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Interaction between foreign financial  
services and foreign direct investment  
in Transition Economies:

An empirical analysis with focus on  
the manufacturing sector



## **Interaction between foreign financial services and foreign direct investment in Transition Economies: An empirical analysis with focus on the manufacturing sector**

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### **Abstract**

This paper studies the nexus between financial and non-financial foreign direct investment and its effect on manufacturing value added in Transition Economies, which are members of the EU. Three questions, which are pointed out in the theoretical literature, are discussed in the paper. We investigate whether financial services foreign direct investment has an effect on non-financial foreign direct investment; whether banks follow their clients; and whether there is any effect of foreign direct investment on economic growth. Those questions are tackled with empirical analysis using a dataset for 9 Transition Economies over the period 1996-2007. For most regressions we apply GMM and for one regression 2SLS, to tackle the endogeneity problem. The empirical results lead to three important statements: non-financial FDI is positively affected by financial services FDI and by market potential. Foreign banks in the EU Transition Economies are mainly driven by non-financial FDI and the capital intensity of a country. FDI crowds out domestic investment in the manufacturing sector.

### **Keywords**

Foreign direct investment, financial services, manufacturing sector, bilateral stocks, transition economies

### **JEL Codes**

F21, F3, O11, O16

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# 1 Introduction

Foreign direct investment and foreign banks are considered as an important source of economic growth and as a positive factor in the development and transformation of Transition Economies. The effect of foreign direct investment (FDI) and its short-run determinants are quite well studied, both in theoretical and empirical sense. However, a few studies about foreign financial services exist. Moreover, until now there has been only little empirical work which deals with the causality issue and answers the often discussed question:

*Do foreign banks follow their clients or do foreign banks work as a catalyst for foreign direct investment in Transition Economies?*

The theoretical as well as the empirical literature is concerned about the effects and determinants of the activity of foreign investors in Transition Economies. A positive growth effect of FDI through backward knowledge spill-overs in Lithuanian firms was found by Smarzynska Javorcik (2004). The general effect of FDI on the whole economy is studied by Borensztein, De Gregorio and Lee (1998). They show that a sufficient high level of absorption capacity is a crucial condition for an economy to gain from the presence of FDI. The determinants of FDI in a gravity model approach are studied by Bevan and Estrin (2004) and Carstensen and Toubal (2004). Both find that market potential and risk have a strong effect on FDI. However, neither one of these two studies considers the role of foreign banks, which is a very important economic factor. A study by M  r   and Valentinyi (2003) on the five largest EU Transition Economies shows the effect of foreign banks on the economy. Foreign banks contributed to privatization and modernization of the banking sector and lead to stability. Another study on this topic, by Weill (2003) shows that foreign banks increase competition and lead to more efficiency in the banking sector. This leads to the question why foreign banks decide to enter Developing Economies. In comparison to the literature on FDI, relatively few studies exist on this topic. Goldberg and Johnson (1990) find that US banks follow their clients abroad. Contrary, Wezel (2004) does not find evidence for this hypothesis for the countries of interest. German banks indeed follow their clients when countries in Asia are considered. However, in Central and Eastern Europe the economic development is the main determinant. Further on, the recent empirical literature shows that foreign banks increase the efficiency of the local economy. Eller, Haiss and Steiner (2006) use foreign banks as an important determinant of total factor productivity growth. Alfaro, Chanda, Kalemli-Ozcan and

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Sayek (2004) find that the development of the local financial system crucially affects the positive effect of FDI on growth.

Data on FDI and foreign banks seems to show a pattern in Central and Eastern European Countries (CEEC): Countries which have undergone a reform and allowed foreign banks to operate quite early, present also the highest FDI to GDP ratio in the past years. For example, by 2004 most of Hungarian banks are fully or partially owned by multinationals (Akbar and McBride 2004). As reported by Buch (1997) the market share of foreign or joint-venture banks in total assets in 1995 was 22.7% in Hungary, 15.9% in Czech Republic and 4.4% in Poland. Mérö and Valentinyi (2003) report data about foreign bank assets as % of GDP. In the year 1998 and 2002 in Hungary the shares are 35.4% and 49%, 31.8% and 94.4% for the Czech Republic and 9.6% and 40.7% for Poland. In the same years the share of foreign banks in commercial bank assets was 62.5% and 90.7% for Hungary, 28.1% and 85.8% for the Czech Republic and 17.4% and 70.9% for Poland. The presence of foreign banks seems to be related to the FDI to GDP ratio in those countries. In 1995 Hungary received a considerable FDI inflow of 10% of GDP, which stayed at around 7% in the subsequent years (The World Bank 2008). The Czech Republic received 4% and only 2% in the following years. A peak of 10% appeared in 1999 and the inflow remained quite high. Finally, Poland received around 2.6% and this number stayed constant, until it increased to 4.3% in 1999 and stayed at this level. The average FDI inflow over the period 1995-2005 was 6.57% in Hungary, 5.94% in the Czech republic and 3.42% in Poland.

Those numbers do not allow for conclusions, however they indicate that an early opening to foreign banks and significant participation of those was followed by a significant inflow of FDI. It is possible that economic factors have triggered both kinds of FDI with different lags. A precise empirical study is necessary to find the exact relationship and causality. Basing on the recent literature, we formalize the following questions, which we answer by empirical evidence: Do foreign banks work as a catalyst for FDI? Do foreign banks follow their client or open new markets? What is the effect of FDI and foreign banks on GDP growth? Three different but strictly connected problems are tackled in this paper. The literature review on each of the topics is presented in the corresponding section.

The data used in this paper is as follows. The CEEC destination countries are Bulgaria (1999-2007), Czech Republic (1997-2006), Estonia (1997-2007), Hungary (1998-2006), Latvia (1996-2007), Lithuania (1995-2007), Poland (1996-2006), Slovak Republic (1996-2005) and Slovenia (1994-2006). Data availability allows to study the period presented in brackets. Romania is excluded due to data availability problems. Data on bilateral FDI stocks and stocks disaggregated by sectors origins from the Vienna Institute for

International Studies. The data on financial services foreign direct investment (FSFDI) is reported at the NACE level. Financial services include banking, insurance, pension funds and leasing. The fraction of banking in the FSFDI stock is at least 80% in the case of Poland and up to 95% in the case of Estonia (Eurostat 2009). Foreign banks and other financial institutions which are usually subsidiaries<sup>1</sup> of the same investor offer also the remaining financial services. Thus, foreign financial services can be called foreign banking activity. However, to be precise, we use the term financial services foreign direct investment (FSFDI) through this paper. Other data that is used in this paper originates mainly from the World Development Indicators (The World Bank 2008), the Eurostat (2009) and OECD (2009). We compare data from different sources and use data which is consistent among different sources<sup>2</sup>. All variables are transformed into international \$ at year 2000 constant prices.

This paper is organized as follows. Section 2 deals with the determinants of foreign direct investment from donor countries to host countries. Section 3 deals with the determinants of foreign financial services. The nexus between foreign direct investment, foreign financial services and domestic investment in the manufacturing sector is presented in section 4. Section 5 concludes.

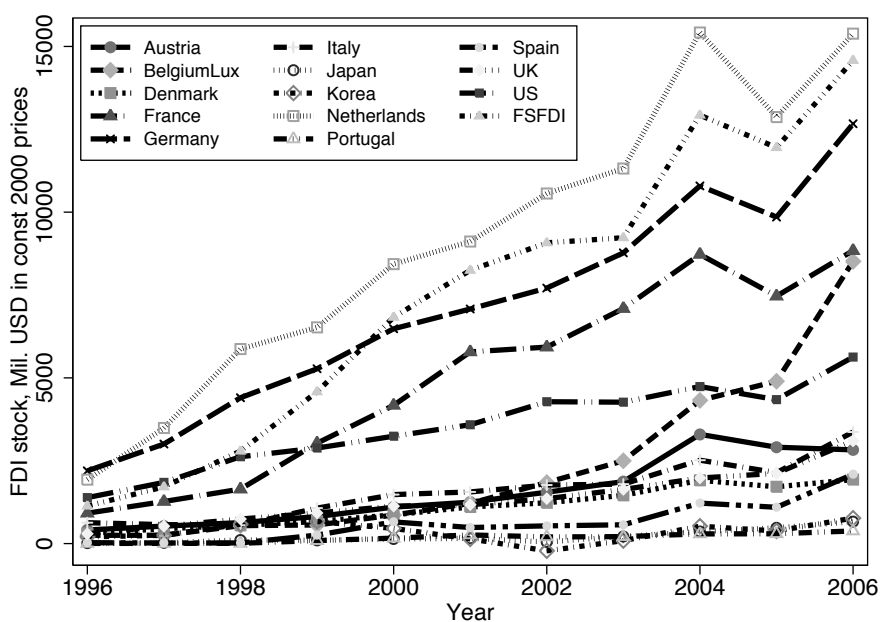
## **2 Determinants of bilateral FDI stocks**

A large and continuously growing stock of foreign direct investment can be observed in Transition Economies. Around 70-85% of FDI in both the financial and non-financial sector originates from the following OECD countries: Austria, Belgium (and Luxembourg), Denmark, France, Germany, Italy, Japan, Korea, Netherlands, Portugal, Spain, UK and US. In order to visualize the magnitude and the dynamics of the FDI stock in Transition Economies, we present data for Poland and for Slovenia. Poland is by far the largest economy in the group of Transition Economies studied in this paper. The highest inward FDI stock originates from Germany, followed by the Netherlands and Belgium and Luxembourg. Graph 2.1 shows the development of bilateral FDI stocks and the aggregate FSFDI stock in Poland.

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<sup>1</sup>For example, in Poland the bank Kredyt Bank and the insurance company Warta are owned by the KBC group; Allianz and ING offer banking and insurance; Moreover, PeKaO, the largest bank, offers banking and leasing. It is owned by UniCredit Banca.

