FOREIGN DIRECT INVESTMENT, HUMAN CAPITAL AND NONLINEARITIES IN ECONOMIC GROWTH

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Abstract
This paper examines the role of FDI using non-parametric techniques to explore on one hand its interactions with human capital and their joint effect on growth and on the other hand to check for possible non-linearities of FDI inflows and human capital on growth. We use a wide range of countries, both developed and developing in order to be able to distinguish potential differential effects between the two groups. Furthermore, we would like to see whether the non-linear effects of human capital on growth established in the relevant literature still holds in the presence of FDI inflows.

Keywords: cross country growth regressions, FDI, human capital, semi-parametric additive model

JEL Classification: O47
1. INTRODUCTION

The role of Foreign Direct Investment (FDI) in the growth process has for long raised intense debates. Although this debate has provided rich insights into the relationship between FDI and growth, theory provides contradicting predictions about this relationship. FDI is considered a vehicle through which new ideas, advanced techniques, technology and skills are transferred across borders hence provide substantial spillover effects. In this sense, and within the framework of new growth theories that stress the effect of technological progress on long-run growth rates, FDI may be considered an important factor boosting growth. There is a body of literature that analyses the effect of FDI on growth and another analyzing knowledge spillovers to domestic firms\(^1\). Empirical evidence seems also contradictory: firm-level studies of particular countries often conclude that FDI is not beneficial to growth and also fail to obtain positive spillover effects to domestic enterprises. On the other hand, country-wide studies examining the effect of FDI inflows in the growth process of countries usually provide positive results, especially in particular environments.

The above are particularly of interest for developing and least developed countries (LDC), which basically lack the necessary background in terms of education, infrastructure, economic and political stability in order to be able to innovate and generate new discoveries and designs. Hence, they would have to benefit from the diffusion of knowledge and technology that is produced in the leader countries and in this vein, FDI and its agents, Multinationals Corporations (MNCs) may conceivably help technological advancement domestically.

\(^1\) For recent surveys please refer to de Mello, 1997; Kumar and Siddharthan, 1997 and Saggi, 2000)
Apart from this, the domestic economy may benefit in the direction of improvements in the network of transport and communication if a MNC builds for example some new roads to facilitate its activity. The new roads in their turn will facilitate not only the MNC but also all firms and hence help boost their productivity. In addition, positive effects exist in the sense that domestic firms through their interaction with MNCs have the opportunity to learn and advance their own methods and thus be more productive and efficient.

Finally, FDI may raise the quality of domestic human capital through their hiring of domestic employees who are trained in the MNC environment. Some of these employees are sometimes hired later in domestic firms and are thus able to offer their expertise, therefore help domestic firms advance their managerial and technical skills.

This is the one side of the coin, i.e., positive effects of FDI on growth. The other side of the coin talks about neutral or even potential negative effects. It was mentioned above that developing countries and LDC might benefit as they can find new technology and knowledge in the FDI. However, there is an array of studies claiming exactly the opposite: just because these countries lack the necessary environment, they are not able to reap the benefits associated with FDI and as a consequence they are only used as platforms for MNCs to promote their own benefit by establishing rent-seeking activities. The presence of MNCs may affect domestic firms adversely given the market power of their proprietary assets such as technology, superior brand names and aggressive marketing techniques. As a result, FDI may crowd-out domestic investment and hence be immiserising.

The contribution of this paper is that it goes beyond what has been done so far in the literature and examines the role of FDI using non-parametric techniques to
explore on one hand the effect on growth and human capital and on the other hand to check for non-linearities of FDI inflows on growth. Whilst there is a number of studies that bring up the issue of non-linear effects of FDI on growth, these are imposing specific restrictions as to the non-linearity on the grounds of human capital, level of development, financial development and openness to trade, by simply incorporating interaction terms in their regressions, or splitting the sample of countries into groups according to the above. We instead impose no prior restriction on the potential non-linearity of FDI on economic growth using non-parametric techniques, outstripping thus existing criticism on the parametric econometric specification. We use a wide range of countries, both developed and developing in order to be able to distinguish potential differential effects between the two groups. Furthermore, we would like to see whether the non-linear effects of human capital on growth established in the relevant literature still holds in the presence of FDI inflows. This is the first study to the best of our knowledge that attempts to do this exercise in the empirical growth literature. The paper is organized as follows: the next section discusses the relevant evidence so far with regards to the role of FDI on growth and human capital and growth. Section 3 discusses the methodology and data sources, section 4 then lays out empirical findings and finally section 5 concludes.

