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## **DETERMINANTS OF FOREIGN DIRECT INVESTMENT (FDI) IN BULGARIA: An econometric analysis using panel data**

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**ABSTRACT:** The objective of this paper is to analyse the determinants of FDI in Bulgaria, using panel data and an extended time-span, from the late-1990s until the late-2000s, in order to explore FDI motivations during the most important phase of the Bulgarian transition, until recently. Results indicate that FDI in Bulgaria has been motivated by both market and efficiency reasons, as well as the high quality of the Bulgarian workforce. The progress in transition reforms and integration into the European Union, have also provided an important stimulus for the establishment of FDI in the Bulgarian market.

**KEYWORDS:** FDI determinants, Bulgaria, Transition, Panel data

**JEL Classification:** F21, P33, C23

### **Introduction**

Globalization and the intensity of economic competition have been exerting enormous pressure on companies of all economic sectors to be in constant search for new strategic advantages and new opportunities for strategic expansion

(UNCTAD, 2005). This has led to the rise and proliferation of the multinational enterprise (MNE), in other words the enterprise that has expanded its operations abroad in the form of foreign direct investment (FDI). In the 1990s, the fall of the Soviet Union and the opening up of Central and Eastern European countries (CEECs), as well as their transition to market economies, has created a particularly favorable area for the international expansion of multinational corporations and the rise of FDI in these economies. As a response to these developments, a significant part of empirical research has been directed towards Central and Eastern Europe (CEE), in an effort to investigate FDI determinants and motivations in that area.

In the countries of CEE, direct investment has played a central role in economic restructuring and has supported the transition to a market economy (Walkenhorst, 2004). Moreover FDI has been the means for the transfer of new technologies, as well as managerial and organizational practices, offering opportunities for raising the yield of the existing stock of capital in host countries (Wes and Lankes, 2001). Its impact however goes beyond the simple transfer of resources, as it has provided a powerful stimulus for the realization of reforms and the building of financial and other institutions (Lankes and Stern, 1998). At the same time, transition reforms, mainly privatization of previously state-owned enterprises (SOEs), have opened up opportunities for the establishment of FDI projects, initially in the form of joint ventures (JVs) and later increasingly in the form of cross-border mergers and acquisitions (M&As) of existing enterprises or the establishment of new projects (greenfield or brownfield investments).

It can be therefore understood that during the transition period, most of the countries in CEE based their economic growth on the availability of foreign capital and predominantly FDI. However the global economic and financial crisis, which resulted in a deep recession for most economies of CEE, has adversely affected FDI inflows in the region. Its negative impact on FDI was widespread across the region, especially in 2009, although some countries were affected less severely than others. The global slowdown of economic activity, limited access to finance and collapsing export markets have resulted in the retirement of FDI, and have put under severe strain the vulnerable economies of CEE, whose impressive growth in the 2000s was increasingly dependent on the external markets of Western Europe and the large inflows of foreign capital.

In this context, it is becoming increasingly significant to investigate FDI determinants in the countries of CEE, especially those with the most fragile and least developed economies such as the economies of South Eastern Europe, in order to understand the reasons that have been motivating foreign investors in these markets, explore ways to re-attract FDI, but also most importantly, find ways to

direct it to the sectors most beneficial for the economy, that is the sectors that could contribute to long-term growth and prosperity. The study of individual countries principally, can contribute to the identification of special country-specific and transition-specific features that can motivate foreign investors in that specific country. Besides, the transition process and gradual transformation to a market economy, as well as the impact of the current economic crisis, have been unique for each country. However, most empirical research of FDI determinants in transition economies has covered groups of countries, while neglecting the in-depth study of FDI determinants in individual countries.

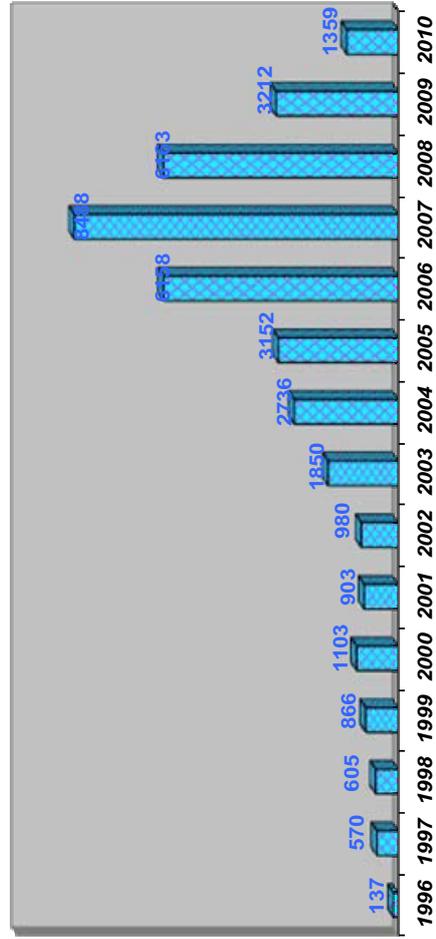
The objective of this study is to discover the determinants of FDI in Bulgaria, using panel data and an extended time-span, from the late 1990s until the late 2000s, in order to explore FDI motivations during a significant phase of the Bulgarian transition, when FDI was increasing at a very high rate. The rest of the paper is structured as follows: Section 2 presents the trends of FDI in Bulgaria during transition and under the impact of the global economic crisis. Section 3 reviews the literature on FDI determinants during transition in the region of CEE and in Bulgaria in particular. Section 4 presents the methodology and discusses the main findings. Section 5 concludes and describes the policy implications.