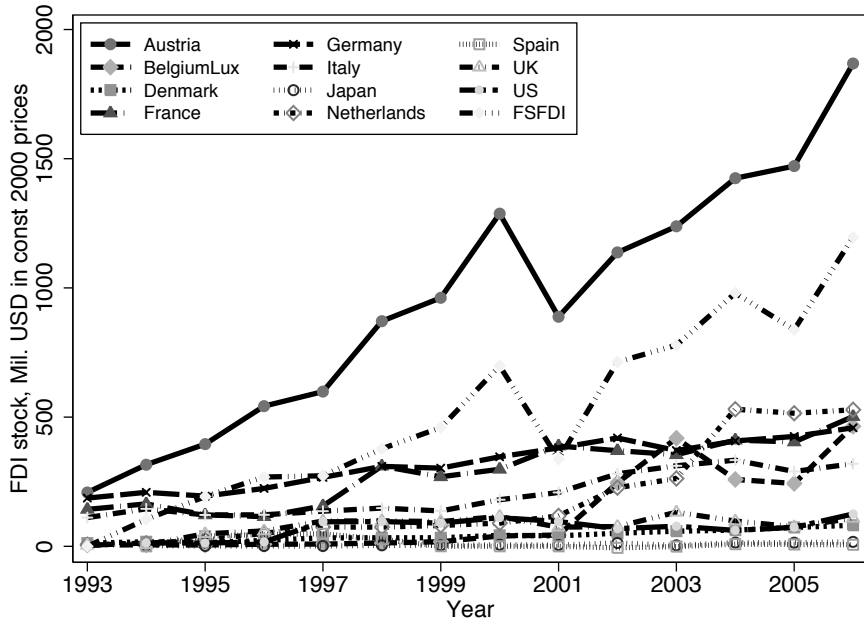
<sup>2</sup>We observe some discrepancies in the data on the same variables from different sources. The reason might be different vintages of original data or different definitions of some variables.



*Figure 2.1: Stock of FDI from 13 donor countries and total FSFDI stock in Poland.*

It is interesting to see the development in Slovenia, which has adopted a market economy very early and is now a member of the European Monetary Union. It also provides the longest time series of data. The development of the FDI and FSFDI stock in Slovenia is presented in graph 2.2. Austria is the main donor country of FDI, followed by France, Germany and the Netherlands. In both countries the FDI and FSFDI stock increases very much over time. For the other host countries, qualitatively a similar picture can be observed. FDI has a very high share in gross capital formation and a significant share of workers is employed by multinational companies (MNCs). However, only few advanced empirical studies on the long-run determinants of bilateral FDI stocks in Transition Economies exist. The determinants of the FDI stock in EU Transition Economies are studied at the bilateral level by Bevan and Estrin (2004). Their study is repeated by Carstensen and Toubal (2004) who take the endogeneity problem into account. Carstensen and Toubal (2004) perform a dynamic panel difference GMM regression on bilateral FDI stocks in 7 Central and Eastern European Countries supplied by 10 OECD countries<sup>3</sup> over the period 1993-1999. They find that the main determinants of FDI in Transition Economies are lagged FDI, market potential, skill ratio, private market share, the methods of privatization and relative capital endowments. Trade costs, relative unit labor costs and risk have a strong negative effect.

<sup>3</sup>In their study, the OECD countries are Austria, Belgium (including Luxembourg), Denmark, France, Italy, Germany, Portugal, Spain, UK and US. The CEEC destination countries are Bulgaria, Czech Republic, Hungary, Poland, Romania, Slovak Republic and Slovenia.



**Figure 2.2:** Stock of FDI from 11 donor countries and total FSFDI stock in Slovenia. Portugal and South Korea do not report a stock.

The application of a dynamic panel and usage of stocks in levels allows to see the long-run relationships and impacts of the variables of interest. We apply a modified version of the equation proposed by Carstensen and Toubal (2004). We include 9 Transition Economies and 13 donor countries, moreover extend the period to 1996-2007. This allows us to make more general statements about the long-run dynamics of the stocks. Moreover, we include financial services FDI. Relative unit labor costs are rising in Transition Economies and thus a well-functioning and competitive capital market is of high importance to FDI inflow, as Akbar and McBride (2004) state. We consider this fact in our study. FDI denotes the stock of foreign direct investment excluding financial services. FSFDI is the stock of foreign direct investment in the financial services sector. The index  $i$  denotes the host country,  $j$  denotes the donor country and  $t$  is the time index. The bilateral FDI stock is described by the following equation:

$$\begin{aligned}
 FDI_{ijt} = & \alpha FDI_{ijt-1} + \beta_1 FSFDI_{ijt} + \beta_2 MKP_{it} + \beta_3 RGDP_{ijt} \\
 & + \beta_4 RKL_{ijt} + \beta_5 INTSPREAD_{it} + \beta_6 RISK_{it} + \mu_{ij} + v_{ijt}
 \end{aligned}
 \tag{2.1}$$

The lagged dependent variable  $FDI_{ijt-1}$  enters the regression with the parameter  $\alpha$  ( $|\alpha| < 1$ ), which gives its persistence.  $MKP$  stands for market potential of the host country. It is the sum of its GDP and the GDPs of the other Transition Economies, which are divided by the road distance between the capitals. Most of FDI is assumed to be of horizontal

nature (Neuhaus 2006), but a fraction is used to serve the surrounding market. GDP and market potential cannot be included in the same regression. Even if market potential is measured excluding the GDP of the host country these variables are collinear. Therefore, GDP is included in *MKP* and not estimated separately. Also GDP per capita and GDP per worker are colinear to *MKP* thus are not included in the regressions. *RKL* measures relative capital intensity per worker, which is proxied by the investment to worker ratio. Different variables which capture the development and stability of the financial market and the economy are included. The interest rate spread (*INTSPREAD*) measures the risk of doing business and proxies the efficiency of banks. The less efficient banks are, the higher their margin is. Moreover, the spread includes the risk premium. *M2RES* is the ratio of M2 money to reserves and it is a good indicator for crisis risk. All \$ variables are divided by the number of workers. We apply logarithm to market potential, in order to capture its growth. We take first differences in order to make the data stationary and get rid of unobservable country specific effects. The equation is estimated with difference GMM and has the form:

$$\begin{aligned} \Delta FDI_{ijt} = & \alpha \Delta FDI_{ijt-1} + \beta_1 \Delta FSFDI_{it} + \beta_2 \Delta \ln MKP_{it} + \beta_3 \Delta RGDP_{ijt} \\ & + \beta_4 \Delta RKL_{ijt} + \beta_5 \Delta INTSPREAD_{it} + \beta_6 \Delta RISK_{it} + \Delta v_{ijt} \end{aligned} \quad (2.2)$$

Data<sup>4</sup> on bilateral FDI stocks is available on total economy level. Stocks of financial services are reported only as total stocks in the host country and their origin is not specified. We have to simplify the regression and use *FSFDI<sub>it</sub>* instead of *FSFDI<sub>ijt</sub>*. The only change is the fact that we cannot determine the direct relationship between FSFDI and FDI from a specific donor country, but rather estimate how firms from different countries react to total FSFDI stock.

## 2.1 Empirical results on the determinants of bilateral FDI stocks

We apply a gravity model and run a Generalized Method of Moments regression to tackle the endogeneity problem. This econometric method is very often used in the recent literature. The GMM regression corrects the endogeneity bias and allows to determine causality between FDI and FSFDI. We present a very short description of the GMM method<sup>5</sup>. The simplest specification of the Dynamic Panel is  $y_{ijt} = \alpha y_{ijt-1} + \beta x_{ijt} + \varepsilon_{ijt}$  with  $|\alpha| < 1$  and  $\varepsilon_{ijt} = \mu_{ij} + v_{ijt}$ . The total error term  $\varepsilon_{ijt}$  is composed of an unobserved

<sup>4</sup>There is a huge interest in disaggregated bilateral data, as stated by the International Monetary Fund (<http://www.imf.org/external/np/sta/cdis/index.htm>), however data will be available in the year 2010 or even 2011. Once data is collected, the regression should be repeated with disaggregated financial service data.

<sup>5</sup>Roodman (2006), who is the author of the GMM implementation in Stata (*xtabond2*) which we apply, gives a theoretical and practical introduction to GMM. Another good introduction to applied GMM and other advanced dynamic panel data models is Baum (2006).



country-pair effect  $\mu_{ij}$  and the error term  $v_{ijt}$ . Following Arellano and Bond (1991) we take first differences, thus the unobserved effect and the time trend disappears. When the explanatory variables are predetermined, we obtain the following moment conditions  $E[x_{ijt-1}\Delta v_{ijs}] = 0$  for  $t \leq s$  and  $E[y_{ijt-2}\Delta v_{ijs}] = 0$  for  $t \leq s$ . Running the gravity regression, we first replicate the specification used by Carstensen and Toubal (2004). We get very similar results, which are not reported. Only the coefficient  $\alpha$  on the lagged dependent variable  $FDI_{ijt-1}$  is around twice as large. This indicates that the FDI stock is more persistent in the recent periods than it was in the periods studied by Carstensen and Toubal (2004). Its present value depends to a large extent on its past value. The parameter  $\alpha$ , which takes values around 0.7 in the regressions, is used to calculate the long-run effects. The short-run effects of the explanatory variables are presented in table 2.1. The long-run multiplier is calculated as  $1/(1 - \alpha)$  and takes a value around 3.3. This means that in the long run a change of an explanatory variable has the impact reported in the table, multiplied by around 3.3.