2. LITERATURE REVIEW

As discussed above, firm level studies usually fail to reach positive growth or spillover effects into the host nation. The influential study of Aitken and Harisson (1999) finds no positive spillover effects from foreign–owned to domestic firms in Venezuela between 1979 and 1989. Blomstrom (1986) finds that Mexican sectors
with a higher degree of foreign ownership exhibit faster productivity growth thus he concludes in favor of positive effects for Mexico. However, Haddad and Harisson (1993) doing the same exercise for other countries failed to obtain growth-enhancing spillover effects. Regarding Mexican industries again, Kokko (1994) finds no evidence of spillovers in industries where the foreign affiliates had a much higher productivity and larger market shares than local firms. In other industries though they found positive effects between foreign presence and local productivity thus, suggesting that spillovers from foreign enterprises are dependent upon the local capability in the industry. Similar results were obtained by Kokko et al (1996) for Uruguay and Kathuria and in a later study (2001) for India.

The literature is much richer in the macroeconomic context. Findlay (1978) argues that FDI increases technical progress in the host country by means of a contagion effect that eases the adoption of advanced managerial techniques by local firms. Fry (1992) examined the role of FDI in promoting growth in a pooled panel data of developing countries for 1966-1988. His results did not support any significant effect of FDI on economic growth while it had a significant negative effect on domestic investment suggesting that it crowds out domestic investment although this latter result differs among different regions of countries. De Gregorio (1992) however suggested a positive effect on growth in his analysis of twelve Latin American countries for the period 1950-1985. Blomstrom, Lipsey and Sejan (1992) also confirmed a positive and significant effect in their sample of 78 developing countries although they stressed that the effect is larger for counties with higher per capita incomes.

Blomstrom et al. (1994) examined a sample of both developed and developing countries and concluded in favor of significant positive effects for both regions.
However, when they split their sample of developing countries into two groups based on their level of income per capita they found that FDI was not statistically significant for lower income developing countries although it remained positive. Borenzstein et al. (1998) in their study of 69 developing economies for 1970-1989 concluded that the effect of FDI is dependent on human capital stock. They also found that FDI crowds-in domestic investment. Balasubramanyam et al. (1996) examined the role of FDI on the growth process of developing countries for 1970-1985 characterized by differing trade policy regimes and concluded that FDI is beneficial for those countries pursuing export oriented strategies but insignificant and some times negative for the ones pursuing import oriented strategies.

De Mello (1999) used time series as well as panel data estimation for 15 OECD and 17 non-OECD countries for the period 1970-1990. In his time series estimations he found that the effect of FDI on growth, capital accumulation, output and productivity growth varies greatly among countries. His panel estimations though showed positive effects for developed and developing countries sub-samples although the effect on capital accumulation and total factor productivity growth varied across developed (technological leaders) and developing (technological laggards) countries. Sanchez-Robles (1998) examined the correlation among FDI, public infrastructure and growth for Latin America in the period 1970-1985 and obtained a positive and significant impact of FDI. Xu (2000) examined US FDI in 40 countries for the period 1966-1994 and concluded that technology transfer from FDI contributes to productivity growth in developed but not in developing countries, while Alfaro et al. (2003) find growth enhancing effects of FDI in economies with sufficiently developed financial markets. The role of FDI in determining long run growth via technological spillovers was further evidenced in Baldwin et al. (1999) for 9 OECD countries,

Bengoa and Sanchez-Robles (2003) suggest that FDI is positively correlated with growth in Latin America however they stressed the importance of the existence of adequate human capital, economic stability and liberalized markets. Kottaridi (2005) examined the FDI-growth nexus across the EU core and periphery countries for 1980-2001 using the Arellano-Bond GMM estimation technique and found out that FDI is beneficial for core countries with adequate stocks of human capital but failed to obtain a statistically significant result for the periphery although the coefficient was with the correct (positive) sign. Carcovic and Levine (2002) criticized existing empirical studies as not fully controlling for simultaneity bias, country-specific effects and the use of lagged dependent variables in their growth regressions. They use Generalised Method of Moments (GMM) and they assess the FDI-growth relationship for 72 countries covering the period 1960-1995. Their findings suggest that FDI does not exert an independent influence on economic growth.

Some of the above mentioned studies talk about non-linear effects of FDI on economic growth based on particular conditions that hold in each economy. Borenztein et al. (1998) stress that the impact of FDI on growth depends heavily on the stock of human capital. Blomström et al. (1994) argue that very poor countries are unable to exploit FDI, while Alfaro et al. (2000) develop a theoretical model where financially developed markets enable spillover effects between foreign and domestic firms and confirm their result with a calibration exercise. Balasubramanyam et al. (1996) found that FDI is particularly good for economic growth in countries with open trade regimes. All relevant studies though impose restrictions as to the type of

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2 Kottaridi (2005) distinguishes two groups of countries according to their level of development and human capital and finds differential effects of FDI between the two.
non-linearity and are confined to parametric techniques by simply incorporating interaction terms in their regressions or by splitting the sample of countries into groups to test such a hypothesis.