### **Patterns of FDI in the Bulgarian market**

#### *Four periods of distinct FDI patterns*

The Bulgarian transition from a centrally planned to a market economy was marked by an impressive transformation of the Bulgarian economy and has gone through four different phases of economic reforms and consequently of FDI patterns (Sakali, 2011a). The first years of transition were highly turbulent and characterized by extreme economic and political instability. Consequently, up until 1997, investor interest in Bulgaria remained extremely low (figure 1). However, a positive sign has been the rather dynamic distribution of FDI by country of origin, already from the early years of transition. Apart from Germany who initially appeared as the main investor in Bulgaria, neighboring countries such as Greece and Turkey, had also started to invest in Bulgaria by the mid-1990s (Bobeva and Bozhkov, 1996; figure 2).

**Figure 1: FDI inflows in Bulgaria, million €, 1996-2010**



Source: Bulgarian National Bank, BNB

As a response to Bulgaria's gradual transformation into a market economy, FDI inflows began to increase significantly towards the end of the 1990s (figure 1), which marked the second period of the Bulgarian transition. The growing amount of FDI in Bulgaria over that period was a reaction to economic development and the long wished-for, political stability in the country. The growing GDP per capita coupled with low wages compared to other European countries also helped to awake foreign investor interest. FDI inflows surged from 137 million Euros in 1996 to 570 millions in 1997 and 1103 millions in 2000. As a result, FDI inflows rose by an unprecedented 705% over the period 1997-2000.

The third period in Bulgaria's transition was marked by European integration. In April 2005 the country signed the accession treaty, after the EU's confirmation that it had become a fully functioning economy. As a result of Bulgaria's 'Europeanization', FDI rose consistently in the years before the Bulgarian economy was hit by the global economic crisis. In 2006 FDI almost doubled, following the signing of the accession treaty and confirmations from the part of the EU that Bulgaria was indeed ready to enter the EU (figure 1). In 2007 FDI rose again, mounting to almost 8500 million Euros (figure 1). As a result of these developments, FDI inflows marked another dramatic increase of 170% in the period 2005-2007.

The fourth and last period started in 2008 and was marked by the detrimental effects of the global financial and economic crisis. Economic growth in CEE and in Bulgaria in particular, has depended strongly on FDI inflows and the export markets of Western Europe, which has been the region's main trading partner. As a consequence, the credit and liquidity crisis that broke out in the Western part of the world was quickly transferred to the economies of CEE. High rates of economic growth came to a halt and CEECs fell into deep recession. In 2008 FDI inflows in Bulgaria declined for the first time after a six year period of growth, dropping to just over 6500 million Euros (figure 1). In 2009 the decline was larger, with FDI inflows falling to approximately half the level of 2008 (just over 3000 million Euros). The same trend continued in 2010, with FDI inflows amounting to just over 1300 million Euros, the lowest figure since 2003. Overall, FDI inflows to Bulgaria plunged by almost 85% in the period between 2007 and 2010 (figure 1).

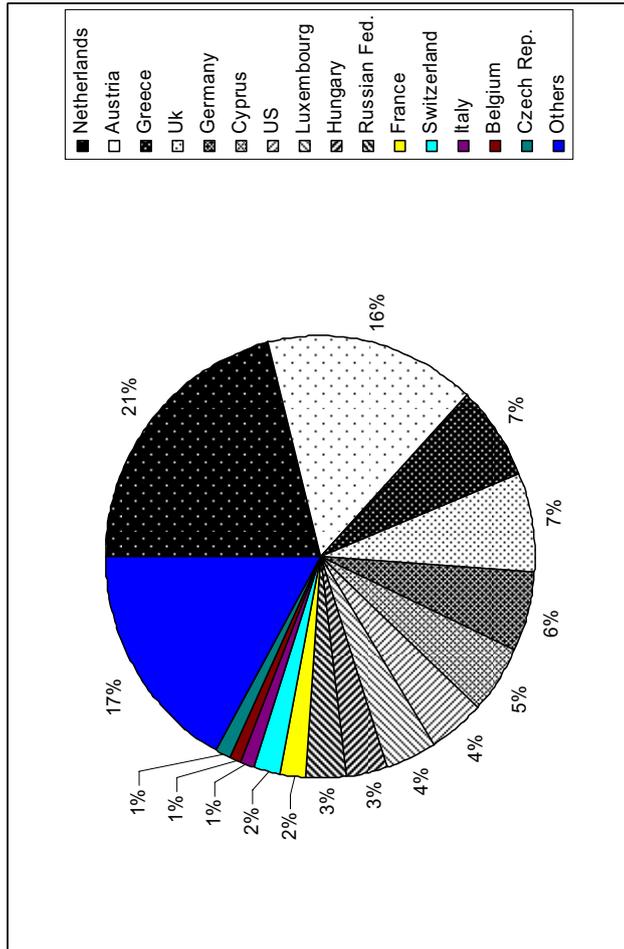
#### *Sources of FDI to the Bulgarian market*

From the beginning of transition, the Bulgarian market has been characterized by the dynamic distribution of FDI by country of origin. In the first couple of years FDI inflows to Bulgaria were coming predominantly from Germany, but soon after

and more specifically in the period 1993-1995, the majority of FDI inflows originated from neighbouring countries, mainly Greece and Turkey (Bobeva and Bozhkov, 1996). Germany and Greece remained significant sources of FDI throughout the following years until today, while at the same time other countries appeared as important sources of FDI inflows at the Bulgarian market, resulting in 15 source countries making up for almost 85% of FDI stock at the end of 2010 (figure 2).