	(1)	(2)	(3)	(4)	(5)	(6)
	FDI	FDI	FDI	FDI	FDI	FDI
FDI_lag	<b>0.6951</b> (18.09)	<b>0.7125</b> (18.93)	<b>0.6960</b> (18.97)	<b>0.7167</b> (18.48)	<b>0.7275</b> (19.79)	<b>0.7107</b> (17.76)
FSFDI	<b>0.1337</b> (3.18)	<b>0.1342</b> (3.21)	<b>0.1060</b> (3.08)	<b>0.1270</b> (3.15)	<b>0.1294</b> (3.31)	<b>0.1019</b> (3.01)
MKP	<b>2100.543</b> (2.70)	<b>2370.877</b> (2.89)	<b>1471.408</b> (2.14)	<b>3314.45</b> (3.49)	<b>3462.643</b> (3.58)	<b>2621.731</b> (3.15)
RKL	-47.21176 (-0.31)	-115.0385 (-0.91)	-22.9976 (-0.18)	-197.1445 (-1.17)	-228.6418 (-1.68)	-107.4878 (-0.78)
RGDP				<b>913.6149</b> (2.19)	660.6271 (1.70)	618.3289 (1.66)
M2RES		<b>-74.6924</b> (-2.54)	<b>-78.7157</b> (-3.03)		<b>-73.4994</b> (-2.98)	<b>-70.3425</b> (-3.13)
INTSPREAD			-13.8853 (-1.16)			-19.0520 (-1.62)
N. Obs	822	822	794	822	822	794
N. Groups	102	102	102	102	102	102
Hansen test	88.48	98.36	100.71	97.66	100.50	100.56
p-value	0.012	0.060	0.299	0.114	0.439	0.829
AR(1) p-value	0.027	0.026	0.019	0.027	0.026	0.019
AR(2) p-value	0.082	0.082	0.131	0.084	0.083	0.128
N. Instruments	66	84	101	88	106	123
LR Multiplier	3.28	3.48	3.28	3.53	3.67	3.45

**Table 2.1:** Short-run determinants of FDI. GMM regression. (z-statistic) in brackets, bold = significant at 5% level. Time trend included.

FSFDI enters all specifications in a positive and highly significant way. The coefficient is estimated to be around 0.10 to 0.13. FSFDI is the total stock in a given country

and is usually bigger than the bilateral FDI stock (see graph 2.1 and 2.2). Thus, the parameter appears small, while the effect is large. It shows that foreign financial services work as an important catalyst for non-financial FDI. Market potential growth enters all regressions in a highly significant way. This confirms that FDI is mostly of horizontal nature and also used to serve the surrounding countries' markets. Relative capital endowments do not have any effect, once we control for FSFDI. In a regression without FSFDI, which is not reported, *RKL* has a positive and significant impact. This goes in favor of the gravity model. The bigger the capital intensity discrepancy is, the more can a multinational company gain from its comparative advantage. However, once we control for the stability and efficiency of the financial market (which is strongly related to FSFDI) the differences play no more a significant role. In specification (2) we add the M2 money over reserves ratio which measures the risk of a crisis. The higher this ratio, the more risk the multinational company has to face. It has a strong negative effect on the FDI stock. In specification (3) we include the interest spread. As expected this variable has a negative sign, but it is insignificant. The spread measures the inefficiency of the banks and also the risk of doing business. Because MNCs can obtain financing through FSFDI, it does not play a significant role. In specification (4) we include the relative size of the donor country GDP to the host country GDP (*RGDP*). It has a significant and positive effect. The larger the donor economy is in relative terms, the more FDI it can supply to the host country. Different combinations of the explanatory variables are presented in specifications (5) and (6). The parameters do not change in a significant way, which means that the model is robust. We also include other risk measures and parameters like government consumption, corporate tax rate, exports and imports but they are insignificant. Those results are not reported. Education of workers and share of telephone line subscribers which is a proxy for technology level were included. Again they are insignificant. Moreover, unit labor costs and relative unit labor costs do not have a significant impact. Most likely because they are rather stable and similar to those of the donor country.

The long-run determinants are calculated by multiplying the coefficient  $\beta$  by the long-run multiplier  $1/(1 - \alpha)$ . For example, the long-run effect of FSFDI in specification (1) is  $1/(1 - \alpha) * \beta_1 = 1/(1-0.7)*0.1337=0.4387$ . We apply the delta method to calculate the standard errors of the nonlinear combination of two coefficients<sup>6</sup>. The significance of the variables does not change in a noticeable way. It is straightforward to interpret the long-run effect of *FSFDI*, *MKPD*, *RKL* and *RGDP*. *FSFDI* and market potential grow over time. An one time increase leads to a permanent positive effect. Relative capital endowments and GDP levels converge, thus their impact will diminish in the long run. However, the interest spread rate and the M2 money to reserves ratio do not show a clear

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<sup>6</sup>This is done with the Stata command *nlcom*.

pattern. One period's impact might be absorbed by a movement in the opposite direction in the next period.

The GMM specification is restricted to include up to 2 lags in order to keep the number of instruments lower than the number of groups. For all regressions we also apply a GMM specification in which the starting lag for the instrument is 2 and the longest lag is 4. Another specification uses lags from 1 to 3. In all cases only the number of instruments increases drastically. The estimation results do not change in a systematic way, which confirms the robustness of the model. These results are not presented. All GMM regressions are well specified, which is indicated by the Hansen test of over-identification and the Arellano-Bond test for first and second order autocorrelation. We always include the time trend, as recommended by Roodman (2006). There is a highly significant negative time trend which is around -100. Most of the stock variables have a time trend. FDI and FDFDI are stationary, once the time trend is accounted for. The time trend is only negative when market potential is included. This means that it leads to a too high FDI level and the time trend corrects it downwards.

	(1)	(2)	(3)	(4)	(5)	(6)
	FDI	FDI	FDI	FDI	FDI	FDI
FSFDI	<b>0.4387</b> (4.39)	<b>0.4671</b> (4.34)	<b>0.3489</b> (4.4)	<b>0.4487</b> (4.38)	<b>0.4749</b> (4.57)	<b>0.3524</b> (4.50)
MKPD	<b>6891.452</b> (2.53)	<b>8246.777</b> (2.66)	4841.233 (1.91)	<b>11701.840</b> (3.01)	<b>12707.880</b> (3.20)	<b>9063.555</b> (2.48)
RKL	-154.892 (-0.31)	-400.145 (-0.92)	-75.666 (-0.18)	-696.029 (-1.18)	-839.114 (-1.72)	-371.594 (-0.79)
RGDP				<b>3225.566</b> (2.10)	2424.497 (1.69)	2137.617 (1.53)
M2RES		<b>-259.8075</b> (-2.56)	<b>-258.9909</b> (-3.12)		<b>-269.7426</b> (-3.01)	<b>-243.1802</b> (-3.12)
INTSPREAD			-45.6855 (-1.15)			-65.8645 (-1.55)

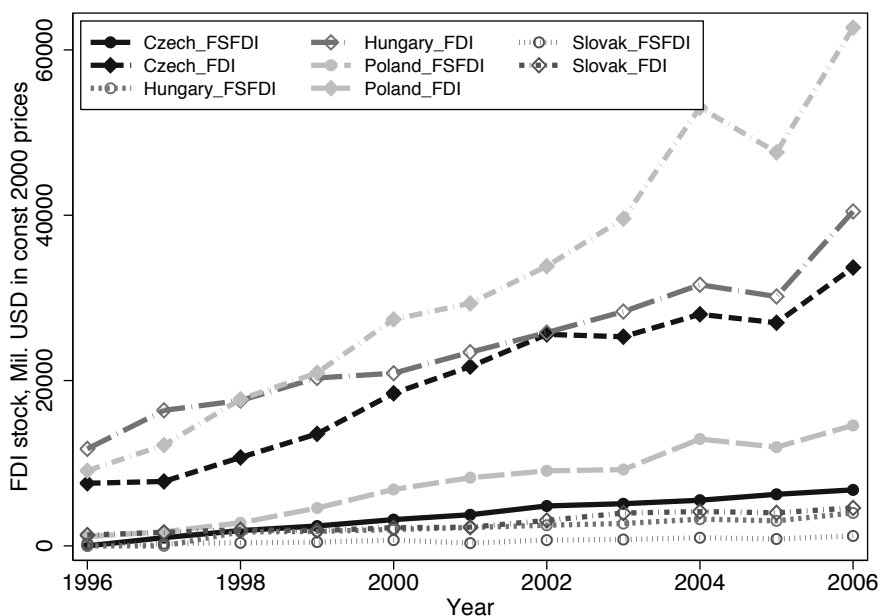
**Table 2.2:** Long-run determinants of FDI obtained from the GMM regression. (z-statistic) in brackets, bold = significant at 5% level.

The descriptive statistics and correlation matrices of the variables in levels and in first differences for all regressions in this paper are presented in appendix A.3 and A.4. The baseline regression specifications in Stata are presented in appendix A.2.

The empirical results allow to conclude that foreign financial services are of highest importance to the bilateral FDI stock. Moreover, the FDI stock is persistent and depends to a large extent on its past period value. The market potential is very important, which indicates that FDI is mainly of horizontal nature and also used to serve the surrounding market. MNCs are exposed to the risk of an economic crisis and prefer to invest in countries which are less prone to it.

### 3 Determinants of foreign financial services

This section presents possible economic determinants of FSFDI in transition economies. The empirical analysis shows to which extent banks follow their clients and whether they aim to serve the host market. An increasing stock of FSFDI can be observed over the last decade, on average. The following graph shows the stock of non-financial FDI and FSFDI in the four largest Transition Economies. The FDI stock is around five to ten times as large as the FSFDI stock. The correlation between the two stocks is presented in the appendix. It is crucial to know what determines the very large and highly important activity of foreign financial services. Among many studies on the benefits of opening up for foreign banks are Buch (1997), M  r   and Valentinyi (2003) and Akbar and McBride (2004). However, there are only a few recent empirical studies on the determinants of foreign banking activity in Central and Eastern European Transition Economies. Concerning banking activity in Developed and Developing Economies many empirical studies can be found. Buch (2000) as well as Jeanneau and Micu (2002) give a good overview of the literature and compare the methods used. A large share of papers deals with the assets of US, Japanese and German banks abroad. We present the results of two papers in more detail. Both deal with the question whether banks follow their clients abroad and come to different conclusions.



