European Integration, Foreign Direct Investment and Growth

by

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Abstract

This study analyzes the impact of trade and FDI net inflows on economic growth in EU-15 and the group that includes both the new EU member states and the candidate members of the Union. The study focuses on the influence of the potential channels of the FDI inflows on growth, namely, the investment-led and technology-led growth. While the EU-15 group results do not provide any evidence of the capital formation impact on growth, evidence indicates that this factor has a significant growth-boosting impact for the second group economies. In the second group, although the economic growth can be characterized as investment-led, there is no strong evidence of the trade or FDI impact on investment rates. On the other hand, for both groups, the presence of the net FDI inflow's impact on technology has been detected, indicating that the FDI inflows have mostly served as a special channel of technological transfers. The findings have significant policy implications of integration in general and further EU enlargement.

1. Introduction

Numerous studies have attempted to evaluate the validity of various growth models and to identify the significant growth determinants in different regions of the world. Economic growth of the European region, and especially that of the European Union (EU), has been widely analyzed, not only through the application of commonly used theoretical models, but also in the lights of specific characteristics of its economic and political integration. A special focus has been placed on the potential growth advantages that EU may provide to its members. The most recent round of the EU enlargement in May 2004 has brought further interest in growth implication of the integration.

The purpose of this paper is to investigate the determinants of the growth patterns in two groups of countries: the EU-15 group and the group of the new accession and potential EU member countries. Besides the analysis of common growth determinants, special interest is placed on the influence of variables that may capture the impact of integration, such as trade flows and the measures of trade barriers. Furthermore, this study introduces another possible growth determinant in the form of foreign direct investment (FDI), and analyzes its impact on the Gross Domestic Product (GDP) per capita growth. The goal of the analysis of this latter factor, as a potential proxy for the integration benefits, is to investigate whether the EU membership has any other growth impact, besides the widely analyzed ability to boost the "trade-induced investment-led" economic growth. This issue is particularly important for the new and the potential EU members whose economies are lagging behind not only in terms of their physical capital formation, but also in terms of technological advances, which are, by some models, argued to be the only possible channel of sustainable growth.

2. Literature Review

In this section, we first briefly summarize the cross-country studies, followed by those specific to the European region.

2.1. Trade and Growth

The issue of the relationship between international trade, among other variables, and living standards levels and growth has been widely analyzed in the literature. Levine and Renelt (1992) conduct a sensitivity analysis of the linkages between the long-run economic growth and several economic, political and institutional variables, using the Leamer's extreme-bounds test. Analyzing 119 countries during the 1960-1989 period, they find that most of the results are fragile. However, the impact of the investment share of GDP on the growth rate of GDP per capita is positive and robust. Also, the impact of the trade ratio of GDP is significant and positive, but only indirect, since this variable has a significant influence on the investment share of GDP, and thus the overall impact on economic growth is realized through the "investment channel" of growth. This process is known as the "trade-induced investment-led growth".

Sala-i-Martin (1994), who presents a survey of literature on the cross-country economic growth, criticizes the Levine and Renelt (1992) results. He argues that the extreme-bounds test may be too strong, and that, if different combinations of explanatory variables are used, one will almost always be able to find a combination that would make a particular variable fragile. Frankel and Romer (1999) admit that it is possible to find moderate positive relationship between income per capita and the ratio of exports or imports to GDP, using cross-country regressions. However, they argue that the trade variable may be endogenous and that it can also be possible that nations, who are rich for reasons other than trade, may also tend to trade more. Using data for 63 countries in 1985 and both OLS and the instrumental variables (IV) approaches, they regress the income per capita on trade share of GDP and country size. Because a positive impact of trade on living standards is supported by both OLS and IV estimations with geographical component, the authors dismiss the hypothesis that the positive relationship exists only because rich countries, which became rich due to the factors other than trade, also tend to trade more. Lee (1995) performs another cross-country analysis for the 1960-1985 period, using a simple endogenous growth model. He investigates the impact of the capital goods imports on the growth rates, and finds that a country which has a higher ratio of imported to domestically produced capital stock, compared to some other country at the same level of economic development, also tends to have the higher growth rates. The intuition behind this result is particularly important for developing countries with comparative advantage in the consumption goods sector. These results imply that those countries can improve their living standard growth rates if the larger share of their capital stock is accumulated through imports from developed countries, since their production of capital goods is characterized by higher productivity.

Baldwin (2000) presents a survey of literature on trade and economic growth and draws several conclusions. According to the large volume of studies, trade policies such as tariffs, export subsidies and some other non-tariff measures with the primary goal to restrict imports and boost exports do not prove to have a significant negative impact on GDP or productivity growth, and the results vary depending on the region and the analyzed period. However, these findings can not be regarded as a straightforward negation of any relationship; trade policies may have a substantial indirect impact through some other policy channels, but those interrelationships are usually complex and many other factors and motives are involved in the process of policy creation. Therefore, the impact of a specific trade policy is hard to isolate. Another literature survey is presented by Walde and Wood (2004). Their conclusions about the trade impact are similar to those found by Baldwin (2000). The goal of their review is to investigate the possible policy implications that some results on the influence of trade instruments may provide. The authors analyze numerous studies that use either OLS cross-country regressions or simultaneous equations, instrumental variables and panel data approaches, and conclude that the existing literature is “quiet” on the direction of the true causality in the trade-growth relationship.

Somewhat controversial results are obtained by Yanikkaya (2003) who conducted a cross-country analysis for a group of over 100 developed and developing economies using a three-equation system with each equation having GDP per capita growth as the dependent variable, but in three different periods, 1970-1979, 1980-1989, and 1990-1997. Besides basic variables commonly used in growth regressions, the author first introduced the measures of the trade volume[1] and found significant, positive relationship with GDP per capita growth, which is consistent with the results of similar studies. However, when the indicators of the trade restrictions[2] are used, the relationship shows up to be significant, but surprisingly positive. This result contradicts the results of some earlier studies, but, at the

[1] Openness, exports share, bilateral exports and imports from U.S. and other

[2] Import and export duties, taxes on international trade

same time, does not contradict the theory. The direction of the trade restrictions' impact is believed to be dependent on numerous circumstances in a specific country, and in some cases, protectionism may prove to be beneficial, which was probably the case in this sample, mostly consisting of developing countries.

2.2. FDI and Growth

The issue of the growth impacts of foreign direct investment (FDI) has been widely investigated, especially in the previous decade. An increasing interest in this area came along with the crucial changes in the world economy brought about by the globalization processes.

