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FINANCIAL CRISIS**

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Foreign direct investment drivers and growth in Central and Eastern Europe in the aftermath of the 2007 global financial crisis[*]

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Résumé

Dans le contexte du récent épisode de ralentissement économique dans l'Europe émergente, nous étudions l'impact des investissements directs étrangers (IDE) sur la croissance économique dans les pays d'Europe centrale et orientale par une analyse empirique menée sur la période 1993-2013. Dans un premier temps, nous montrons que les principaux déterminants internes des flux d'IDE sont la taille du marché, les primes de risque, le coût unitaire du travail, l'ouverture commerciale ainsi que le progrès dans la poursuite de réformes structurelles et institutionnelles dans le pays d'accueil. A cela s'ajoutent les conditions macroéconomiques dans la zone euro qui constituent un déterminant important des IDE dans l'Europe émergente. Dans un second temps, nous analysons l'impact des IDE sur la croissance économique et concluons quant à la nature bénéfique des entrées d'IDE sur l'économie des pays d'accueil. Nous tenons compte de la crise économique et financière de 2007 et de la crise de la dette de la zone euro de 2011 et nous montrons que ces deux crises réduisent l'effet positif des IDE sur la croissance économique dans les pays d'accueil.

Mots-clés : investissements directs étrangers; Europe centrale et orientale
Code JEL : F21; O52; P33

Abstract

In the context of the recent deceleration of growth in emerging Europe, we reassess empirically the effect of foreign direct investment (FDI) inflows on economic growth in Central and Eastern European countries (CEECs) through an analysis carried out over the period 1993-2013. In a first step, we show that the main domestic determinants of FDI inflows are the market size, risk premia, unit labour costs, the openness, as well as progress in structural reforms (mainly related to privatisation process and banking sector) and institutional reforms (namely the lack of trade barriers, the ability for individuals to accumulate private property and progress in fighting corruption) in the host economy. Moreover, the macroeconomic conditions in the euro area also play an important role in explaining FDI flows to the region. In a second step, we analyse the impact of FDI inflows on economic growth. Our findings add to the strand of literature pointing out a positive effect of FDI inflows on growth. We consider the occurrence of the 2007 and 2011 crises and show their negative impact on the FDI - economic growth link, both crises reducing the positive impact of FDI on economic growth.

Keywords: foreign direct investment; Central and Eastern Europe
JEL Classification: F21; O52; P33

Non-technical summary

Analysing the determinants of foreign direct investment (FDI) and the relationship between FDI inflows and economic growth in the EU New Member States from Central and Eastern Europe (CEECs) remains a considerable challenge. The impact of FDI on economic growth is especially debated in the literature. FDI is sometimes seen as a natural factor of the catching-up process of these economies, but can also be associated with macro-financial vulnerabilities that exacerbated the boom-bust cycle in the CEECs.

This paper adds to the existing literature on FDI in CEECs. Through an analysis carried out over the period 1993 - 2013, we show that the attractiveness of the region for FDI is explained by the macroeconomic, financial and institutional situation of host economies, as well as by the macroeconomic developments in the euro area. The classical domestic drivers of FDI revealed by our analysis are the market size, risk premia, unit labour costs, the openness, as well as progress in structural and institutional reforms. Moreover, the important role played by macroeconomic conditions in the euro area is explained by the increased dependence of CEECs on the euro area (both through trade and financial channels).

Besides exploring FDI drivers in the region, we also analyse the FDI and GDP dynamics around the 2007 global financial crisis and the 2011 euro area sovereign debt crisis. To this end, we undertake a study event analysis which reveals that both crises have affected the developments in FDI and GDP. However, the timing of collapse of the two indicators is found to be different, economic growth being impacted more rapidly (compared to FDI) by the 2007 crisis.

Besides documenting the evolution of FDI and GDP dynamics around crises, we equally examine the relationship between FDI and economic growth. Our results reveal that, on average, FDI inflows contributed in a positive and statistically significant way to economic growth. This positive contribution has, however, diminished in the aftermath of both the 2007 and 2011 crises.

1 Introduction

Against the backdrop of the recent growth path in emerging Europe, our paper seeks to complement the existing literature on determinants of foreign direct investment (FDI) and the relationship between FDI inflows and economic growth in the EU New Member States from Central and Eastern Europe (CEECs). On one hand, we have the perspective of rather volatile real GDP growth during the last years: the boom in the period preceding the 2007 global financial crisis was followed by a deep recession and, afterwards, by a sluggish resumption of economic growth, with the 2011 euro area sovereign debt crisis contributing to a slight slowdown. On the other hand, we have the perspective of volatile capital flows: the large capital inflows in these countries in the period preceding the 2007 crisis clearly unwound after both the 2007 global financial crisis and 2011 euro area sovereign debt crisis.

During a long period of time, FDI inflows, referring to long-term capital investment such as the purchase or construction of machinery, buildings, or whole manufacturing plants[1], have been considered a somewhat natural factor of the catching-up process of CEECs with the old EU Member States[2]. This is in line with recent developments in growth theory, according to which improvements in technology, productivity and efficiency are crucial for growth (Lim, 2001). FDI can increase the technical progress in the host country through efficiency "spillovers", for instance via the linkages between multinational corporation affiliates and their local suppliers and customers (Lall, 1980). Fitting into this framework, the catching-up process in CEECs has coincided with large inflows of FDI by multinational corporations, mainly from Western Europe.

However, the CEECs' growth pattern, especially in the years preceding the 2007 global financial and economic crisis, was judged by some authors as being excessively dependent on capital inflows and thus leading to unsustainable macroeconomic and financial imbalances and large vulnerabilities (Lane and Milesi-Ferretti, 2007). The recession and the credit crunch that ensued the crisis coincided with a steep decline of capital inflows in the region. In this line, a pattern of growth excessively dependent on capital inflows has been judged to be undesirable (EBRD, 2009). Even if FDI is less prone to sudden reversals than portfolio debt and bank lending (Kose et al., 2006), FDI inflows clearly declined alongside other types of capital flows during the crisis.

These considerations raise several questions that we seek to answer through our analysis. What are the drivers of FDI inflows in CEECs? How important is FDI for economic growth in the region? Has the economic growth - FDI link been stable over the period of analysis and how was it impacted by the 2007 and 2011 crises ?

In the absence of a clear-cut link between economic growth and FDI, and having in mind the recent deceleration of growth in emerging Europe, we reassess empirically the determinants of FDI inflows and the link between FDI inflows and economic growth in the region.

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[1]For a complete definition of FDI, refer to Session 4.1.

[2]Over 1993-2013, there was significant progress in the catching-up process in the region. However, despite this progress, a marked gap still exists compared to the "old" EU Member States; when looking at GDP per capita in terms purchasing power standards, the indicator equaled 66.4 in CEECs in the end of 2012, for a EU-27 average of 100.

Our results show that the general macroeconomic, financial and institutional situation of the host economy is an important determinant of FDI inflows: the market size, risk premia, unit labour costs, the openness of the host economy, and progress in structural reforms (mainly those concerning the process of privatisation and the banking sector) as well as in institutional reforms (mainly those related to fighting corruption) are the main domestic drivers. Moreover, macroeconomic conditions in the euro area play an important role in explaining FDI flows to the region.

As regards the relationship between economic growth and FDI inflows, our findings point that, on average, FDI inflows contributed in a positive and statistically significant way to economic growth. Developments in both FDI inflows and economic growth have been affected by the 2007 global financial crisis and 2011 euro area sovereign debt crisis; consequently, both crises might have affected the relationship between FDI and economic growth. We take into account the occurrence of both crises and show that the positive contribution of FDI on economic growth has been reduced in the aftermath of both crises.