*Figure 3.1: Stock of FDI and FSFDI in the Czech Republic, Hungary, Poland and the Slovak Republic.*

Goldberg and Johnson (1990) study the assets of foreign branches of US banks in 22

countries over the period 1972-1985. Total assets are related to regulation, foreign direct investment, exports relative to GDP, population, GDP per capita, domestic deposits and exchange rate change. The authors state that the literature as well as some previous empirical results connect foreign bank activity with the follow-the-client hypothesis. Consequently, also trade is linked to foreign bank assets. The level of development is proxied by GDP per capita, while market potential is proxied by the population size. Domestic assets represent the activity of domestic banks, which have a negative effect on foreign banks. Foreign branches focus on wholesale banking and the study by Goldberg and Johnson deals with this kind of banking. Their empirical result seems to confirm that banks follow their clients. FDI has a positive and highly significant impact. Also trade and regulation affects foreign bank assets positively. Domestic assets and the level of development have a negative effect. Finally, potential market size and exchange rate fluctuations do not enter in a significant way. We conclude from their study that US banks were attracted by US firms operating abroad and by less developed economies in the 70's and 80's. In contrast to banks considered in their study, most of foreign banks in EU Transition Economies have a considerable share in retail banking. Wezel (2004) studies the determinants of the presence of German banks abroad. While for Asia he finds a very strong follow-the-client effect, for CEECs this effect is absent. Banks are strongly attracted by GDP per capita. Crisis risk, measured as M2 money over domestic reserves, has a strong negative effect.

In order to find the determinants of foreign banks in Transition Economies, we base on the specification proposed by Goldberg and Johnson (1990) and Wezel (2004), modify it and regress the following equation:

$$\begin{aligned} \Delta FSFDI_{it} = & \alpha \Delta FSFDI_{it-1} + \beta_1 \Delta FDI_{it} + \beta_2 \Delta INV_{it} + \beta_3 \Delta FREEDOM_{it} \\ & + \beta_4 \Delta TAX_{it} + \beta_5 \Delta INFLATION_{it} + \beta_6 \Delta M2RES_{it} + \Delta v_{it} \end{aligned} \quad (3.1)$$

We include the lagged dependent variable to obtain the long-run determinants. *FSFDI* depends on the non-financial *FDI* stock and total investment in a given year. This allows to state whether banks follow their clients or are directly involved in the host market. While many studies include GDP, we include investment. The results do not change very much, as investment takes a rather constant share of GDP. Banks are directly connected to investment. In the later part of this paper we focus on investment, therefore we use it here as a determinant of *FSFDI*. There is a strong collinearity between investment and GDP, thus only one measure of economic development can be used. The index of economic freedom *FREEDOM* is included. This variable originates from the Heritage Foundation (2009) and measures how easily individuals can operate on the market. A free economy allows individuals to take most efficient decisions and allocate their effort in actions they consider as profitable. This increases the number of businesses and thus more potential

clients for the foreign financial services exist. Dissaggregated indicators of economic freedom cannot be applied for the considered countries. The freedom of banking, business and investment is nearly constant, thus by taking first differences these variables drop out. Further on, we include the corporate tax rate *TAX*. High taxes make a host country less attractive to foreign investors. Inflation which measures macroeconomic risk and M2 money over reserves, which measures the risk of a crisis are included. Moreover, we include the real interest rate *REALINT* and the development of the financial market *FMKT*. Financial market development is measured as the sum of stock market capitalization plus credits to the private sector divided by the GDP. Both variables can have a positive effect on the profitability of foreign financial services. To tackle the endogeneity between *FSFDI*, *FDI* and investment, we apply a 2SLS regression, using the XTIVREG2 code written by Schaffer (2007). We include FDI and investment lagged by one period as instruments. Moreover, lagged GDP, unit labor costs and share of exports to GDP are used as instruments. Lagging GDP solves the problem of strong correlation between GDP and investment in the same period. The stock of FSFDI follows a time trend and moreover, unobserved country effects can play a role. We therefore use the First Difference regression to solve this problem. The error terms are robust to heteroskedasticity and autocorrelation. We expect the FDI variable to enter significantly. Investment, tax and country risk should play an important role, too. Contrary to the results obtained by Goldberg and Johnson (1990), we expect that economic development, measured by investment, has a strong positive effect. Investment should enter positively, as it requires different financial services and thus increases the need for an advanced financial market. Foreign banks have a comparative advantage and can compete with domestic banks very well. In fact, foreign banks control former state banks and compete in the retail banking market. Moreover, the activities of foreign and domestic banks seem to converge as Weill (2003) states. This means that foreign banks serve to a large extent host country clients. On the other hand, domestic banks have to improve their business practices due to the increased competition.

### **3.1 Empirics on the determinants of foreign financial services**

The regressions, presented in table 3.1, show that the FSFDI stock does not depend on its past period value. This result is in line with the fact that FDI in financial services can move very quickly and is mainly determined by market parameters. Financial capital is very mobile compared to any other fixed capital. Moreover, as expected, FDI and investment positively affect the size of the FSFDI stock. In all specifications the stock of non-financial FDI has a very strong positive effect. The Stock-Yogo test for weak identification indicates that in all specifications the maximal IV relative bias is 5%. Thus,

all regressions and the choice of instruments can be considered as well specified.

FDI enters with very high significance, which means that foreign financial services follow their clients, or more general, they follow western clients to Transition Economies. Throughout all specifications investment has a significant effect on FSFDI. This means that foreign banks are not only following their clients but to a large extent also serve the host country market. Surprisingly, the index of economic freedom has no effect. This might result from the fact that it changes only little over time. The change of the tax rate does not have any effect, too. The tax rate declines in general, but is constant over many periods. In specification (2) we include two measures of macroeconomic risk, namely inflation and crisis risk, measured by the ratio of M2 money to reserves. Inflation enters with high significance, while crisis risk has no effect. The negative effect of inflation indicates that banks are afraid of losing their loans due to a too high inflation. Crisis risk has no significant effect, because unlike FDI, FSFDI is very mobile and in case of an incoming crisis banks can shift capital from one market to another.

	FSFDI (1)	FSFDI (2)	FSFDI (3)	FSFDI (4)
FSFDI_lag	0.2324 (0.90)	0.1982 (0.87)	0.2139 (0.89)	0.2413 (0.90)
FDI	<b>0.1313</b> (3.71)	<b>0.1362</b> (3.95)	<b>0.1379</b> (3.97)	<b>0.1304</b> (3.61)
INV	<b>0.2052</b> (3.37)	<b>0.1833</b> (2.97)	<b>0.1863</b> (3.21)	<b>0.2035</b> (3.32)
FREEDOM	-13.7642 (-0.63)	-22.4501 (-1.04)	-15.4058 (-0.73)	-11.7058 (-0.53)
TAX	-9.4361 (-0.43)	-19.0510 (-0.82)	-15.7533 (-0.71)	-11.6959 (-0.53)
INFLATION		<b>-30.7126</b> (-2.06)		
M2RES		151.0707 (1.16)		
REALINT			21.2013 (1.56)	
FMKT				5.3370 (1.00)
Nr. Obs	76	76	76	76
R <sup>2</sup>	0.58	0.63	0.61	0.59
Weak ID test	19.32	18.11	21.46	18.65
Stock-Yogo critical values				
5% max IV relative bias	13.97	13.97	13.97	13.97
10% max IV size	19.45	19.45	19.45	19.45
15% max IV size	11.22	11.22	11.22	11.22

**Table 3.1:** Short-run determinants of FSFDI. 2SLS First Differences regression (XTIVREG2) with heteroskedasticity and autocorrelation robust standard errors. Kleibergen-Paap rk Wald F weak identification test statistic and Stock-Yogo critical values for 5% maximal IV bias and 10% and 15% relative size bias reported. (z-statistic) in brackets, bold = significant at 5% level.

In specification (3) the real interest rate is added to the base specification. The real interest rate directly affects the profit of banks. However, this variable just fails to be significant at the 10% level. The real interest rate differs significantly in levels among countries. Some, like Estonia and Latvia show negative real interest rates. However for most of the observations the interest rate is relatively stable. Finally, specification (4) captures the development of the financial market. This variable is the stock market capitalization plus credit to private sector divided by GDP. It does not enter in a significant way. This shows that the financial development is not a determinant of *FSFDI*. Following the literature, it seems that the development of the financial market is a result of the presence of foreign financial services and does not affect those.

The estimation results show that FSFDI does not depend on its past value, is mainly affected by FDI and domestic investment. Financial services seem to follow to a large extent foreign clients. Data does not allow to state whether FSFDI is following FDI from the same country or whether FDI is attractive to foreign financial services, in general. Domestic investment positively and significantly affects the FSFDI stock, which indicates that the host market is of importance. This is consistent with the findings of Wezel (2004). Crisis risk does not have any significant effect. The mobility of FSFDI makes it less prone to some risks, which hinder FDI.

## **4 The nexus between FSFDI, FDI and domestic investment in manufacturing**

The manufacturing sector attracts a large share of FDI and is important to the whole economy. On average 30% of the FDI stock can be found in the manufacturing sector (Vienna Institute for International Studies 2008a). Products from the manufacturing sector are used in the services sector or the trade sector. Tools of any kind produced by manufacturing firms serve in the construction sector. Moreover, the output of the manufacturing sector can be easily stored and exported or imported. Because of its importance, we focus in this section on the different industries of the manufacturing sector. Investigating the nexus of FDI, FSFDI and value added growth, we focus on the DA-DN NACE classification manufacturing industries<sup>7</sup>. This is the deepest disaggregation level for which all necessary data for all countries is available. The considered countries and time-periods

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<sup>7</sup>The classification is: DA: food products, beverages & tobacco; DB: textiles and textile products; DC: leather and leather products; DD: wood and wood products; DE: pulp, paper, pap. products, publishing & printing; DF: coal, refined petrol. products & nuclear fuel; DG: chemicals, chemical products & man-made fibers; DH: rubber and plastic products; DI other non-metallic mineral products; DJ: basic metals & fabricated metal products, DK: machinery and equipment n.e.c.; DL: electrical and optical equipment; DM: transport; DN: manufacturing n.e.c.



are as follows: Czech Republic (1996-2006), Estonia (2000-2007), Hungary (1998-2006), Lithuania (1995-2007), Poland (1995-2006), Slovak Republic (1995-2006) and Slovenia (1995-2007). For all countries but Estonia and Poland all industries are considered. For Estonia data is available only for industries DD, DF, DG, DH, DI, DJ and DK, while for Poland all industries but DC, DE and DN are present. We completely exclude Bulgaria and Latvia, because data on crucial variables like investment and FDI in industries is available for a very short period only. For all regressions we apply two-step difference GMM in order to tackle the endogeneity problem. The error terms are robust to heteroskedasticity and autocorrelation.