Borensztein, De Gregorio and Lee (1998) analyze the impact of FDI on growth using the data on FDI flows from developed countries to 69 developing countries in the 1970's and 1980's. They apply cross-country and panel regressions frameworks for an endogenous growth model and investigate the interaction of human capital and FDI, and the possible channels of FDI impact on growth. The results show a strong and positive relationship between FDI inflows and growth, with FDI being an important vehicle of technology transfer, contributing more through its impact on technology growth than through its impact on the investment. However, the extent of that impact depends on the stock of human capital. Namely, only if a country has a sufficient ability to absorb new technologies (with that ability represented by the higher levels of human capital stock), is the impact of FDI on growth detected. The study of the investment impact of FDI is based on the estimation of two equations, total investment equation and GDP per capita growth equation, with and without investment rate as an independent variable. The authors conclude that FDI has a growth impact that goes beyond its influence on the total investment. In other words, the benefits of higher FDI are realized not only through simple capital accumulation, but also through the efficiency gains.

Durham (2004) analyzes the impact of FDI and equity foreign portfolio investment on GDP per capita growth in 80 countries in the 1979-1998 period, and as in Borensztein et al. (1998), he finds that the FDI and foreign portfolio investment impacts depend on the "absorptive capacity" of the home country. Aitken and Harrison (1999) investigate the case of Venezuela and the possible technology spillovers brought by foreign direct investment, using a panel data on more than 4000 plants in the 1976-1989 period. They find that the net effect of the FDI on the whole economy is positive, but very small, and that the benefits of foreign ownership mainly come through joint ventures. However, the economy of Venezuela may not be sufficiently developed or diversified to receive larger gains, and thus, those results can not be regarded as representative for all developing countries.

Saggi (2000) conducts a literature survey on the issue of international technology transfers, with the special focus on the impact of FDI and the diffusion of technologies to the local companies brought by multinational corporations. This survey reaches several important conclusions. First, the impact of trade on growth as a channel of technology transfers is believed to depend on the geographical dimension of technology spillovers. Second, while the convincing evidence of the superiority of FDI as the vehicle of technology transfers is hard to find, there are several facts which imply that conclusion. Besides the technology effect, FDI also involves capital inflows which may have a positive impact on growth.

2.3. European Growth, Trade and FDI

The European economic development has been analyzed both in a general context and also in light of the integration processes, with a special focus on the growth impact of integration. Baldwin and Seghezza (1996) investigate the impact of European integration on economic growth. The central analysis is based on a two-equation system derived from a theoretical trade and growth model which emphasizes the link between trade barriers and the demand for capital. The first equation is the GDP per capita growth equation which includes initial level of GDP per capita, population growth, investment in human capital, initial level of human capital and the investment to GDP ratio as explanatory variables. The second is an investment equation, which explains the investment ratio using the same variables as the growth equation (with log-levels of initial GDP per capita, initial human capital and human capital, instead of levels) plus some measures of domestic and foreign trade barriers. The preferred cross-country sample includes only European nations that were manufacture exporters in 1989, and the estimation technique is three-stage least squares, with all variables, except the investment ratio and GDP per capita growth, used as instruments. The results show that domestic trade barriers tend to decrease investment and consequently have a negative impact on growth. Foreign barriers are found to have the same impact on growth, but those results are less robust to sample used and trade proxy changes. Since one of the main characteristics of the European integration was a sharp decline in trade barriers and finally the elimination of tariffs among the EU and European Free Trade Area (EFTA) nations, it can be concluded that the integration had a significant impact on European economic growth through the investment channel. The authors characterize this effect as trade-induced investment-led growth. Furthermore, they also test for a possible impact of trade on technological progress, by including the trade variable both in the growth and investment equation, and find that there is no evidence of technology boosting impact of trade. However, they also note that those findings certainly do not provide conclusive evidence for the rejection of the trade-induced technology-led growth hypothesis. It is likely that the investment coefficient in the growth equation is picking some of the technological progress impact on growth, and thus, it is hardly possible to isolate the trade impact on the innovation.

Henrekson, Torstensson and Torstensson (1997) investigate the impact of the European Community (EC) and EFTA stages of European integration on economic growth in the 1960-1985 period (and subperiods), in a sample of 22 OECD countries. In a Barro-style regression, besides commonly used variables, a trade policy variable (real exchange rate distortion) and a dummy variable for the EC or EFTA membership are included. This study found a positive impact of European integration on growth, suggested by the significant EC/EFTA coefficient, which stays significant even when the general trade policy measure is included[3] in the regression. However, the authors note that the EC/EFTA dummy may actually capture not the integration impact, but the characteristics of developed countries that are difficult to account for in the growth regressions. Therefore, two additional dummy variables are constructed, one for lower-income countries and one for more developed

[3] In this way, with both these variables included in the regression, it is possible to make a distinction between the impact of integration and the impact of trade in general.

countries, and they are included in the regression instead of, or together with the original integration dummy. The impact of the EC/EFTA dummy, although smaller in magnitude, was still significant and positive. In addition, a separate equation for investment is estimated, and, as opposed to Baldwin and Seghezza (1996), no impact of European integration on investment is found, suggesting that the integration growth effect has been technology-led in this1976-85 period. Further, Henrekson et al. (1997) extend their analysis by adding other indicators in the regressions and also using a panel-data set, but the results do not change qualitatively.

The impact of FDI on the European economies has been analyzed in numerous studies, as well. Dohrn, Milton and Radmacher-Nottelmann, (2001) discuss several implications of the FDI inflows in the EU member economies. They argue that a substantial increase in the FDI activity occurred as a globalization effect, especially in the 1990's, but also as a response to the European Single Market Program. At the same time, shares of the intra-EU and total trade among EU members have not increased dramatically, which attaches even more importance to the possible growth effects of FDI inflows. The authors argue that FDI brings new technology transfers, skills and governance improvement, which are particularly important for the newly entering members who have experienced a surge in FDI inflows in the 1990's as their accession to EU became more probable. About one half of those inflows came from present EU members, and half of that level represented FDI inflows from Germany. A positive correlation between the economic growth and FDI per capita has been detected. However, the causation direction is still difficult to confirm.

Several studies investigate the impact of FDI on technology transfers and spillovers in Europe, trying to provide evidence of the FDI-induced technology-led growth[4]. Damijan, Knell, Majcen and Rojec (2003) perform a study of that type for eight transition economies, six newly accessed EU members and two candidate countries,. Using a firm-level panel data sample for 1994-1998 period, they investigate the importance of several possible channels of technological development and transfers. The results show that, in five out of eight countries, direct FDI presents the most efficient source of productivity growth in the recipient firm,

[4] See, for example Barrell and Pain (1997).

compared to some other channels of technological development, such as intra-industry FDI spillovers, firms' own R&D activities and international R&D spillovers through trade. If one can assume that EU integration encourages FDI inflows in the EU member states, it can be concluded that the integration has a beneficial impact on growth through this channel.

