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Foreign Direct Investment and Aid: Engines for Growth in Transition Economies?

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Abstract

The key aim of this paper is to investigate the role of Foreign Direct Investment and aid as engines of growth for the transition economies. We build a holistic framework and then examine empirically the triangular relationship between growth, international aid flows and foreign direct investment flows. Particular emphasis with respect to the empirical investigation of the relationship was placed on the Central and Easter European transition economies and on the role of institutional factors in enhancing growth, aid and FDI. We use a representative sub-sample of sixteen European post-communist economies some of which have joined the EU, are likely to join or have political and economic agreements with the Union. We have found that in transition economies institutional improvements alone do not enhance economic growth, nor do foreign direct investment and aid without the appropriate institutional framework. This suggests that governments need to start the virtuous circle of reforms by creating a favourable institutional framework and by attracting aid into the country, given that MNEs are more likely to need structural reforms and signals of future economic growth before deciding to enter these markets.

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Foreign Direct Investment and Aid: Engines for Growth in Transition Economies?

1. Introduction

Since the work of Solow (1956) the issue of economic growth and development has been identified as a key component of the policy agenda. It is not only most economic policies in developed, developing or transition economies that aim to increase economic growth rates and consequently improve living standards, it is also the current agenda of international, economic and political, organisations like United Nations (UN) that has at its core the enhancement of living standards through upgrading basic infrastructure, widening participation in education and offering health services to inhabitants of developing countries. Moreover, international organisations established after the Second World War like the International Monetary Fund, the World Bank, or even organisations like the European Union, usually offer aid to countries facing financial or other structural imbalances. Within this context, where aid usually originates from the international organisations upon the satisfaction of specific criteria, countries do also compete for other foreign capital flows. The majority of those flows are foreign direct investment (FDI), steaming from multinational enterprises' (MNEs) activities. FDI is related to specific investment motives and is being determined by market forces rather than international organisations or international agendas.

Both flows, i.e. aid and FDI, although determined in a completely different way, enhance economic growth and mirror the efforts of the country towards building a more stable political, institutional, social and macroeconomic environment. In this context a clear relationship has been identified in the literature between international aid and economic growth (Cheney and Strout, 1966; Papanek, 1973; Levi, 1987, 1988; Fayissa and El-Kaissy, 1999) and between FDI and economic growth (Hejazi, 1999; Meyer, 1998; Borensztein et al, 1998). Conversely, growth directly affects inward FDI through the increase of the potential market size. This reinforces specific market-seeking motivations of international investors. Growth also affects the level of international aid, as it might signal, especially in the early stages of development, the commitment of the country towards achieving economic stability. This, in turn, will facilitate international aid flows to the country under investigation. However, until now, economic research has investigated the effects of growth on aid or vice versa, while the international business literature has focused primarily on the effects of FDI on growth, thereby maintaining a separation between the three economic factors. As a consequence, to date there has been no conceptualisation of the triangular relationship between growth, international aid and FDI. It is the first main contribution of this paper to

provide such a conceptualisation and in so doing bridge the two pre-existing perspectives in a holistic framework and thus offer a complete picture on understanding growth, aid and FDI.

With the fall of Communism, countries in Central and Eastern Europe have embarked upon a challenging process of democratisation and transition towards a market economy. With Communism failing to deliver, a main goal of the post-1989 period has been to improve the living standards for the population and ultimately to bring them closer to the, much sought after, Western European living standards. While setting up political and economic co-operation agreements with the successor states of the Soviet Union, the EU has offered the prospect of EU membership to several Central and Eastern European countries, ten of which joined the union in May 2004 and January 2007 respectively. Part of the EU's strategy to assist the development of the European post-Communist economies has been encouraging institutional reforms, opening up trade, offering aid and enhancing foreign direct investment. In this paper we explore the role of MNEs and of economic aid in enhancing growth in European post-communist economies while also considering the role of the institutional environment. This is the second contribution of the paper. We have chosen to focus specifically on transition economies because the process of transition from a centrally planned to a market economy has been implemented through a variety of paths and has had a mixture of outcomes in terms of economic growth and development, thus providing a rich and illuminating empirical context. We use a representative sub-sample of sixteen European post-communist economies some of which have joined the EU, are likely to join or have political and economic agreements with the Union with observations for a period between 1990 and 2002. This decade includes most of the economic and political transition to date. Data is provided by the World Development Indicators (WDI), Vienna Institute of Economics (WIIW) and the International Country Risk Guide Database (IRIS).

Advancing the discussion a step further and with reference to recent research, a third contribution of the paper is to explore the extent to which institutional factors account for different patterns of FDI and growth in European post-communist economies by using specific institutional data. Indeed, according to Peng (2003) and Meyer and Peng (2005), institutional theories offer the higher degree of novelty in assessing the international business context in transition economies.

The fourth contribution of the paper relates to its novel empirical methodology. As both FDI and aid are not exogenous to growth, we test the interplay between growth, FDI and aid through a three-way system of simultaneous equations. This methodology builds on

Zellner and Theil (1962) and allows the investigator to isolate the endogeneity effects of the different variables.

The remainder of the paper is organised as follows. The next section provides an overview of the literature on growth, aid and FDI. We then present the conceptual framework and formulate our hypotheses. Section four contains the methodology, the data and the sample description. Section five presents our econometric results and their discussion. Finally, the last section presents our conclusions, policy implications and suggestions for future research.

2. Literature review

For this analysis we draw on several strands of research which deal with the determinants of growth, of FDI and of aid respectively. The key aim of this section is to provide the common ground for the building of our conceptual model in the next section as well as to give an in-depth picture of the current research agenda on growth, aid and FDI.

Studies on determinants of economic growth

The last decade has seen a revival of studies on economic growth, including new approaches such as endogenous growth theory, as well as a greater emphasis on empirical studies. In order to account for differences in income, the neoclassical analysis focuses on the supply and quality of production factors, the supply of labour and its level of education, as well as the incentives to invest and adopt advanced techniques of production. The policy recommendations of the mainstream neoclassical school, however, are of a 'laissez-faire' nature and these have been the basis for the economic policies pursued by transition countries since the early nineties. Mainstream economists and policy advisors hold responsible, for this lack of convergence between Central and Eastern Europe and the EU, the insufficient commitment of governments towards quick liberalisation of their economies.

Alternatively, critics of the neoclassical framework challenge its assumption that all countries have the same access to exogenous technology and dispute the claim that 'untrammelled market forces' are capable of inducing sustained economic growth and economic convergence in underperforming transition and developing economies (United Nations, 2000:158). Way before Solow (1956), Schumpeter (1934) proposed that innovative entrepreneurship and the associated structures, which nurture it, are the key for sustained growth. Similarly, the post-Keynesian analysis stresses the importance of institutional frameworks in mobilising resources while placing critical importance on the role of the demand, especially expectations of demand. This strand of thought also argues that

cumulative causation may either confine countries in low level development traps or determine a breaking through, via higher profits and a higher propensity to invest (Kaldor, 1966).

More recently, the dominant neo-classical growth model has been challenged by the 'new growth' or 'endogenous growth' theories which severely qualify the case of 'untrammelled market forces'. Much emphasis is put on the endogenous sources of growth and technical progress, including the need to invest in human capital and the spillover effects of capital formation. Some of these analyses agree that increased investment may raise the long run rate of growth due to increasing returns. The main driver of the catching-up process is the closing of the technology gap between the poor and the richer countries (Fagerberg, 1987, 1988; Verspagen, 1992). This can be achieved via accelerated imports of capital goods and by FDI (Hejazi, 1999). Technology import, however, inside the MNEs may be limited as they try to prevent leakages and positive externalities (Meyer, 1998) or may depend on the successful integration of the country's enterprises into international corporations' networks. Borensztein et al (1998) also argue that FDI is more productive than domestic capital only when the host country has a minimum threshold stock of human capital that can cope with imported technology.

