Agriculture* by receiving significantly more FDI inflow. Because of the high value of the coefficient, we can deduce that the difference is of importance and the first signal of sector-preferential FDI.

Financial and insurance activities appear to be next in line for foreign investors. The 1% level of significance and high coefficient value indicates that this sector also is a substantial receiver of FDI in the cluster.

Table 5.8: Cluster sector-specific estimation: coefficients and test statistics, RQ2

Base: Agriculture, forestry and fishing	Coeff.	Stat. sig
Mining and quarrying	-0,07	
Manufacturing	3,97	***
Electricity, gas and water supply	1,97	
Construction	1,35	
Wholesale, retail trade, repair of motor vehicles etc.	3,29	**
Transport, storage and communication	2,97	**
Accommodation and food service activities	0,41	
Financial and insurance activities	3,67	***
Real estate, renting and business activities	3,20	**
Education	-3,27	**
Human health and social work activities	-1,19	
Other	1,61	

Note: ***, **, * represent statistical significant at 1%, 5% and 10%, respectively

Wholesale, Transport, Real estate and *Education* are also statistically significant, but at the 5% level. While *Education* receive significantly less FDI than *Agriculture*, *Wholesale*, *Real estate* and *Transport* receives significantly more. All of these 5%-coefficient also has a high coefficient value, suggesting that there are substantial sectorial differences within the cluster. The other sectors listed are not statistically significant and does not influence any final conclusion. In order to capture these differences within the cluster, dummy variables was constructed in the country-specific model and computed with a LSDV model.

Table 5.9 illustrates the estimation results for each country. *Agriculture* is still used as base and the same sector-specifications were used as in table 5.8. The magnitude of significant coefficients for CZ suggests that there are big sectorial differences within the economy in terms of receiving FDI. In addition, most of them are presented with a positive sign, implying that they are receiving significantly more than *Agriculture*. Since all sector coefficients have the same base (*Agriculture*), the value of the coefficients will

determine which sector receives most or least FDI. *Education* and *Human health* are presented with a negative sign. Since Education is the only negative coefficient that is statistically significant, we can identify this sector as the smallest recipient of FDI in CZ.

Table 5.9: Country-specific estimation results: coefficients and test statistics, RQ2

	Czech R.		Estonia		Hungary		Latvia		Poland	
	Coeff	Stat sig	Coeff	Stat sig	Coeff	Stat sig	Coeff	Stat sig	Coeff	Stat sig
Mining	2,39	***	-0,72	**	-0,84	***	-0,95	**	-0,32	
Manufacturing	5,59	***	3,09	***	3,97	***	2,39	***	4,58	***
Electricity	3,89	***	1,31	***	2,10	***	1,32	***	1,30	***
Construction	2,39	***	1,02	***	0,64	***	0,72	*	1,92	***
Wholesale	4,44	***	2,74	***	2,90	***	2,46	***	3,76	***
Transport	4,12	***	2,49	***	2,87	***	2,43	***	2,75	***
Accommodation	1,40	***	0,02		0,23		-0,07		0,26	
Financial	4,80	***	3,70	***	2,75	***	2,95	***	3,92	***
Real estate	4,35	***	2,92	***	3,32	***	2,33	***	3,15	***
Education	-3,34	***	-3,44	***	-		-3,65	***	-4,25	***
Human health	-0,02		-2,92	***	-		-2,67	***	-0,95	**
Other	1,82	***	1,08	***	1,79	***	1,76	***	1,77	***
R-square	0,84		0,84		0,84		0,74		0,77	

Note: ***, **, *represent statistical significant at 1%, 5% and 10%, resp.

The non-significant coefficient of *Human health* implies that the sector does not differ significantly from *Agriculture* and thereby experience approximately the same growth in FDI inflow. It seems as if *Manufacturing* is the main recipient of FDI in CZ, with a coefficient value of 5,59. This means that when *Agriculture* experiences an increase in FDI of 1%, *Manufacturing* FDI inflows increases additionally 5,59%. Other substantial sectors in CZ are *Financials*, *Wholesale*, *Real Estate* and *Transport*, all four with a coefficient value above 4%. These sectors also constituted the majority recipients in the cluster. The other sectors in CZ are significant and positive with respect to Agriculture, but the five sectors mentioned are by far the biggest recipients and thus will be the focus for CZ further in the conclusion. Since the greater part of the sector coefficients are significant and positive, it can insinuate that Agriculture is a rather miniscule recipient of FDI.

The Estonian sectors are also presented with a large number of significant coefficients. "*Accommodation and food service activities"* is the only sector with a statistically insignificant coefficient, suggesting that it does not differ from *Agricultural* FDI. However, there are a few sectors that negatively differ. *Education*, *Human health* and *Mining* are presented with negative coefficients of 3,44, 2,92 and 0,72, respectively. "*Education"* and "*Health care"* are usually funded by governments and the negative coefficient is expected. The coefficient of Mining is relatively inelastic, but the coefficient is statistically significant at the 5% level, suggesting the growth in FDI inflow to *Mining and quarrying* is systematically less than in *Agriculture*. The sectors that make the biggest recipients of net FDI inflow in Estonia, in order of coefficient size, are *Financials*, *Manufacturing*, *Real estate*, *Wholesale* and *Transport*. These sectors are the same as in CZ, but not in the same order of size.