As an extension of these studies, we analyze the impact of trade and FDI net inflows on economic growth in two groups of European countries, EU-15 group and the group that includes not only the new member states but also the candidate members of the Union. The study focuses on the influence of the potential channels of the FDI inflows on growth, namely, the investment-led and technology-led growth. Although numerous previous studies analyze the impact of trade liberalization and development in this manner, not many studies have been conducted on the influence of FDI using this framework. Compared to the previous studies, the analysis in this study is based on the extended sample, which provides more reliable estimates on the impact of integration. We also extend the analysis to the new accession and candidate EU countries. Finally, instead of a cross-country investigation which is the most common analysis employed in the related literature, we use both a panel data and the pooled data estimation to produce more reliable inferences.

3. Theoretical and Empirical Framework

The starting point in the methodology development is the augmented Solow (1956) model of economic growth which includes human capital accumulation (Mankiw, Romer and Weil, 1992).The first equation of the system is the Cobb-Douglas production function in terms of GDP per capita (Y/L), which depends on four factors: capital formation (K), human capital (H), labor force (L) and total factor productivity (A):

$$Y/L = (K/L)^{\alpha} \, (H/L)^{\beta} A^{1-(\alpha+\beta)}, \tag{1}$$

with α and β being the parameters that explain the magnitude of returns to physical and human capital[5]. In this function, the change in GDP per capita, representing living standards,

[5] $\alpha + \beta$ is assumed to be smaller than 1, otherwise (if $\alpha + \beta=1$) there are no diminishing returns to capital and the steady state does not exist (the specification becomes a representation of an endogenous growth model).

occurs as a result of changes in the four factors included in the production function. In other words, the change in GDP per capita can be explained by the changes in the investment rate (s_k), human capital formation rate (s_h)[6], population growth rate (n) and the total factor productivity growth (g). A high investment rate, human capital formation rate and TFP growth all imply higher GDP per capita growth, while high population growth rate impedes GDP per capita growth, since a greater share of investment has to be devoted to equipping the new workforce and a smaller share is devoted to capital deepening.

The second portion of the model defines the changes in capital stock, physical and human. When the production function and capital change equations are combined, the model predicts that each economy grows toward its own steady-state of physical and human capital per unit of effective labor ratios, or k* and h*, respectively. The steady-state is determined by the structural parameters: the savings rate, the rate of investment in human capital, the population growth rate, the TFP growth, g and the capital depreciation rate, d. (Mankiw et al. (1992).

$$k^* = (s_k^{\beta}\, s_h^{1-\beta} / (n+g+d))^{1/ 1-(\alpha + \beta)} \qquad (2)$$

$$h^* = (s_k^{\alpha}\, s_h^{1-\alpha} / (n+g+d))^{1/ 1-(\alpha + \beta)} \qquad (3)$$

Once the steady state is reached, living standards continue to grow at the rate of total factor productivity growth. The Solow theory also accounts for the differences in a country's position relative to its steady state. The convergence theory implies that the further below the economy is from its steady state, the faster it grows, since the low level of capital formation implies high returns and, thus, an increase in capital inflows which accelerates GDP per capita growth. In order to test for this effect, GDP per capita growth models include the log-value of the initial GDP per capita in the analyzed period. Although this theory predicts that each economy grows toward the steady state, it does not necessarily imply that living standards converge to the same steady state value, since steady-state parameters can be significantly different across countries. The theory only implies that living standards converge to a country's specific steady state, determined by its structural parameters (Jones,

[6] Or human capital level, depending on the specification.

2002). However, if the analyzed countries are similar in terms of their economic structure and development, their steady states will be similar, as well. It may seem reasonable to assume similar economic structures for the European Union members since each potential member is required to conduct strict structural pre-entry reforms in order to be integrated in the unified economic system of the Union. In addition, free capital flows and technological transfers that characterize free trade zones like the EU may imply similar total factor productivity levels and growth rates. Although, this is a simplified structural representation of the EU, this study is not primarily focused on the analysis of the convergence theory and the estimated convergence coefficient in the growth regression may be analyzed based on this assumption.

After substituting the steady state expressions for physical and human capital into the production function and taking logs, Mankiw et al. (1992) obtain the equation for GDP per capita and suggest a regression to investigate the living standards growth, based on this simple growth theory. In this model, GDP per capita growth is a function of the determinants of the steady state, population growth rate and investment in physical and human capital, and the initial level of GDP per capita as the convergence factor.

The following specification is used in this study:

$$g(Y/L)_{it} = \beta_1 + \beta_2 \ln(Yo/Lo)_{it} + \beta_3 s_{k\,it} + \beta_4 n_{it} + \beta_5 s_{h\,it} + \beta_6 s_{h0\,it} + e_{it}, \qquad (4)$$

where i [1,14] represents the country index (14 countries included in both groups[7], EU-15 and the new and potential members group) and t represents the time index. In order to avoid the influence of short-term disturbances, the observations are averaged over 5 year intervals for the EU-15 group (5-year averages for the 1973-2002 period result in t [1, 6])[8]. For the second group of countries, the observations are averaged over 3 year intervals, since the

[7] Luxembourg is not included in the analysis of the E-15 group due to lack of data and the characteristics of this economy.
[8] See, for example, Barro and Sala-i-Martin (1992).

analyzed period (1991-2002) is not long enough to allow for wider intervals construction[9] (3-year averages for the 1991-2002 yield t [1, 4]).

The model implies that the average growth rate of GDP per capita, [g (Y/L)], depends on the investment rate, s_k, the population growth rate, n, the starting log-value of GDP per capita, [ln (Yo/Lo)], the rate of investment in human capital, s_h, and an additional human capital factor, namely, the initial investment in human capital, s_{h0}. Even though human capital formation is exogenous in this model, it may be possible that it is affected by some other variables in the model (e.g., income per capita) and thus, its initial value is included to allow for endogeneity. The coefficients on capital formation (physical and human) should enter as positive in the model, since higher levels of those variables imply higher steady-states and acceleration in growth rates. Population growth coefficient should have the negative sign, and the impact of the initial level of income per capita should be negative, since a low initial level of living standards lives room for rapid "catch-up" growth. In fact, this effect can include both rapid factor accumulation and rapid technological convergence. Therefore, this variable may serve as the only explanatory factor of the technological progress, because technological change is not explained by this specification of the model and is actually a part of the residual.