Though the studies stress the particular role of human capital for FDI to be beneficial to host countries, the contribution of human capital to growth is controversial in its own. Whereas at the micro level there is consistent evidence that education raises incomes significantly\(^3\), evidence at the micro level has been mixed. Studies such as Barro (1991), Bils and Klenow (2000), Mankiw et al. (1992) and others use enrollment rates for primary and secondary education and point toward a positive and significant effect. Benhabib and Spiegel (1994), Kyriacou (1991), Lau et al. (1991) and Pritchet (2001) on the other hand find an insignificant or even negative result for the stock of human capital, i.e. the total means years of schooling. Some authors (Barro, 1998; Barro and Sala-i-Martin, 1995) incorporate differentiated measures of human capital not only by level of education but also by gender.

Regarding the time dimension of growth, it is found that as the frequency of changes over which growth rates are calculated increases there is less evidence of a positive effect of human capital accumulation on growth (Krueger and Lindahl, 2000; and Islam, 1995).

The vast majority of the studies to the empirics of economic growth have assumed that human capital exerts the same effect on economic growth both across countries and across time and have assumed a (log) linear relationship. Motivated by recent theories emphasizing threshold externalities (Azariadis and Drazen, 1990) several researchers have questioned this assumption. Durlauf and Johnson (1995) and

\(^3\) Commonly referred to as Mincerian wage regressions
Masanjala and Papageorgiou (2002) use the regression tree and the threshold regression methodology to show the existence of multiple regimes.

Liu and Stengos (1999) allow for two nonlinear components, one for the initial GDP level and the other for the secondary enrollment rate. Kalaitzidakis et al. (2001) use semi-parametric techniques and find that there are substantial non-linearities in the growth-human capital nexus. Kourtellos (2003) also uses a semiparametric coefficient model to study a local generalization of the Solow model in the spirit of Durlauf et al. (2001). More recently, Mamuneas, Savvides and Stengos (2006) estimate a general model of the economic growth process for 51 countries during 1971-1987 by allowing the contribution of both traditional inputs and human capital to vary across both countries and time and find that the average output elasticity of human capital varies substantially across countries and above that in some cases the estimate is negligible.

Our study lies in the spirit of the above latter work with the main aim however to detect potential non-linearities in the FDI-economic growth relationship in the presence of human capital, combining the two strands. Also, to check whether the non-linearities of human capital effect found in the literature still holds in the presence of FDI.

3. METHODOLOGY, DATA AND SOURCES

We follow an extended Solow type model as in Mankiw et al. (1992), whereby investment is divided between its domestic and its foreign direct component.

We assume a production function of the form \( Y_t = K_d^K_d^\alpha K_f^K_f^\beta H_t^K_t^\gamma (A_t L_t)^{1-\alpha-\beta-\gamma} \), where \( Y \), \( K_d \), \( K_f \), \( H \) and \( L \) represent total output, domestic physical capital stock, foreign
physical capital stock, human capital stock and labor respectively and $A$ is a technological parameter. Technology is assumed to grow exponentially at the rate $g$, or $A_t = A_0 e^{gt}$. Along the lines of Mankiw et al. (1992) we define $k_d$ as the stock of domestic capital per effective unit of labor, $k_d = K_d / AL$ and $k_f$ as the stock of foreign capital per effective labor, $k_f = K_f / AL$, and $y$ as the level of output per effective unit of labor, $y = Y / AL$.

Hence, following an extended Solow type model and in common with most recent contributions we employ panel data estimations of the unrestricted model suggested by Mankiw et al. adding foreign direct investment in the right hand side.

$$y_{it} = \alpha_0 + \alpha_1 \ln I^d_{it} / Y + \alpha_2 \ln (n_{it}) + \alpha_3 \ln x_{it} + \alpha_4 \ln I^f_{it} / Y + \alpha_5 \ln h_{it} + \varepsilon_{it} \quad (1)^4$$

where $y_{it}$ refers to the growth rate of income per capita during each period, $x_{it}$ is per capita income at the beginning of each period, $I^d_{it} / Y$ is the domestic investment taking place in the economy, $I^f_{it} / Y$ foreign direct investment and $h_{it}$ is human capital.