Our analysis adds to the existing literature pointing out a positive impact of FDI on economic growth. FDI inflows to CEECs are particularly sensitive to developments in the euro area (both through trade and financial channels). In the current context of relatively low levels of FDI in the region and of a slight recovery in the euro area, host countries from Central and Eastern Europe could further encourage, to a certain extent, the entry of FDI flows in order to foster growth.

2 Stylised facts: FDI in emerging Europe before, during and after the 2007 crisis

During the pre-crisis period, CEECs attracted large capital inflows (in particular FDI), enhanced by privatisation and prospects of EU accession. Compared to other emerging market economies, the Central and Eastern European region has been particularly successful in attracting FDI (Castejón and Wörz, 2007). Many authors have linked the productivity convergence in CEECs to FDI inflows, considered to be the main vehicle of economic restructuring and technology diffusion (EBRD, 1994; Damijan and Rojec, 2007; Bijsterbosch and Kolasa, 2009). At the same time, the massive scale of capital flows contributed significantly to the build-up of macro-financial vulnerabilities in a number of CEECs in the early to mids-2000. Signs of overheating appeared in the pre-crisis period: accelerated inflation, wage increases superior to labour productivity gains, strong credit growth, increases in asset prices and large accumulation of net external liabilities (Lane and Milesi-Ferretti, 2007). Moreover, substantial vulnerabilities emerged in bank and household balance sheets, particularly because of the large part of borrowing in foreign currencies[3].

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[3]Foreign-owned banks were a natural vehicle of capital inflows as they could extend loans funded from home market sources, typically via credit lines from parent institutions or wholesale markets. Flows through banks were channeled mostly into mortgages or consumer loans, pushing up consumption and property prices. As a result, excessive credit growth produced a self-reinforcing boom in real estate and the overall economy. In addition, unlike FDI, the capital inflows through banks fostered investment in the sector of non-tradable goods and, thus, did not contribute to an increase in the productive capital (from the point of view of the economy's ability to service foreign debt).

As underlined by Arratibel et al. (2007), annual FDI inflows in Central and Eastern European countries averaged roughly 5% of GDP between 1995 and 2005, while their inward FDI stock grew to 30% of GDP in 2000 and, respectively, to 43% of GDP (nearly 211 billions of euro) in 2005. Among the countries in our sample, Estonia, the Czech Republic and Hungary benefited of the largest inflows (in % of their GDP). In terms of FDI allocation across sectors, the services sector was the main recipient, mostly motivated by market seeking and supply cost optimization; it was enhanced by privatisation in the region and the high presence of foreign investors in the banking and telecommunication sectors during the 1990s. Services concerned were financial intermediation, followed by business-related services (i.e. real estate, renting and business activities) and trade, as well as transport, storage and communication. On the other hand, FDI in the manufacturing sector was mostly motivated by low input costs and production cost savings, and typically counted towards "vertical" FDI. FDI in the manufacturing sector has been concentrated in few industries, mainly transport equipment, electrical and optical equipment, food, chemicals and metals.

After the outbreak of the 2007 global economic and financial crisis, the sharp macroeconomic and financial adjustment process in the region, coupled with the drying-up of net FDI inflows on the financing side of the current account (see Figure 1), led to important losses in output; these losses were particularly pronounced in the Baltic States. Countries like Hungary and Romania have turned to the financial aid of international institutions (IMF, EU) in order to compensate for this drying up of private financing. However, in the case of some other economies, the solidity of the macroeconomic fundamentals proved to be an important shock absorber. The Czech Republic overcame the crisis without needing exterior aid, while Poland accessed a flexible credit line (FCL) from the IMF[4] without drawing the resources so far, mainly due to the favorable market reaction.

During 2010-2011, owing to a certain improvement of macroeconomic fundamentals, the return of risk appetite and expansionary monetary policy in advanced economies, balance-of-payments imbalances returned in many CEECs, along with the rebound of exterior financing in emerging Europe (see Figure 2). However, for emerging Europe, this rebound has been anemic compared to the 2004-2007 average (before the 2007 crisis) or the 1991-97 average (before the Asian crisis) (IMF World Economic Outlook, 2011 and 2012). Moreover, after this relative improvement, CEECs have been significantly affected by the intensification of the euro area sovereign debt crisis late 2011, through declining net FDI inflows coinciding with a drop in outward investment from the euro area (EBRD Transition Report, 2012).

In terms of composition, over the period 2010-2013, portfolio debt flows replaced FDI as the main source of financing (as can be seen in Figure 3), making the CEE region more vulnerable to the market sentiment (Daude and Fratzscher, 2006). The relatively smaller share of bank and other private flows compared to portfolio debt flows reflects ongoing deleveraging in external asset positions by Western European banks. When looking at the period ahead, the latest IMF World Economic Outlook data point out an increase in the share of FDI in the total net private financial flows in CEECs; this increase should intervene in 2014 and should even amplify in 2015, when FDI is expected to become the main source of financing.

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[4]The IMF flexible credit line is a new precautionary loan agreement designed to meet the increased demand for crisis prevention and crisis mitigation, whose beneficiaries are economies presenting robust macroeconomic fundamentals.

Figure 1: Foreign direct investment inflows in CEECs (billions, US dollars).
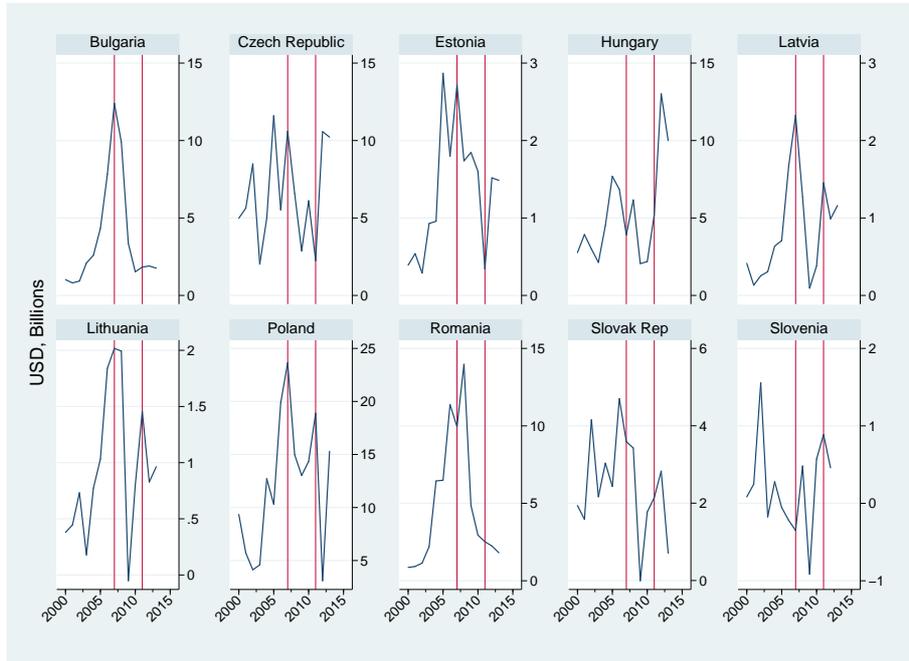
Source: IMF World Economic Outlook, April 2014. Vertical red lines correspond to 2007 and 2011 crises.