As a result, the majority of FDI stock has originated predominantly from Western European countries, with the Netherlands appearing to have invested the largest amounts of FDI in Bulgaria (21% of total). Other significant sources of FDI from Western Europe include Austria (16%), the United Kingdom (7%) and Germany (6%). Neighbouring Greece still constitutes a dynamic source of FDI (7%) and is in fact the 3<sup>rd</sup> largest source of FDI stock in the Bulgarian market. Important source countries from other areas include also Cyprus (5%), the US (4%) and Luxembourg (4%). Another striking development is the emergence of transition countries from the CEE region, as dynamic sources of FDI, in the recent years. These include Hungary, the Russian Federation and the Czech Republic, all of which together make up for 7% of FDI in Bulgaria, with Hungary and the Russian Federation being the most important sources among them (figure 2).

**Figure 2. FDI stock in Bulgaria by country of origin, 1996-2010, % of total**



Source: Own calculations from the Bulgarian National Bank, BNB

## **Review of literature on FDI determinants**

### *FDI determinants in the region of Central and Eastern Europe*

The literature about FDI determinants in the region of CEE has mainly consisted of econometric and survey studies<sup>5</sup>. Survey studies have focused predominantly on individual countries while, on the other hand, econometric studies have focused on large groups of countries, largely neglecting the in-depth study of FDI determinants in individual or specific countries. An exception to this trend has been the study of Wang & Swain (1995, 1997), who looked at FDI determinants in Hungary and in China, using a one-equation model and a time-series approach. Another exception may be regarded the study of Lansbury *et al.* (1996) who focused their research on three countries of Central Europe, namely Poland, Hungary and the Czech Rep, making use of panel data.

Another limitation of previous econometric studies has been the limited time span used in the analysis, ranging from only three to seven years. This can be partly justified by the limited time period since both the start of the transition and the opening up of CEECs to FDI, as well as data availability constraints. This limitation however makes it difficult for determinate conclusions to be drawn, and certainly conclusions that refer to the entire period of transition (Kottaridi *et al.*, 2002, 2004). The only study which made use of a relatively more extended time span is that of Kottaridi *et al.* (2002, 2004), who used a sample period of ten years up to 2000, covering the entire first decade of transition.

Most of the research on FDI determinants in CEE examined the role of both traditional and transitional or institutional variables. Traditional variables refer to variables that have been traditionally used in the research studying FDI determinants, in order to explore the presence of market-seeking, efficiency-seeking, and resource-seeking FDI motives (Altomonte and Guagliano, 2001; Botric and Skufflic, 2005). Market-seeking motives refer to the establishment of FDI in order to tap a newly emerged market with the purpose to serve consumers in this market, and are therefore related to the size of the market, market potential, GDP per capita and real GDP growth of the host economy. Efficiency-seeking motives refer to the establishment of FDI seeking to take advantage of production cost differentials between the source and host country, such as lower costs of raw materials, lower labour costs and lower trade costs because of trade/regional integration of the host economy with the source or other neighboring economies.

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<sup>5</sup> For a comprehensive review of the empirical literature on FDI determinants in CEE, consult Holland *et al.* (2000); Clausing and Dorobantu (2005).

Resource-seeking motives refer to FDI that is motivated by the acquisition or the use of resources that are available in the host market, such as the abundance in natural resources, availability of a skilled and well-trained labor force, the existence of good quality infrastructure or a smoothly functioning business environment.

Apart from the examination of traditional variables as FDI determinants in CEE, both econometric and survey studies became interested in the exploration of determinants which are related to the process of transition to a market economy. Due to the fact that the transition from the centrally planned regime of the Soviet Union to a free market economy, has been unique for the countries of CEE, the process of transition itself has provided and keeps providing a unique opportunity to analyze the relationship between the establishment of FDI and the special features and characteristics of the CEE transition. The determinants that are related to the process of transition are referred to in some studies as transition or transition-specific variables (Botric and Skuflic, 2005; Carstensen and Toubal, 2003; Altomonte and Guagliano, 2001; Brada *et al.*, 2006), while in other studies they are referred to as institutional variables (Altomonte, 2000; Kinoshita and Campos, 2003; Bevan *et al.*, 2004). In both cases however these variables are connected to the process of transition and the realization of reforms in the markets of CEE, as well as the building of institutions that are present and operate in a market economy.