The literature identifies several main channels through which technological spillovers from FDI to host countries affect growth positively (Kinoshita, 2001; Halpern and Muraközy, 2005; Fillat Castejón and Wörz, 2006). Building backward or forward links with local firms, advanced personnel training and links with local research institutes and universities are the traditional channels. A broad consensus also suggests that local firms need a certain level of indigenous human capital in order to be able to benefit from knowledge transfer by multinational enterprises. This argument is related to the concept of 'absorptive capacity', that is 'the firm's ability to recognise valuable new knowledge, integrate it into the firm and use it productively' (Meyer, 2004: 263). Overall, the long- term impact of FDI depends on the type of FDI undertaken, the structure of indigenous resources and capabilities of countries concerned, political and economics institutions as well as the macroeconomic and organisational policies pursued by the government (Abramovitz, 1986; Romer, 1993; Hunya, 2003). By recognising the impact of institutions and policies on investment, R&D and access to foreign technology, the new growth theories allow, at least in principle, a greater role for government policy in creating the conditions for sustained growth and catch-up (United Nations, 2000:159). This view has constituted the basis for the investigation conducted in the present paper and we incorporate it by assessing the impact of FDI on growth and by using

institutional variables and human capital variables as determinants of both growth and foreign direct investment in transition economies.

We equally build on previous studies on growth in Central and Eastern Europe. These have investigated the reasons of rapid recovery by some countries and not others. Some studies explored the role of initial conditions (Fisher and Sahay, 2000; Campos, 2001; Falcetti et al, 2005), or the importance of sound macroeconomic policies (Fisher and Sahay, 2000; Falcetti et al, 2005), and their results are rather contradictory. By estimating the standard growth equation (e.g. Mankiw, Romer and Weil, 1992) for a period from 1990 to 1997, Campos (2001) finds that none of the variables (initial per capita income, secondary school enrolment and investment rate) has the expected sign, while Polanec (2001) confirms these results for an extended period from 1989 to 1999, when controlling for government failure (corruption) and unobserved differences (year on year panel data estimation). Most of the previous studies dealing with institutional factors determining growth in transition economies use the EBRD transition indicators and constructs of these (Falcetti et al, 2002; Barlow and Radulescu, 2002; Lawson and Wang, 2004; Merlevede, 2003) and conclude that the quality of institutions is significant for growth.[2] Yet, none of these studies addresses specifically the endogeneity between FDI and growth while the role of foreign aid in enhancing growth in transition economies appears to be under-investigated. We aim to enrich the debate by filling this gap in the literature.

The role of aid in enhancing economic growth has always been a controversial issue. According to a significant strand of literature, aid affects positively growth by supplementing domestic savings and helping to close the foreign exchange gap (Cheney and Strout, 1966; Papanek, 1973; Levi, 1987, 1988; Fayissa and El-Kaissy, 1999). These conclusions have been confirmed by the experience of some individual developing countries (Fayissa and El-Kaissy, 1999:2). Conversely, there is significant literature showing that foreign aid fails to promote growth or that it needs a long time for such effects to appear. As a result of aid, some governments may reduce the tax rates or their effort to collect taxes, or they may increase public consumption, all with a negative impact on growth (Griffin and Enos, 1970; Weisskopf, 1972 and Boone, 1994).[3] Ultimately, Bauer (1981) argues that aid does not go to the poor, but to their rulers whose spending policies do not depend on the needs of the people. This has been further amended to show that development aid is not necessary to rescue poor

[2] For institutional determinants of growth in developing countries see Ali and Isse (2005).

[3] For a more comprehensive literature review, see Ali and Isse (2005), Ovaska (2003) and Djankov et al (2006).

societies from a 'vicious circle of poverty' but is 'far more likely to keep them in that state' (Bauer, 2000:46). This is why the levels of democratisation and bureaucratic quality in the recipient country are very important in determining the impact of aid on growth. By taking them into consideration in our model of aid determinants we complement the previous debate.

other studies provide rather ambiguous results. Mosley et al (1980) argue that foreign aid may have different impact on different developing countries depending on other tax policies. The seminal work by Burnside and Dollar (2000) concluded that 'aid has a positive impact on growth in developing countries with good fiscal, monetary and trade policies, but has little effect in the presence of poor policies'. These results have been later on challenged by Easterly, Ross and Roodman (2004), Ovaska (2003) and by Brumm (2003). Ali and Isse (2005) find that there is a threshold, for foreign aid, beyond which aid is detrimental for growth but that a good policy environment is important for aid to work effectively.

In particular, Bornchier, Herkenrath and Ziltener (2000:71-85) argue that the economic convergence within the European Union is a consequence of special forms of inter-state redistribution within the EU rather than a result of the access to the Single Market. Cappelen et al (2003: 621) also find that EU regional support has a significant and positive impact on growth performance of European regions and that the major reform of structural funds, undertaken in 1988, may have succeeded in making EU's regional policy more effective. However, Lyberaki (1996) concludes that while Ireland has constituted a success regarding the impact of EU funds on economic growth, Greece is obviously the example of funds failing to deliver. A latter study by Barry (2003: 918) finds that convergence in the cohesion countries (Greece, Ireland, Portugal and Spain) since 1986, arose for a number of reasons: tight macroeconomic policies, an expansion of EU regional aid, labour-market reforms in Spain, the effect of increased FDI in Ireland and stronger commitment to administrative reform in Spain. We complement previous research by considering aid and growth endogenous and by testing different institutional variables as determinants of aid. We, thus, build on two further strands of literature regarding the determinants of foreign financial assistance and the determinants of FDI.

Studies on determinants of foreign aid

The research on the determinants of aid is rather scarce. Instead, the debate has been centred on using interaction variables between aid and policies in the growth equation to ascertain the conditions for aid effectiveness (Burnside and Dollar, 2000; Ali and Isse, 2005) or on using instrumental variables for aid (Ovaska, 2003). A study by Mc Kinlay and Little (1979) finds

that aid allocation is not influenced by the recipient's income level, but rather by the donor's interest. Also, Davenport (1970) finds a positive and significant relationship between aid and Gross National Product (GNP) per capita, suggesting that aid is not allocated preferentially to poor countries. Maizels and Nissanke (1984) conclude that bilateral aid allocations are based on the political and economic interests of donor countries while aid from multilateral agencies is allocated conform with the economic needs of the recipients. Ovaska (2003:180) uses as instruments, for aid, income per capita, total population, infant mortality and illiteracy rate.

In this paper we use the aggregate level of foreign assistance and we complement previous studies by testing the joint significance of economic growth, bureaucratic quality, external conflict and democratisation on aid.

Studies on the determinants of foreign direct investment

Empirical research based on Dunning's OLI paradigm (1981) suggests that the key location-related FDI determinants are demand, cost factors and the risk of investment, in terms of both the political and the economic environment (Singh and Jun, 1995; Holland and Pain, 1998; Bandelj, 2002; Bevan and Estrin, 2004; Bevan et al, 2004; Disdier and Mayer, 2004; Pournarakis and Varsakelis, 2004). However, Deichmann (2001) concluded that labour costs are not a statistically significant determinant of FDI in the Central and Eastern European Countries (CEECs) because wage variations within the region do not offer additional information to that conveyed by more influential variables. Furthermore, so far the results regarding secondary education are inconclusive, with Fidrmuc (2000) finding a positive effect on growth and Campos (2002) suggesting a negative one. Boeri (2000) also comments that the high level of secondary education in Eastern Europe may not have the adequate quality for enhancing growth as a result of high specialisation and the lack of transferable skills.