Figure 2: Net private financial flows to main emerging regions (billions, US dollars).
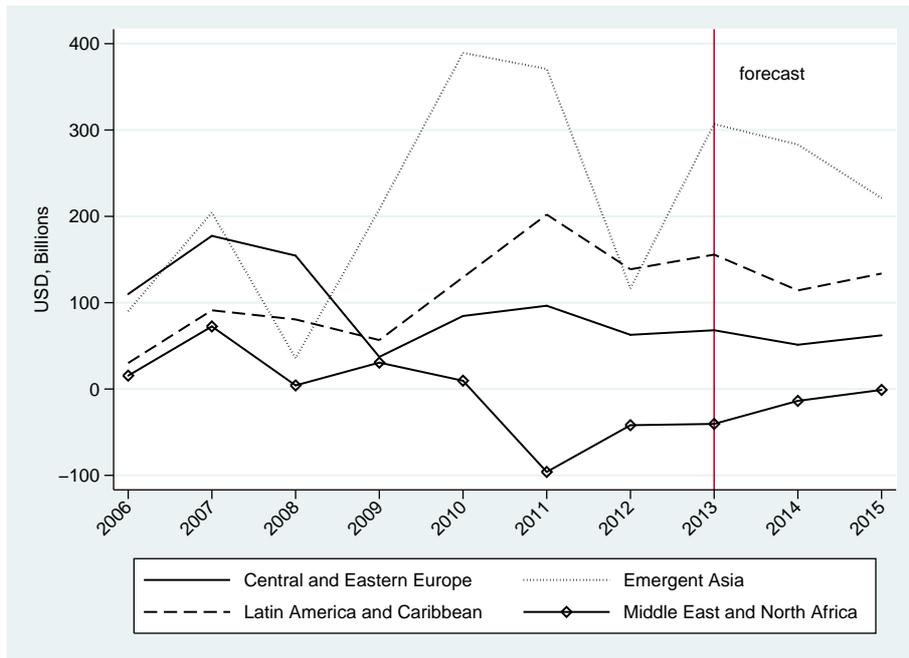
Source: IMF World Economic Outlook, April 2014.

Figure 3: Central and Eastern Europe: Composition of net private financial flows (billions, US dollars).
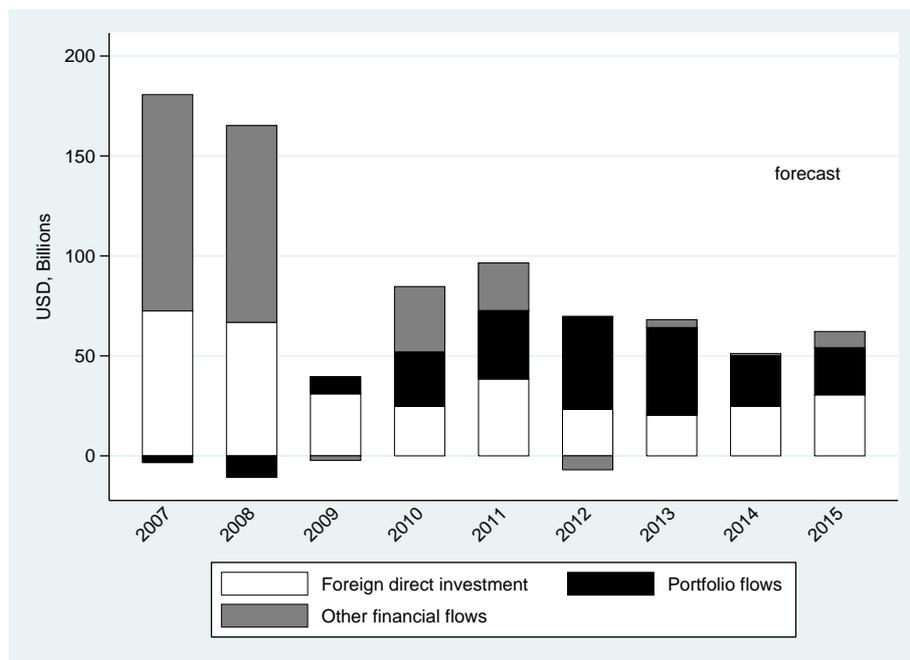
3 Overview of literature

3.1 Determinants of FDI

The reasons for the emergence of multinational firms made the object of many speculations, beginning with Caves (1982). If companies from abroad were identical to domestic ones, it would not be profitable for them to enter host markets, given the likelihood of additional transactions costs of operating in a foreign environment (i.e. training costs for personnel, communications costs, barriers caused by language, customs, and unfamiliarity with local business and government practice). According to Dunning (1981), three conditions must be satisfied simultaneously for FDI to occur. The firm must have both an ownership (O) advantage and an internalisation (I) advantage, while the foreign market must offer a locational (L) advantage. Ownership advantages take the form of firm-specific assets both tangible (products or technologies) and intangible (patents or brands). Multinational firms equally need an internalisation advantage in the sense that benefits accrue to the enterprise choosing to produce abroad internally, rather than through the market by franchising or licensing the product or process internationally. Moreover, location advantages are relevant in determining where the firm chooses to manufacture its products. The location advantages include factor prices, access to customers, government regulations with respect to trade, capital flows, exchange rates, and institutional and political stability.

Dunning's model provides a useful organising framework but it has not succeeded in explaining the rapid increase in FDI since the mid-1980s and the growth of regional integration (Brenton et al., 1999). The new theory of FDI integrates OLI with general equilibrium mod-

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els that focus on relative factor endowments (Helpman, 1984), proximity and concentration advantages (Brainard, 1997), and with gravity models of trade and FDI (Hejazi and Safarian, 1999).

The existing empirical studies of FDI into transition economies can be classified in several categories: i) those using aggregate inflow data (Brenton et al., 1999; Sapienza, 2009) or enterprise surveys (Meyer, 1998); ii) those focusing on particular issues like the impact of institutional factors on FDI (Wheeler and Mody, 1992; Resmini, 2000); iii) those using bilateral flows for assessing whether FDI is motivated by factor cost or market opportunity (Holland and Pain, 1998; Bevan and Estrin, 2004) and, additionally, by transitions specific factors (Carstensen and Toubal, 2004); and iv) those assessing the determinants of FDI while disentangling the factors related to the external economic and financial environment from those specific to recipient countries (Jevčák et al., 2010).

According to the existing literature, key determinants of FDI are the production cost, including wage differences (Holland and Pain, 1998), host country market size and relative factor prices, infrastructure availability (Wheeler and Mody, 1992), the past stock of FDI, as well as the riskiness of investment in terms of economic and political environment. Moreover, FDI flows could be considered complementary to trade flows (Carstensen and Toubal, 2004; Nath, 2009; Sapienza, 2009). In general, positive initial conditions were shown to have played an important role by attracting substantial FDI at the early stage of transition and, as a result, contributing to achieving superior economic performance (Garibaldi et al., 2001). The role of structural reforms, mainly financial liberalization and privatisation, as FDI determinants has been equally emphasized (Forbes, 2006; Campos and Kinoshita, 2008).

In the CEE, the anticipation of EU membership has been found to have played an important role in attracting FDI inflows (Resmini, 2000; Bevan and Estrin, 2004; Coricelli and Ianchovichina, 2004).

Finally, in line with the last point, external determinants have been found to play a key role in explaining capital flows to CEECs (Jevčák et al., 2010):

- Short-term financing conditions in the euro area are found to affect capital inflows to CEECs. International investors looking for high short-term yields might orientate towards the EU new member states when interest rates in euro area are lower. However, these "short-term considerations" are relevant mainly for portfolio and bank lending.

- The euro area business cycle might equally affect FDI attractiveness. However, its potential impact is equivocal. One the one hand, economic growth in creditor countries is found to have a negative impact on capital flows to recipient economies (Calvo, Leiderman and Reinhart, 1996); during the early 1990s, the economic slowdown in industrial countries has often triggered enhanced investment opportunities in emerging market economies. On the other hand, economic growth in creditor countries is sometimes found to have a positive effect on international capital flows (Ferrucci et al., 2004): stronger growth boosts the profitability of firms which increase their investment abroad. The latter causality seems to be more relevant for FDI because of its relatively long time horizon.

- At the same time, global risk sentiment is found to influence international capital flows. In a low global risk environment, funds flow towards investment in higher-returns and riskier catching-up economies (like the EU new member states), whereas during periods of high risk aversion, investors orientate towards safer and more liquid securities. Once again, this seems more relevant for short-term capital flows than for FDI.