The impact of the EU integration variables is possible to investigate only through their influence on one of the four factors of the production function. This study assumes endogenously determined physical capital investment rate and derives the investment equation as following:

$$s_{k\ it} = \beta_1 + \beta_2 \ln(Yo/Lo)_{it} + \beta_3 n_{it} + \beta_4 s_{h\ it} + \beta_5 s_{h0\ it} + \beta_6 EU_{it} + e_{it} \qquad (5)$$

The explanation of the factors and their expected signs are the same as represented for the growth equation, with the initial level of GDP per capita being a proxy for initial level of capital formation or the catch-up factor. Based on the findings of the studies discussed in the

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[9] The second group sample period starts from 1991, because the transition process generally started after the fall of the communist regimes in those countries. Therefore, a 5-year interval application would result in maximum 2 observations per country.

literature review section, this study uses trade barriers and volumes, and also FDI inflows, as proxies for benefits brought at least in part by the EU integration. Therefore, the EU variable stands for the trade indicators or net FDI inflows and allows for the analysis of the integration-induced investment-led growth. If trade barriers are used as a proxy for integration, the expected sign is negative, and in the case of trade openness measures or net FDI inflows, the expected signs are positive. If those variables prove to have significant impact on investment rate, the results would imply that EU integration helped the investment rate increase and, thus, if higher investment increases growth, the integration also had a positive growth impact through this channel. Since the independent measure of technological progress is not available, this variable can not be separately explained in the same manner as the investment rate. Therefore, after the analysis of integration variables' impact on the investment rate, the EU variable is also included in the growth regression, together with the investment rate variable, in order to investigate the presence of an impact that goes beyond the integration influence on the investment rate. If any separate, non-investment effect is found, that would imply that the integration had a significant impact on the technological development. This effect is known as the integration-induced technology led-growth (Levine and Renelt, 1992).

4. Empirical Results

The estimation is conducted as follows. First, panel estimation is applied for the growth and investment equations, Equations 4 and 5, respectively. The Hausman test of random vs. fixed effects is used to determine which specification fits the data better. In all estimations, the chosen model results are reported in the corresponding tables. The coefficients are then estimated using the least squares estimation technique (with cross-section weights in the case of fixed effects), and also using the two-stage least squares technique with the lagged values of all explanatory variables used as instruments. Following the methodology used in Baldwin and Seghezza (1996), the second approach applied is the two-equation system estimation, using the stacked data and three-stage least squares technique, again with all explanatory variables used as instruments. In this specification, the investment equation is slightly altered by including the log values of human capital variables instead of the original human capital variables. It has to be noted that the quality of the results for the second group of analyzed countries (new and potential members) is limited by the short length of the sample period, and the obtained results may serve not as a strong evidence for the suggested effects, but rather as a preliminary growth study of this type, as more data on future performance is obtained.

4.1. Data

The list of sample countries is presented in Table 1. The sample period is 1973-2002 for the EU15 group, and 1991-2002 for the new EU members and candidates group. The sample periods are divided into 5-years (or 3-years for the second group) intervals, each represented by one observation per country consisting of the averaged values of the included variables. Therefore, there are 84 observations for the first group and 56 for the second. Besides the GDP per capita growth rate, log value of the initial GDP per capita (log value of GDP per capita in the starting year of each interval) and the population growth rate, the following variables are used for the growth and investment equations. As the measure of the investment rate, two indicators are used: gross capital formation as a percentage of GDP (addition to the fixed assets of the economy plus net changes in the inventory) and the gross domestic savings rate (GDP less total final consumption, as a percentage of GDP). The difference between those two categories equals total international savings. Human capital variables are represented by the secondary school enrollment rates (the interval average and the initial value of the interval). Two indicators are used as the trade variable: import duties as a percentage of revenues (as a proxy for trade barriers) and the total value of exports and imports as a percentage of GDP (as the measure of the trade openness). FDI is represented by the net FDI inflows as a percentage of GDP. All the data is obtained from the World Development Indicators 2004, database. Some missing observations are obtained from IMF's IFS data base and from the Eurostat on-line database.

4.2. Results

Table 2 and Table 3 present the results of the basic growth regressions, LS and IV estimation results for both groups of countries, respectively. For LS estimation, Hausman test was used to determine the appropriate type of estimation (random effects for the EU-15 group and fixed effects for the group consisting of new and potential EU members).

The results for the EU-15 group suggest that gross capital formation has no effect on GDP per capita growth under both LS and IV specifications. However, when domestic savings rate is included, instead of gross capital formation, the coefficient of this factor becomes significant and positive under both specifications. The results indicate that for each one percent point increase in domestic savings rate, there is, on average, more than 0.2 percent point increase in GDP per capita growth. In addition, the catch-up factor also shows up to be significant and negative, but only when savings rate is used, implying the existence of the convergence process toward the steady-states of the EU-15 members. If similar steady-state parameters are assumed for all members of this group, this finding also implies convergence among the countries. Contrary to some earlier studies, human capital formation does not prove to be significant in general, unless under LS specification when gross capital formation is employed.

The issue of capital formation vs. domestic savings deserves some further discussion. One possible explanation of the insignificance of the gross capital formation for economic growth in the EU-15 members may be derived from the predictions of the Solow model. Since the majority of the countries in this group can be characterized as developed, the model predicts that the most significant factor influencing the GDP per capita growth is actually the technological progress, and the capital formation does not contribute much to the further economic progress if a country has already reached higher development stages. Thus, one can expect that the factors which are included in the residual of the growth regression would actually have the most important impact on growth.

Second, it should be noted that the gross capital formation measure, as opposed to gross domestic savings, includes both domestic and international savings. In this group of countries, except for Greece, Portugal and the U.K. (two poorest and one of the richest countries, respectively), all other economies had mostly negative values of international savings in the analyzed period, indicating that these countries have been investing abroad.

Since the measure of gross domestic savings rate includes the positive investment in foreign countries (negative international savings), it is more likely that the significance of the savings rate coefficient in the growth equation is actually the result of the positive correlation between the economic growth and the outflows of investment. In other words, it may be the case that countries with higher growth also tend to have negative values of international savings (positive investment in foreign countries) and thus, have higher total domestic savings rates. In this sense, the impact of the gross domestic savings rate can not be regarded as a contribution to physical capital accumulation.

As opposed to the findings for the first group, the results for the second group suggest a strong, positive impact of capital formation on growth. This finding is consistent with the predictions of the model for developing countries, which are still at the stages where higher capital accumulation can boost economic growth. The point estimates of the capital formation coefficient are somewhat higher than what is usually expected based on the findings of the previous studies of economic growth. On the other hand, the domestic savings rate impact is either negative in the case of LS estimation or not significant when IV estimation is applied. It should also be noted that in this group, as opposed to the first group of countries, international savings have been positive and high throughout the whole analyzed period (with the exception of the first 3-years interval in the case of several countries).