The sector-specific FDI inflow to *Education* and *Human health* in Hungary was not available, suggesting that FDI inflow to these sectors are non-existing or is picked up by *Other* because of its small size. The most substantial sectors in Hungary are *Manufacturing, Real Estate, Wholesale, Transport* and *Financials*. Still, these are the same sectors as in the previous two countries, but in different order in terms of coefficient value size and thereby importance. The fact that there are differences between the countries is expected and positively accepted in terms of answering the question on sector-preferential FDI and comparative advantages.

The Latvian estimates also provide a great deal of significant coefficients and still acknowledges that *Education* and *Human health* are not particularly funded by FDI. *Mining* is also negatively related to *Agriculture* in Latvia, significant at the 5% level. Here, the biggest recipients of FDI are Financials, Wholesale, Transport, Manufacturing and Real estate with their respective coefficients of 2,95, 2,46, 2,43, 2,39 and 2,33. Again, the order of importance has changed, but not the sectors that constitute the five biggest recipients. All of the coefficients are statistically significant at the 1% level of significance.

Poland, which is the biggest country in the cluster in terms of GDP, presents itself with a majority of significant sectors that positively differ from *Agriculture*. Here, *Manufacturing* is by far the biggest recipient of FDI with a coefficient value of 4,58. The next sectors on the list are *Financials*, *Wholesale*, *Real estate* and *Transport* with 3,92, 37,6, 3,15 and 2,75, respectively. *Accommodation* and *Mining* is not presented as

significantly different from *Agriculture* and thereby their coefficient signs are not reliable.

"Electricity, gas and water supply" and "*Construction"* are presented with positive and statistically significant coefficients in all five countries. Their coefficient values, however, does not indicate them being one of the five biggest sectors and are therefore excluded when attempting to explain whether the sector-specific investments may suggest patterns of comparative advantages.

The R squared values presented at the end of table 5.9 tells us that the LSDV model had significant explanatory power, which in turn makes the sector-specific coefficients valid and consistent. The five sectors that represented the majority of sector-specific FDI provided us with essential information that will be employed when attempting to answer RQ2 in chapter 6.

6 Conclusions

The objectives of this study have been to find potential push and pull determinants of net FDI inflow to Czech Republic, Estonia, Hungary, Latvia and Poland, as well as determine if there are patterns of comparative advantages indicated by high levels of sector-preferential FDI. The results of the econometric models were presented and briefly discussed in chapter 5. This chapter will provide a summary of the most important findings for both the cluster and country-specific, and highlight how these might affect policy makers in terms of attracting more FDI to the countries in the study. Because of the variation these countries exhibit, both political and economically, the results may prove useful to other Central and Eastern European countries, as the cluster results could represent an *average CEE country*. Further on, this chapter includes a section on the limitations of the study and a section on suggestions for further research.

6.1 Main findings

6.1.1 Objective I

The first objective of this study is to determine potential push and pull factors that drive net FDI inflow in to the five countries highlighted by employing panel data of 15 major investing countries to each host country during 1996-2012. The model was constructed based on a theoretical framework from chapter 3 and previous empirical results introduced in the literature review. A Hausman-Taylor estimation technique for panel data was used, treating Host-country GDP and Wage as endogenous variables. The results varied between the five subject countries, but they all presented significant coefficients. The results from the cluster estimation appear to be of a higher quality due to the large sample size.

The positive and statistically significant coefficient of GDP and infrastructure in the cluster suggests that by raising GDP and government expenditure would play an important role in attracting FDI inflows. However, this result does not apply in the country-specific estimation results. Czech Republic and Poland are presented with statistically significant coefficients for GDP, but with a negative sign. This could suggest that these countries have experienced negative growth rates in FDI inflow while GDP

increases, implying that investors invest less despite the increased GDP. This might be a coincidence, since we get a positive coefficient when increasing the sample size for cluster estimation.

Source country GDP growth is estimated statistically significant and positive for the cluster and all countries except Latvia. An increasing market size facilitates investors to participate in direct investments abroad. This result is regarded as a push factor for FDI to the CEE countries. Host country policy makers do not have sufficiently influence on foreign GDP growth to use this in attracting FDI inflow, but it provides important insight to what factors drive FDI. The distance coefficient proved significant and negative for the cluster and Estonia. However, the other countries' coefficients were also negative, but not statistically significant. This variable can be viewed as a proxy for cost of information and threshold of doing business. The negative coefficients suggest that the distance is an important determinant for investors' decision-making. While the distance cannot the reduced, the countries could lower the threshold by reducing the cost and ease of doing business, therein attracting more FDI.

Positive and significant coefficient on governance indicator for Latvia suggests that improving good governance will play an important role in raising investors' confidence and in attracting FDI. For the cluster, this coefficient is significant but negative. Since the other country-specific coefficients for host governance indicator did not appear statistically significant, taking the aggregated average GOV into the cluster estimation may have distorted the estimation result for this specific coefficient. This might also provide an answer to why the source-country governance indicator did not come out as significant, although empirical studies suggest it is.

The growth in real wage is estimated to have a significant and positive impact on the attraction of FDI for Czech Republic and Poland. This result might insinuate that foreign investors are attracted by a growing middle-class and consumption ability in these countries. Combined with the results from table 5.9, the level of significance and size of *Wholesale* make a strong indication of this. By increasing the level of disposable income, the government will attract substantially more FDI due to the relatively elastic coefficients for wage. The cluster results, however, indicate that investors searches to exploit cheaper labour in CEE countries. This asset exploiting FDI is generally closely combined with infrastructure and by increasing budget spending on infrastructural improving projects, countries might still be able to attract this type of FDI.