Although Lankes and Venables (1996) observe that FDI projects in CEE have been largely heterogeneous in respect to the entrance mode and the nature of the investment project, however the research on FDI determinants does find some common motives, with little differentiations from one study to another. Motives that are found to be significant in most of the studies include market and efficiency motives, as well as trade integration, which indicates the openness of the host country, and integration into regional free trade areas or into the European Union (Lansbury *et al.*, 1996; Holland and Pain, 1998; Kinoshita and Campos, 2003; Galego *et al.*, 2004; Janicki and Wunnava, 2004; Botric and Skuflic, 2005; Clausing and Dorobantu, 2005; Merlevede and Schoors, 2004, 2009). Results are not always unanimous in respect to other motives, such as the quality of the workforce, geographical distance or macroeconomic indicators (Bevan and Estrin, 2000; Altomonte, 2000; Tondel, 2001; Kottaridi *et al.*, 2002, 2004; Kinoshita and Campos, 2003; Demekas *et al.*, 2005).

Regarding the transitional or institutional variables, these are generally found to be statistical significant in most of the empirical studies on FDI determinants in CEE. Especially important appear to be: the host country risk (Lankes and Venables,

1996; Altomonte, 2000; Bevan and Estrin, 2000; Carstensen and Toubal, 2003; Janicki and Wunnava, 2004; Merlevede and Schoors, 2004, 2009), the process of privatization of the host economy (Lansbury *et al.*, 1996; Holland and Pain, 1998; Carstensen and Toubal, 2003; Bevan *et al.*, 2004; Botric and Skuflic, 2005; Brada *et al.*, 2006) and variables related to the liberalization of host institutions, such as trade liberalization and banking sector reform (Altomonte and Guagliano, 2001; Kinoshita and Campos, 2003; Bevan *et al.*, 2004; Botric and Skuflic, 2005). The significance of transitional or institutional variables is also confirmed by the modern theoretical contributions on FDI determinants, which emphasize the role of host institutions in attracting and retaining foreign direct investment (Forsgren *et al.*, 2005; Loveridge, 2007; Pournarakis and Varsakelis, 2004; Dunning and Zhang, 2008).

#### *FDI determinants in Bulgaria*

Research on FDI determinants in Bulgaria has been conducted mainly through surveys, based on interviews and questionnaires. From a review of the literature we can point out that at the beginning of transition, there were no particular advantages, specific to Bulgaria, that could motivate foreign investors, except perhaps the existence of natural resource endowments, albeit limited, and the lack of competition in the country (Glaister and Atanasova, 2001). On the contrary it could be said that the Bulgarian market was characterized by significant challenges, such as: extreme macroeconomic instability, political instability and an unstable legal system, high bureaucracy and official corruption, crime and mafia, lack of information about market conditions and uncertainty, lack of a business culture by local employees and local partners, the small size of the country, negative growth rates and a low per capita GDP, as well as the long distance from western European borders (Iammarino and Pitelis, 2000; KPMG, 2000; Glaister and Atanasova, 2001; Bitzenis, 2003, 2004b, 2006a, b; Totev, 2005). The above challenges were due to a combination of adverse initial conditions at the start of the transition, and the unsuccessful implementation of reforms in the first few years following the start of the transition (Bitzenis and Marangos, 2009).

As a result of the above challenges or barriers to investment, FDI in Bulgaria was extremely limited during the first few years of its transition to a market economy. The limited FDI that came into the country in the 1990s was mainly motivated by firms' global expansion strategies, and the competitive pressures among global leading firms (Jordanova, 1999; Iammarino and Pitelis, 2000; Glaister and Atanasova, 2001; Bitzenis, 2004a, 2006a). Moreover, these firms were motivated by prospects for future market and business growth, as well as EU integration, and therefore they had long-term perspectives for their business (Marinova *et al.*, 2004;

Totev, 2005; Bitzenis and Vlachos, 2010). More particularly, the gradual transformation of the economy and its prospects for integration with western organizations and free trade areas were powerful motivating factors which gradually helped boost FDI inflows in Bulgaria.

In other words, as the transition reforms continued and the country was gradually being transformed into a market economy, location challenges began to turn into location advantages (Sakali, 2011a). Here we can identify both '*transition-specific*' features, such as: political stability and improvements in the legal system, macroeconomic stabilization, integration with western organizations, the building of market institutions and an increasing business culture leading to more successful business relations, and '*country-specific*' features, such as geographic location, access to neighboring countries and trade links with other European countries, as well as the quality of the workforce, that served as advantages or incentives to the increasing levels of FDI in the recent years, especially in the years before the global economic crisis struck (Sakali, 2011a).

Consequently, and more specifically, the most important determinants of FDI in Bulgaria, as outlined by the literature, were found to be:

- Market potential & prospects for economic growth (Iammarino and Pitelis, 2000; Glaister and Atanasova, 2001; Marinova et al., 2004; Bitzenis, 2004a, 2006a).
- Low labour costs (Iammarino and Pitelis, 2000; Totev, 2005; Bitzenis, 2004a, 2006a; Kalotay, 2008).
- Well trained and motivated workforce (Totev, 2005; Kalotay, 2008).
- Proximity to the EU market & prospects for EU integration (Iammarino and Pitelis, 2000; Totev, 2005; Bitzenis, 2004a, 2006a; Kalotay, 2008; Bitzenis and Vlachos, 2010).
- Economic relations with source countries (Totev, 2005).
- Improved economic & business environment (Totev, 2005; Kalotay, 2008)

### **FDI determinants in Bulgaria: empirical analysis**

#### *Methodology and hypotheses for testing*

In order to test the FDI determinants in Bulgaria, a panel dataset has been used, recording FDI from source country *i* to Bulgaria at time *t* (a cross-section and a period dimension). Panel datasets have considerable benefits over simple cross-section or time-series data because they can give more informative data and more

variability and can therefore identify effects that are not detectable in pure cross-section or pure time-series data (Baltagi, 2001). As a result they can produce more efficient and more reliable estimates and they are being increasingly used in many applications of modern econometrics (Gujarati, 2003).