In the first specification, where the capital formation is included, the impact of the initial GDP per capita ("catch-up" factor) is substantial and negative as expected, but significant only under LS estimation. The initial level of secondary school enrollment shows up to have a significant positive impact on economic growth, although only when IV estimation is applied, suggesting the importance of the initial level of human capital formation for growth. However, the impact of human capital formation is negative, but only marginally significant. The population growth coefficient is not statistically significant in either specification.

Table 3 and Table 4 present the LS and IV analysis of the EU integration impact on the gross capital formation. Although the previous results show no significant impact of this factor on growth in the EU-15 group, and thus physical capital accumulation can not be regarded as a possible channel of the EU integration impact on growth in those countries, gross capital formation rate is still one of the parameters that determine the steady state. Therefore, any positive impact of the integration on the physical capital accumulation would raise the steady-state living standards. However, since the capital formation proved to be a growth-boosting factor for the second group of countries, the significance of the EU integration factors in the investment equation may indeed serve as the evidence of the integration-induced investment-led growth. It should be noted that none of these countries became an EU member during the period analyzed. However, the integration process should not be regarded as a specific event or a break-point in the history of a country, but rather as a long-term process that starts well before the actual accession date. Therefore, the benefits could be felt well before the accession, as well.

Three different specifications of the investment regression include three specific EU integration variables. The first model introduces the measure of import duties (only analyzed for the EU-15 group), the second model includes the indicator of the trade openness of the economy, and finally, the third specification introduces FDI inflows. It is not assumed that the increase in FDI inflows is solely a result of integration progress and not a consequence of globalization, but it is argued that at least some part of that effect came as a response to the development of the EU Single Market Program, and thus, in some sense, FDI inflows can be analyzed as a specific benefit of the EU integration.

The results for the EU-15 group show that in all three specifications, the initial value of GDP per capita shows up to be significant and of expected negative sign. Since this factor did not show up to be significant in the growth equation, it seems to be the case that a country’s position relative to its steady state primarily had an impact on its physical capital investment rates. Less developed economies had higher rates of capital formation; however, they did not tend to grow faster. The initial human capital variable, besides having only a marginal, positive and expected impact in the LS estimations, does not prove to have any significant impact on the domestic savings rate in the IV specifications. The impact of the human capital accumulation showed up to be negative (opposite of expected) and significant in the LS specifications, but it is generally insignificant when the IV estimation was applied.

The first integration variable, import duties, has a negative impact in the IV specification; however, its coefficient was not significant in either LS or IV estimation. Since the import duties were eliminated or stayed close to zero mostly in the second half of the analyzed period for the majority of the EU members, it can be expected that this factor's impact will no longer be significant. Therefore, the second integration measure is introduced in terms of the trade openness, exports plus imports, as a percentage of GDP. However, the openness of the EU-15 members did not prove to be a significant factor in the explanation of the gross capital formation. Finally, FDI inflows are introduced into the investment regression and the impact of this factor shows up to be insignificant, as well. According to these results, there is no evidence of a significant impact of the EU integration on physical capital formation in the EU-15 group. Having also in mind that the physical capital formation did not prove to have any impact on growth, it can be concluded that, based on this sample, there is no evidence of the integration-induced investment-led growth in the analyzed period.

The results for the new and potential members group suggest that, in the first specification, where the openness measure is included, the initial value of GDP per capita impact is negative as expected, since this factor serves a proxy for the initial level of capital accumulation and therefore suggests the catch-up effect, but it is only significant in the case of the LS estimation. The impacts of both human capital variables are significant at different levels. However, the signs of the coefficients alter when different estimation techniques are applied, and a clear nature of their effect can not be distinguished. The coefficient on the trade variable is positive, but significant only with the LS estimation, and therefore the evidence for the trade-induced investment-led growth appears to be weak.

The second specification introduces net FDI inflows as a possible determinant of capital formation in the host country. The only significant variable with the LS estimation is the initial secondary school enrollment (positive impact). In the case of the IV estimation, only the coefficient on the secondary school enrollment proved to be significant (but only marginally), and the sign of this impact is positive. Surprisingly, net FDI inflows do not show any significant impact on the capital formation in this group of countries. It is possible that this factor did not increase the physical capital accumulation, but produced efficiency gains and higher quality of the physical capital instead. This result suggests that there is no evidence of the FDI-induced investment-led growth. Therefore, other channels of the possible impact of FDI should be analyzed.

The results for both groups of countries suggest that it is more important to analyze other channels of a possible growth impact of those integration variables. Furthermore, the model implies that the only important growth factor for the countries which have reached their steady-states is technological progress. Since some of the previous studies suggest the importance of FDI as a vehicle for technological transfers, the following analysis attempts to investigate the growth impact of FDI inflows which goes beyond their impact through capital formation, and includes both variables, FDI and capital formation, in the growth regression. Table 6 and Table 7 present the results of that analysis, using LS and IV estimation results, respectively.

In this specification, the impact of all previously analyzed variables is consistent with the results of the basic growth regression and the interpretation is the same. The most important result for the EU-15 group is that net FDI inflows prove to have a significant positive impact on GDP per capita growth. In the LS (IV) specification, for each one percent point increase in the FDI inflows (as a percentage of GDP), there is, on average, a 0.2981 (0.3273) percent point increase in GDP per capita growth rate, ceteris paribus. Based on the theoretical model, this finding indicates that net FDI inflows have a positive impact on technological growth. To the extent that an increase in the net FDI inflows can be regarded as a result of the EU integration, these results also provide evidence of the integration (FDI)-induced technology-led growth.

Numerous studies have been conducted on the issue of the FDI impact on transition economies, and its importance for technological development is stressed even more than in the case of the EU-15 group. The results for the second group show that gross capital formation has a highly significant and positive impact, which is consistent with the results of the basic growth regression, but the magnitude of that impact is higher in this specification. The initial GDP per capita impact is still significant and negative, and the impact of the initial human capital is positive, but significant only in the LS specification. Net FDI inflows have a strong positive impact on GDP per capita growth, suggesting that this factor has influenced the economic growth mostly through the technology channel, and not through its influence on the investment rate. According to Bevan and Estrin (2004), FDI flows in the transition economies have been determined by the announcements about the integration progress, and therefore, FDI activity can be regarded as a proxy for the EU integration. Consequently, it can be concluded that the results provide evidence of integration-induced technology-led growth in new and potential members group in the analyzed period.