3.2 FDI as a determinant of economic growth

The relation between internationalization of firms, technology transfer, and host-country effects has long been a concern in economic research (Giroud et al, 2012).

"In general, FDI is thought of as a composite bundle of capital stocks, know-how, and technology, and hence its impact on growth is expected to be manifold and vary a great deal between technologically advanced and developing countries. The ultimate impact of FDI on output growth in the recipient economy depends on the scope for efficiency spillovers to domestic firms, by which FDI leads to increasing returns in domestic production, and increases in the value-added content of FDI-related production" (De Mello, 1997).

The empirical examination of the role of FDI flows in the process of technology diffusion and economic growth in CEECs is of particular relevance as the catching-up process of these countries has coincided so far with large inflows of FDI. Unlike many developing countries, East European transition countries started out with an existing industrial structure and relatively educated workforce. Most of these economies started comprehensive privatisation processes at a time when FDI was starting to peak world-wide.

The majority of existing research on FDI effects in CEECs transition economies is based on the standard production function approach that measures the effects of FDI in terms of employment or value-added on domestic firms total factor or labour productivity.

The basic augmented production function is the following:

$$Y = A\Phi(K, L, F, Q) \tag{1}$$

where Y is output, K is capital, L is labour, F denotes FDI inflows, A captures the efficiency of production, and Q is a vector of ancillary variables. We drop time indices for simplicity.

Taking logarithms and time derivatives of an augmented Cobb-Douglas approximation of equation (1) yields the following equation:

$$g_y = g_A + \gamma g_k + \alpha g_f + \theta g_w \tag{2}$$

where g_i is the growth rate of $i = A, y, k, f, w$ (lower-case variables are defined in per capita terms), and γ, α and θ are the elasticities of output with respect to physical capital, FDI and the ancillary variables. In equation (2)), $g_A = g_y - \gamma g_k - \alpha g_f - \theta g_w$ is the total factor productivity (TFP), or the Solow residual, which is the conventional measure of technological change.

In a panel, the impact of FDI on growth can be estimated using the following equation:

$$g_{y,h} = \gamma g_{k,h} + \alpha g_{f,h} + \theta g_{w,h} + \epsilon \qquad (3)$$

where h identifies the countries in the panel, and the remaining variables are the ones in equation (3), and ϵ is a white-noise disturbance term.

When taking into account unobservable country-specific growth determinants, then equation (3) can be estimated as follows:

$$g_{y,h} = \delta_h + \gamma g_{k,h} + \alpha g_{f,h} + \theta g_{w,h} + \epsilon \qquad (4)$$

where δ_h is a time-invariant individual country-effect term, or country dummies (which avoid the requirement that countries in the panel should have a common intercept).

The findings of the existing research on the relationship between economic growth and FDI inflows in CEECs are rather controversial. Several studies have shown a positive impact of FDI on growth and productivity[5] (Holland and Pain, 1998; Bijsterbosch and Kolasa, 2009; Sapienza, 2009; Weber, 2011). However, other studies have proved less conclusive and found a negative relationship between FDI and growth (Djankov and Hoekman, 2000; Mencinger, 2003; Lyroudi et al., 2004; Nath, 2009).

The absorptive capacity (proxied by human capital indicators) is susceptible to enhance the transfer of technology and, thereby, to strengthen the impact of FDI on productivity growth. FDI has been found to represent an important vehicle for the transfer of technology, provided that the host country has a minimum threshold of human capital (Borensztein et al., 1998). The improved availability of firm-level data has allowed the detailed analysis of the productivity spillovers from foreign-owned companies to other firms in the economy, that were found to be dependent on the nature of FDI, as well as on the absorptive capacity of domestic firms (Görg and Greenaway, 2004; Kolasa, 2008; Damijan et al., 2013).

4 Econometric strategy and data

4.1 Data

Our analysis is undertaken over the period going from Q1 1993 to Q3 2013 and the sample is formed by ten EU new member states[6]. We use quarterly data.

FDI net inflows to the ten CEECs are our main variable of interest. Data come from Eurostat and are consistent with the OECD Benchmark Definition of FDI (third edition) and the Balance of Payments Manual definition of the IMF (IMF, 1993, 2009): FDI corresponds to the category of cross-border investment that is associated with a resident entity in one economy (direct investor) having a lasting interest, in the form of control or a significant degree

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[5]Generally, since World War II, FDI has been a consistently important source of capital in developing countries.

[6]We consider the economies having joined the EU in 2004 and 2007 respectively (Bulgaria, the Czech Republic, Estonia, Latvia, Lithuania, Hungary, Poland, Romania, Slovakia and Slovenia), even if Slovenia, the Slovak Republic and Estonia joined the euro area (in 2007, 2009 and 2011, respectively) and thus are in a different position vis−à−vis international investors.

of influence, in an enterprise resident in another economy (direct investment enterprise). An immediate direct investment relationship is defined by its ownership of equity that entitles it to 10 percent or more of the voting power in the direct investment enterprise, whereas indirect direct investment relationships are defined by the ownership of voting power in one direct investment enterprise that owns voting power in another enterprise. We use the total FDI flows data[7].

The definitions and the sources of the variables are presented in Appendix (Table 7).

4.2 Estimating the determinants of FDI

We take into account both external and domestic determinants of FDI inflows into CEECs. We consider key the distinction between global and domestic driving factors, as it has important policy implications: if FDI is mainly driven by domestic factors, policymakers are better able to affect it, while if FDI reacts mainly to global factors, recipient countries are vulnerable to global shocks even if domestic policymakers maintain prudent macro-policies.

Among the external factors that may alter the attractiveness of investment in recipient countries, we focus on the euro area macroeconomic conditions, as CEECs are largely exposed to the euro area through both the financial and trade channels. The existing studies that are using the same approach (i.e. distinction between external and domestic factors), usually take into consideration both macroeconomic and financial conditions in the euro area (Jevčák et al., 2010). However, given that we do not examine the determinants of all capital flows, we exclude financial conditions as they should not, in principle, affect the attractiveness of FDI.

As far as domestic determinants are concerned, we take into account classical determinants (i.e. the macroeconomic environment), institutional factors (such as trade freedom, investment freedom, property rights and corruption) and structural reforms (related to the privatisation process of large-scale firms, competition policy, reforms in the banking and financial sectors).

Trade freedom "reflects the openness of an economy to imports of goods and services from around the world and the ability of citizens to interact freely as buyers and sellers in the international market place" (Index of Economic Freedom). Investment freedom reflects investors' freedom in a market (most countries have a variety of restrictions on investment). The property rights consist in the assessment of the ability of individuals to accumulate private property, secured by clear laws, fully enforced by the state. Corruption undermines economic freedom by introducing insecurity into economic relationships. All these institutional factors are taken from 2013 Index of Economic Freedom. These indicators should affect the attractiveness of FDI in a positive manner.

Structural reforms in host countries have proven to play a significant role in attracting foreign investors to emerging economies (Forbes, 2006; Campos and Kinoshita, 2008). To

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[7]FDI flows, recorded in the Balance of Payments financial account, can be broken down by kind of instrument used for making the investment: equity capital (equity in branches, all shares in subsidiaries and associates and other contributions like the provision of machinery), reinvested earnings (direct investor's share of earnings not distributed by the direct investment enterprise), and other FDI capital (intercompany transactions like borrowing and lending of funds, including debt securities and trade credits between direct investors and direct investment enterprises).

asses their role, we use the EBRD reform indices of large scale privatisation, competition policy, banking reform and interest rate liberalisation and securities markets and non-bank financial institutions reform.