The impact of financial services and indicators of development of the financial market can have different effects on each industry. A better developed financial market serves all industries, in general. However, the more an industry depends on external finance, the higher this positive effect will be. To capture this, the FSFDI are interacted with the dependence on external financing (*DEF*) of each industry<sup>8</sup>. "External dependence is the fraction of capital expenditures not financed with cash flow from operations", as defined by Rajan and Zingales (1998)[p. 567]. Rajan and Zingales (1998) compute the dependence of different sectors on external financing for the US and argue that this pattern holds for any country in the world. Their variables are used by Guiso, Jappelli, Padula and Pagano (2004) to test the impact of financial development on growth in the EU. We interact the dependence variable with FSFDI and other financial variables in order to determine their effect on growth and investment in different sectors. The least dependent sector is DC, leather and leather products with a value equal to -0.14. The highest dependence, 0.77, is found in the electrical and optical equipment sector DL. Those values mean that leather producers create more cash-flow than they need for capital expenditures. Contrary, electrical equipment producers finance 77% of capital expenditures with external funds.

#### **4.1 Determinants of FDI in the manufacturing sector**

FDI in manufacturing is the stock of FDI in each of the DA-DN NACE classification manufacturing industries. The stock of FDI in each manufacturing industry is called *FDIM*. We regress *FDIM* and not *FDIM* per worker because of two reasons. First, we want to have comparable results to those obtained in section 2. Secondly, we do not have data on employment in firms that are foreign owned. Only data on total employment in industries is available. Given that the employment strategy of domestic firms and foreign

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<sup>8</sup>We aggregated the data proposed by Rajan and Zingales (1998) to obtain values at the DA-DN level. For the DN sector we take the mean of all other sectors. The dependence on external financing is: DA 0.14, DN 0.4, DC -0.14, DD 0.28, DE 0.18, DF 0.33, DG 0.25, DH 0.23, DI 0.06, DJ 0.24, DK 0.45, DL 0.77, DM 0.31, DN 0.27.

firms can differ significantly, dividing *FDIM* by workers might lead to a counterfactual dynamic of the *FDIM* stock per worker. From now on, *i* denotes manufacturing industry, *j* host country and *t* time. *FDIM* is regressed on its lagged value, because we expect that the past value has a significant effect on the current stock. The presence of MNCs in manufacturing as well as in any other sector of the economy is assumed to depend strongly on the presence of foreign banks. Their impact on FDI stocks in the whole economy is presented in section 2. To account for different needs for external finance, we interact the foreign financial services stock with the dependence measure DEF. The value added (VA) in an industry can be seen as the main reason why the MNC operates in this industry. Further on, we investigate whether current investment in the same industry has any effect on the presence of FDI. MNCs gain from their comparative advantage, thus strong domestic investment should crowd out FDI. On the other hand, they need intermediate goods in the production process and a branch of the literature argues that they enforce domestic investment. The effect of domestic investment is thus assumed to be ambiguous. One problem arises from the fact that we do not have any data on purely domestic investment in the manufacturing sector. Total investment, denoted INV, is the sum of foreign and domestic investment. *FDIM* is a stock and it is not easy to construct the flow from the stock. Taking first differences might create a wrong time series, as the depreciation of capital is neglected. However, applying this procedure shows that *FDIM* flows account for around 30% of total investment. Thus, INV captures to a large part domestic investment. Beside these economic variables, also the corporate tax rate and risk measures are added. The risk measures are as before M2 money over reserves and inflation. The current FDI stock in manufacturing is described by the following equation:

$$\begin{aligned} \Delta FDIM_{ijt} = & \alpha \Delta FDIM_{ijt-1} + \beta_1 \Delta FSFDI_{jt} \times DEF_i + \beta_2 \Delta VA_{ijt} + \beta_3 \Delta INV_{ijt} \\ & + \beta_4 \Delta TAX_{jt} + \beta_5 \Delta INFLATION_{ijt} + \beta_6 \Delta M2RES_{ijt} + \Delta v_{ijt} \end{aligned} \quad (4.1)$$

The regression results are presented in table 4.1. In all specifications the Hansen test of over-identification and the Arellano Bond test for autocorrelation of the error term of second order performs well. The number of instruments used is less than the number of groups. To keep the number of instruments low, we constrain the number of lags in the GMM regression to at most 2. This constraint is applied to all GMM regressions in this paper. Secondly, only *FDIM\_lag*, *VA* and *INV* are treated as endogenous variables. The other variables are treated as exogenous variables in the regression. A time trend is included, however it is always insignificant.

The baseline specification (1) includes all variables mentioned above. First and foremost, the lagged dependent variable, foreign financial services and value added enter with high significance. These results are robust to different specifications which include

other variables. The dependence of FDI on its lagged value in manufacturing industries is similar to the case of all non-financial FDI studied in section 2. This indicates that the persistence of FDI stock in the real economy is independent of the disaggregation level. The current value depends approximately with a parameter  $\alpha = 0.60$  on its past value. On average the long-run impact of the determinants presented above has to be multiplied by  $1/(1 - \alpha) = 2.5$  to obtain its long-run impact. The long run multiplier for each specification is presented in the last line of the results table. The increase of the FSFDI stock multiplied by the corresponding dependence on external finance increases the FDI stock in the same industry by a factor of around 0.11. The increase in value added by one million international \$ in an industry increases the FDIM stock by 0.41 million \$. Throughout all specifications, inflation does not affect the FDIM stock.

	FDIM (1)	FDIM (2)	FDIM (3)	FDIM (4)	FDIM (5)
FDIM_lag	<b>0.5991</b> (6.82)	<b>0.5628</b> (3.53)	<b>0.6000</b> (6.88)	<b>0.5961</b> (6.71)	<b>0.5618</b> (4.07)
FSFDI x DEF	<b>0.1081</b> (2.35)	<b>0.1484</b> (2.05)	<b>0.1069</b> (2.36)	<b>0.1114</b> (2.38)	<b>0.1530</b> (2.28)
VA	<b>0.4128</b> (1.97)	0.5848 (1.71)	<b>0.4107</b> (1.95)	<b>0.4161</b> (1.97)	<b>0.5917</b> (1.86)
INV	-0.2611 (-0.89)	-0.0993 (-0.32)	-0.2642 (-0.89)	-0.2577 (-0.87)	-0.0864 (-0.27)
TAX	0.0369 (0.02)	0.2035 (0.11)	0.0908 (0.04)	0.4941 (0.23)	0.6608 (0.33)
INFLATION	-3.1936 (-1.35)	-2.7215 (-0.93)	-3.0843 (-1.34)	-3.2993 (-1.37)	-3.0262 (-1.23)
M2RES	-11.3211 (-0.96)	-6.3529 (-0.55)	-10.9315 (-0.99)	-11.4530 (-0.93)	-6.0771 (-0.51)
STKMKTCAP x DEF		<b>-0.0310</b> (-1.87)			<b>-0.0315</b> (-2.15)
ULCRA			-0.0786 (-0.11)		0.3354 (0.37)
H				-18.5642 (-0.20)	-43.1225 (-0.44)
N. Obs	703	703	703	703	703
N. Groups	84	84	84	84	84
Hansen test	71.6	73.24	70.63	74.55	75.44
p-value	0.189	0.156	0.212	0.132	0.117
AR(1) p-value	0.004	0.007	0.004	0.004	0.006
AR(2) p-value	0.065	0.066	0.065	0.065	0.063
N. Instruments	70	71	71	71	73
LR Multiplier	2.49	2.29	2.50	2.48	2.28

**Table 4.1:** Short-run determinants of FDI in the manufacturing sector. Two-step difference GMM regression. (z-statistic) in brackets, bold = significant at 5% level. Time trend included, always insignificant.

In specification (2) we include the capitalization of the stock-market interacted with the

dependence on external finance. The stockmarket capitalization is a measure for the development of the host country's financial system and also a measure of general economic development. The stock market allows domestic firms to acquire capital and also measures how developed they are. When domestic firms grow, also the stock market grows. Because foreign firms gain from comparative advantage, this variable enters significantly and negatively. The increase of the stock market capitalization by one million \$, multiplied by the DEF, decreases the *FDIM* stock by 0.031 million. The other variables do not change in a significant way. In specification (3) unit labor costs in relation to those in Austria are included. This variable allows to account for the relative costs per unit of produced good in each country in comparison to Western Europe. Because no other data is available, Austria is considered as representative for the western EU. Relative unit labor costs do not have any effect. Most likely, because the ULC seem to converge among countries and increase, as Akbar and McBride (2004) state. Specification (4) includes human capital of the whole labor force. We assume that MNCs prefer to invest in human capital rich countries. First, more advanced products can be created. Secondly, better educated workers are potential clients for the advanced goods that MNCs produce. However, it has no effect on *FSFDI*. All control variables are included in specification (5). The highly significant variables do not change in an important way.

The empirical results allow to conclude that the lagged *FDIM*, *FSFDI* interacted with dependence on external finance and the value added have a very strong and robust effect. This result is consistent with the determinants of bilateral FDI stocks at total economy level, studied in section 2.

## **4.2 The effect of FDI and FSFDI on domestic investment**

As shown above, *FSFDI* has a strong positive effect on FDI and we investigate whether it also has an effect on domestic investment. It is possible that foreign financial services improve the business climate and enhance investment. Investment is considered as a main source of economic growth. DeLong and Summers (1991) and Sala-i-Martin (1997) show that investment, especially in manufacturing and equipment, is a robust and highly significant factor of growth among many countries. This makes it an interesting question to see whether the presence of MNCs has any effect on investment. For the countries which we consider there could be a strong positive effect because a large share of FDI is of horizontal nature and a lot of backward linkages exist (see Smarzynska Javorcik (2004)). On the other hand the more advanced MNCs can invest in the more profitable firms and thus crowd out domestic investment.

The long-run effect of foreign direct investment flows, loans and portfolio flows on gross capital formation in 60 Developing Countries over the period 1979-1999 is studied

by Mody and Murshid (2005). In their study none of the Transition Economies which we consider is included. They find a very strong positive effect of FDI flows especially in the 1980's. Contrary, in the 1990's there is no significant effect. The authors conclude that the financial integration which appeared since the 1990' allowed domestic investors to diversify investment and invest also abroad.