The untraditional variable, domestic investment, proved significant for the cluster in terms of attracting additional FDI inflows. By facilitating an increase in domestic investment, the CEE countries might improve investors' confidence and promote further investments and/or joint ventures. This coefficient was especially important for Czech Republic with a highly elastic coefficient of 2,80, which actually makes it the most important determinant for CZ in terms of attracting FDI inflow. The level of domestic investments in CZ's source countries has approximately the same, but offsetting effect on FDI flows to CZ. Therefore, it is important for CZ to create incentives for foreign investors to invest abroad, rather than domestically.
Finally, coefficients for openness to trade and EU membership go hand in hand. All of the five countries in the cluster became members of the EU in 2004 and 75% of their trading partners in this study are also members. The openness to trade proves significantly positive for the whole cluster and that is also the case for source-country EU membership. By increasing trade relations within the EU, the countries could be able to establish further relations and tie bonds, which result in new major sources of FDI. This also coincides with the distance coefficient.

Many of these results are aligned with both theory and related research, and it also tells us that there are differences between the countries. Most importantly, the estimations identified multiple important determinants of what pull and push FDI inflow to the CEE countries, making it possible for decision-makers within these five countries to attract more FDI inflow to their respective economies.

6.1.2 Objective II

The second objective of this study is an attempt to answer whether there are patterns in the FDI inflows at the disaggregated level that could indicate the presence of comparative advantages in these countries. Assuming that investors are rational and target their investments toward sectors that will yield a higher rate of return than other sectors, both within each country and among others (i.e., if the investor chooses to invest in manufacturing in Estonia, it is because the manufacturing sector in Estonia is expected to yield a higher rate of return than other sectors in Estonia and in other countries) (Miller and Modigliani 1961).

The cluster estimations suggest that *Manufacturing* is the biggest recipient of FDI inflows, closely followed by *Financials* and the *Wholesale* sector. These results for the cluster supports the theory imposed in 6.1.1 that suggested that the CEE cluster might be exploited for both cheaper labour and a growing ability to consume. A growing middle-class does not rule out that there are low wages in the manufacturing sector. Since there is such a small difference in the coefficients of these three sectors, it is not possible to make an assumption that any of them inhabit patterns of comparative advantage for the cluster. This conclusion was rather expected for the cluster, and it is the country-specific estimations that are of interest in search for these indications.

Manufacturing sector is a substantial recipient of FDI in Czech Republic and significantly differs from other sectors. The coefficient value of 5,59 could imply that we can see some patterns of comparative advantages in manufacturing. The manufacturing coefficient for Poland also stands out as the most significant recipient in Poland, and thereby suggesting that Poland might have a comparative advantage in manufacturing. These results might be influenced by the existence of cheap labour in the two countries, but the sector has proved to be highly sector-preferential for foreign investors.
The other three countries also exhibit high coefficients for manufacturing, but is either ranked lower or has another sector alongside it. The assumption is that specific sectors will be especially preferred, and other closely adjacent sector coefficients will dismiss this assumption, making it not possible to reach a conclusion for these three countries.

However, the results from the estimations speak in favour of the existence of significant patterns in sector-preferential FDI inflow to *Manufacturing* in Czech Republic and Poland, suggesting that these countries inhabit patterns of comparative advantages in manufacturing.

6.2 Limitations

One of the possible limitations for this study is the validity of the coefficient estimates. Some of the results, especially in RQ2, are presented with an unseeingly high R squared. The potential problem related to an inflated R square is that there could be an issue with multicollinearity. However, multicollinearity often presents itself with a high R square

and very low t statistics, which is not the case here. There are multiple significant coefficients all the way up to the 1% level of significance. An possible answer could be omitted variables. Omitted variables issues presents itself with inflated t statistics, but also with a very low R squared, which is not the case. There is no clear theory on how a combination of these two issues would present itself in terms of t statistics and R squared, making it difficult to discover what issues might be present. On that note, I recommend that these coefficient estimates be handled with caution.

Despite the temporary admittance to the Vienna Institute's database, there are still a few missing observations in both the dependent and independent variables. Since the time span is 17 years, only a couple of missing observations is necessary to have a negative impact on the final coefficient estimates. This limitation is especially present in the country-specific estimations, since they have a much smaller sample size than of the cluster estimations.

Finally, even though attempted solved by using a Hausman-Taylor model, there could still be a problem with endogeneity. Economic indicators are often closely linked and have an effect on each other. This is especially the case for GDP and government spending, and GDP versus domestic investment. Their development is often closely related and could indicate a causality issue. This might cause the coefficients to be inconsistent and biased, another reason to handle coefficient estimates with caution.

6.3 Suggestions for further study

For further studies, it could be beneficial to embrace different aspects of the economy than what has been included in this study. *Gravity variables* and governance indicators have been empirically tested and proved substantially, but it would be interesting to see whether there are other factors that drive foreign investments into these CEE countries. For instance, if employment in different sectors could prove any relation in terms of the disaggregated FDI flows. There is no clear theory on what the determinants of FDI are, making this research question very much open for experimentation with panel data sets.

The political and economic effects of foreign direct investments are also yet to be determined. Different studies suggest different impacts, depending on the country where the study was conducted and which variables that were included. I would recommend a study of the effect of FDI on CEE countries. The study might include looking at the impact on GDP, social welfare, domestic income and even the CEE countries' FDI outflow.