We estimate the following equation:

$$FDI_{i,t} = \alpha_0 + \alpha_1 FDI_{i,t-1} + \alpha_2 C_{i,t} + \alpha_3 INSTIT_{i,t} + \alpha_4 REF_{i,t} + \alpha_5 EAcycle_t + \epsilon_{i,t} \qquad (5)$$

where $FDI_{i,t}$ are net foreign direct investment inflows (% of GDP), and $C_{i,t}$ represents a set of classical determinants in country i at time t: macroeconomic stability (proxied by the log of inflation), the quality of infrastructure (proxied by the log of the number of the main telephone lines), market size (proxied by the quarterly year on year GDP growth), the risk premium (proxied by the log of the spread of 10-year government bond yields relative to German bonds), competitiveness (proxied by the log of the unit labour cost) and openness (proxied by the share of exports in the GDP). $INSTIT_{i,t}$ represents the institutional quality in country i at time t, $REF_{i,t}$ the structural reforms in country i at time t, and $EAcycle_t$ the euro area business cycle (proxied by the euro area output gap) at time t.

As in Carstensen and Toubal (2004), we choose a semi-log model given that FDI can take negative values due to disinvestment. The only variables that are given in log are the classical determinants, except for the year-on-year quarterly GDP growth that is expressed in percentage points.

We apply the two-step System Generalised Method of Moments (GMM), designed by Arellano and Bover (1995) and fully developed by Blundell and Bond (1998). The use of this method is due to the inclusion of the lagged dependent variable as an explanatory variable[8]. The Arellano-Bond (1991) estimation starts by transforming all regressors, usually by differencing, and uses the Generalized Method of Moments (Hansen, 1982). The Arellano-Bover/Blundell-Bond estimator augments Arellano-Bond by making an additional assumption, i.e. that the first differences of instrument variables are uncorrelated with the fixed-effects. This allows the introduction of a larger number of instruments and can improve the efficiency of estimators. We apply the Windmeijer (2005) finite-sample correction, without which the standard errors in two-step estimation tend to be significantly downward-biased because of the large number of instruments. A crucial assumption for the validity of GMM is that the instruments are exogenous, tested by the Sargan/Hansen test (for the joint validity of instruments). The GMM validity also depends on the assumption that the model is not subject to serial correlation in ε_{it}.

The increased number of instruments is a common feature both of Arellano-Bond and Arellano-Bover/Blundell-Bond methodologies. According to Roodman (2008), in small samples, numerous instruments can cause different kinds of problems: the over-fitting of endogenous variables, imprecise estimates of the optimal weighting matrix, downward bias in

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[8]The presence of the lagged dependent variable among the regressors in a specification which considers the individual effect as well, brings about a correlation between the error term and the right-hand regressor. In such a case, the OLS estimation would be inconsistent and biased.

two-step standard errors[9] and a weak Hansen test of instrument validity. We seek to avoid the proliferation of instruments by collapsing them[10] and limiting the lag depth.

Both the short-run and the long-run elasticities of the model are presented[11]. The short-run estimates translate the immediate reaction of FDI to a change in determinants, while the long-run estimates represent the overall response of FDI to the change in determinants. The collapsed instruments are the second, third and the fourth lags of the dependent variable. The other determinants are considered to be exogenous.

Table 1: Short-term estimates of FDI determinants: classical determinants.

Independent variable	(1)	(2)	(3)	(4)	(5)	(6)
Lagged FDI	0.321*	0.186	0.235	-0.096	0.081	0.070
	(0.154)	(0.211)	(0.332)	(0.194)	(0.275)	(0.264)
Classical determinants						
Market size	0.165***	0.168***	0.188**	0.157**	0.225***	0.100*
	(0.028)	(0.034)	(0.068)	(0.061)	(0.064)	(0.046)
Infrastructure	1.624	2.045	1.567	2.690	1.663	0.111
	(2.429)	(2.266)	(2.219)	(2.406)	(2.485)	(2.327)
Macroeconomic		0.265	0.283*	1.118***	0.356**	
stability		(0.156)	(0.147)	(0.224)	(0.135)	
Competitiveness			-0.011	-0.017***	-0.015**	-0.010**
			(0.007)	(0.005)	(0.005)	(0.004)
Country risk				-1.143*		
				(0.547)		
Openness					1.266**	2.007**
					(0.518)	(0.653)
External factors						
Euro area cycle						0.705***
						(0.153)
AR2	0.771	0.866	0.965	0.206	0.701	0.659
Hansen test(2nd step)	0.676	0.783	0.699	0.978	0.774	0.790
Number of instruments	7	8	9	10	10	10
Number of observations	720	720	707	625	702	702

Notes: Two-step System GMM with the Windmeijer (2005) correction. Standard errors in parenthesis. *,**,*** denotes significance at 10%, 5%, 1% level. The *P*-values of the second order autocorrelation (AR2) and Hansen tests are reported.

We examine the results of the estimation of equation (5), by introducing progressively the domestic and the external determinants. We start by introducing the classical determinants. The results are reported in Tables 1 and 2.

The coefficients of classical determinants are mostly consistent with the existing literature.

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[9]Before the Windmeijer correction, researchers considered one-step results in making inferences (Roodman, 2008).

[10]One instrument is created for each variable and lag distance, rather than one for each time period, variable and lag distance. This reduces the statistical efficiency in large samples but, in small samples, it can avoid the bias that arises as the number of instruments increases with the number of observations (Roodman, 2008).

[11]The long-term coefficient of a variable is computed as the sum of its coefficients divided by one minus the sum of coefficients of the lags of the dependent variable. This way, the measure of the long run impact of the classical determinants is $\alpha_2/(1-\alpha_1)$ and capture the effects of a change in the classical determinants in period t on FDI over several subsequent periods.

Table 2: Long-term estimates of FDI determinants: classical determinants.

Independent variable	(1)	(2)	(3)	(4)	(5)	(6)
Classical determinants						
Market size	0.243***	0.206***	0.247***	0.143**	0.245***	0.108***
	(0.045)	(0.035)	(0.040)	(0.045)	(0.030)	(0.024)
Infrastructure	2.395	2.514	2.049	2.453	1.811	0.120
	(3.642)	(3.247)	(2.893)	(2.378)	(2.731)	(2.505)
Macroeconomic stability		0.326**	0.370**	1.020***	0.388***	
		(0.115)	(0.125)	(0.173)	(0.095)	
Competitiveness			-0.015	-0.015**	-0.016**	-0.010 *
			(0.010)	(0.006)	(0.007	(0.005)
Country risk				-1.042*		
				(0.566)		
Openness					1.378**	2.160**
					(0.465)	(0.702)
External factors						
Euro area cycle						0.759***
						(0.182)

Notes: Standard errors in parenthesis. *,**,*** denotes significance at 10%, 5%, 1% level.

Market size presents a positive and statistically significant coefficient both in the short and the long run. The higher the growth potential, the higher the incentive to invest in the recipient countries. According to our results, in the short run, a 1% increase in the GDP growth rates induces, on average, an increase in net FDI inflows of about 0.10% to 0.22%. In the long run, the impact of the market size of recipient countries remains positive and statistically significant and is slightly larger than in the short run : the increase in net FDI inflows induced by a 1% increase in the GDP growth rates is of about 0.11% to 0.25% (see columns (1) to (5) in tables 1 and 2)

Inflation (that is the proxy for macroeconomic stability) presents a positive and statistically significant coefficient both in the short and the long run. This result is rather counter-intuitive, since a stable macroeconomic environment, characterized by a low inflation, is expected to attract more FDI inflows.

The high quality of infrastructure does not seem to affect the attractiveness of FDI in the region.

The risk premium (as a proxy for the risk profile of each country in the sample) presents the expected negative and statistically significant coefficient both in the short and the long run. The larger the long-term interest spread, the riskier is the investment climate and, consequently, the less attractive is the region for foreign investors.

Competitiveness (proxied by the change in the unit labour cost) is found to affect in a significant way the entry of FDI in CEECs. The larger the change in the unit labour cost (i.e. an increase), the lower the net FDI inflows in the region. As underlined by the trade theory, relative low unit labour costs are the main incentive of vertical FDI by multinational companies, as they can reduce the overall costs of production by locating their labour-intensive activities in these countries presenting low unit labour costs.