In particular, the institutional frameworks have been found significant determinants of foreign direct investment in transition economies (Wheeler and Mody, 1992; Bevan et al, 2004; Bevan and Estrin, 2004; Pournarakis and Varsakelis, 2004)[4]. However, Pournarakis and Varsakelis (2004) find that institutions alone do not contribute substantially to explaining the cross-country variation of FDI-inflows. Instead, they argue that FDI decisions require simultaneous improvements in markets and institutions. Increasingly, FDI is undertaken not to exploit existing resources but to tap into resources and capabilities through the interaction with diverse locations (Bevan et al, 2004:45). We complement this strand of research by using

[4] See also Carstensen and Toubal, 2004; Dunning, 2004; Trevino and Mixon, 2004 and Disdier and Meyer, 2004 for a full literature review.

variables reflecting the investment climate in the host country and the social conditions, the latter being intended to account to a certain extent for the absorptive capacity of the host economy. We also build on a study by Stoian and Vickerman (2006) by testing the importance of aid for enhancing FDI in post-communist economies while assuming that aid is endogenous to FDI and to growth.

3. Conceptual framework and hypotheses

The key aim of this section is to build a holistic framework for examining the relationship between economic growth, aid from international organisations and FDI from multinational enterprises. As already mentioned in the Introduction, the three variables affect each other through specific channels and can either further influence each other in a positive way and thus take the country to a 'virtuous cycle', or alternatively they can have a negative impact and thus put the country in a 'vicious cycle' of growth. This relationship between the three variables can shape a triangle, where each corner is of crucial importance for the other two.

In a nutshell, growth theory puts forward two key sources of economic development. First, growth is determined by factor accumulation of capital and labour, with labour having a certain human capital aspect. Second, growth depends on productivity which, according to new growth theory can be either generated by the country's own R&D or derive from technology transfer (Tondl and Vuksic, 2003:3). Technology transfer can result either from foreign direct investment, from aid or from increasing imports. Since multinationals decide to invest in a certain market based on growth performance, FDI and growth cannot be considered as exogenous. Furthermore, as aid is given based on strict conditionality, we cannot consider growth and aid exogenous, hence the triangular relationship.

So, how does FDI affect growth? Building backward or forward links with local firms, advanced personnel training and links with local research institutes and universities are the traditional channels. In this paper we go step further and we also acknowledge the role of the institutional environment in providing the basis for those channels to operate efficiently.Firstly, domestic companies may imitate foreign investors, thus beneficiating from indirect technological transfers (Meyer and Sinani, 2007:4). This effect depends on regulations, infrastructure, human capital endowment and the complexity of technology (Fillat Castejón and Wörz, 2006). This channel is related with upgrading the 'absorptive capacity' of local economy and therefore can have a multiplier effect on economic growth. Two basic forms of Research and Development (R&D) are important here: basic research and applied

research for product adaptation to local tastes. Both types of research can be performed through building links with local research centres and universities. MNEs devote a substantial part of resources in such collaborations that can enhance the 'absorptive capacity' of the local economy on the one hand, but and can also generate positive technological spillovers to local companies via dissemination of knowledge and the training of skilled researchers. This leads onto the next channel.

Secondly, foreign investors tend to improve the quality of human capital by training the locals and by transferring know how (Patibandla and Petersen, 2002; Meyer and Sinani, 2007:4). This process has a direct effect on productivity which leads to an enhanced level of economic growth. MNEs usually tend to pursue the most effective way of production even for products that have already reached their maturity stage on their product life cycle (Vernon, 1966). We would expect this effect to become larger the more sophisticated is the value added activity that is transferred to the host country. However, this can have the opposite effect as many times, MNEs skim the market of well trained workers, hence free riding on previous training by domestic companies. Through the subsequent movement of labour from foreign companies to domestic ones intra-industry spillovers may occur (Meyer, 2004; Meyer and Sinani, 2007:4).

Thirdly, foreign investors increase competition in the market, thus encouraging domestic firms to innovate and become more efficient. This effect depends, however, on the technology gap and the barriers to entry and exit in the industry (Fillat Castejón and Wörz, 2006). It is also possible that foreign investors would crowd out domestic companies (Dunning, 1993; Meyer, 2004).

Fourthly, FDI can affect growth positively through backward and forward linkages which can create inter-industry spillovers (Meyer, 2004). By sourcing from the host country or providing intermediary goods for other industries foreign companies tend to induce more efficiency in their suppliers and distributors. The increased variety of intermediate products may lead to a more effective international specialisation, increasing returns to scale and higher productivity growth (Fillat Castejón and Wörz, 2006). FDI has a positive effect on growth via exports (Greenaway and Görg, 2004; Meyer and Sinani, 2007). By facing competition internationally, foreign investors are pushed to innovate and to achieve higher efficiency while also benefiting from external demand. By changing the industry and foreign trade structure new specialisation patterns emerge, leading to better resource allocation (Hunya, 2003). Finally, there are demonstration and agglomeration effects of FDI (Hunya,

2003; Stoian, 2005). The interest of foreign investors in a country is a good proof of advanced reforms, favourable business climate and market potential.

How does aid affect growth? By providing aid for technology acquisition, human capital improvement, institutional building or for safety nets for the population- thus increasing the participation in the economy, international organisations are likely to spur economic growth in transition economies. Based on the above we formulate our first hypothesis:

H1: The extent of an economy's growth rate is positively related to the extent of foreign direct investment and aid flows in the economy.

How do aid and growth affect FDI? When estimating the determinants of FDI, it is often assumed that FDI is determined by demand and cost factors, generally considered the main economic drivers of FDI (Lankes and Venables, 1996; Resimini, 2000; Deichmann, 2001; Bevan and Estrin, 2004), conform with Dunning's (1993) typology of FDI motivations.In particular, economic growth is an indicator of market prospects for investors, hence a strong determinant of FDI (Bhasin and Economu, 1994). Most previous studies, nevertheless, tend to determine the growth and FDI determinants separately, with results being implicitly affected by endogeneity. Furthermore, contrary to Meier (1981), post-1989 experience suggests that aid is needed in the CEECs in areas which do not meet efficiency requirements for private investment, but which are absolutely necessary for reforms. Finally, the involvement of international financial institutions in economic reforms acts as a sign of a country's credibility and hence may affect FDI positively (Lavigne, 1995; Mohammed, 1995). Moreover, if aid is directed towards modernising infrastructure and improving human resources, then aid affects FDI indirectly. Aid also affects FDI by easing the cost of transition and thus enhancing internal support for economic reforms and implicitly FDI related policies (Stoian and Vickerman, 2006). With the above argumentation in mind we formulate our second hypothesis.

H2: The extent of inward foreign direct investment is positively related to the extent of the growth rate and the aid flows.

How do FDI and growth affect aid? Following on previous research which discusses the effectiveness of aid and the role of internal policies in enhancing the aid's positive impact on growth and on the conditionality, usually attached to loans and grants, by international lenders, we hypothesise that donors are directing aid towards countries which meet certain criteria in institutional development, as well as meeting specific growth targets through the

implementation of economic policies. Furthermore, it is likely that donors prefer to help countries in incipient stages of their reforms which have lower appeal to MNEs and have, thus, to rely on foreign aid for the much needed transfer of technology and improvement in the human capital. With the above argumentation in mind we formulate our third hypothesis.