For further study it would be interesting to see whether the significant sector-preferential FDI inflows are actually due to comparative advantages and/or if comparative advantages arise due as an effect of receiving FDI. The theoretical framework for FDI suggests that a potential benefit could be transference of technology and managerial skills. If these benefits are adapted in to a sector that has the possibility to apply these skills/technologies more efficiently, it could in turn create a comparative advantage in the sector.

References

Appleyard, D. R. and A. J. Field (2014). International economics. New York, McGraw-Hill/Irwin.

Asiedu, E. (2002). "On the determinants of foreign direct investment to developing countries: is Africa different?" World development **30**(1): 107-119.

Bengoa, M. and B. Sanchez-Robles (2003). "Foreign direct investment, economic freedom and growth: new evidence from Latin America." European journal of political economy **19**(3): 529-545.

Bevan, A., et al. (2004). "Foreign investment location and institutional development in transition economies." International Business Review **13**(1): 43-64.

Bevan, A. A. and S. Estrin (2000). "The determinants of foreign direct investment in transition economies."

Bevan, A. A. and S. Estrin (2004). "The determinants of foreign direct investment into European transition economies." Journal of Comparative Economics **32**(4): 775-787.

Biswas, R. (2002). "Determinants of foreign direct investment." Review of Development Economics **6**(3): 492-504.

Blanchard, O. (1993). Post-communist reform: pain and progress. Cambridge, Mass., MIT Press.

Breusch, T. S. and A. R. Pagan (1980). "The Lagrange multiplier test and its applications to model specification in econometrics." The Review of Economic Studies: 239-253.

Chakrabarti, A. (2001). "The determinants of foreign direct investments: Sensitivity analyses of cross‐country regressions." Kyklos **54**(1): 89-114.

Cheng, L. K. and Y. K. Kwan (2000). "What are the determinants of the location of foreign direct investment? The Chinese experience." Journal of international economics **51**(2): 379-400.

CIA (2013). "The World Factbook." from https://http://www.cia.gov/index.html.

Clague, C. and G. C. Rausser (1992). The Emergence of market economies in Eastern Europe. Cambridge, Mass., Blackwell.

De Benedictis, L. and D. Taglioni (2011). The gravity model in international trade. The Trade Impact of European Union Preferential Policies, Springer**:** 55-89.

Dunning, J. H. (1993). "Multinational enterprises and the global economy, 1993." Addison-Welsley Publishing Company.

EIU, T. E. I. U. (1990). "Eastern Europe & the USSR: Economic structur and analysis." EIU Regional Reference Series.

Estrin, S. a. U., Milica (2013). "Foreign Direct Investment into Transition Economies: Are the Balkans Different?" **LEQS Paper No. 64**.

Fischer, S. and A. Gelb (1991). "The Process of Socialist Economic Transformation." The Journal of Economic Perspectives **5**(4): 91-105.

Fisher, S. (2006). Political change in post-Communist Slovakia and Croatia: from nationalist to Europeanist, Macmillan.

Grewal, R., et al. (2004). "Multicollinearity and measurement error in structural equation models: Implications for theory testing." Marketing Science **23**(4): 519-529.

Gros, D. and A. Steinherr (1995). Winds of change: economic transition in Central and Eastern Europe. London, Longman.

Hausman, J. A. (1978). "Specification tests in econometrics." Econometrica: Journal of the Econometric Society: 1251-1271.

Kekic, L. (2005). "Foreign direct investment in the Balkans: recent trends and prospects." Southeast European and Black Sea Studies **5**(2): 171-190.

Krugman, P. R. and M. Obstfeld (2003). International economics: theory and policy. Boston, Mass., Addison-Wesley.

Medve-Bálint, G. (2014). The role of EU in shaping FDI flows to east central Europe. Oxford, Blackwell. **52(2014)nr. 1:** S. 35-51.

Miller, M. H. and F. Modigliani (1961). "Dividend policy, growth, and the valuation of shares." the Journal of Business **34**(4): 411-433.

Pavitt, K. (1984). "Sectoral patterns of technical change: towards a taxonomy and a theory." Research policy **13**(6): 343-373.

Prasad, E. S. (2003). Effects of financial globalization on developing countries: some empirical evidence. Washington, D.C., The Fund.

Resmini, L. (2000). "The determinants of foreign direct investment in the CEECs: New evidence from sectoral patterns." Economics of transition **8**(3): 665-689.

Sachs, J., et al. (1994). "Structural Factors in the Economic Reforms of China, Eastern Europe, and the Former Soviet Union." Economic Policy **9**(18): 102-145.

Stock, J. H. and M. W. Watson (2012). Introduction to econometrics. Boston, Mass., Pearson.

Tabachnick, B. G. and L. S. Fidell (2001). "Using multivariate statistics."

Transition, C. f. C.-o. w. E. E. i. (1993). Glossary of industrial organisation economics and competition law, Organization for Economic.

WIIW (2014). "Vienna Institute for International Economic Studies (WIIW)."

Wooldridge, J. M. (2010). Econometric analysis of cross section and panel data, MIT press.

Wooldridge, J. M. (2013). Introductory econometrics: a modern approach. [S.l.], South-Western, Cengage Learning.

WorldBank (2013). "World Development Indicators." Online data base. from http://data.worldbank.org/.

Åslund, A. (2007). How capitalism was built: the transformation of Central and Eastern Europe, Russia and Central Asia. New York, Cambridge University Press.