Openness (proxied by the share of exports in GDP) has a significant positive effect on the net inflows of FDI. The larger the share of exports in GDP, the larger the FDI inflows in CEECs. This result is in line with the literature pointing out a complementarity between trade flows and FDI (Carstensen and Toubal, 2004; Nath, 2009; Sapienza, 2009).

The euro area business cycle has a positive and statistically significant effect on FDI inflows: the higher the output gap in the euro area, the higher the average FDI inflows to the EU new member states. Quite intuitively, a positive output gap signals that the euro area economy is running above potential so that domestic demand is expanding, encouraging lenders to increase their cross-border exposure. The strong influence of macroeconomic conditions in the euro area on FDI flows to CEECs is in line with the 2012 EBRD Transition Report, according to which FDI flows into the countries in the region had been affected, over the previous decade, by economic conditions in the source country rather than by prevailing or past growth rates in the recipient state.

We further consider the institutional and the structural reform indicators, that are introduced one by one, in order to avoid multicollinearity[12]. We drop inflation when introducing the institutional and structural reform indicators because of the high correlation among these variables. The results are reported in Tables 3 and 4 below.

As regards the indicators of structural reforms, none of them is statistically significant in the short-run. However, in the long-run, both the large-scale privatisation index and the banking reform index have a positive and significant effect on net FDI inflows in CEECs. The highest the progress in policies related to the privatisation process and to the banking reform, the larger the attractiveness of foreign investors.

Concerning the institutional reform indicators, in the short run, trade freedom and the property rights have a positive impact on FDI. In the long run, the impact of the trade freedom indicator becomes statistically non-significant. Thus, in the short term, the lack of trade barriers and the ease of individuals to accumulate private property, secured by clear laws increase the attractiveness of FDI flows to the region.

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[12]The collinearity diagnostic tests indicate the appropriate separate use of each of these indicators.

Table 3: Short-term estimates of FDI determinants: institutional and structural reforms.

Independent variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Lagged FDI	0.458	0.224	0.328	0.445	0.179	0.194	0.224	0.231
	(0.529)	(0.341)	(0.415)	(0.447)	(0.313)	(0.354)	(0.363)	(0.367)
Classical determinants								
Market size	0.124	0.176*	0.157	0.148*	0.177**	0.185*	0.170*	0.165*
	(0.113)	(0.084)	(0.099)	(0.078)	(0.078)	(0.085)	(0.082)	(0.081)
Infrastructure	2.805	1.564	1.581	-0.209	1.189	1.465	1.992	1.929
	(2.758)	(2.254)	(2.111)	(2.093)	(2.274)	(2.099)	(2.560)	(2.102)
Competitiveness	0.006	0.037	0.006	-0.265	-0.006	-0.003	-0.010*	-0.011*
	(0.021)	(0.688)	(0.015)	(0.244)	(0.005)	(0.006)	(0.005)	(0.005)
Openness	-1.029	0.947	-0.161	1.685	1.329**	0.794	1.842**	1.690*
	(1.397)	(0.543)	(0.706)	(1.669)	(0.492)	(0.469)	(0.810)	(0.823)
Structural reforms								
Privatisation	2.546							
	(2.882)							
Competition policy		0.037						
		(0.688)						
Banking sector			2.081					
			(1.713)					
Financial sector				-0.758				
				(0.579)				
Institutional reforms								
Trade freedom					1.952*			
					(1.044)			
Investment freedom						0.811		
						(2.020)		
Property rights							3.148 ***	
							(1.511)	
Corruption								2.608
								(1.513)
AR2	0.702	0.988	0.842	0.656	0.894	0.932	0.991	0.991
Hansen test(2nd step)	0.468	0.762	0.610	0.664	0.803	0.781	0.741	0.718
Number of instruments	10	10	10	10	10	10	10	10
Number of observations	702	702	702	702	702	702	702	702

Notes: Two-step System GMM with the Windmeijer (2005) correction. Standard errors in parenthesis. *,**,*** denotes significance at 10%, 5%, 1% level. The *P*-values of the second order autocorrelation (AR2) and Hansen tests are reported.

In the long run, international investors seem to react more strongly to changes in institutional factors related to property rights and corruption. Thus, the reduced number of restrictions on investment in a market and the lack of corruption are associated with higher net FDI inflows.

Table 4: Long-term estimates of FDI determinants: institutional and structural reforms.

Independent variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Classical determinants								
Market size	0.229***	0.228***	0.235***	0.268**	0.216***	0.230***	0.219***	0.215***
	(0.059	(0.039)	(0.037)	(0.100)	(0.034)	(0.0334)	(0.035)	(0.034)
Infrastructure	5.178**	2.018	2.354	-0.378	1.448	1.818	2.567	2.512
	(1.953)	(2.685)	(3.069)	(3.842)	(2.695)	(2.560)	(3.270)	(2.547)
Competitiveness	0.011	-0.006	0.009	-0.478	-0.008	-0.004	-0.013	-0.014
	(0.031)	(0.011)	(0.019)	(0,648)	(0.008)	(0.009)	(0.009)	(0.009)
Openness	-1.899	1.222	-0.240	3.038	1.619**	0.986	2.374**	2.200***
	(1.117)	(0.767)	(1.023)	(4.843)	(0.617)	(0.637)	(0.937)	(0.553)
Structural reforms								
Privatisation	4.700***							
	(1.385)							
Competition policy		0.048						
		(0.876)						
Banking sector			3.099**					
			(1.263)					
Financial sector				-1.368				
				(1.916)				
Institutional reforms								
Trade freedom					2.378			
					(2.057)			
Investment freedom						1.006		
						(2.264)		
Property rights							4.057*	
							(2.258)	
Corruption								3.395**
								(1.150)

Notes: Standard errors in parenthesis. *,**,*** denotes significance at 10%, 5%, 1% level.

4.3 Estimating the effect of FDI on economic growth

We first proceed to an event study analysis of the dynamics of FDI around crises, like in Broner et al. (2013). We focus on the dynamics of FDI not only during crisis years, but also in the run-up to crises and the immediate aftermath by analyzing the 2 years preceding and following crises. We estimate the following equation:

$$FDI_{i,t} = \alpha_i + \gamma_i t + \sum_{k=-2}^{k=2} \beta_i Crisis_{i,t+k} + \epsilon_{i,t} \qquad (6)$$

Here $FDI_{i,t}$ stands for FDI inflows (% of GDP) in country i at time t and $Crisis_{i,t+k}$ makes reference to the 2007 and 2011 crises.

We create two dummy variables $crisis_{07}$ and $crisis_{11}$ to take into account the occurrence of both the 2007 global financial crisis and the 2011 euro area sovereign debt market crisis. For defining $crisis_{07}$, we consider the definitions of Fratzscher (2012) and Brunnermeier (2009); according to Fratzscher (2012), the 2007 crisis went from 7 August 2007 till 15 March 2009, while for Brunnermeier (2009) the 2007 crisis went from the 2nd quarter of 2007 till the 2nd quarter of 2009. Given that in our analysis we use quarterly data, we apply Brunnermeier (2009)'s definition of the 2007 crisis (i.e. $crisis_{07}$ takes the value 1 over the period Q2 2007 -

Q2 2009 and 0 otherwise). Along the same reasoning, we define $crisis_{11}$ as taking the value 1 over the period Q2 2011 - Q4 2012 and 0 otherwise.

Table 5: FDI and GDP around crises.