Twelve countries have been selected as source countries of FDI in Bulgaria, which consist of ten members of the EU, namely Austria, Belgium, France, Greece, Germany, Italy, Hungary, Luxembourg, the Netherlands and the UK, and two countries that do not belong to the EU, namely Switzerland and the USA. These twelve countries account for the biggest sources of FDI flows into the Bulgarian market since the mid 1990s and make up for about 75% of FDI stock in Bulgaria (figure 2). The dataset covers an extended time-span, from 1998 until 2008, in order to capture the motivations of FDI during the most important phase of transition and certainly the years in which FDI in Bulgaria was most significant (since 1997). Belgium and Luxembourg are considered together as one country (due to data constraints and following the example of previous research) making a sample of 121 observations (11 cross-sections x 11 years).

Based on previous empirical findings about FDI determinants in the region of CEE and in Bulgaria in particular, as well as the patterns of FDI inflows in the Bulgarian market during the years of transition, the variables identified as important determinants for the establishment of FDI in Bulgaria are shown in Table 1.

**Table 1. FDI determinants in Bulgaria**

<b>Variable</b>	<b>Label of variable</b>	<b>Type of variable</b>	<b>Expected effect (sign)</b>
GDP growth	GG	Market - seeking	Positive (+)
Relative unit labour cost	RULC	Efficiency - seeking	Negative (-)
Trade integration with source country:	TRADE	Market / Efficiency - seeking	Positive (+)
Quality of the Bulgarian workforce: tertiary education	TERT	Resource / Efficiency - seeking	Positive (+)
Quality of the Bulgarian workforce: secondary education	SEC	Resource / Efficiency - seeking	Positive (+)
EU integration	EU	Efficiency / Strategic market - seeking	Positive (+)
Progress in transition reforms / Building of institutions	TRANS PRIV FINAN	Transitional	Positive (+)

Based on the identification of the above variables as important determinants of FDI in Bulgaria, the following hypotheses have been formulated for testing<sup>6</sup>:

- Hypothesis 1

Since 1997 and after three severe economic crises, Bulgaria managed to achieve macroeconomic stability and impressive rates of economic growth. Growth rates remained high until 2009 when the Bulgarian economy fell into recession. Moreover patterns of FDI in Bulgaria are clearly following patterns of GDP growth. As a result, it is clear that FDI in Bulgaria was motivated predominantly by market reasons (as also highlighted by previous empirical findings). Due to the fact that the absolute GDP figure was found to be highly correlated with most of the other explanatory variables and because it does not exhibit dramatic changes from year to year, the GDP growth rate was chosen as a variable that better captures the strength and potential of the Bulgarian market over the years. The variable is labeled GG and a positive effect on FDI is expected.

- Hypothesis 2

Wages and labor cost in Bulgaria are still relatively low, compared to Western European countries, where the majority of FDI flows comes from, but also compared to other CEE countries which are more developed than Bulgaria and South-Eastern countries in general. This is reflected in Bulgaria's low GDP per capita which currently remains at only 35% of the Eurozone's average. We can therefore conclude that FDI in Bulgaria was also motivated by efficiency reasons and more specifically the low relative unit labor costs in the Bulgarian market. The variable that was chosen to test for efficiency reasons was RULC and was constructed by dividing unit labor costs in Bulgaria by unit labor costs in every source country. This way a measure for relative unit labor costs was obtained. Unit labor costs in Bulgaria and all the source countries were calculated as the ratio of labor costs to productivity in each country. A negative relationship between RULC and FDI is expected.

- Hypothesis 3

The Bulgarian market offers a workforce of high quality as is demonstrated by the relatively high enrollment ratios in tertiary and secondary education. It is therefore expected that FDI is attracted by the high quality of the Bulgarian workforce. An educated and highly skilled workforce is particularly important for the tertiary sector of the economy (services) which in fact makes up for the bulk of FDI stock

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<sup>6</sup> For more detailed information regarding the construction of variables and sources of data, as well as the descriptive statistics of the variables tested, see Appendices 1 and 2 at the end of the paper.

in Bulgaria. In order to test for the quality of the workforce the enrollment ratios in tertiary and secondary education are used, labeled TERT and SEC respectively. A positive effect is expected for both, especially for SEC.

- Hypothesis 4

Previous literature has shown that FDI is greater among countries with close trade and business links. This is obvious in the case of Bulgaria as well, since we can see that FDI inflows in Bulgaria come predominantly from European countries, with which Bulgaria also shares important trade links. As a result, we expect that a positive relationship exists between FDI and trade integration of Bulgaria with the source countries. Trade integration is approximated by the variable TRADE which also indicates the degree of openness of the Bulgarian economy, and hence a positive relationship with FDI is expected.