To support this result, the following system estimation as in Baldwin and Seghezza (1996) was conducted as well, for both groups of countries:

$$g(Y/L)_{it} = \beta_1 + \beta_2 (Yo/Lo)_{it} + \beta_3 s_{k\,it} + \beta_4 n_{it} + \beta_5 s_{h\,it} + \beta_6 s_{h0\,it} + \beta_7 EU_{it} + e_{it}, \quad (6)$$

$$s_{k\,it} = \beta_1 + \beta_2 \ln(Yo/Lo)_{it} + \beta_3 n_{it} + \beta_4 \ln s_{h\,it} + \beta_5 \ln s_{h0\,it} + \beta_6 EU_{it} + e_{it} \quad (7)$$

The growth and the investment rate equations are estimated simultaneously, using three-stage least squares technique, with lags of all explanatory variables used as instruments. Net FDI inflows are included both in the investment and GDP per capita growth equation in order to confirm the impact of FDI inflows on growth through the technological progress channel. The system estimation results for the EU-15 group (Table 8) are found to be consistent with the findings of the separate growth and capital formation regressions. However, those results are not consistent with the findings of Baldwin and Seghezza (1996).

Table 9 presents the results of the two-equation system estimation for the second group of countries, In the investment equation results, the initial GDP per capita does not have a significant impact, which is consistent with the findings of the separate investment equation estimation, in case when FDI inflows were included. The initial level of human capital has a positive and significant impact on the investment rate, which was also found in the separate investment regression. However, the human capital variable does not prove to be significant. As was found in the separate investment regression, net FDI inflows do not have a significant impact on the capital formation.

In the results of the growth equation portion of the system estimation, net FDI inflows prove to have a significant and positive impact on the GDP per capita growth, but the point estimate of the FDI coefficient is far less than the one found in a separate growth regression. Surprisingly, the coefficient on the capital formation, although of the right sign, is not significant in the growth equation if the system of equations is estimated. Therefore, the results of this specification are in that sense distorted, probably due to the sample problems previously noted, but they still provide evidence of the FDI impact on technological growth in the transition economies.

4.3. Summary and comparison of the empirical findings with previous studies

Our results for the EU15 group can be summarized as follows. The basic growth regression results suggest that physical capital accumulation does not have a significant impact on the GDP per capita growth in the EU-15 group in the period analyzed. This finding is not surprising if the predictions of the Solow model are taken into account. Namely, the model suggests that at the higher stages of economic development, which is the case for the majority of the countries in this group, if a country has already reached its steady-state living standards level, higher physical capital formation does not have the ability to produce higher steady-state growth. The economy continues to grow at the rate of technological progress which becomes the only source of economic growth. As the results suggest, the overall impact of the human capital formation is also insignificant, as well as the coefficient of the "catch-up" factor, suggesting no presence of the convergence process in this group of countries in the analyzed period. However, when a different proxy for investment, in terms of gross domestic savings rate is applied, a substantial change in the results occurs. The technology "catch-up" factor proves to have a significant negative impact on GDP per capita growth, and the coefficient of the gross domestic savings rate also becomes significant and positive. Since the capital formation, a valid proxy for domestic investment, does not have a significant impact on growth, the significance of the domestic savings rate coefficient can not be regarded as a representation of the growth-boosting impact of investment. The gross domestic savings rate includes the portions of the total domestic savings that flow out of the country and which were mostly positive for this group of countries in the analyzed period. It is more likely that the results for this factor's influence actually represent bi-directional relationship of that component and GDP per capita growth. In other words, it may be the case that rich countries also tend to have higher domestic savings rates, but a clear causation, if it exists, can not be determined.

Furthermore, the results show no significant impact of import duties, trade openness and net FDI inflows on gross capital formation, and thus imply that the EU integration did not have a significant influence on the determination of the steady-state position through its impact on the capital formation parameter. Moreover, since the capital formation variable did not have a significant growth impact, this sample evidence does not only dismiss the possibility that integration-induced investment-led growth has occurred, but it dismisses the hypothesis that any investment-led growth has occurred, as well. Therefore, the influence of the integration variables on growth should be investigated through other channels. This study has focused on the impact of net FDI inflows. When both capital formation and FDI inflows are included in the growth regression, the impact of the net FDI inflows were positive and significant, suggesting the presence of the FDI influence through technological progress. The results are robust when the growth-investment system estimation is included. If the assumption of the positive impact of EU integration on FDI activity holds, those results imply the existence of the integration-induced technology-led growth.

The results presented above are not consistent with those obtained in Baldwin and Seghezza (1996), since that study detected the presence of integration-induced investment-led growth, and no evidence on the presence of the EU integration impact on growth through the technology channel. However, several facts that may explain the different findings should be noted. First, Baldwin and Seghezza (1996) analyzed growth patterns in earlier stages of the EU integration, and second, the authors used somewhat different indicators of integration policies from the ones used in this study. Second, the sample periods used are different. Finally, they also note that their findings certainly do not provide conclusive evidence for the rejection of the trade-induced technology-led growth hypothesis.

Furthermore, Henrekson, Torstensson and Torstensson (1997) found a significant and positive impact of the EC/EFTA dummy on growth, but, as opposed to Baldwin and Seghezza (1996), no impact of European integration on investment is found, suggesting that the integration growth effect has been technology-led in the 1976-85 period, which is consistent with the results of this study.

As far as the impact of FDI on the European economies is concerned, the results of this study are consistent with those obtained by Dohrn, Milton and Radmacher-Nottelmann, (2001) who argued that FDI brings new technology transfers, skills and governance improvement, and found a positive correlation between the economic growth and FDI per capita. However, the causation direction is still difficult to confirm. The results of Damijan, Knell, Majcen and Rojec (2003) showed that direct FDI presents the most efficient source of productivity growth in the recipient firm, and if one can assume that EU integration encourages FDI inflows in the EU member states, as it is assumed in this paper, they also concluded that the integration has a beneficial impact on growth through this channel.

The results for the second group of countries, which consists of the newly accessed EU members and four candidate countries, can be summarized as follows. The basic growth regression results for this group fit well with the predictions of the model. Since this group involves developing, mostly post-communist countries, the impact of capital formation on GDP per capita growth is substantial and positive, implying that those economies have not yet reached their steady-state positions where technological progress becomes the only source of sustainable living standard growth. The “catch-up” factor is negative and significant, but only with the LS estimation, and the impact of human capital variables is ambiguous. The coefficient on the initial secondary school enrollment is positive, but the impact of human capital accumulation is negative in the basic growth regression.

The trade openness and FDI inflow measures are first introduced in the investment equation, but they did not prove to have an important impact on the physical capital formation (except in the case of LS estimation when openness is included as an explanatory variable), and thus theories of trade- or FDI-induced investment-led growth were not justified by this study's results. In addition, human capital formation impact on growth was again ambiguous and of alternating signs in different specifications.