H3: The extent of aid flows is positively related to the extent of the growth rate and negatively related to the inward foreign direct investment flows.

How do institutions affect FDI, growth and aid? One of the most important processes in transition countries was institutional building and this is likely to have had a strong impact on all factors of the triangular relationship. Throughout the above argumentation the role of institutional framework in promoting growth, securing aid and attracting FDI acts as a catalyst. We are including in our hypotheses formulation thus a fourth hypothesis, necessary for the existence of this triangular relationship. This hypothesis is further broken down to individual hypotheses focusing on the different effects of the institutional environment on growth, aid and FDI.

H4: The extent of growth, FDI and aid are positively related to the quality of institutions.

Government stability and law and order are necessary for growth. In order for policies to be coherent governments have to be stable and the laws have to be abode and well implemented. These would affect indirectly FDI. Furthermore, the better the social conditions, the higher the growth. The latter argument follows on Tondl and Vuksic (2003). Indeed, higher employment rate leads to higher demand hence a higher growth. To complement previous research, we use alternative variables such as government stability, law and order and social conditions, the latter accounting for the participation of labour in the economy or the absorptive capacity of the economy as defined in a later section.

H4(a): The extent of growth is positively related to the quality of institutions.

RF: more literature review

Poor institutions increase search, negotiation and enforcement costs, thus hindering the establishment of new business relationships and the initiation of new transactions (Antal Mokos, 1998; Meyer, 2001). FDI can be discouraged by increased bureaucracy where

investment permits, registration or screening are required, or where sectoral restrictions and barriers exist (Alter and Wehrle, 1993) and alternatively can be encouraged by a good quality of institutions.

H4(b): The extent of FDI is enhanced by the quality of institutions.

Following on previous research which discusses the effectiveness of aid and the role of internal policies in enhancing the aid's positive impact on growth and on the conditionality usually attached to loans and grants by international lenders, we hypothesise that donors are directing aid towards countries which meet certain criteria in institutional development and democratisation. However, the inclusion of the democratisation variable in the model, one should bear in mind the reverse causality that may exist between aid and democratisation as discussed by Ovaska (2003).

H4(c): The extent of aid is enhanced by the quality of institutional variables.

Finally, we use several control variables in order to account for the absorptive capacity of the economy when capturing the impact of FDI or aid on economic growth. First, growth is positively determined by the quality of human capital. Education determines efficiency by providing the skills and knowledge that enter in the production process (Mankiw, Romer and Weil, 1992; Tondl and Vuksic, 2003). While primary enrolment is associated with general skills and secondary enrolment with blue collar jobs or semi-skilled jobs, higher level education is considered to have a direct impact on the research capacity and thus the economy's absorptive capacity.

Growth is also positively determined by capital accumulation. With Eastern Europe seeing higher capital formation than the EU since the mid 1990s (Campos and Coricelli, 2002), capital formation has had a significantly positive effect on growth in Central and Eastern European countries (Campos and Kinoshita, 2002) as well as on regional growth in Eastern Europe (Tondl and Vuksic, 2003). We test the joint significance of capital formation and FDIin order to account for the absorptive capacity of the host economy. The empirical verification or rejection of the above formulated hypotheses is the focus of our sixth section.

4. Data and sample description

We use a representative sub-sample of sixteen European post-communist economies some of which have joined the EU, are likely to join or have political and economic agreements with the Union. These countries are Albania, Belarus, Bulgaria, Croatia, the Czech Republic,

Estonia, Hungary, Latvia, Lithuania, Moldova, Poland, Romania, Russia, Slovakia, Slovenia and Ukraine with observations for a period between 1990 and 2002. This decade includes most of the economic and political transition to date. The definitions and measurements of our variables[6] are presented in table 1, whilst the descriptive statistics and a correlation table in the paper's appendix. Finally, we have constructed several dummies to account for country differences as well as time effects, mainly associated to the process of EU enlargement and the progress throughout made by groups of countries within the sample.

Insert Table 1 here

5. Methodology

We undertook the empirical analysis in two stages. We first performed an Arellano-Bond (1991) estimation of the determinants of economic growth. The introduction of a lagged independent variable capturing agglomeration economies entails the problem of correlation of error terms with common specifications (fixed effects models) (Hsiao, 1986). Then the Least Square Dummy Variable (LSDV) is biased even for a moderate time-period sample. Consequently, one has to apply an instrumental variables estimation technique to sweep out the correlation problems. Arellano and Bond (1991) suggest the use of orthogonality conditions between lagged values of the dependent variable and the disturbance terms to obtain additional instruments. They propose the use of a Generalised Method of Moments (GMM) estimator. That being said, the GMM estimator is consistent if and only if there is no second-order serial correlation in the error term of the first-differenced equation.

Two tests were used, one for the second order serial correlation of the residuals, and a Sargan test (1958) of over-identifying restrictions assuring the validity of the instruments used. The failure to reject the null hypothesis in both tests provides support for the model specification and the estimation method[7].

A second stage is the estimation of a three way system of equations with growth, aid and FDI as endogenous variables. To account for endogeneity we use a 3SLS (Three-stage Least Squares) estimator (Zellner and Theil, 1962) which provides efficient estimators. The present study differs from all relevant articles in the literature testing growth, aid and FDI relationship in that we depart from conventional testing of simple regression tests (Swensson, 2004; Aizenman and Noy, 2005) and proceed with Zellner and Theil (1962) 3SLS (Three-

[6] A special note on the institutional variables is provided by IRIS: these are categorical variables taking values from 0 to 4, 6 or 12 as detailed in table 1. Certain limitations to their explanatory power may occur given that they are collected as a result of large scale surveys and that they reflect relatively subjective issues.

[7] Due to the size of the paper the tests were not included but are available upon request from the authors.

stage Least Squares) estimator to get consistent and efficient estimators of the system in order to account for endogeneity. The 3SLS satisfies the requirements for an IV (Instrumental Variable) estimator and therefore is consistent. The IV in this case makes use of the equation correlations of the disturbances. Furthermore, among all IV estimators that use only the sample information embodied in the system, 3SLS is asymptotically efficient. In estimating our model, we have also instrumented all other potential endogenous variables to avoid endogeneity problems.

6. Results and discussion

In this section we proceed in two steps. Our first step is to test our first hypothesis and the effects of aid and FDI on the economic growth. The crucial role of the institutional environment for channelling the positive effects of aid and FDI on growth is also investigated providing preliminary evidence on the validity of our fourth hypothesis. We present the results of the Arellano Bond estimations for economic growth in Table 2 by including several specifications of the model. Our coefficients are generally robust throughout the different specifications.

Insert Table 2 here

We generally find strong evidence that previous economic growth (GDPPC(-1)) affects positively the rate of growth in a transition economy, suggesting a potential for sustainability of economic growth in the area, subject to certain conditions being met. This can also suggest that a negative growth in a specific year may trigger a recession cycle and hence increase the necessity to enhance growth through government's policies, FDI, aid or institutional improvements. These other factors are included in the various specifications of the model to test their joint significance.

We find that human capital affects positively economic growth with SEC or TERT being interchangeably significant in most specifications of the model. In the most basic specification SEC is significant, showing that for the most part of transition period, growth in Central and Eastern Europe has been supported by the lower value added sectors, primarily manufacturing, where secondary education was more important. Indeed, in the early 1990s many of the companies that were using highly skilled labour were in the process or restructuring and privatisation which affected negatively growth in the short run. Finally, some of the highly skilled work force in the area was in the early 1990s employed in sectors of the economy-such as retail- which were not making the most of their skills, hence the lack

of significance of TERT in model 1.1. We find that capital, here expressed as gross fixed capital formation as a percentage of GDP (GFCF), is significant and affects positively economic growth. Capital formation, however, was highly influenced since mid-1990s by increased FDI and foreign aid flows.