Mileva (2008) applies their model to 22 Transition Economies over the period 1995-2005. She finds a very strong effect of FDI on investment, especially if the domestic financial market is underdeveloped. Mileva finds evidence for crowding-in of investment in the least developed Transition Economies, namely the former Soviet Republics. MNCs might buy input goods from local suppliers and motivate them to invest. However, for the EU member Transition economies no positive effect on investment is found. She argues that most likely the more productive MNCs push the less developed local competitors out of the market.

Both studies mentioned before focus on investment on total economy level. We apply the regression to investment in manufacturing industries. In this case investment is very volatile and changes its direction depending on the current economic situation. The results on the aggregate level and disaggregated level can be expected to be substantially different. We include the lagged dependent variable, but expect it to be insignificant. We do so because of two reasons. First, we want to have results that are comparable to the recent literature. Secondly, the lagged domestic investment serves as a good instrument for the endogenous variables. There is no data about strict domestic investment, thus we calculate it. First, we take first differences of the FDIM stock to obtain flows (denoted *FDIMFL*). This procedure neglects the depreciation of capital, thus contains an error. The FDIM flow is subtracted from the total investment to obtain domestic investment. Domestic investment is then divided by the number of workers in each industry (denoted *DOMINW*). Total investment consists to around 70% of domestic investment. To make sure that our results are not mainly affected by the way we calculate the variable, we repeat the regression with total investment in the manufacturing industries. The results do not change in a significant way. Neither Mody and Murshid (2005) nor Mileva (2008) split FDI in its financial and non-financial part. We include FDIM and FSFDI flows per worker in the regression, and expect that they have different effects. To analyze the effect of foreign financial services and FDI on domestic investment, we regress domestic investment per worker on the following variables:

$$\begin{aligned} \Delta DOMINW_{ijt} = & \alpha \Delta DOMINW_{ijt-1} + \beta_1 \Delta VAPW_{ijt} + \beta_2 \Delta INFLATION_{it} \\ & + \beta_3 \Delta M2RES_{jt} + \beta_4 \Delta INTSPREAD_{jt} + \beta_5 \Delta ULC_{ijt} + \beta_6 \Delta FDIMFLW_{ijt} \\ & + \beta_7 \Delta FMKT_{jt} \times DEF_i + \beta_8 \Delta FSFDIFLW_{jt} \times DEF_i + \Delta v_{ijt} \end{aligned} \quad (4.2)$$

The dependent variable *DOMINVW* is domestic investment per worker and can be considered a good proxy for the capital intensity in each industry. It is reasonable to assume that it depends on the value added. Thus, value added per worker *VAPW* is included. This relation is not merely a correlation but a causality, as the correlation between these variables is very low. This originates from the fact that we regress domestic investment and not total investment on value added. Analysis of the time series shows that the relationship is much more volatile than it is on macroeconomic level<sup>9</sup>. The willingness to invest is affected by risk and the cost of capital, which is measured by *INFLATION* and interest rate spread *INTSPREAD*. Macroeconomic risk is also measured by the ratio of M2 money to reserves. The dependent variable measures the capital intensity per worker in each industry. Capital and labor can be considered as substitutes. Unit labor costs (*ULC*) measure the cost of labor that is needed to produce one unit of output, relative to the whole manufacturing sector. *ULC* for the whole manufacturing sector is normalized to 100. This tells whether the labor input is more effective or less effective in given industries than it is on average. In general the unit labor costs are increasing, which might lead producers to substitute labor with capital. *FDIMFLW* denotes the flow of FDI in a sector of manufacturing in the host country, which is divided by the number of workers. The development of the financial market is measured as before and denoted *FMKT*. The better the financial market, the easier domestic firms can operate. It facilitates the creation of firms that produce intermediary goods, which gain from backward linkages. Further on, the FSFDI flow should have an effect on domestic investment. Because the inflow of FSFDI is used for investment purposes, a fraction should go to the manufacturing sector and increase domestic investment in it. The inflow of FSFDI per worker is denoted *FSFDIFLW*. As above, the dependence on external finance *DEF* is used to account for the impact of financial services and the financial market on different industries.

The specification is similar to that of Mody and Murshid (2005). But unlike in their regression, we allow FDI and FSFDI flow to enter the regression with different coefficients. Moreover, we regress purely domestic investment. We consider this as an improvement because of two facts. FDI and FSFDI flow per worker can have an enhancing effect on domestic investment, but their effect is expected to be different. Foreign banks make investment and business simple and MNCs can be an important business partner and a general source of technology and knowledge that might spill over to domestic firms. On the other hand, FDI can crowd out domestic investment. Secondly, gross capital formation

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<sup>9</sup>For the considered countries, investment at economy level accounts for around 25% of GDP annually, ranging from 15% to 39%, with a variance of 5%. In the manufacturing industries it accounts for 20% of value added on average, but it takes a very wide range, from -350% to 150% with variance 25%. This highly volatility indicates that domestic investment is crowded out by FDI. MNCs buy large and productive firms, thus domestic investment sometimes becomes negative.

is by construction the sum of domestic investment and FDI inflows. Thus total investment and FDI inflow would be strongly correlated.

	DOMINV (1)	DOMINV (2)	DOMINV (3)
DOMINW_lag	-0.1098 (-1.04)	-0.1117 (-1.01)	-0.1115 (-1.06)
VAPW	<b>0.1171</b> (2.26)	<b>0.1098</b> (2.90)	<b>0.1107</b> (2.38)
INFLATION	-77.9181 (-1.10)	-68.0933 (-0.94)	-71.4540 (-1.00)
M2RES	625.4967 (1.17)	596.7087 (1.43)	625.6508 (1.16)
INTSPREAD	-268.5894 (-1.46)	-270.6855 (-1.53)	-266.4457 (-1.50)
ULC	22.8838 (0.89)	21.7575 (0.94)	24.4710 (0.87)
FDIMFLW	<b>-1.1375</b> (-11.59)	<b>-1.1392</b> (-12.40)	<b>-1.1373</b> (-11.73)
FMKT x DEF	-33.0496 (-0.40)		-30.6883 (-0.36)
FSFDIFLW x DEF		0.0162 (0.55)	0.0162 (0.59)
N. Obs	561	561	561
N. Groups	82	82	82
Hansen test	74.93	76.46	76.48
p-value	0.237	0.201	0.2
AR(1) p-value	0.277	0.278	0.278
AR(2) p-value	0.235	0.233	0.23
N. Instruments	76	76	77

**Table 4.2:** Short-run determinants of domestic investment per worker in the manufacturing sector. Two-step difference GMM regression. (z-statistic) in brackets, bold = significant at 5% level.

The regression results are presented in table 4.2. In all specifications the regression can be considered as well specified. The number of instruments used is less than the number of groups. In all specifications the value added per worker enters with high significance. Neither inflation nor the interest rate spread enter significantly and also unit labor costs can be neglected. The baseline specification (1) shows that the flow of FDI has a very strong negative effect on domestic investment in manufacturing industries. The estimated coefficient does not differ significantly from -1. This value is robust to any modification of the regression, thus it clearly shows that FDI crowds out domestic investment. In the same industry MNCs invest in the most profitable firms and leave the second best choice to the local competitors. One million \$ invested by a MNCs replaces one million \$ of domestic investment. Further on, growth of value added enforces domestic investment. An increase of value added by one million \$ leads to an increase of the investment flow

by around 0.11 million. The development of the financial market alone does not play any role. In specification (2) the flow of foreign financial services per worker is included. It is interacted with the DEF variable. The inflow of foreign financial services has no effect on domestic investment. This seems to be quite surprising, as one could expect that foreign banks facilitate access to credit and should enhance investment. In specification (3) the inflow of financial services FDI and the development of the financial market are included. The results do not differ from the previous ones. Again neither the development of the financial market nor the inflow of foreign financial services has any effect. It is quite troublesome to interpret this result. The literature presented at the beginning of this section shows that foreign banks improve the financial system and facilitate host firms access to credit. At the disaggregated level no effect is visible. As estimated in the previous section, FSFDI enhances FDI. FDI picks the most productive investment objects and crowds out domestic investment. Consequently less profitable objects remain for domestic investors. Maybe this explains, why we cannot find any effect of foreign financial services on domestic investment. The indirect effect annihilates the direct effect.

We conclude that value added attracts domestic investors, FSFDI inflow has no effect and FDI inflow crowds out domestic investment.

## **5 Concluding remarks**

This paper investigates the causes and effects of foreign direct investment in the financial and non-financial sector in Transition Economies. The empirical results allow to make three important statements. Non-financial FDI is positively affected by financial services FDI. Foreign banks in the EU Transition Economies are mainly driven by non-financial FDI and the capital intensity of a country. FDI inflow crowds out domestic investment in the manufacturing sector.

We tackle three important questions using one set of countries in approximately the same period of time. In the present literature those questions have been answered only partially and always in relation to different countries and very different time periods. Our study allows to draw a general conclusion. First and foremost, it is necessary to study the nexus between FDI, FSDFI, domestic investment and economic growth. Studies which look only at one direction of causality miss the mutual enforcement and the strong interaction between those very important economic variables. Secondly, it is important to apply a dynamic panel to capture the long-run relationship between the variables. GMM has to be applied whenever possible to tackle the endogeneity problem and the issue of heteroskedasticity and autocorrelation of the error term.

The main results of the estimations are as follows. First: At macroeconomic level,



non-financial FDI stock that originates from different donor countries follows strongly its past period realization. This is a sign that FDI constitutes a permanent capital stock and is well integrated in the host economy. The current value is positively affected by the market potential and also by foreign financial services which give financial stability. The risk of a macroeconomic crisis has a strong detrimental effect. Secondly: The third section shows that financial services FDI is strongly affected by non-financial FDI. This confirms the follow-the-client hypothesis. However, domestic investment plays a significant role and is an important determinant of FSFDI, too. Inflation affects the stock of FSFDI negatively. Thirdly: In the last section we investigate the nexus in the manufacturing sector. Like at aggregate level, the stock of FDI in each industry depends on its previous realization. Moreover, foreign financial services and the value added have a strong positive effect. Domestic investment has no effect on FDI. The stock market capital has a negative effect, which might indicate that FDI prefer weak economies in which they can exploit their comparative advantage. Further on, we find that domestic investment does not depend on its past realization. It is a flow, and depends on the value added. FDI flows have a strong negative effect and crowd out domestic investment.