	FDI	GDP
Year t-2	3.632***	2.807***
	(0.864)	(0.457)
Year t-1	3.530***	3.490***
	(1.020)	(0.367)
$crisis_{07}$	1.549**	-2.280***
	(0.652)	(0.808)
Year t+1	-1.779**	-9.530***
	(0.877)	(1.183)
Year t+2	-1.409***	-1.306***
	(0.541)	(0.429)
$crisis_{11}$	-0.979*	-1.739***
	(0.596)	(0.369)
Country dummies	Yes	Yes
Observations	757	746
Number of countries	10	10
R^2	0.199	0.23

Notes: 1/ $Year_{t-2}$ is the period q2 2005 - q2 2006, $Year_{t-1}$ is the period q2 2006 - q2 2007, $Year_{t+1}$ is the period q2 2009 - q2 2010, $Year_{t+2}$ is the period q2 2010 - q2 2011.
2/ Fixed-effect panel data regression estimates, with robust standard errors.

Table 5 shows the dynamics of FDI during crises, pooling all countries together. The results (in column 1) show robust evidence of FDI retrenchment starting from Q2 2009. According to the evidence, FDI remains at depressed level or declines even further during the 2nd year period after the 2007 crisis. And the decline of FDI goes further during the 2011 crisis. The decline in FDI during crises is not only statistically significant by also economically large. In particular, mean FDI increased from 4.91 percent of GDP to 7.92 percent of GDP 2 years before the 2007 crisis and, respectively to 8.03 percent of GDP the year before the 2007 crisis. During the 2007 crisis, mean FDI was of 6.65 percent of GDP (well above the average level before the pre-crisis period); and it declined afterwards to 2.03 percent of GDP the year after the 2007 crisis and, respectively, to 2.98 percent of GDP 2 years after the 2007 crisis. During the 2011 crisis, mean FDI was of 3.34 percent of GDP (below the average level before the 2007 pre-crisis years) and it declined further to 1.85 percent of GDP the year after.

We equally analyse the dynamics of GDP around crises, using the same reasoning as for FDI dynamics. We report the results in column (2) of the Table 5. The findings point out a difference in the timing of the collapse of GDP, that starts declining with the burst of the 2007 crisis. The biggest decline in GDP growth rates takes place in the year after the 2007 crisis. As in the case of FDI, GDP growth rates increased in the 2 years preceding the 2007 crisis, from 3.71% to 6.81% 2 years before the 2007 crisis erupted and, respectively to 7.49 % the year before the 2007 crisis. During the 2007 crisis, mean GDP growth rate was of 3.07% percent of GDP (slightly below the average level before the pre-crisis period) and it declined

afterwards to -6.04% the year after the 2007 crisis and, respectively, to 2.69% 2 years after the 2007 crisis. During the 2011 crisis, mean GDP growth rate was of 2.49% (below the average level before the 2007 pre-crisis years) and it declined further to 0.99% the year after.

As shown by this event study, developments in both FDI inflows and economic growth have been affected by both 2007 and 2011 crises. The timing of the collapse of the two indicators is different, economic growth being impacted more rapidly than FDI by the 2007 crisis.

Based on the findings of the event study above, we further proceed to the empirical analysis of the relationship between economic growth and FDI, and take into account the occurrence of both crises.

We estimate a simple growth equation (as derived from the basic production function presented in sub-section 3.2) for our sample of countries from Central and Eastern Europe:

$$\Delta GDP_{i,t} = \beta_0 + \beta_1 FDI_{i,t} + \beta_2 H_{i,t} + \beta_3 Y_0 + \beta_4 A_{i,t} + \epsilon_{i,t} \tag{7}$$

where $\Delta GDP_{i,t}$ is the quarterly year-on-year real GDP growth rate in country i at time t, $FDI_{i,t}$ are the net foreign direct investment inflows (% of GDP) in country i at time t, $H_{i,t}$ the stock of human capital[13] in country i at time t, proxied by the log of the initial rate of secondary school enrollment (i.e. the 1993 level), $Y_{i,0}$ the initial GDP ("catching-up" effect) in country i, and $A_{i,t}$ the set of other variables affecting economic growth in country i at time t, such as government consumption, financial development and inflation rate (Barro and Sala-i-Martin, 1995).

The log of initial GDP and the log of inflation are standard proxies for the level of development and macroeconomic stability; we expect a negative sign for the coefficient of initial GDP, corresponding to the catching-up effect (since less developed countries, with a lower initial GDP, are expected to register higher real GDP growth rates). At the same time, low inflation is a sign of macroeconomic stability; a negative sign of the coefficient of (log) inflation is expected. We equally include the quadratic inflation in our regressions, because of the non-linear relationship that has been found in a large number of studies estimating the inflation-economic growth nexus. At the same time, government consumption (% of GDP) should impact negatively economic growth. Moreover, financial depth is proxied by domestic credit to private sector (% of GDP)[14].

As in the empirical analysis of FDI determinants, we choose a semi-log model. The only variables that are given in log are the initial GDP and inflation, the other explicative variables being expressed in percentage points.

In the growth equation above, FDI might be endogenous. We control for its possible endogeneity by using the instrumental variables method and apply the panel data two-step efficient GMM estimator. The efficiency gains of this estimator relative to the traditional

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[13]The application of more advanced technologies, coming with FDI, requires the presence of a sufficient level of human capital in the host economy. Thus, the stock of human capital in the host country limits the absorptive capacity of a developing country.

[14]This proxy of financial depth is largely used in the literature on financial development (King and Levine, 1993).

IV/2SLS estimator derive from the use of the optimal weighting matrix, the overidentifying restrictions of the model, and the relaxation of the i.i.d. assumption [15]. We test the validity of instruments (the Sargan-Hansen test[16]), and for the endogeneity[17] of the FDI variable. We use the unit labour cost, the EBRD large-scale privatisation index and the EBRD banking reform index as instruments.

In order to capture the potential effect of 2007 and 2011 crises on the relationship between FDI and economic growth, we interact the crises dummy variables with the FDI variable.

The results of the estimations are presented in Table 6 below.

We include first only the FDI indicator (columns 1 and 2), then we add the interaction of net FDI inflows with the crisis dummies (columns 3 to 5).

Even if, according to Nelson and Phelps (1996), FDI and human capital are complementary in the process of productivity growth, the stock of human capital presents here a non-significant coefficient for our sample of countries[18].

The initial level of GDP presents a non-significant coefficient. Thus, it does not confirm the catching-up effect over the period of analysis.

As far as the set of "other" variables affecting economic growth is concerned, government consumption presents the expected negative but non-significant coefficient. Our results do not confirm the convex relationship between inflation and economic growth, both the inflation rate and its quadratic form presenting non-significant coefficients. Finally, the measure of financial depth (i.e. domestic credit to the private sector) presents a negative and statistically significant effect on growth.

We turn to the variable of interest, i.e. net inflows of FDI (in % of GDP). The findings are of a positive and statistically significant coefficient for FDI: the higher the FDI inflows, the higher, on average, the economic growth. Accordingly, a 1 % increase in FDI inflows (in terms of GDP) induces average GDP growth rate to increase by about 0.55 %.

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[15]For an exactly identified model, the efficient GMM and traditional IV/2SLS estimators coincide, and under the assumptions of conditional homoskedasticity and independence, the efficient GMM estimator is the traditional IV/2SLS estimator.

[16]The joint null hypothesis is that the instruments are valid instruments, i.e., uncorrelated with the error term, and that the excluded instruments are correctly excluded from the estimated equation. A rejection casts doubt on the validity of the instruments.

[17]Under the null hypothesis that the specified endogenous regressors can actually be treated as exogenous, the test statistic is distributed as chi-squared with degrees of freedom equal to the number of regressors tested.

[18]We examined whether FDI interacts with the stock of human capital to affect the growth rates, like in Borensztein et al. (1998), by adding the interaction term between FDI and the human capital ($FDI_{i,t} \times H_{i,t}$) to equation (7). The coefficient of this interaction term was non-significant; consequently, we excluded it further on.

Table 6: FDI inflows in CEECs and economic growth.