The early transition period was characterised by government instability in many Central and Eastern European countries and by extensive institutional building processes throughout the area. New institutions were necessary for the transition from a centrally planned to a market economy and their quality was important for growth. We hence estimate model 1.2., where we account only for the internal drivers of economic growth, including institutional variables. Contrary to expectations, none is significant. However, CORRUPT has a negative sign, showing that more corruption affects negatively economic growth. Indeed, higher corruption signals an inefficient allocation of resources, thus damaging prospects of growth. Finally, higher government instability (GOVSATB) seems to be associated with higher growth. This could be a reflection of the fact that many governments which implemented advanced reforms were unpopular, hence instability occurs (Stoian, 2007). In the medium run, when at least some of these reforms were carried through they did lead to higher economic growth. This was the case of Poland which achieved high growth since 1995 after a period of continuous instability in the early 1990s (Stoian, 2004).

To account for FDI and aid as drivers of growth we estimate model 1.3. Given that the impact of FDI on growth via transfer of know-how and technology, vertical and horizontal employment, the multiplier effect and other spillovers in the economy takes time to occur, we use lagged FDI (FDIINF(-1)). We also use lagged aid (AID(-)) as it also take time for aid to improve the infrastructure, the labour force or to provide safety nets for population and ultimately increase the demand in the economy. Interestingly enough, in model 1.3 neither of these potential drivers of growth are significant, indicating that from a preliminary reading there is not enough support for out first hypothesis. In our previous discussion, though, the role of the institutional environment for those two variables was crucial. This leads us to believe that, in order for FDI and aid to enhance growth, the economy has to have a certain absorptive capacity which mitigates the impact by improving the channels of spillovers (Meyer, 2004). Conforming to the literature (Hunya, 2003), we test the importance of institutions for mitigating the impact of FDIINF (-1) and AID (-1).

In model 1.4 we find that both Aid (-1) and FDIINF (-1) have a positive and significant impact on economic growth, and thus supporting strongly our first hypothesis, provided that the host country has a significant pool of highly skilled labour, has good social

conditions reflected in low unemployment, high consumer confidence, low levels of poverty and a solid judicial system that protects the right of MNEs, consumers and governments alike. In order for the know how to be transferred to the subsidiary or then through labour migration to domestic firms high labour skills in the host economy are essential. These could also enhance the innovation within MNEs and domestic companies who want to imitate the foreign companies. The effectiveness of aid in fostering growth can be further enhanced if the aid is used to improve the skills of already highly skilled labour. Indeed, much of the aid was used for training the new local managers or employees in both private and public sector in transition economies with potential significant positive impact on growth. Low level of unemployment and high consumer confidence is crucial if MNEs want to target these countries for their markets and this raises the question of endogeneity between FDI and growth. Indeed, it is widely documented in the literature that MNEs target growing markets for higher returns (Dunning, 1981). This endogeneity may affect the accuracy of the results obtained through the Arellano Bond estimations, hence the need to further investigate the relationship between FDI and growth by using a system of equations as in the second step of our investigation. In model 1.4 corruption (CORRUPT) and government stability (GOVSTAB) have an unexpected sign but are not significant. This could be because they may affect growth indirectly, via their impact on FDI or aid. This further points to the need of refining the investigation by using a system of equations, with growth, aid and FDI as endogenous variables as presented later.

Before proceeding with the next step of the investigation we discuss the final specification of the model. This includes an interaction variable between FDIINF(-1) and AID (-1) and dummies which differentiate between the countries which were initially considered in the WAVE1 of accession to the European Union and WAVE2, the ones that through the Agenda 2000 (1997) were not considered yet ready for accession into the EU (See Table 1 for further explanations of the countries included). We find that when distinguishing between the two groups of countries both AID(-1) and WAVE2 are positive and significant while WAVE1 and FDI are positive but not significant. This result is consistent with the fact that the WAVE2 countries continued to receive aid, as part of their accession process, while investors interpreted differently the signals given by the European Commission through this decision. This distinction between the two waves could be useful for extending the results of this study to countries which are now in the process of negotiating EU membership such as Turkey or Croatia. The interaction variable between FDIINF(-1) and AID (-1) is not

significant and thus we should test the relationship by looking at a three way system of equations with growth, aid and FDI as endogenous variables.

Our second step refers to the investigation of the triangular relationship between growth, aid and FDI. This is done through a system of equations and the results of this second step of the investigation are reported in table 3 and discussed below.

Insert Table 3 here

These results generally confirm our results from the single equations estimations for the growth determinants. Both AID(-1) and FDIINF (-1) are significant and affect positively growth in the selected Central and Eastern European countries. Secondary education is consistently significant and positive throughout the several specifications and so are social conditions. Gross capital formation becomes negative and insignificant but this could be due by the fact that it also affects FDI and hence is also included in the FDI equation.

Equations 2 and 3 test the determinants of FDI (FDIINF) and aid (AID) under the assumption that these are endogenous to growth. Indeed, in three out of five models we find strong evidence that growth affects positively both aid and FDI, and thus strongly supports our second and third hypotheses with respect to the growth impact. In order to attract either FDI or AID, countries need to achieve economic growth. It appears that this bi-directional relationship signals a chicken and egg situation which may pose challenges to decision makers in Central and Eastern Europe regarding the policies to enhance different drivers of growth. Indeed, both FDI and aid enhance growth, but the impact appears in time, as the significant variables are actually lagged aid and lagged FDI. However, the impact of growth on both FDI and aid appears to be instantaneous, which may ensure continuity in the growth path. One might argue whether this instantaneous impact makes sense. We argue that it does. Many times investors use prognoses to anticipate the growth in a market and they may make an investment in the exact year when growth is anticipated, hence the instantaneous effect. Similarly, some aid offered by international organisations such as the IMF is released upon meeting several conditions, including macroeconomic stabilization and most recently growth, hence the instantaneous effect of growth on aid.

We also capture the relationship between aid and FDI by including FDIINF and FDIINF (-1) as determinants of AID and AID and AID (-1) as determinants of FDIINF. We consistently find a trade off between these variables, in both equations. These results seem to verify our third hypothesis. Investors are not attracted by aid but rather by the growth

generated by aid, hence the need to channel the aid in creating growth in the host economy. Furthermore, institutional investors are indeed offering aid to countries which lack the appeal to foreign investors, hence bridging the gap between the domestic capital and the need for capital. This is reflected by the negative sign and the significance of FDIINF (-1) for AID. This is an encouraging sign that there may be a way out of the chicken and egg situation with aid being offered to Central and Eastern European countries provided that certain conditions are met. These conditions are further investigated in equation 3.

The equation on the aid determinants shows that poorer countries attract more aid, with GDPPC negative and significant throughout. This again is consistent with the fact that donors would like to enhance the growth of less economically developed countries. We also find that countries which are highly democratic and are placed in zones of conflict are more likely to attract aid, with DEMOC being positive and significant throughout the estimations and with EXTCONF being negative and significant at 10%, 5% and respectively 1%. Indeed, government's accountability to its people is important when deciding to release aid to a certain country, as the more accountable the government, the more likely that the aid will go into enhancing the infrastructure and improving human capital rather than filling the pockets of the political élite. This result could be even more relevant for developing countries. We also find that good bureaucratic quality attracts more aid. This may be also related to alleviating the concern of the donor over the appropriate use of funding by the recipient country. Indeed, in several transition countries aid has been found to enhance corruption, hence the need for institutional reforms to attract aid and the need for conditionality.