Åslund, A. (2013). How capitalism was built: the transformation of Central and Eastern Europe, Russia, the Caucasus, and Central Asia. Cambridge, Cambridge University Press.

Appendix 1 – Governance Indicators

Indicators are: 1) Voice and accountability, 2) Political stability, 3) Government Effectiveness, 4) Regulatory Quality, 5) Rule of Law, and 6) Control of corruption.

Table A.1-1: Governance Indicators Czech Republic, 1996-2012

	1	2	3	4	5	6
1996	1,00	1,04	0,62	1,02	0,84	0,65
1998	0,91	0,81	0,62	0,92	0,84	0,55
2000	0,68	0,26	0,62	0,73	0,60	0,08
2001	0,83	0,60	0,79	0,96	0,71	0,22
2002	0,98	0,95	0,97	1,19	0,83	0,36
2003	0,97	0,85	0,89	1,18	0,84	0,44
2004	0,95	0,63	0,91	1,08	0,74	0,38
2005	0,88	0,91	0,97	1,12	0,82	0,46
2006	0,93	1,01	1,08	1,11	0,84	0,30
2007	0,96	0,98	0,90	1,03	0,86	0,23
2008	1,00	1,01	1,01	1,16	0,89	0,27
2009	1,02	0,88	0,89	1,33	0,94	0,33
2010	1,00	0,96	0,91	1,30	0,93	0,26
2011	0,99	1,10	0,93	1,21	1,02	0,30
2012	0,93	1,04	0,92	1,06	1,01	0,23

Source: World Bank- World Development Indicators

Table A.1-2: Governance Indicators Estonia, 1996-2012

	1	2	3	4	5	6
1996	0,87	0,68	0,57	1,37	0,47	-0,06
1998	1,00	0,56	0,53	1,27	0,53	0,57
2000	0,95	0,79	0,72	1,30	0,58	0,65
2001	1,00	0,82	0,72	1,34	0,67	0,65
2002	1,06	0,84	0,72	1,39	0,76	0,64
2003	1,06	0,86	0,93	1,32	0,75	0,79
2004	1,10	0,66	0,97	1,33	0,92	0,92
2005	1,01	0,59	0,99	1,34	0,92	0,97
2006	1,05	0,71	1,15	1,30	1,09	0,96
2007	1,06	0,60	1,04	1,37	1,12	0,91
2008	1,07	0,54	1,16	1,43	1,16	0,87
2009	1,08	0,53	1,03	1,41	1,09	0,91
2010	1,10	0,60	1,11	1,40	1,13	0,86
2011	1,12	0,58	1,10	1,39	1,16	0,93
2012	1,09	0,60	0,96	1,40	1,13	0,98

Source: World Bank- World Development Indicators

Table A.1-3: Governance Indicators Hungary, 1996-2012

	1	2	3	4	5	6
1996	1,01	0,91	0,84	0,88	0,83	0,58
1998	1,08	1,12	0,94	1,01	0,79	0,65
2000	1,16	0,82	0,96	1,07	0,85	0,69
2001	1,16	1,00	0,99	1,19	0,89	0,61
2002	1,16	1,18	1,02	1,31	0,93	0,52
2003	1,13	1,11	0,96	1,12	0,89	0,60
2004	1,14	0,81	0,90	1,18	0,89	0,65
2005	1,16	0,98	0,80	1,11	0,83	0,62
2006	1,02	0,96	0,88	1,21	0,96	0,61
2007	1,04	0,72	0,72	1,19	0,92	0,56
2008	0,96	0,72	0,71	1,19	0,89	0,38
2009	0,90	0,52	0,68	1,08	0,76	0,34
2010	0,90	0,67	0,67	1,02	0,75	0,25
2011	0,82	0,74	0,68	1,03	0,74	0,32
2012	0,72	0,67	0,62	0,97	0,60	0,28

Source: World Bank- World Development Indicators

Table A.1-4: Governance Indicators Latvia

	1	2	3	4	5	6
1996	0,63	0,44	0,19	0,99	0,03	-0,82
1998	0,76	-0,08	0,15	0,86	0,18	-0,03
2000	0,67	0,29	0,26	0,75	0,14	-0,29
2001	0,74	0,57	0,40	0,82	0,21	-0,20
2002	0,81	0,85	0,54	0,88	0,28	-0,12
2003	0,74	0,97	0,66	0,96	0,56	0,18
2004	0,69	0,60	0,65	0,99	0,58	0,14
2005	0,77	0,79	0,59	0,94	0,59	0,32
2006	0,82	0,82	0,69	1,00	0,64	0,29
2007	0,81	0,57	0,49	1,01	0,71	0,25
2008	0,75	0,23	0,56	1,03	0,79	0,13
2009	0,84	0,34	0,63	0,99	0,80	0,13
2010	0,77	0,49	0,72	0,99	0,78	0,13
2011	0,71	0,30	0,71	0,97	0,75	0,19
2012	0,74	0,43	0,83	1,00	0,76	0,15