Comparing our results with those from the recent literature we find that some results change drastically, conditional on the period and the sector of the economy that is considered. For example, recent studies at aggregate level show that foreign banks increase and stabilize the investment in the whole economy. However, in the manufacturing industries we do not find any effect of FSFDI on domestic investment. This shows that a variable can have different effects in different sectors of the economy and at different disaggregation levels. However, most of our results are in line with the empirical analysis presented in the literature. Our results should be interpreted with caution. The results apply to a period in which a high FDI inflow was observable. Nowadays, as the global financial crisis makes multinational corporations consolidate their capital in the home country, the effect might be very different. MNCs slow down their production or even stop it completely. Foreign banks withdraw funds and shift them to their home country. The economic impact of FDI might turn around. It was a major motor of economic growth, but due to the strong connection of the economies to the global economy it might have a detrimental effect during the next few years. This means, that a new study which uses data since the middle of 2008 is necessary. Moreover, the effect of FDI and foreign financial services on TFP and value added growth should be studied.

# A Appendix

## A.1 Data description

Data sources and construction of time series. All variables expressed in \$ are in international \$ at year 2000 constant prices. Data used in this paper is available upon request.

**FDI, FSFDI** - non-financial and financial services FDI stock in the host country. **FDIM** - non-financial FDI in the manufacturing industries. Data reported as stocks. Source: Vienna Institute for International Studies (2008a)

**ULC** - Unit Labor Costs, **RULC** - Relative Unit Labor Costs to Austria. Source OECD, Vienna Institute for International Studies (2008b)

**GDP** - Gross Domestic Product, **GDP**C - GDP divided by population, **GDP**W - GDP divided by labor force; **INV**W Gross Capital Formation, divided by labor force; **DOM-INV**W - domestic investment, obtained by subtracting the FDI flow from total investment. Source: The World Bank (2008).

**INFLATION, INTSPREAD** - spread between lending and deposit interest rate, **LENDINT** - lending interest rate, **REALINT** - real interest rate, **FIXEDLINE** number of fixed line and mobile phones per 1000 inhabitants, **EDUCATED** - share of labor force with secondary and tertiary education, **EXPORTS, M2RES** - M2 money over domestic reserves, **GOVCONS** - share of governmental consumption in GDP; Source: The World Bank (2008).

**FMKT** - financial market development, stock market plus credit to private sector divided by GDP; **CDP** - credit to private sector, divided by GDP; **DCB** - credit provided by banks, divided by GDP; **STKMT** - stock market capitalization divided by GDP; **STMKTCAP** - stock market capitalization; Source: The World Bank (2008).

**RULC** - relative unit labor costs.  $RULC_{ijt} = ULC_{jt} / ULC_{it}$

**RGDP** - relative GDP size.  $RGDP_{ijt} = \ln(GDP)_{jt} - \ln(GDP)_{it}$

**RKL** - relative capital endowments, proxied by relative investment per worker.  $RKL_{ijt} = \ln(INVW)_{jt} - \ln(INVW)_{it}$

$i$  denotes the host country,  $j$  the donor country,  $t$  is the time index.

**HUMANCAP** - schooling human capital per worker. I calculate human capital of workers with primary, secondary and tertiary education and then construct the average human capital using the following formula.  $h_t = share_{prim} \cdot h_t^{prim} + share_{sec} \cdot h_t^{sec} + share_{tert} \cdot h_t^{tert}$  with  $h_t^{prim} = e^{\phi(s_{prim})}$ ,  $h_t^{sec} = e^{\phi(s_{sec})}$  and  $h_t^{tert} = e^{\phi(s_{tert})}$ . Here  $s$  denotes years of schooling and  $\phi(s) = 0.13 * s$  for  $s \leq 4$ ,  $\phi(s) = 0.13 * 4 + 0.1 * (s - 4)$  for  $4 < s \leq 8$  and  $\phi(s) = 0.13 * 4 + 0.1 * 4 + 0.07 * (s - 8)$  for  $8 < s$ . Basing on empirical observations, workers with primary education have 8 years of schooling, those with secondary 12 years and those with tertiary 16 years, on average. Original source for shares of laborforce with different education levels is The World Bank (2008).

**HM** - human capital in manufacturing industries. First, human capital is constructed as above for the whole country. The human capital is multiplied by labor productivity in each industry. The productivity for the whole manufacturing sector of each country is normalized to 100 and origins from Vienna Institute for International Studies (2008a).

## A.2 Stata commands used

### Bilateral FDI, section 2

```
xtabond2 nonfsfdi l.nonfsfdi fsfdi mkpd rkl m2res intspread year,
iv(year mkpd ) gmm( l.nonfsfdi fsfdi rkl m2res intspread,
laglimit(. 2)) twostep robust noleve leq
```

### FSFDI, section 3

```
xtivreg2 fsfdi l.fsfdi (nonfsfdi invtotal = l.nonfsfdi l.invtotal
l.gdp ulc exports ) freedom tax inflation m2res ,
fd small robust bw(4)
```

### FDI in manufacturing, section 4.1

```
xtabond2 fdim l.fdim fsfdidef va inv tax inflation m2res
stockmktcapitaldef ulcra humancap year if country!="Latvia",
iv(year fsfdidef inflation m2res tax stockmktcapitaldef ulcra
humancap) gmm( ( l.fdim va inv ), lag(. 2) ) twostep robust noleveleq
```

## Domestic investment, section 4.2

```

xtabond2 dominvw l.dominvw vapw inflation intspread ulc m2res
fdimdifw financemktdef fsfdidifwdef year if country!="Latvia",
iv(year inflation intspread m2res financemktdef fsfdidifwdef )
gmm( ( l.dominvw vapw fdimdifw ulc), lag(. 2)) twostep robust nolevelq

```

## A.3 Data statistics

	Nr. Obs.	Mean	Std. Dev.	Min	Max
FDI	1082	868.4651	1920.127	-217.6137	15420.76
FDI_lag	980	790.5061	1780.338	-217.6137	15420.76
FSFDI	1274	2056.439	2789.485	28.92924	14578.72
MKPD	1274	25.05466	0.5005671	24.19063	26.22956
RKL	1207	1.31901	0.5744506	-0.3654585	3.260717
RGDP	1274	3.477498	1.622366	-0.5814743	7.498953
M2RES	1274	2.412449	0.6220888	1.256944	4.097924
INTSPREAD	1183	5.359921	2.144544	-1.372323	14.06833
FDI	980	132.9796	421.149	-2550.638	4103.592
FDI_lag	878	106.068	374.5442	-2550.638	4103.592
FSFDI	1157	367.2951	619.5027	-978.4277	3697.788
MKPD	1157	0.0438048	0.0128706	0.0161152	0.0736103
RKL	1090	-0.0601981	0.1076219	-0.7230849	0.3581786
RGDP	1157	-0.0270773	0.0306333	-0.1412716	0.1077309
M2RES	1157	0.0221332	0.3794107	-1.444741	0.7981882
INTSPREAD	1066	-0.4221164	1.318739	-4.718333	5.105803

*Table A.1: Data statistics for section 2, in levels (upper part) and in first differences (lower part).*

	Nr. Obs.	Mean	Std. Dev.	Min	Max
FSFDI	98	2056.439	2802.726	28.92924	14578.72
FSFDI_lag	89	1845.112	2549.856	28.92924	12927.69
FDI	98	10584.29	13017.64	400.2242	62701.14
INV	95	10252.56	11544.8	1008.904	46904.21
FREEDOM	95	63.32316	6.702595	46.2	78
TAX	97	26.3299	7.10034	15	40.2
INFLATION	98	6.711214	6.444006	-0.922097	48.66133
M2RES	98	2.412449	0.6250418	1.256944	4.097925
REALINT	98	4.993422	4.686608	-14.51656	15.27376
FMKT	97	49.85987	22.0908	11.81805	103.2064
FSFDI	89	367.2951	622.7434	-978.4277	3697.788
FSFDI_lag	80	315.5996	590.4214	-978.4277	3697.788
FDI	89	1566.672	2801.056	-5406.441	15089.45
INV	86	533.4668	1430.186	-5702.375	5908.727
FREEDOM	86	1.023256	2.496052	-4	7.599998
TAX	88	-1.026136	2.227802	-11	4
INFLATION	89	-1.032768	4.502364	-28.16428	4.698236
M2RES	89	0.0221332	0.3813955	-1.444741	0.7981882
REALINT	89	-0.3313076	4.034395	-16.0329	15.39869
FMKT	88	3.104126	7.660714	-20.77226	25.65207

*Table A.2: Data statistics for section 3, in levels (upper part) and in first differences (lower part).*

	Nr. Obs.	Mean	Std. Dev.	Min	Max
FDIM	873	429.1435	707.6299	-1.88382	4649.797
FDIM_lag	790	398.0549	657.9068	-1.88382	4636.717
FSFDI DEF	889	707.9924	1170.531	-948.9115	11225.61
VA	927	701.451	863.807	5.712266	6319.136
INV	924	187.0511	252.5842	-5.808561	1765.363
TAX	927	27.30313	7.82887	15	51.6
INFLATION	927	7.05333	7.80661	-0.922097	48.66133
M2RES	927	2.569574	0.6074822	1.423284	4.097925
STMKTCAP	927	1329.971	2382.008	-3147.637	26300.71
ULCRA	877	51.91482	44.85576	1.2	518.4
H	914	3.468907	0.1202323	3.301942	3.719676
FDIM	789	55.21046	175.032	-770.3252	1700.859
FDIM_lag	706	46.25041	162.5377	-770.3252	1700.859
FSFDI DEF	805	117.6945	250.1302	-753.3896	2847.297
VA	843	24.14048	131.1503	-1294.655	1672.601
INV	840	7.185123	78.93236	-378.9277	796.2479
TAX	843	-1.143298	2.604995	-13.3	4
INFLATION	843	-1.869979	5.345785	-28.16428	4.455523
M2RES	843	0.0040389	0.406079	-1.444741	0.7981882
STMKTCAP	843	179.3458	1134.063	-6050.847	11146.4
ULCRA	793	3.011475	10.00719	-59.2	81.4
H	830	0.0038473	0.0700235	-0.3028553	0.2864501