- Hypothesis 5

The years following the signing of the EU Accession Treaty in January 2005 have also demonstrated a significant increase in FDI inflows. It is therefore expected that the signing of the Accession Treaty, which confirmed Bulgaria's accession into the EU in January 2007, has exerted an important and positive influence on FDI inflows in Bulgaria. The impact of the Accession Treaty and Bulgaria's consequent accession into the EU are measured by a dummy variable (EU), taking the value 1 from 2005 onwards, when the Accession Treaty was signed. A positive effect is expected for the EU variable.

- Hypothesis 6

It has been mentioned earlier in the paper that the transition reforms have provided an opportunity and a stimulus for multinational enterprises to enter the Bulgarian market and establish foreign investments projects. Moreover the role of institution building in attracting FDI and making it more efficient and profitable has been emphasized by both empirical and theoretical literature on FDI determinants. In order to account for the impact of transition reforms and the building of institutions, three separate variables were used in the study, all of which were based on the transition indicators, provided annually by the European Bank of Reconstruction and Development (EBRD). EBRD indicators measure the progress in reforms in various areas such as privatization of the domestic market, price and trade liberalization, extensiveness and effectiveness of legal institutions, competition policy and others. EBRD's transition indicators take the value from 1 to 4 according to how much progress has been achieved in respect to the country's transition to a fully operating market economy. The variables used in the study to account for the effect of transition reforms and the building of market institutions in Bulgaria are the following:

- the variable TRANS, which accounts for the general progress in transition reforms and was constructed as the unweighted average of all thirteen EBRD's transition indicators,
- the variable PRIV, which accounts specifically for the progress in privatization of the Bulgarian economy, and
- the variable FINAN, which accounts specifically for the progress in banking reforms and the building of financial institutions.

For each of the above variables a strong positive effect on FDI is expected.

In order to test the above hypotheses and the variables identified as possible determinants of FDI in Bulgaria, and because of the high correlation among some of the explanatory variables<sup>7</sup>, two empirical models were constructed:

Basic model 1 tests for efficiency motives and is the following:

$$FDI_{it} = GG_t + RULC_{it} + TRADE_{it} + TERT_t + SEC_t + EU_t + \varepsilon_{it}$$

Basic model 2 tests the impact of transition reforms and is specified as follows:

$$FDI_{it} = GG_t + TRADE_{it} + TERT_t + SEC_t + TRANS_t + \varepsilon_{it}$$

For each of the above models, three different specifications were estimated, resulting in six specifications. In the case of the first model, the variables TERT and SEC were used separately in the first two specifications and included together in the third specification. In the case of the second model, the variable TRANS was used to test for the impact of transition reforms in the first specification, and was replaced by the variables PRIV and FINAN in the second and third specification respectively.

Moreover, for the purpose of testing for individual effects in the data, the Breusch-Pagan (LM) test and the F test were carried out, both of which strongly rejected the null hypothesis of no individual effects in the cross-section dimension. In order to capture these effects (unobservable heterogeneity in the cross-sections), the fixed effects specification was chosen over the random effects, as it was considered more appropriate for the sample and the data used in the study. More specifically, the choice of the sample was not made through a random selection from a larger population and therefore any conclusions drawn from the study apply specifically to the chosen sample and to the countries (cross-sections) included in the sample.

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<sup>7</sup> See Appendix 3 for a correlation matrix of the explanatory variables.

This is specified in Greene (2003) and Tondel (2001) who describe the reasons why the random effects specification is better suited to samples that are randomly selected from a larger population.

*Empirical results*

Tables 2 and 3 summarize the main empirical results. Table 2 reports estimates from basic model 1, while table 3 reports estimates from basic model 2. All the parameters in both tables appear to have the expected sign, which indicates that all the variables examined have potentially a positive effect on FDI, except the variable referring to relative unit labour costs (RULC), which appears to have a negative effect on FDI, as expected. Moreover, values for the R-squared ( $R^2$ ) range from 0.62 to 0.66, indicating the good explanatory power of the regressions. Results for the F-statistic strongly support the statistical significance of the overall model, while the values of the DW-statistic further confirm the good fit of the model and reliability of estimation results.

**Table 2: Estimation results from model 1**

Dependent variable: FDI <sub>it</sub> , Sample period: 1998-2008, N=121			
	<b>(2.1)</b>	<b>(2.2)</b>	<b>(2.3)</b>
GG	1.644587*** (4.29)	1.067601*** (2.62)	1.217522*** (2.998)
RULC	-1.609214* (-1.68)	-0.373363 (-0.54)	-1.771547* (-1.90)
TRADE	1.190217** (1.98)	1.491403*** (2.60)	1.140326** (1.95)
TERT	5.890186** (1.94)		6.466004** (2.19)
SEC		4.294974** (2.46)	4.569618*** (2.66)
EU	0.473089*** (2.68)	0.430167** (2.57)	0.122242 (0.56)
R <sup>2</sup>	0.626096	0.633848	0.649941
F-stat	11.72139***	12.11774***	12.06829***
DW-stat	2.028201	2.0392236	2.073408

Note: t-statistics in parentheses.  
 \* Significant at the 10% level.  
 \*\* Significant at the 5% level.  
 \*\*\* Significant at the 1% level.