Independent Variable	(1)	(2)	(3)	(4)	(5)
Initial GDP	0.010	-0.025	-0.007	0.010	0.016
	(0.186)	(0.176)	(0.179)	(0.180)	(0.182)
Schooling	0.013	0.008	-0.006	-0.007	-0.015
	(0.067)	(0.067)	(0.064)	(0.066)	(0.063)
Government Consumption	-0.052	-0.052	-0.088	-0.013	-0.059
	(0.063)	(0.063)	(0.063)	(0.066)	(0.065)
FDI	0.554***	0.553***	0.634***	0.611***	0.691***
	(0.144)	(0.143)	(0.166)	(0.155)	(0.178)
Domestic credit to private sector	-0.079***	-0.080***	-0.072***	-0.079***	-0.071***
	(0.014)	(0.014)	(0.014)	(0.014)	(0.015)
Inflation rate	-0.202	1.508	1.655	1.399	1.541
	(0.273)	(1.436)	(1.491)	(1.441)	(1.509)
$Inflationrate^2$		-0.941	-0.969	-0.898	-0.918
		(0.738)	(0.767)	(0.739)	(0.775)
$crisis_{07}$			0.114		0.545
			(1.249)		(1.292)
FDI*$crisis_{07}$			-0.295*		-0.351*
			(0.176)		(0.184)
$crisis_{11}$				3.305***	3.188***
				(1.064)	(1.096)
FDI*$crisis_{11}$				-0.692***	-0.766***
				(0.185)	(0.203)
Underidentification test [a]	0.000	0.0000	0.0000	0.0000	0.0000
Hansen test [b]	0.1745	0.2112	0.1106	0.1331	0.1115
Endogeneity test [c]	0.0016	0.0014	0.0003	0.0012	0.0003
Observations	714	712	712	712	712
Number of countries	10	10	10	10	10

Notes: Panel data two-step efficient generalized method of moments (GMM) estimator. Standard errors in parentheses. *,**,*** denotes significance at 10%, 5%, 1% level.
[a] P-value corresponding to the Kleibergen-Paap (2006) rk LM statistic. A rejection of the null indicates that the matrix is full column rank, i.e., the model is identified.
[b] The joint null hypothesis is that the instruments are valid instruments and that the excluded instruments are correctly excluded from the estimated equation.
[c] We test the endogeneity of FDI. Under the null hypothesis, the specified endogenous regressors can actually be treated as exogenous.

Taking then into account the occurrence of both crises (columns 3 to 5), our results show that both the 2007 and the 2011 crises had a negative impact on the FDI - economic growth relationship. According to our findings, the positive effect of FDI on economic growth diminished during the 2007 crisis; over the period Q2 2007 - Q2 2009, a 1 % increase in FDI inflows (in terms of GDP) induces the average GDP growth rate to increase by about 0.34 %. Moreover, the effect of FDI on economic growth became negative and statistically significant during the 2011 crisis; a 1 % increase in FDI inflows (in terms of GDP) induces the average GDP growth rate to decrease by about 0.08 % over the period Q2 2011 - Q4 2012. Taken separately (i.e. non-interacted with the FDI indicator), the 2007 crisis dummy presents a negative but non-significant coefficient, while the 2011 crisis dummy presents a positive and statistically significant coefficient.

Overall, the established relationship between FDI and growth suggests that not only portfolio flows and bank lending, but also supposedly "virtuous" FDI contributed to the boom-bust cycle and associated imbalances in the CEECs. This is in line with recent findings on a more granular level suggesting that FDI in the financial sector can be associated with macroeconomic instability in receiving countries (Dell'Erba and Reinhardt, 2013). Thus, FDI seems to be a multifaceted, i.e. not only stabilising growth-driver in the CEECs; a more granular analysis could further clarify this complex causality.

5 Conclusion

Our paper complements the existing empirical literature examining FDI in CEECs.

In a first step, we analyse both the external and the domestic determinants of FDI inflows in CEECs. Our results show that the macroeconomic conditions in the euro area affect the attractiveness of FDI inflows in CEECs. The strong influence of macroeconomic conditions in the euro area on FDI inflows in CEECs is in line with the 2012 EBRD Transition Report, according to which FDI flows into the countries in the region over the previous decade had been affected by economic conditions in the source country rather than by prevailing or past growth rates in the recipient state.

Main internal determinants revealed by our regression estimates are the market size, risk premia, unit labour costs, the openness of the host economies, as well as their progress in structural reforms (mainly related to privatisations and to banking sector reforms) and in institutional reforms (mainly the absence of trade barriers, the ease of individuals to accumulate private property and also the progress in fighting corruption).

In a second step, we examine whether changes in net FDI inflows affect economic growth. Our findings show that, on average, net FDI inflows contributed in a positive and statistically significant way to economic growth over the period 1993 - 2013. We consider the occurrence of both crises and show that the positive effect of FDI on economic growth diminished during the 2007 crisis, while it became negative during the 2011 crisis.

Given the positive impact of FDI inflows on economic growth, host countries from Central and Eastern Europe could continue to encourage, to a certain extent, the entry of FDI flows. As privatisation has ceased to be the main driver of FDI in the region, economic features attracting non-privatisation-related FDI are becoming increasingly more important (Arratibel et al., 2007). Moreover, a stable macroeconomic environment, labour costs that develop in line with productivity, and a sufficiently developed infrastructure, most of them identified by our results, are preconditions for future FDI inflows.

However, based on the former experience, it is neither desirable nor sustainable for Central and Eastern Europe to return to a growth model excessively dependent on capital inflows. This applies all the more as the procyclicality and potential volatility of capital inflows in this region are still an issue (Coricelli and Ianchovichina, 2004). Among the policy decisions, the development of local currency capital markets should make the region less dependent on capital inflows and less vulnerable to their potential reversal (EBRD).

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Appendix

Table 7: Data sources.

Variable	Sources	Definition
GDP	Eurostat	GDP in volumes (millions of euros, seasonally adjusted).
FDI	Eurostat	Net foreign direct investment flows in the reporting economy (millions of euros). Authors' calculation (% of GDP).
Schooling	WDI, World Bank	Secondary school enrollment rate (%, gross).
Inflation	Eurostat	HICP overall index (seasonally adjusted).
Government consumption	Eurostat	Government consumption (% GDP).
Telephones	Eurostat	Number of main telephone lines.
Domestic credit to private sector	National Central Banks	Domestic credit to private sector (% GDP).
Trade freedom	Index of economic freedom	Composite measure of the absence of tariff and non-tariff barriers affecting imports and exports of goods and services; index going from 0 (trade barriers) to 100 (free trade).
Investment freedom	Index of economic freedom	Index going from 0 (restrictions on investments) to 100 (no constraints on the flow of investment capital).
Property rights	Index of economic freedom	Ability to accumulate private property and wealth; index going from 0 (bad) to 100 (good).
Corruption	Index of economic freedom	Index going from 0 (very corrupt government) to 100 (very little corruption).
Large-scale privatisation	BERD, Transition indicators	Index going from 1(little private ownership) to 4 (more than 50 per cent of state-owned enterprise and farm assets in private ownership).
Banking reform and interest rate liberalization index	BERD, Transition indicators	Index going from 1 (Little progress beyond establishment of a two-tier system) to 4 (Significant movement of banking laws and regulations towards BIS standards).
Competition policy index	BERD, Transition indicators	Index going from 1 (no competition legislation and institutions) to 4 (significant enforcement actions to reduce abuse of market power and to promote a competitive environment).
Securities markets and non-bank financial institutions index	BERD, Transition indicators	Index going from 1 (little progress) to 4 (Securities laws and regulations approaching IOSCO standards; substantial market liquidity and capitalisation; well-functioning non-bank financial institutions and effective regulation.
Euro area business cycle	OECD	Output gap of the economy, euro area 15.
Government bond yields	Eurostat	10 year government bond yields.

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