The signals given by the European Union to the candidate countries by launching the enlargement process in 1995 at the or by differentiating between the first and the second waves do not appear to impact significantly on aid as showed by equation 3 in models 2.3 and 2.4. This could be because other variables already capture this effect (for example, growth is affected positively by WAVE2, as found in the single equation model), or could imply that the effect is more important for other variables such as, for example, FDI. Indeed, ENLARG, WAVE1 and WAVE2 are highly significant for FDI as shown by equation 2 in models 2.3, 2.4 and 2.5. This shows that investors are highly influenced by decisions taken by the European Union as EU membership may be associated with lower risk (Stoian, 2007; Stoian and Vickerman, 2007). This could be a useful lesson for the process of accession to the European Union of the remaining candidates. Indeed, the quality of the investment climate (INVPROF) also affects positively the amount of FDI as shown in equation 2, model 2.1. Although this variable loses its significance in other specifications, variables such as WAVE1

and WAVE2 are capturing partially the differences in investment climate in model 2.4. Furthermore, bureaucratic quality is constituently significant for investors and this is closely related to ensuring a positive investment climate.

Apart from our discussion on this triangular relationship between growth, aid and FDI there are other factors that influence international investors decisions. The results for the determinants of FDI captured in equation 2 also show that MNEs are attracted by lower skilled labour force which can lead to efficiency gains by paying lower wages. This is reflected by the significance of SEC, insignificance of TERT and the negative sign and significance of WAGES. This could be a worrying sign for these countries if they want to move up the value added in their economy. It is possible that the data set which ends in 2002 does not reflect the trend of IT off-shoring in the area and also that the large number of the various countries included in the sample does not allow to pick up this trend. Finally, the absolute size of the internal market does not appear to be significant. This is counteracted by the fact that prospects of growth are significant. Furthermore, GDP per capita reflects the standards of living which are strongly related to wages. The trade variable is significant but has an unexpected sign suggesting that the larger the trade contribution in GDP, the lower FDI. This can reflect the fact that much FDI in these economies in the early 1990s was tariff jumping or did not involve the integration of local subsidiaries in the international networks of subsidiaries. This was a result of the low competitiveness of some of these economies and of the unsaturated markets which made so that many MNEs served the local markets rather than set up export platforms.

Finally, by including MILPOL- a variable capturing the military involvement in politics- when estimating the determinants of aid, we set the stage for testing these results on a larger sample of developing countries. While MILPOL does not affect significantly aid in transition economies, it is likely that donors are weary of developing and least developed countries which are ruled by governments with strong connections to the military, as these may be using important government resources on armies rather than on creating a sustainable environment for attracting FDI and enhancing economic growth.

7. Conclusions, policy recommendations and future research

The main aim of this paper was to build a holistic framework and then examine empirically the triangular relationship between growth, international aid flows and foreign direct investment flows. Particular emphasis with respect to the empirical investigation of the relationship was placed on the Central and Easter European transition economies and on the

role of institutional factors in enhancing growth, aid and FDI. We have found that in transition economies institutional improvements alone do not enhance economic growth, nor do foreign direct investment and aid without the appropriate institutional framework. This suggests that governments need to start the virtuous circle of reforms by creating a favourable institutional framework and by attracting aid into the country, given that MNEs are more likely to need structural reforms and signals of future economic growth before deciding to enter these markets. Hence, countries need to show success in democratisation and improvements of bureaucratic quality in order to attract external aid that may have a significant impact on the economy. Indeed, these reforms signal that aid flows trickle down in the economy rather than ending up in the pockets of the political élite, thus anticipating economic growth. International organisations need these signals representing the governments' commitment to enhance economic growth in order to release their financial aid. Hence, robust implementation of reforms by governments is vital for attracting financial assistance and continuing conditionality of aid is likely to improve the potential impact of these funds on the host economies.

Furthermore, by focusing on giving aid to less economically developed economies and countries bordering conflict zones, donors are likely to make a more significant impact on their economic growth as other alternative sources such as FDI may be scarce. This aid may result in improved growth and better country image, ultimately attracting MNEs which are risk takers. This is the case of foreign investors originating from Greece which have become significant players in South Eastern Europe (Stoian and Filippaios, 2006; Filippaios and Stoian, 2007). Once aid is attracted in the economy, setting the preconditions for economic growth and potentially further foreign aid, further institutional reforms are advised in order to attract foreign direct investment: improving the bureaucratic quality is equally significant for FDI and so is improving the investment climate. A good level of secondary education enrolment is also important for both attracting FDI and enhancing economic growth.

In the case of Central and Eastern European countries, positive signals from the European Union regarding their progress in the process of accession to the European Union have a risk mitigating effect, thus attracting further investment. This can be interpreted as positive steps currently being made in the process of expanding the EU towards Croatia or Turkey are likely to have a positive impact on FDI in these countries and it is important that the EU enlargement process is managed properly both by national governments and EU authorities in order for transition economies or other potential EU member states to best benefit from these likely positive effects on foreign investors and implicitly on economic

growth. It is common knowledge that new stages in the accession process are often accompanied by increased external funding, so this is also likely to affect growth and hence indirectly FDI. As investors do not seem to be affected by aid received by host countries in the previous year, one may conclude that eventually aid towards transition economies can be eventually phased out in time with no significant negative effects on inward investment flows. This is good news for donors and the EU in particular, as some of its funds, especially the cohesion funds allocated to EU members, act as aid flows. The cohesion funds are faced with increased demands from Central and Eastern European countries most of which have a GDP per capita of less than 75% of the EU average, hence qualifying for receipt of such funding. The demand on these funds is likely to increase with further EU enlargements, thus putting further pressure on the EU budget and enhancing the debate over the distribution of such funds.

One fact that is rather worrying for policy makers is that low wages and relatively low skills continue to represent significant motives for FDI in transition economies. Governments should be aware that cost advantages are easily eroded, thus leading to footloose investments. The focus on providing good quality infrastructure and an improved investment climate, thus becomes even more important. However, our results may be related to the data set and our time frame, so by extending the time scale the real impact of higher education may be reflected in the results.

Having set the stage for attracting both aid and FDI in the economy, these are likely to enhance economic growth if there is government stability in place to ensure consistency of reforms. Furthermore, in order to enhance the impact of aid and the spillovers from FDI, governments need to ensure sound judiciary systems, to fight corruption and to improve the absorptive capacity of the economy reflected in good social conditions i.e. low levels of unemployment and good levels of secondary education enrolment. The low levels of unemployment are likely to be achieved by careful targeting of the MNEs attracted in the economy. These MNEs are likely to enhance economic growth through spillovers in the local economy, thus further attracting market seeking multinationals and others.

In this study we find strong support for all our hypotheses. We have consistently shown that both FDI and aid are engines of economic growth in transition economies provided that institutional reforms- including bureaucratic quality- are in place and provided that the host economy has significant absorptive capacity- as a result of improved social conditions and high secondary education enrolment. Furthermore, aid – leading to economic growth and subsequently FDI - can be phased out, as foreign investment can enhance growth

once institutional reforms and signals from international organisations are in place. However, we also find that low costs and relatively low skills continue to constitute important – yet unsustainable-drivers for FDI in transition economies, thus raising the question of whether policies should be implemented to target certain MNEs and to create other sustainable advantages in these economies.