Source: World Bank- World Development Indicators

Table A.1-5: Governance Indicators Poland, 1996-2012

	1	2	3	4	5	6
1996	1,01	0,72	0,78	0,65	0,67	0,54
1998	1,06	0,74	0,67	0,68	0,76	0,67
2000	1,06	0,22	0,60	0,73	0,65	0,55
2001	1,07	0,44	0,55	0,74	0,64	0,44
2002	1,07	0,65	0,49	0,75	0,63	0,33
2003	0,97	0,54	0,55	0,72	0,51	0,38
2004	1,00	0,11	0,49	0,81	0,40	0,11
2005	0,90	0,34	0,48	0,81	0,42	0,22
2006	0,76	0,33	0,42	0,71	0,35	0,17
2007	0,84	0,64	0,40	0,77	0,37	0,19
2008	0,92	0,86	0,48	0,82	0,51	0,35
2009	1,01	0,90	0,52	0,95	0,60	0,37
2010	1,03	0,99	0,64	0,99	0,66	0,41
2011	1,03	1,06	0,62	0,94	0,75	0,49
2012	1,06	1,03	0,66	0,96	0,74	0,59

Source: World Bank- World Development Indicators

Table A.2-1: Correlation Matrix Czech Republic

var	mean	SD	GDP_j	GDP_i	$DIST_{ij}$	GOV_j	GOV_i	INF_j	W_j	DI_j	DI_i	OT_{ij}	EU_j	EU_i
GDP_j	11,622	0,514	1,000											
GDP_i	12,973	1,749	0,190	1,000										
$DIST_{ij}$	6,855	1,013	0,019	0,356	1,000									
GOV_j	0,813	0,109	0,660	0,133	0,007	1,000								
GOV_i	1,299	0,405	-0,040	0,113	-0,279	-0,033	1,000							
INF_j	13,982	0,337	0,890	0,147	0,025	0,470	-0,039	1,000						
W_j	9,739	0,294	0,950	0,173	0,023	0,520	-0,036	0,978	1,000					
DI_j	0,020	0,086	-0,082	-0,034	0,003	-0,226	0,001	-0,064	-0,115	1,000				
DI_i	0,029	0,091	-0,144	-0,148	-0,011	-0,121	-0,054	-0,208	-0,191	0,482	1,000			
OT_{ij}	0,056	0,091	0,082	0,295	-0,444	0,032	0,050	0,083	0,087	0,016	-0,052	1,000		
EU_j	0,529	0,500	0,923	0,174	0,017	0,537	-0,043	0,800	0,867	0,027	-0,058	0,083	1,000	
EU_i	0,706	0,457	0,171	-0,057	-0,472	0,105	0,347	0,135	0,152	0,003	0,007	0,224	0,191	1,000

Note: Authors own calculations

Table A.2-2: Correlation Matrix Estonia

var	mean	SD	GDP_j	GDP_i	$DIST_{ij}$	GOV_j	GOV_i	INF_j	W_j	DI_j	DI_i	OT_{ij}	EU_j	EU_i
GDP_j	9,308	0,601	1,000											
GDP_i	12,451	1,936	0,233	1,000										
$DIST_{ij}$	6,868	1,009	0,009	0,391	1,000									
GOV_j	0,917	0,128	0,928	0,203	0,008	1,000								
GOV_i	1,328	0,691	0,017	0,162	0,017	0,019	1,000							
INF_j	8,146	0,505	0,980	0,230	0,010	0,940	0,019	1,000						
W_j	15,906	7,945	0,971	0,239	0,011	0,891	0,022	0,989	1,000					
DI_j	0,109	0,214	-0,254	-0,019	0,005	-0,179	0,024	-0,307	-0,280	1,000				
DI_i	0,039	0,132	-0,105	-0,153	-0,080	-0,074	-0,145	-0,155	-0,148	0,465	1,000			
OT_{ij}	0,062	0,069	0,038	0,105	-0,746	0,038	-0,026	0,036	0,038	0,052	0,039	1,000		
EU_j	0,529	0,500	0,929	0,213	0,008	0,837	0,011	0,878	0,867	-0,242	-0,069	0,044	1,000	
EU_i	0,639	0,481	0,180	-0,024	-0,269	0,166	0,455	0,169	0,164	-0,062	-0,102	0,270	0,198	1,000

Note: Authors own calculations

Table A.2-3: Correlation Matrix Hungary

var	mean	SD	GDP_j	GDP_i	$DIST_{ij}$	GOV_j	GOV_i	INF_j	W_j	DI_j	DI_i	OT_{ij}	EU_j	EU_i
GDP_j	11,336	0,457	1,000											
GDP_i	13,386	1,730	0,157	1,000										
$DIST_{ij}$	7,346	0,971	0,000	0,368	1,000									
GOV_j	0,865	0,107	-0,495	-0,101	0,000	1,000								
GOV_i	1,329	0,366	-0,081	-0,184	-0,470	0,055	1,000							
INF_j	15,987	0,445	0,932	0,141	0,000	-0,313	-0,072	1,000						
W_j	11,754	0,485	0,934	0,142	0,000	-0,345	-0,072	0,998	1,000					
DI_j	0,025	0,106	-0,389	-0,065	0,000	0,386	0,044	-0,440	-0,464	1,000				
DI_i	0,020	0,079	-0,131	-0,128	-0,010	0,241	0,088	-0,152	-0,166	0,549	1,000			
OT_{ij}	0,051	0,083	0,024	0,338	-0,337	0,012	0,098	0,049	0,049	-0,013	-0,062	1,000		
EU_j	0,529	0,500	0,923	0,150	0,000	-0,551	-0,074	0,826	0,822	-0,319	-0,067	0,021	1,000	
EU_i	0,635	0,482	0,064	-0,103	-0,635	-0,038	0,113	0,057	0,057	-0,022	0,050	0,336	0,069	1,000