In the next step of the analysis, the impact of FDI inflows on technological progress was investigated. Growth equation was estimated with both investment and FDI variables included. The impact of other factors in the regression was consistent with the results of the basic growth regressions, and more importantly, the impacts of both the capital formation and net FDI inflows were significant and positive. This result implies the influence of FDI inflows on technological progress, most likely as the vehicle of technological transfers to the transition economies, which are consistent with the implications of the some of the previous studies. Although the system estimation results are not completely consistent with the results of separate estimation of growth and investment equations, since the capital formation coefficient lost its significance, the result still imply a significant impact of net FDI inflows even when capital formation is included in the growth regression.

5. Conclusion and Policy Implications

This study has investigated the impact of the trade and FDI variables on the growth performance of the two groups of countries. The comparison of the two groups' results is relatively clear. First, as expected, the EU-15 group and the group consisting of new and potential EU members clearly do not follow the same growth patterns. While the first group results do not provide any evidence of the capital formation impact on growth, this factor has a significant growth boosting impact for the second group economies. Therefore, for the first group, the presence of any kind of investment-led growth can hardly be supported by the evidence from this sample. In the second group, although the economic growth can be characterized as investment-led, there is no strong evidence of the trade or FDI impact on investment rates, and thus, the investment-led growth has probably not been induced by the

EU integration when trade openness and net FDI inflows are used as proxies for the EU integration.

However, for both groups, the presence of the net FDI inflow's impact on technology has been detected, suggesting that the FDI inflows have mostly served as a special channel of technological transfers. Therefore, the policy implications of this study should be focused on that issue. To the extent that the EU integration has caused higher FDI inflows, it is clear that this process had a beneficial impact on the member and candidate economies, and the importance of that impact is relatively higher for the second group countries which are lagging behind the "core" EU members, especially in terms of technological development. For that reason, the governments of the potential EU members and other non-member countries in the region should have a high incentive to start the accession negotiations and design their economic policy in the way that would secure structural changes as a part of the EU integration process. Even if the integration process does not impact FDI inflows at all, or at least not through its influence on any of the analyzed determinants, the impact of FDI inflows on growth is nevertheless important. For both groups of countries, the impact of FDI through the technological progress has been detected. However, the policy implications are probably stronger for transition economies, especially for the present and potential EU candidate countries, whose economic development has not yet reached the levels of the former EU-15 group. In order to set the FDI-induced technology-led growth process in motion, foreign investment inflows should be encouraged through the creation of favorable economic and political conditions in the host countries. The primary goals should include substantial reduction in the regulatory burden, improvement in the government performance and responsibility, and further democratization of the society. However, the initiative for those reforms should come from within a country, certainly not only as an obligation externally imposed by the EU integration policies. If those requirements are met, not only will an increase in the FDI activity occur, and thus induce technological progress, but, at the same time, a faster integration will further promote this and other beneficial effects to the advantage of the living standards growth.

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Table 1. Countries included in the study

EU-15 Members		New Members and Candidates	
Country	Accession year	Country	Accession year
Belgium	1951	Cyprus	2004
Germany	1951	Czech Republic	2004
France	1951	Estonia	2004
Italy	1951	Hungary	2004
The Netherlands	1951	Latvia	2004
Denmark	1973	Lithuania	2004
Ireland	1973	Malta	2004
Great Britain (U.K.)	1973	Poland	2004
Greece	1981	Slovak Republic	2004
Spain	1986	Slovenia	2004
Portugal	1986	Bulgaria	*candidate*
Austria	1995	Croatia	*candidate*
Finland	1995	Romania	*candidate*
Sweden	1995	Turkey	*candidate*

Table 2. GDP per capita Growth: Base Regressions – LS

Dependent Variable: GDP per capita Growth

Variable	EU-15		New and Potential EU Members	
Constant	3.5041	9.9753	157.2399**	154.3114***
	(8.3866)	(7.2003)	(61.4484)	(39.6901)
Gross Capital Formation	0.0382	-	0.5117***	-
	(0.0736)		(0.1339)	
Domestic Savings rate	-	0.2175 ***	-	-0.4268**
		(0.0419)		(0.1960)
Log Initial GDPpc	-0.3313	-1.4750 *	-22.9216***	-20.3262***
	(0.8108)	(0.7822)	(7.7616)	(4.5043)
Initial Sec.School.Enroll.	0.0750 **	0.0531	0.0008	0.5105*
	(0.0361)	(0.0359)	(0.0698)	(0.2854)
Secondary School Enroll.	-0.0607	-0.0317	0.2421	-0.2352
	(0.0370)	(0.0364)	(0.1519)	(0.2613)
Population Growth	-0.1743	-0.3227	-1.3336	-1.0119
	(0.6294)	(0.4722)	(0.8572)	(0.8867)
Number of Observations	84	84	56	56
Adj.R^2	0.02	0.31	0.48	0.61
Hausman test	5.1737	1.0542	35.2757	19.1244
p-value	0.0753	0.5903	0.0000	0.0000
Type of estimation	Random eff.	Random eff.	Fixed eff.	Fixed eff.

*** significant under 1%, ** 5% and * 10% (standard errors in parenthesis)

Table 3. GDP per capita Growth: Base Regressions – IV

Dependent Variable: GDP per capita Growth

Variable	EU-15		New and Potential EU Members	
Constant	5.1167	20.5584***	-3.5872	24.7118
	(28.6771)	(5.8451)	(13.8021)	(86.7089)
Gross Capital Formation	-0.0674	-	0.5962***	-
	(0.5195)		(0.1255)	
Domestic Savings rate	-	0.2271***	-	1.8996
		(0.0542)		(2.6486)
Log Initial GDPpc	-0.3091	-2.2230***	-1.2797	-14.8750
	(1.7702)	(0.2527)	(1.2891)	(10.6169)
Initial Sec.School.Enroll.	0.0406	0.3079	0.2474**	-0.5148
	(0.5729)	(0.3005)	(0.1081)	(0.6879)
Secondary School Enroll.	-0.0203	-0.3027	-0.2088*	1.2567**
	(0.6509)	(0.3381)	(0.1044)	(0.5507)
Population Growth	-0.9008	-3.1678	-2.1808	5.9800
	(2.4732)	(4.0138)	(5.7267)	(14.7886)
Number of Observations	70	70	42	42
Adj.R^2	0.06	0.30	0.70	0.53