In table 2, column 2.1 reports the parameter estimates of basic model 1 with the variable SEC excluded from the equation, while the next specification (column 2.2) includes the SEC and drops the TERT variable. Specification in column 2.3 reports estimates obtained from basic model 1 with both the SEC and TERT variables included in the equation. In Table 3 column 3.1 reports estimation results of basic model 2 with the variable TRANS accounting for the progress in transition reforms, while regressions in columns 3.2 and 3.3 explore the empirical impact of the indicators that refer to privatization and reform of the financial sector respectively.

**Table 3: Estimation results from model 2**

Dependent variable: FDIit, Sample period: 1998-2008, N=121			
	<b>(3.1)</b>	<b>(3.2)</b>	<b>(3.3)</b>
GG	1.130961*** (2.84)	0.915336** (2.10)	0.955335** (2.21)
TRADE	1.544293*** (3.00)	1.548188*** (2.98)	1.527403*** (2.94)
TERT	4.319198*** (2.61)	4.067903*** (2.43)	4.144568** (2.48)
SEC	3.217288** (2.07)	4.176777** (2.89)	2.716009* (1.54)
TRANS	5.480041*** (2.99)		
PRIV		4.548240*** (2.62)	
FINAN			4.312503** (2.55)
R <sup>2</sup>	0.661433	0.655084	0.653959
F-stat	13.67537***	13.29479***	13.22879***
DW-stat	2.048803	2.067973	2.091011

Note: t-statistics in parentheses.  
 \* Significant at the 10% level.  
 \*\* Significant at the 5% level.  
 \*\*\* Significant at the 1% level.

Overall, both models and all specifications indicate the statistical significance of the variables tested as FDI determinants, although the result of significance is clearly stronger for some of the variables than for others. Real growth of GDP (GG), which accounts for the market potential as an FDI determinant, seems to be strongly significant in both models and all specifications. The same applies to trade integration (TRADE), which also appears to be significant in all specifications. Relative unit labor cost (RULC) appears significant in specifications 1.1 and 1.3, however the result is not very strong, as the level of significance is around 6% and 9% respectively. The same variable drops significance in specification 1.2, further supporting the conclusion that the effect of some of the other variables appears to be stronger than the effect of relative unit labor costs.

The quality of the workforce appears to be significant in both models, as both the variables SEC and TERT appear to have a significant effect on FDI. The dummy variable that accounts for EU integration appears to be strongly significant at 1% level of significance. However, it drops significance when SEC and TERT are included together in the same specification, due to possible multicollinearity among the variables. The average TRANS indicator which accounts for the general progress in transition appears to be strongly significant at 1% level of significance. Finally, the indicators accounting for privatization (PRIV) and financial sector reforms (FINAN) are also significant, at 1% and 5% levels of significance, respectively. Not surprisingly, the result on significance is therefore stronger for privatization than it is for reforms of the financial sector.

The empirical results estimated in the current study generally support the hypotheses formulated regarding FDI determinants in Bulgaria and confirm previous findings, at most of the part. However, we can observe two interesting variations:

- The result about the impact of relative unit labor costs is not as strong as expected, based on the findings of previous studies in the region of CEE and in Bulgaria in particular.
- The current study confirms the significant impact of workforce qualifications, compared to conflicting results from previous studies, in respect to the same variables.

These variations can be explained by the sample period that is used in the studies and the changing nature of investors' motives. As countries move on in the process of transition, traditional variables, which played a predominant role in attracting investment at the start of the transition, such as labor costs of the host economy, may gradually lose significance in favor of emerging variables, such as the

quality of the workforce, the business environment and the building of efficient institutions related to the restructuring of the economy, the quality of infrastructure and others. As a result, it is important that host countries continue to work on the building and improvement of their institutional environment, as well as to strengthen the links and collaboration among host institutions, domestic and foreign enterprises in their markets. Furthermore, it is also important to continue to always seek new ways of attracting and retaining foreign investment (Botric and Skufflic, 2005).

### **Conclusions and policy implications**

Bulgaria provides a case of an emerging country, which underwent major transformation since the beginning of its transition from a centrally planned to a market economy (Sakali, 2011b). This transformation and the impressive rates of growth until 2009 were largely based on the availability of foreign capital, and particularly FDI since the mid-1990s. The breakout of the global financial and economic crisis, however, has affected severely all of the emerging economies of CEE, including Bulgaria, and has resulted in a sharp decline of FDI inflows in the last few years since 2008. As a consequence, the study of FDI determinants in individual countries, especially those with the least developed economies, acquires a special importance, as it can contribute to our understanding of investors' motivations in specific markets. It can therefore assist with the design of policies that would help attract, but also control and direct FDI to the sectors of the economy, which could provide a solid base for the long-term growth of the economy.