Note: Authors own calculations

Table A.2-4: Correlation Matrix Latvia

var	mean	SD	GDP_j	GDP_i	$DIST_{ij}$	GOV_j	GOV_i	INF_j	W_j	DI_j	DI_i	OT_{ij}	EU_j	EU_i
GDP_j	9,535	0,612	1,000											
GDP_i	12,115	2,169	0,166	1,000										
$DIST_{ij}$	6,933	0,885	0,000	0,312	1,000									
GOV_j	0,518	0,161	0,819	0,140	0,000	1,000								
GOV_i	1,299	0,657	-0,003	0,147	0,094	0,000	1,000							
INF_j	8,328	0,573	0,992	0,164	0,000	0,802	-0,003	1,000						
W_j	5,822	0,544	0,987	0,163	0,000	0,794	-0,003	0,996	1,000					
DI_j	0,098	0,213	-0,579	-0,091	0,000	-0,298	0,004	-0,600	-0,624	1,000				
DI_i	0,039	0,143	-0,166	-0,080	-0,120	-0,065	-0,088	-0,187	-0,206	0,440	1,000			
OT_{ij}	0,037	0,038	0,041	0,252	-0,561	0,047	-0,376	0,039	0,036	0,028	0,062	1,000		
EU_j	0,529	0,500	0,905	0,157	0,000	0,763	-0,006	0,890	0,868	-0,449	-0,092	0,057	1,000	
EU_i	0,675	0,469	0,254	0,062	-0,171	0,214	0,537	0,250	0,234	-0,126	-0,076	0,109	0,290	1,000

Note: Authors own calculations

Table A.2-5: Correlation Matrix Poland

var	mean	SD	GDP_j	GDP_i	$DIST_{ij}$	GOV_j	GOV_i	INF_j	W_j	DI_j	DI_i	OT_{ij}	EU_j	EU_i
GDP_j	12,525	0,455	1,000											
GDP_i	13,112	1,677	0,198	1,000										
$DIST_{ij}$	7,253	0,800	-0,006	0,339	1,000									
GOV_j	0,666	0,110	0,072	0,024	-0,006	1,000								
GOV_i	1,462	0,348	-0,102	-0,250	-0,703	0,000	1,000							
INF_j	12,909	0,355	0,960	0,190	-0,006	0,081	-0,093	1,000						
W_j	7,672	0,394	0,872	0,169	-0,005	-0,055	-0,076	0,960	1,000					
DI_j	0,066	0,108	-0,085	0,000	0,001	-0,165	-0,005	-0,267	-0,399	1,000				
DI_i	0,023	0,079	-0,184	-0,119	-0,012	-0,159	0,105	-0,226	-0,210	0,528	1,000			
OT_{ij}	0,026	0,040	0,116	0,429	-0,257	-0,004	-0,110	0,116	0,109	0,004	-0,073	1,000		
EU_j	0,529	0,500	0,906	0,184	-0,004	-0,185	-0,101	0,848	0,767	0,071	-0,104	0,114	1,000	
EU_i	0,835	0,372	0,077	-0,113	-0,365	-0,021	0,031	0,072	0,065	0,007	0,035	0,219	0,087	1,000

Note: Authors own calculations

Appendix 3 – Estimation results for countries, RQ1

Table A.3-1: Estimation results RQ1, Czech Republic

		Pooled model		FE model		RE model		Hausman-Taylor	
		Coeff.	Stat. sig.	Coeff.	Stat. sig.	Coeff.	Stat. sig	Coeff.	Stat. sig.
GDP_j		0,13		-2,35	***	-0,46		-1,67	**
GDP_i		0,18	***	3,20	***	0,49	***	2,14	***
$DIST_{ij}$		-0,26	*			-0,62	*	-1,73	
GOV_j		0,18		0,33		0,07		0,22	
GOV_i		1,91	***	-1,20	*	0,49		-0,93	
INF_j		0,13		-0,40		-0,29		-0,45	
W_j		3,23		5,17	**	4,70	**	5,21	**
DI_j		3,22	**	2,73	***	2,79	**	2,80	***
DI_i		-3,55	**	-2,58	***	-2,56	***	-2,52	***
OT_{ij}		3,20	***	-0,82		-0,70		-2,05	
EU_j		-0,04		-0,26		-0,22		-0,27	
EU_i		0,45	*	0,44		1,02	***	0,75	**
Constant		8,34	***	6,50	***	10,48	***	18,36	**
Wald.chi						433,830	***	503,640	***
Number of obs.		230		230		230		230	
F-test		24,38	***	45,98	***				
R-square	within			0,71		0,68			
	between			0,05		0,43			
	overall	0,65		0,08		0,56			
LM						332,64	***		
Hausman test						32,62	***		
F-test						13,03	***		

Note: ***, **, * represent statistical significant at 1%, 5% and 10%, respectively