*** significant under 1%, ** 5% and * 10% (standard errors in parenthesis)

Table 4. Investment Regressions – LS

Dependent Variable: Gross Capital Formation

Variable	EU-15			New and Potential EU Members	
Constant	49.2897***	53.8218***	51.3408***	75.8417**	36.1318
	(8.8302)	(14.1954)	(8.2850)	(29.8293)	(37.4888)
Log Initial GDPpc	-2.1015**	-2.5312*	-2.2535***	-6.8456**	-2.2184
	(0.9031)	(1.5518)	(0.7992)	(3.0908)	(4.3049)
Initial Sec.School.Enroll.	0.1430*	0.1423*	0.1232*	0.5222**	0.4491**
	(0.0751)	(0.0725)	(0.0722)	(0.2458)	(0.2123)
Sec. School Enroll.	-0.2094 **	-0.2051***	-0.1969**	-0.5276 *	-0.3645
	(0.0825)	(0.0757)	(0.0798)	(0.2838)	(0.2417)
Population Growth	1.6081	1.9735**	1.8885**	0.3712	-0.1409
	(1.3286)	(0.8759)	(0.9071)	(0.5812)	(1.5316)
Import Duties	0.0895	-	-	-	-
	(0.1351)				
Openness	-	-0.0101	-	0.0539***	-
		(0.0181)		(0.0092)	
FDI	-	-	0.0755	-	-0.1991
			(0.0518)		(0.1696)
Number of Observations	84	84	84	56	56
Adj.R^2	0.44	0.44	0.44	0.87	0.50
Hausman test	6.2183	4.8533	16.0069	1.5222	1.3465
p-value	0.0446	0.0883	0.0003	0.4671	0.5100
Type of estimation	Random eff.	Random eff.	Random eff.	Fixed eff.	Fixed eff.

*** significant under 1%, ** 5% and * 10% (standard errors in parenthesis)

Table 5. Investment Regressions – IV

Dependent Variable: Gross Capital Formation

Variable	EU-15			New and Potential EU Members	
Constant	52.2094***	56.4422***	58.6291***	-119.9051	-44.4028
	(13.7612)	(14.6480)	(15.0855)	(164.3153)	(367.9686)
Log Initial GDPpc	-2.5865*	-2.9959*	-3.3009*	10.7982	1.4803
	(1.5688)	(1.6104)	(1.6959)	(16.1585)	(49.3971)
Initial Sec.School.Enroll.	0.2544	0.1541	-0.0805	-1.1714***	-0.3095
	(0.1641)	(0.2167)	(0.1553)	(0.1266)	(0.8489)
Sec. School Enroll.	-0.3154*	-0.2031	-0.1288	1.7457*	1.0267*
	(0.1779)	(0.2460)	(0.1721)	(0.9386)	(0.5797)
Population Growth	2.7634	1.4883	1.7104	7.7073	14.8824
	(2.2168)	(1.5768)	(1.6378)	(12.9893)	(30.2114)
Import Duties	-0.0520	-	-	-	-
	(0.2896)				
Openness	-	-0.0039	-	0.0378	-
		(0.0187)		(0.1820)	
FDI	-	-	0.1086	-	-1.2257
			(0.1192)		(1.2150)
Number of Observations	70	70	70	42	42
Adj. R^2	0.32	0.35	0.37	0.76	0.46

*** significant under 1%, ** 5% and * 10% (standard errors in parenthesis)

Table 6. GDP per capita Growth: FDI Impact – LS

Dependent Variable: GDP per capita Growth

Variable	EU-15	New and Potential EU Members
Constant	9.8591	192.4858***
	(7.0466)	(40.3658)
Gross Capital Formation	0.0180	0.6571***
	(0.0484)	(0.1078)
Log Initial GDPpc	-0.8058	-26.7540***
	(0.6980)	(5.0773)
Initial Sec.School.Enroll.	0.0318	0.0995**
	(0.0279)	(0.0451)
Secondary School Enroll.	-0.0352	0.0301
	(0.0282)	(0.0726)
Population Growth	-0.5328	-0.2455
	(0.4059)	(0.5339)
FDI	0.2981***	0.8064***
	(0.0567)	(0.1353)
Number of Observations	84	56
Adj.R^2	0.39	0.75
Hausman test	0.4402	62.5694
p-value	0.8024	0.0000
Type of estimation	Random eff.	Fixed eff.

*** significant under 1%, ** 5% and * 10% (standard errors in parenthesis)

Table 7. GDP per capita Growth: FDI Impact – IV

Dependent Variable: GDP per capita Growth

Variable	EU-15	New and Potential EU Members
Constant	19.4272*	116.9180***
	(10.4623)	(38.2538)
Gross Capital Formation	-0.1895	0.6578**
	(0.1224)	(0.2347)
Log Initial GDPpc	-1.1821	-16.6840***
	(0.8860)	(3.6695)
Initial Sec.School.Enroll.	0.0637	0.0562
	(0.0821)	(0.1020)
Secondary School Enroll.	-0.0784	0.0023
	(0.0845)	(0.0739)
Population Growth	-1.1536	0.3725
	(0.9776)	(2.1324)
FDI	0.3273***	0.7282***
	(0.0558)	(0.0589)
Number of Observations	70	42
Adj.R^2	0.29	0.94

*** significant under 1%, ** 5% and * 10% (standard errors in parenthesis)

Table 8. System Estimation – EU-15

Growth Equation		Investment Equation	
Variable	IV	Variable	IV
Constant	0.9838	Constant	32.2161
	(3.6940)		(102.6621)
Gross Capital Formation	0.1218	Log Initial GDPpc	-0.6488
	(0.0995)		(4.1584)
Initial GDPpc	-5.83E-05*	Log Initial Sec.School.Enroll.	-44.1247
	(3.45E-0.5)		(195.8317)
Initial Sec.School.Enroll.	0.0623	Log Sec. School Enroll.	42.2864
	(0.2332)		(210.4425)
Sec. School Enroll.	-0.0591	Population Growth	11.1275
	(0.2447)		(20.8497)
Population Growth	-3.6376*	FDI	-0.1528
	(2.1596)		(0.7254)
FDI	0.5063***		
	(0.1337)		
Number of Observations	83	Number of Observations	83
Adj.R^2	0.33	Adj.R^2	0.61

*** significant under 1%, ** 5% and * 10% (standard errors in parenthesis)

Table 9. System Estimation – New and Potential Members

Growth Equation		Investment Equation	
Variable	IV	Variable	IV
Constant	-14.4930	Constant	-4.0590
	(9.4880)		(27.4294)
Gross Capital Formation	0.2938	Log Initial GDPpc	0.5683
	(0.3444)		(1.1161)
Initial GDPpc	-0.0004	Log Initial Sec.School.Enroll.	44.4701**
	(0.0003)		(21.7927)
Initial Sec.School.Enroll.	-0.3618	Log Sec. School Enroll.	-39.1484
	(0.3562)		(23.7056)
Sec. School Enroll.	0.4626	Population Growth	1.1407
	(0.3585)		(0.8836)
Population Growth	0.8226	FDI	0.1015
	(1.1445)		(0.1898)
FDI	0.4756**		
	(0.2262)		
Number of Observations	55	Number of Observations	55
Adj.R^2	0.15	Adj.R^2	0.13

*** significant under 1%, ** 5% and * 10% (standard errors in parenthesis)