Further research could expand the data set by including observations after 2002 aiming to capture the trend of relocating R&D labs in some transition economies. Furthermore, the empirical exercise could be carried out on a large sample of developing countries to test the validity of the results of the three way system of equation in particular. The group of developing countries is rather heterogeneous and thus particular attention to specific group of countries is needed in order to fully understand the impact of aid and foreign direct investments on growth and economic developments. The existence of different motivations on behalf of international organisations, as well as multinationals when providing aid or investing respectively, makes the analysis of the developing countries group a necessity, in order to draw policy and managerial recommendations. Finally, different data on institutional reforms may be included to test the significance of other types of institutional reforms for attracting FDI and aid and for enhancing economic growth in transition and developing economies.

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Table 1. Variables Description

Variable	Description	Source
FDIINF	Foreign Direct Investment Inflows as percentage of GDP, (Total, Constant 1995 USD)	WIIW, UNCTAD and authors' calculations
AID	Aid dependency ratio calculated as Aid as % of imports of goods and services (Values in USD) converted at official exchange rates)	WDI, World Bank
GDPPC	GDP per Capita, PPP (Constant 1995 International USD)	WDI, World Bank
GDPGR	GDP per Capita Growth, PPP (Constant 1995 International US $)	WDI, World Bank
GFCF	Gross Fixed Capital Formation as percentage of GDP, PPP (Constant 1995 International USD)	WDI, World Bank and authors' calculations
SEC	School Enrolment, Secondary education (% gross)	WDI, World Bank
TERT	School Enrolment, Tertiary education (% gross)	WDI, World Bank
WAGES	Real Wages Index (2000=100)	WIIW Database, International Labour Office
TRADE	Trade (% of GDP)	WDI, World Bank and European Bank for Reconstruction and Development
GOVSTAB	Government Stability (Government Unity, Legislative Strength, Popular Support). Takes values from 0 to 12 with higher values corresponding to higher government stability.	IRIS
LAO	Law and Order (Judicial system, Crime rate). Takes values from 0 to 6 with higher values corresponding to better judicial systems and lower criminal rates.	IRIS
BURQUA	Bureaucratic Quality. Takes values from 0 to 4 with higher values corresponding to a better bureaucratic quality of the governmental system.	IRIS
SOCCON	Socioeconomic Conditions (Unemployment, Consumer Confidence, Poverty). Takes values from 0 to 12 with higher values corresponding to better social conditions.	IRIS
CORRUPT	Corruption within the political system of the country. Takes values from 0 to 6 with higher values corresponding to higher levels of corruption.	IRIS and authors' calculations
INVPROF	Investment Profile (Contract Viability/Expropriation, Profits Repatriation, Payments Delays). Takes values from 0 to 12 with higher values representing less risk.	IRIS
DEMOC	Democratic Accountability (Government's Responsiveness to its people). Takes values from 0 to 6 with higher values representing Alternating Democracies and lower values autarchies.	IRIS
EXTCONF	External Conflict (War, Cross Border Conflict, Foreign Pressures). Takes values from 0 to 12 with higher values representing very low risk of external conflict	IRIS
MILPOL	Military in Politics (Engagement of Military in Politics). Takes values from 0 to 6 with higher values representing lower degree of military participation in politics.	IRIS
ENLARG	Dummy=1 if year>=1995 onwards - reaffirmation of the Madrid European Council about EU's enlargement	Authors' dummy
WAVE1	Dummy=1 if country is Czech Republic, Estonia, Hungary, Poland and Slovenia & year >=1997 – Agenda 2000 announcement identifying two groups of countries (wave1 and wave2 countries)	Authors' dummy
WAVE2	Dummy=1 if country is Romania and Bulgaria & year >=1999 – Agenda 2000 announcement identifying two groups of countries (wave1 and wave2 countries)	Authors' dummy

Table 2. Arellano Bond Estimations of Economic Growth
Dependent Variable GDP per capita

	Model 1.1	Model 1.2	Model 1.3	Model 14	Model 1.5
GDPPC(-1)	0.731***	0.652***	0.441***	0.511***	0.467***
	(0.049)	(0.064)	(0.050)	(0.064)	(0.075)
SEC	21.631**	6.092	9.896*	-1.504	0.040
	(9.227)	(7.459)	(5.751)	(6.371)	(4.941)
TERT	1.718	12.943	13.836**	22.541**	26.310***
	(7.120)	(11.386)	(6.225)	(9.645)	(7.795)
GFCF	19.598*	33.203***	45.653***	55.956***	56.743***
	(10.558)	(11.174)	(8.785)	(15.295)	(14.796)
SOCCON		59.918		71.898**	101.633***
		(37.389)		(29.228)	(26.590)
GOVSTAB		-30.317		-26.619	-9.491
		(18.751)		(17.694)	(17.027)
LAO		57.033		97.555**	103.387**
		(69.089)		(42.233)	(49.752)
CORRUPT		-77.586		-13.842	-54.216
		(64.819)		(70.990)	(80.194)
FDIINF(-1)			0.015	0.053***	0.020
			(0.036)	(0.020)	(0.033)
AID(-1)			5.157	10.228***	9.782***
			(5.393)	(2.900)	(3.457)
AID(-1)*FDI(-1)					0.003
					(0.003)
WAVE1					112.479
					(69.777)
WAVE2					118.669*
					(68.354)
Constant	89.283***	89.242***	104.128***	70.307***	30.036
	(23.920)	(22.014)	(21.428)	(18.625)	(31.290)
N	127	127	127	127	127
chi2	338.030	770.185	340.030	2402.325	9486.633

Standard errors in parenthesis
Stars denote significance *** at 1%, ** at 5%, * at 10%

Table 3. Three Way System of Equations Estimations

Dependent Variable: GDPGR	Independent Variables	Model 2.1	Model 2.2	Model 2.3	Model 2.4	Model 2.5
	FDIINF(-1)	0.955***	0.668*	0.662*	1.066***	1.091***
		(0.351)	(0.363)	(0.362)	(0.342)	(0.338)
	AID(-1)	0.469***	0.475***	0.467***	0.461***	0.460***
		(0.063)	(0.063)	(0.063)	(0.062)	(0.062)
	SEC	0.105*	0.121**	0.118**	0.102*	0.103*
		(0.056)	(0.057)	(0.057)	(0.056)	(0.055)
	TERT	0.015	0.017	0.014	0.009	0.000
		(0.044)	(0.044)	(0.043)	(0.044)	(0.043)
	GFCF	-0.072	-0.098	-0.098	-0.058	-0.059
		(0.144)	(0.149)	(0.147)	(0.140)	(0.138)
	SOCCON	1.137**	1.226**	1.253**	1.090**	1.093**
		(0.506)	(0.526)	(0.520)	(0.485)	(0.477)
	GOVSTAB	0.527*	0.637*	0.664**	0.469	0.463
		(0.317)	(0.325)	(0.323)	(0.309)	(0.303)
	LAO	1.169	1.452*	1.369*	0.972	0.911
		(0.716)	(0.741)	(0.732)	(0.689)	(0.679)
	CORRUPT	-1.904***	-1.962***	-1.964***	-1.964***	-1.924***
		(0.659)	(0.673)	(0.668)	(0.651)	(0.643)
	Constant	-21.639***	-23.222***	-22.752***	-20.336***	-20.070***
		(4.922)	(4.978)	(4.967)	(4.860)	(4.830)
Dependent Variable: FDIINF						
	GDPGR	0.137***	0.080	0.079	0.185***	0.196***
		(0.046)	(0.051)	(0.051)	(0.047)	(0.046)
	AID	-0.109*	-0.162**	-0.163**	-0.086	-0.082
		(0.063)	(0.068)	(0.068)	(0.055)	(0.055)
	AID(-1)	0.021	0.069	0.071	-0.012	-0.019
		(0.042)	(0.046)	(0.046)	(0.038)	(0.037)
	GDPPC	0.114	0.079	0.136	0.086	0.051
		(0.879)	(0.889)	(0.891)	(0.877)	(0.873)
	INVPROF	0.213***	0.132	0.132	0.100	0.096
		(0.073)	(0.086)	(0.086)	(0.085)	(0.085)
	SEC	0.031*	0.032**	0.033**	0.026	0.025
		(0.016)	(0.016)	(0.016)	(0.016)	(0.016)
	TERT	-0.011	-0.013	-0.014	-0.016	-0.014
		(0.012)	(0.012)	(0.012)	(0.012)	(0.012)
	WAGES	-0.021**	-0.018*	-0.017*	-0.025***	-0.026***
		(0.009)	(0.010)	(0.010)	(0.009)	(0.009)
	TRADE	-0.021***	-0.023***	-0.023***	-0.022***	-0.021***
		(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
	GFCF(-1)	0.040	0.028	0.026	0.034	0.035
		(0.041)	(0.043)	(0.043)	(0.040)	(0.039)
	BURQUA	0.502**	0.591**	0.581**	0.603**	0.626***
		(0.235)	(0.238)	(0.238)	(0.239)	(0.239)
	ENLARG		0.908**	0.901**		
			(0.455)	(0.456)		
	WAVE1				0.817*	0.789*
					(0.467)	(0.466)
	WAVE2				0.738*	0.725*