The empirical results of the current study suggest that FDI in the Bulgarian market was motivated by both market and efficiency reasons, as well as the quality of the workforce, while the progress in transition reforms and integration into the EU have also provided a powerful stimulus for the attraction of FDI. More specifically, the prospects for economic growth, as well as trade integration and integration into the EU have played a significant and predominant role in attracting foreign investors. At the same time however, we can observe the emergence of new significant determinants, such as the educational attainment of the labor force and the building of efficient institutions, while traditional determinants such as unit labor costs appear to be losing significance, in favor of other, more important determinants.

We can therefore conclude that traditional variables alone are no longer enough to attract foreign investors, especially under the changing circumstances brought about by the global economic crisis. Governments must focus on economic growth,

competitiveness, the availability of skills and the building of institutions. This is especially important for Bulgaria, which at the moment remains the poorest member of the EU and its economy is greatly affected by the global economic crisis and recession. Integration into the Economic and Monetary Union (EMU) may provide a boost to investment; however preparation for integration into EMU should not be addressed in haste, and certainly not at the expense of economic growth, as a very strict and one-dimensional focus on fiscal discipline would undermine prospects for future growth and the establishment of FDI. Finally, stimulation of the economy and investment should be targeted at areas that would help increase long-term prospects for growth and competitiveness, such as education, new technologies, R&D, infrastructure and the provision of incentives for export growth.

#### **Appendix 1: Description of variables and sources of data**

FDI = Bilateral FDI flows from source country to Bulgaria (millions of US\$). Source: Bulgarian National Bank (BNB).

GG = Annual percentage growth rate of GDP in Bulgaria, based on constant local currency (% rate). Source: World Bank, World Development Indicators (WDI).

RULC = Constructed as the ratio of Unit Labour Costs in Bulgaria to Unit Labour Costs in source country (% ratio). Unit Labour Costs constructed as the ratio of hourly compensation rates in manufacturing to GDP per hour worked (productivity). Sources: International Labour Organisation (ILO), Laborsta and Key Indicators of the Labour Market (KILM)

TRADE = Constructed as the ratio of bilateral trade (X+M) between Bulgaria and source country to total bilateral trade (X+M) between Bulgaria and world (% ratio). Source: International Monetary Fund (IMF), Direction of Trade Statistics (DOT).

TERT = Enrolment rate in tertiary education in Bulgaria (gross rates, % of population aged 19-24). Source: World Bank, World Development Indicators (WDI).

SEC = Enrolment rate in upper secondary education in Bulgaria (gross rates, % of population aged 15-18). Source: UNICEF.

EU = Dummy variable taking the value 1 from 1995 onwards when the Accession Treat was signed between EU and the second wave candidates (including Bulgaria)

TRANS = Constructed as the unweighted average of all 13 EBRD's transition indicators (Index of 1 to 4). Source: European Bank of Reconstruction and Development (EBRD).

PRIV = Constructed as the unweighted average of the two EBRD's transition indicators referring to progress in small-scale and large-scale privatization (Index of 1 to 4). Source: European Bank of Reconstruction and Development (EBRD).

**EAST-WEST Journal of ECONOMICS AND BUSINESS**

FINAN = Constructed as the unweighted average of the two EBRD's transition indicators referring to progress in reforms of the banking sector and non-bank financial institutions (Index of 1 to 4). Source: European Bank of Reconstruction and Development (EBRD).

Where needed, values were converted to US\$ using the official exchange rates. Sources for exchange rates: Eurostat for EUR/USD exchange rate, World Bank for BLV/USD exchange rate.

All values were converted to logs prior to estimation, in order to achieve greater uniformity among the variables.

**Appendix 2: Descriptive statistics**

Variable	Observations	Mean	Std. Dev.	Min	Max
<b>fdi</b>	121	246.9048	367.8664	-68.92314	1839.53
<b>gg</b>	121	5.376462	1.356168	1.964141	6.748294
<b>rule</b>	121	0.218791	0.084734	0.1185126	0.6174046
<b>trade</b>	121	4.373633	3.810024	0	12.97461
<b>tert</b>	121	44.40155	3.271765	40.20752	51.02843
<b>sec</b>	121	83.07981	7.70517	73.61013	91.8721
<b>eu</b>	121	0.363636	0.483045	0	1
<b>trans</b>	121	3.165315	0.253876	2.589231	3.462308
<b>priv</b>	121	3.683182	0.315103	3	4
<b>finan</b>	121	2.818636	0.338563	2.335	3.335

**Appendix 3: Correlation matrix of explanatory variables**

	gg	rule	trade	tert	sec	eu	trans	priv	finan
<b>gg</b>	1.0000								
<b>rule</b>	-0.1085	1.0000							
<b>trade</b>	-0.0321	-0.1486	1.0000						
<b>tert</b>	0.0818	0.3460	-0.0374	1.0000					
<b>sec</b>	0.6173	0.0566	-0.0423	0.4999	1.0000				
<b>eu</b>	0.4863	0.1197	-0.0490	0.7080	0.8281	1.0000			
<b>trans</b>	0.6019	-0.0980	-0.0294	0.3222	0.7531	0.6903	1.0000		
<b>priv</b>	0.6909	-0.1267	-0.0293	0.2855	0.7073	0.6389	0.9795	1.0000	
<b>finan</b>	0.6909	-0.0290	-0.0333	0.3680	0.8472	0.7687	0.9189	0.8823	1.0000

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