**Table A.3:** Data statistics for section 4.1, in levels (upper part) and in first differences (lower part).

	Nr. Obs.	Mean	Std. Dev.	Min	Max
DOMINWV	779	3176.465	6728.85	-51586.85	73030.45
DOMINWV_lag	701	3332.379	6418.381	-42216.75	73030.45
VAPW	914	15222.77	12844.36	2595.817	156272.6
INFLATION	927	7.05333	7.80661	-0.922097	48.66133
INTSPREAD	872	4.958184	1.666419	-1.372323	8.285833
ULC	907	118.456	52.05175	14.8	340.4
M2RES	927	2.569574	0.6074822	1.423284	4.097925
FDIMFLW	780	1353.902	5617.366	-21633.56	66761.94
FMKT DEF	927	12.21142	10.53213	-11.62392	63.93155
FSFDIDIFL DEF	793	3459.03	11121.07	-55635.53	117140.3
DOMINWV	696	-140.4853	8378.758	-91068.02	95530.14
DOMINWV_lag	618	272.0365	8356.659	-91068.02	95530.14
VAPW	831	741.8394	6186.371	-77981.97	107238.4
INFLATION	843	-1.869979	5.345785	-28.16428	4.455523
INTSPREAD	788	-0.3044262	1.274703	-4.131199	5.105803
ULC	825	0.0447272	13.46056	-79.7	104.8
M2RES	843	0.0040389	0.406079	-1.444741	0.7981882
FDIMFLW	697	327.7136	6498.306	-49749.09	85042.05
FMKT DEF	843	0.6420874	2.543675	-11.38638	16.22735
FSFDIDIFL DEF	710	227.0614	11796.28	-109778.5	78545.63

**Table A.4:** Data statistics for section 4.2, in levels (upper part) and in first differences (lower part).

	Nr. Obs.	Mean	Std. Dev.	Min	Max
ln VAPW	914	9.431957	0.5928415	7.861657	11.95936
DOMINV	779	3176.465	6728.85	-51586.85	73030.45
FDIMFLW	780	1353.902	5617.366	-21633.56	66761.94
FSFDIW DEF	876	21299.77	60080.53	-141027.4	745573.4
TAX	927	27.30313	7.82887	15	51.6
INFLATION	927	7.05333	7.80661	-0.922097	48.66133
ln HM	894	5.778832	0.6569776	4.099947	8.133567
ln KW	912	10.04336	0.9226693	6.925606	13.02661
INTSPREAD	872	4.958184	1.666419	-1.372323	8.285833
DCB DEF	927	12.45392	10.08474	-10.4367	57.40184
CBTP DEF	927	10.08388	8.68767	-9.83686	54.10273
STKMKT DEF	927	2.127542	3.063307	-4.773468	26.25407
ln VAPW	831	0.0432378	0.1660653	-1.020861	1.159084
DOMINV	696	-140.4853	8378.758	-91068.02	95530.14
FDIMFLW	697	327.7136	6498.306	-49749.09	85042.05
FSFDIW DEF	793	3555.412	13062.96	-66222.63	151887.6
TAX	843	-1.143298	2.604995	-13.3	4
INFLATION	843	-1.869979	5.345785	-28.16428	4.455523
ln HM	812	0.0015293	0.1094903	-0.6275849	1.065452
ln KW	829	0.0709507	0.1075514	-0.7659502	0.9208164
INTSPREAD	788	-0.3044262	1.274703	-4.131199	5.105803
DCB DEF	843	0.4662231	1.719273	-7.725639	9.959278
CBTP DEF	843	0.5697253	1.872674	-10.56084	9.631168
STKMKT DEF	843	0.0723621	1.527565	-12.55328	12.92161

*Table A.5: Data statistics for section ??, in levels (upper part) and in first differences (lower part).*

## A.4 Correlation matrices

FDI	1							
FDI_lag	0.98	1						
FSFDI	0.51	0.50	1					
MKPD	0.46	0.44	0.77	1				
RKL	-0.10	-0.11	-0.17	-0.27	1			
RGDP	-0.27	-0.25	-0.51	-0.60	0.26	1		
M2RES	0.20	0.20	0.37	0.41	-0.49	-0.23	1	
INTSPREAD	-0.19	-0.19	-0.27	-0.30	0.50	0.16	-0.39	1
FDI	1							
FDI_lag	0.04	1						
FSFDI	0.44	0.13	1					
MKPD	0.01	-0.12	-0.01	1				
RKL	-0.01	0.10	0.03	-0.23	1			
RGDP	0.08	0.10	0.15	-0.52	0.55	1		
M2RES	-0.05	0.04	0.02	0.12	-0.02	-0.08	1	
INTSPREAD	0.00	0.07	0.09	0.04	0.13	0.18	-0.01	1

*Table A.6: Correlation matrix for section 2, in levels (upper part) and in first differences (lower part).*

FSFDI	1										
FSFDI_lag	0.98	1									
FDI	0.92	0.91	1								
INV	0.87	0.83	0.85	1							
FREEDOM	0.00	0.01	-0.02	-0.13	1						
TAX	-0.11	-0.14	-0.18	0.06	-0.40	1					
INFLATION	-0.28	-0.31	-0.22	-0.08	-0.28	0.13	1				
M2RES	0.39	0.39	0.39	0.38	0.18	-0.03	-0.07	1			
REALINT	0.02	0.00	0.00	0.22	-0.44	0.40	-0.27	0.08	1		
FMKT	0.21	0.22	0.34	0.17	0.28	-0.22	0.01	0.60	-0.32	1	
FSFDI	1										
FSFDI_lag	0.01	1									
FDI	0.79	-0.14	1								
INV	0.46	-0.27	0.52	1							
FREEDOM	-0.22	-0.04	-0.19	-0.09	1						
TAX	-0.26	-0.04	-0.22	-0.18	0.16	1					
INFLATION	0.01	-0.11	0.13	0.12	-0.23	-0.21	1				
M2RES	0.02	0.05	-0.09	-0.03	0.06	0.07	0.03	1			
REALINT	0.03	0.09	-0.09	-0.03	0.12	0.23	-0.76	-0.01	1		
FMKT	0.01	-0.17	-0.11	0.13	-0.13	0.10	0.15	0.23	-0.09	1	

**Table A.7:** Correlation matrix for section 3, in levels (upper part) and in first differences (lower part).

FDIM	1										
FDIM_lag	0.97	1									
FSFDI DEF	0.43	0.42	1								
VA	0.76	0.74	0.57	1							
INV	0.79	0.77	0.41	0.89	1						
TAX	-0.13	-0.14	-0.08	0.03	0.06	1					
INFLATION	-0.13	-0.15	-0.22	-0.04	0.00	0.17	1				
M2RES	0.21	0.23	0.25	0.23	0.19	0.38	0.01	1			
STMKTCAP	0.43	0.44	0.82	0.52	0.39	-0.13	-0.10	0.25	1		
ULCRA	-0.20	-0.20	-0.08	-0.19	-0.19	0.06	-0.01	0.00	-0.11	1	
H	-0.23	-0.22	-0.20	-0.32	-0.30	0.13	-0.29	-0.06	-0.22	0.02	1
FDIM	1										
FDIM_lag	-0.05	1									
FSFDI DEF	0.35	0.01	1								
VA	0.26	0.08	0.16	1							
INV	0.10	0.01	-0.01	0.19	1						
TAX	-0.15	-0.04	-0.21	-0.11	0.05	1					
INFLATION	0.05	-0.05	-0.01	0.10	0.01	-0.21	1				
M2RES	-0.01	0.10	0.03	-0.01	-0.02	0.13	0.02	1			
STMKTCAP	0.04	0.03	0.34	0.20	0.04	-0.07	-0.02	0.00	1		
ULCRA	-0.04	-0.02	0.03	-0.05	-0.06	0.01	0.02	0.05	0.01	1	
H	0.01	0.06	0.06	0.00	0.04	0.47	-0.15	0.11	0.01	0.04	1

**Table A.8:** Correlation matrix for section 4.1, in levels (upper part) and in first differences (lower part).

DOMINVW	1									
DOMINVW_lag	0.21	1								
VAPW	0.24	0.31	1							
INFLATION	0.01	0.05	0.04	1						
INTSPREAD	-0.03	-0.02	-0.12	-0.08	1					
ULC	-0.25	-0.30	-0.46	-0.05	-0.05	1				
M2RES	0.14	0.03	0.06	0.07	-0.23	-0.07	1			
FDIMFLW	-0.57	0.08	0.43	0.05	-0.06	-0.19	-0.09	1		
FMKT DEF	0.06	0.07	0.13	0.05	-0.23	-0.15	0.27	0.02	1	
FSFDIDIFL DEF	0.20	0.27	0.35	-0.07	-0.05	-0.30	0.04	0.15	0.14	1
DOMINVW	1									
DOMINVW_lag	-0.45	1								
VAPW	0.00	-0.11	1							
INFLATION	-0.06	0.02	0.11	1						
INTSPREAD	-0.08	0.01	-0.01	0.04	1					
ULC	0.02	0.02	-0.08	0.04	-0.09	1				
M2RES	0.14	-0.12	0.02	-0.15	0.01	-0.02	1			
FDIMFLW	-0.82	0.27	0.12	0.04	0.06	-0.02	-0.08	1		
FMKT DEF	0.02	0.05	0.05	-0.01	-0.09	0.04	0.13	-0.05	1	
FSFDIDIFL DEF	-0.02	0.10	0.26	-0.03	-0.01	-0.01	0.02	0.09	-0.03	1

**Table A.9:** Correlation matrix for section 4.2, in levels (upper part) and in first differences (lower part).

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