Table A.3-2: Estimation results RQ1, Estonia

		Pooled model		FE model		RE model		Hausman-Taylor	
		Coeff.	Stat. sig.	Coeff.	Stat. sig.	Coeff.	Stat. sig	Coeff.	Stat. sig.
GDP_j		0,26		-0,54		-0,11		-0,26	
GDP_i		0,33	***	1,23	***	0,63	***	0,81	***
$DIST_{ij}$		-0,34	**			-0,82	***	-0,99	**
GOV_j		2,44		2,47		2,31		2,34	
GOV_i		0,48	***	-0,43		0,04		-0,10	
INF_j		1,12		1,85		1,53		1,64	
W_j		0,00		0,00		0,00		0,00	
DI_j		-0,11		0,17		0,10		0,13	
DI_i		0,07		0,22		0,20		0,21	
OT_{ij}		8,73	***	-2,04		0,13		-0,92	
EU_j		0,11		-0,06		-0,03		-0,05	
EU_i		0,06		1,34	***	1,22	***	1,32	***
Constant		6,99	***	3,87	***	9,64	***	10,78	***
Wald.chi						819,080	***	855,760	***
Number of obs.		230		230		230		230	
F-test		54,28	***	76,20	***				
R-square	within			0,81		0,79			
	between			0,22		0,62			
	overall	0,76		0,29		0,69			
LM						431,87	***		
Hausman test						16,36	**		
F-test						13,53	***		

Note: ***, **, * represent statistical significant at 1%, 5% and 10%, respectively

Table A.3-3: Estimation results RQ1, Hungary

		Pooled model		FE model		RE model		Hausman-Taylor	
		Coeff.	Stat. sig.	Coeff.	Stat. sig.	Coeff.	Stat. sig	Coeff.	Stat. sig.
GDP_j		0,50		-0,95	*	0,16		-0,62	
GDP_i		0,12	***	2,28	***	0,48	***	1,72	***
$DIST_{ij}$		-0,05				-0,58	*	-1,51	
GOV_j		-0,48		0,95		-0,24		0,58	
GOV_i		1,24	***	0,38		0,39		0,32	
INF_j		1,71		0,87		1,45		1,04	
W_j		-0,15		0,90		0,18		0,71	
DI_j		-0,62		-0,46		-0,73		-0,54	
DI_i		0,28		0,24		0,71		0,41	
OT_{ij}		7,02	***	4,02		5,08	*	3,87	
EU_j		-0,05		-0,01		-0,02		-0,01	
EU_i		0,53	***	-0,08		0,24		0,03	
Constant		6,86	***	6,85	***	10,92	***	17,88	**
Wald.chi						469,560	***	555,820	***
Number of obs.		195		195		195		195	
F-test		52,77	***	50,60	***				
R-square	within			0,77		0,73			
	between			0,08		0,52			
	overall	0,69		0,11		0,59			
LM						419,45	***		
Hausman test						28,57	***		
F-test						13,45	***		

Note: ***, **, * represent statistical significant at 1%, 5% and 10%, respectively

Table A.3-4: Estimation results RQ1, Latvia

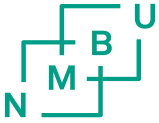
		Pooled model		FE model		RE model		Hausman-Taylor	
		Coeff.	Stat. sig.	Coeff.	Stat. sig.	Coeff.	Stat. sig	Coeff.	Stat. sig.
GDP_j		-1,39		-0,78		-1,42		-1,22	
GDP_i		0,52	***	-0,65		0,42	***	0,07	
$DIST_{ij}$		-0,08	***			-0,55		-0,34	
GOV_j		1,43		1,71	**	1,57	**	1,63	**
GOV_i		-0,09		2,05	**	-0,07		0,89	
INF_j		2,97		2,33		2,90	*	2,69	
W_j		0,40		0,96		0,53		0,69	
DI_j		0,22		-0,02		0,01		0,00	
DI_i		-0,43		-0,01		0,02		0,02	
OT_{ij}		0,78		7,09		5,04		5,01	
EU_j		-0,53		-0,60	*	-0,81	**	-0,75	**
EU_i		0,13		1,27	***	1,17	***	1,29	***
Constant		10,32	***	4,05	***	7,94	***	6,39	
Wald.chi						407,19	***	435,020	***
Number of obs.		220		220		220		220	
F-test		26,04	***	38,81	***				
R-square	within			0,69		0,67			
	between			0,16		0,44			
	overall	0,61		0,02		0,56			
LM						277,70	***		
Hausman test						16,73	**		
F-test						32,22	***		

Note: ***, **, * represent statistical significant at 1%, 5% and 10%, respectively

Table A.3-5: Estimation results RQ1, Poland

		Pooled model		FE model		RE model		Hausman-Taylor	
		Coeff.	Stat. sig.	Coeff.	Stat. sig.	Coeff.	Stat. sig	Coeff.	Stat. sig.
GDP_j		-0,25		-1,19	***	-0,52		-0,89	**
GDP_i		0,29	***	2,21	***	0,76	***	1,54	***
$DIST_{ij}$		0,11				-0,53		-1,08	
GOV_j		-0,80		-0,45		-0,62		-0,53	
GOV_i		0,60	**	0,03		0,00		0,02	
INF_j		1,55		0,98		1,33		1,14	
W_j		1,10		1,54	***	1,39	**	1,47	***
DI_j		0,09		-0,26		0,21		-0,05	
DI_i		0,00		0,34		0,04		0,21	
OT_{ij}		8,38	***	-3,97		-5,84	*	-5,64	*
EU_j		0,19		0,07		0,19		0,13	
EU_i		0,39	**	0,24		0,50	*	0,35	
Constant		6,39	***	7,27	***	10,96	***	15,10	**
Wald.chi						1182,53	***	1290,28	***
Number of obs.		250		250		250		250	
F-test		73,15	***	116,63	***				
R-square	within			0,85		0,84			
	between			0,32		0,33			
	overall	0,68		0,29		0,58			
LM						796,44	***		
Hausman test						21,95	***		
F-test						12,13	***		

Note: ***, **, * represent statistical significant at 1%, 5% and 10%, respectively



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