					(0.426)	(0.424)
	Constant	3.193	3.437	2.988	4.855	5.198
		(6.826)	(6.912)	(6.920)	(6.925)	(6.908)
Dependent Variable:						
AID	GDPGR	0.589***	0.609***	0.687***	0.547***	0.652***
		(0.172)	(0.173)	(0.187)	(0.165)	(0.183)
	FDIINF	3.457	3.680*	3.725*	2.931	2.260
		(2.220)	(2.218)	(2.249)	(2.098)	(1.769)
	FDIINF(-1)	-4.620**	-4.846**	-4.681**	-4.136**	-3.778**
		(1.919)	(1.916)	(1.936)	(1.815)	(1.540)
	GDPPC	-12.447***	-12.377***	-11.753***	-12.599***	-12.304***
		(2.528)	(2.533)	(2.626)	(2.530)	(2.437)
	EXTCONF	-1.986***	-1.908***	-2.044***	-2.155***	-1.415
		(0.614)	(0.615)	(0.625)	(0.609)	(0.882)
	DEMOC	1.223*	1.249*	1.560**	1.583**	1.590**
		(0.677)	(0.677)	(0.740)	(0.734)	(0.703)
	BURQUA	2.718***	2.651**	2.285**	2.463**	2.928***
		(1.033)	(1.036)	(1.094)	(0.991)	(1.045)
	ENLARG			-2.239		
				(1.706)		
	WAVE1				0.672	0.985
					(1.846)	(1.774)
	WAVE2				-2.773	-1.961
					(1.927)	(1.971)
	MILPOL					-1.218
						(1.370)
	Constant	128.964***	127.420***	123.018***	131.949***	127.999***
		(20.150)	(20.187)	(20.946)	(20.067)	(19.545)
N		73	73	73	73	73
F-stat	Equation 1	10.04***	10.39***	9.55***	9.58***	10.53***
F-stat	Equation 2	8.54***	7.26***	8.64***	8.71***	7.45***
F-stat	Equation 3	20.33***	18.01***	17.46***	20.26***	17.64***
ll		-495.596	-501.955	-501.268	-484.161	-478.744
aic		1051.192	1065.911	1066.536	1036.322	1027.488

Standard Errors in Parenthesis
Stars denote statistical significance: *** at 1%, ** at 5%, * at 10%.

Appendix. Descriptive Statistics and Correlation Matrix

	N	Mean	St.Dev	gdpgr	lfdiinf	aidimp	lgdppcppp	scenrls	scenrlt	gfcfgdp	wages	tradegdp	soccond	govstab	lao	corr	invprof	burqua	extconf	demacc	milpol
gdpgr	199	-0.52	8.39	1.0000																	
fdiinf	181	1072.71	1698.93	0.3816*	1.0000																
aidimp	173	4.60	10.30	-0.1826*	-0.3703*	1.0000															
gdppcppp	203	7029.35	3174.03	0.1959*	0.5131*	-0.4449*	1.0000														
scenrls	173	86.64	11.38	0.0718	0.3778*	-0.5081*	0.5493*	1.0000													
scenrlt	177	32.59	13.27	0.2024*	0.2401*	-0.3726*	0.1445*	0.4789*	1.0000												
gfcfgdp	207	21.66	5.33	0.1934*	0.2001*	-0.4359*	0.4573*	0.4393*	0.1733*	1.0000											
wages	177	88.00	33.57	0.1390*	0.0525	-0.1450*	0.5288*	0.2281*	0.0153	0.4841*	1.0000										
tradegdp	204	98.06	35.83	0.0375	-0.0901	-0.2776*	0.1037	0.2801*	0.1990*	0.3317*	0.1099	1.0000									
soccond	136	4.64	1.56	0.0710	0.2718*	-0.2499*	0.5860*	0.1054	-0.3049*	0.5496*	0.5913*	0.1995*	1.0000								
govstab	136	7.81	2.09	0.5460*	0.2733*	-0.2445*	0.0510	0.2622*	0.5328*	0.1445*	0.1056	0.3067*	-0.1948*	1.0000							
lao	136	4.46	0.93	0.0570	0.1632*	-0.4276*	0.3837*	0.2460*	-0.1318	0.3651*	0.2124*	0.2259*	0.5012*	-0.0693	1.0000						
corr	136	3.51	1.10	-0.2359*	0.0050	-0.0639	0.3543*	0.1779*	-0.2895*	0.1998*	0.1789*	0.0372	0.3704*	-0.3746*	0.5207*	1.0000					
invprof	136	6.70	2.50	0.3616*	0.5210*	-0.2900*	0.4794*	0.3917*	0.3682*	0.3232*	0.4068*	0.3951*	0.3480*	0.5946*	0.1270	-0.1331	1.0000				
burqua	136	2.22	0.94	0.0385	0.4333*	-0.3372*	0.6942*	0.5215*	0.0109	0.4917*	0.5653*	0.3988*	0.5888*	-0.0393	0.6129*	0.5317*	0.4383*	1.0000			
extconf	136	10.94	1.15	-0.3344*	0.2094*	-0.3202*	0.4076*	0.3087*	-0.2619*	0.1908*	0.0282	-0.0197	0.3706*	-0.3176*	0.5033*	0.4224*	-0.0036	0.3822*	1.0000		
demacc	136	4.45	1.14	0.1339	0.4260*	-0.1891*	0.3922*	0.3531*	0.0320	0.2727*	0.3346*	0.2296*	0.3133*	0.3170*	0.2993*	0.1882*	0.6717*	0.5293*	0.1484*	1.0000	
milpol	136	5.03	0.78	0.1134	0.4646*	-0.4621*	0.6340*	0.4865*	0.0612	0.5088*	0.3978*	0.3661*	0.5954*	0.0067	0.6384*	0.4719*	0.4163*	0.6936*	0.5521*	0.4355*	1.0000

Stars denote statistical significance at 10%.

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