Whilst Mankiw et al. (1992) used the secondary enrollment rate to measure human capital and Barro and Sala-i-Martin (1995) used the primary as well as secondary enrollment ratios, recent research on human capital has focused on stock measures of human capital as more appropriate. We follow here this recent trend and measure human capital as total mean years of schooling. The data were obtained and updated from Vikram and Dhareshwar (1993). For a full description of their methodology see Vikram, Swanson and Dubey (1995). The data cover the period 1950 to 1990 therefore we use extrapolation to update the human capital stock up to

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4 For simplicity we assume that $g$ and $\delta$ (the depreciation rate stemming out of the solution) are equal to zero.
2004. We also took into consideration the Barro and Lee (2001) human capital stock, however, we cannot directly use their data since their data are calculated in 5-year intervals. Foreign direct investment is obtained by United Nations Cooperation on Trade and Development (UNCTAD). FDI inflows comprise capital provided (either directly or through other related enterprises) by a foreign direct investor to a FDI enterprise. FDI includes the three following components: equity capital, reinvested earnings and intra-company loans. Equity capital is the foreign direct investor's purchase of shares of an enterprise in a country other than that of its residence. Reinvested earnings comprise the direct investor's share (in proportion to direct equity participation) of earnings not distributed as dividends by affiliates or earnings not remitted to the direct investor. Such retained profits by affiliates are reinvested. Intra-company loans or intra-company debt transactions refer to short- or long-term borrowing and lending of funds between direct investors (parent enterprises) and affiliate enterprises. Data on FDI flows are presented on net bases (capital transactions' credits less debits between direct investors and their foreign affiliates). Net decreases in assets or net increases in liabilities are recorded as credits (with a positive sign), while net increases in assets or net decreases in liabilities are recorded as debits (with a negative sign). Hence, FDI flows with a negative sign indicate that at least one of the three components of FDI is negative and not offset by positive amounts of the remaining components. These are called reverse investment or disinvestment.\(^5\) All other data on we have used regarding GDP per capita, GDP per capita growth, gross fixed capital formation measuring domestic investment are in

\(^5\) For more detailed information please refer to the UNCTAD World Investment Report 2005: Transnational Corporations and the Internationalization of R&D.
constant 2000 US$ and are obtained from the World Development Indicators (WDI) of the World Bank.6

The sample we are testing covers a wide range of developed and developing countries for the period 1970 to 2004. In particular we incorporate twenty five OECD countries and twenty non-OECD countries from all over the world, representing all regions. The selection of developing countries was based on the availability of the data especially with regards to the human capital variable. A full list of the countries and the regions they belong to may be found in Appendix A.

4. ECONOMETRIC ESTIMATION

Parametric estimates assume a unique response coefficient for human capital and FDI in growth regressions. Recent work, however, has indicated that this assumption is not warranted. Azariadis and Drazen (1990), Durlauf and Johnson (1995) and Murphy et al. (1989) point to the possibility of threshold effects in the growth process, the former focusing on thresholds in human capital. Alternatively, the growth experience is a nonlinear function of human capital. While non linearities in the convergence process have been extensively discussed in the literature7, remarkably little has appeared in connection with human capital and nil to the best of our knowledge regarding the effect if FDI on economic growth.

We hereby use a semiparametric partially linear regression (PLR) specification of the growth regression function. In contrast to a standard linear parametric formulation, a semiparametric PLR specification is an adequate representation for the

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6 Nevertheless, we have used other data sources for these variables for robustness purposes. We have also experimented with the corresponding variables from the Penn World Tables 6.2 where the variables are given in 2000 PPP US$. However, results were similar.

7 See for example Quah (1996).
data. Using a particular version of the PLR models that allows for additive semiparametric components, we obtain graphical representations of the nonparametric components: initial GDP per capita, FDI and human capital. These graphs can shed light into nonlinearities in these variables and can be used as a guide to a more suitable parametric specification.

The semiparametric PLR specification of the model in (1) can be written as follows:

\[ y_{it} = X_{it}^\top \gamma + g(Z_{it}) + u_{it} \quad (2) \]

where \( X_{it} \) is a variable of dimension \( q \), \( \gamma \) is a \( q \times 1 \) vector of unknown parameters, \( Z_{it} \) is a continuous variable of dimension \( p \) and \( g(\cdot) \) is an unknown function. In the context of equation (2) \( X_{it} = \{D_i, I_{it}^k / Y_i, n_{it}\} \) and \( Z_{it} = Z_{1it}, ..., Z_{pit} \) where \( Z_{1it} \) refers to initial income \( x_{it} \), \( Z_{2it} \) refers to FDI and \( Z_{3it} \) to human capital. Robinson (1988) provided a way of obtaining a \( \sqrt{n} \)-consistent estimator of the parameter vector \( \gamma \) By concentrating out the influence of the nuisance variables, the \( Zs \). This is accomplished by conditioning them through kernel methods and estimating the conditional expectations \( E(y_{it} / Z_{it}) \) and \( E(X_{it} / Z_{it}) \). In the second stage of a two-step estimation procedure, the kernel estimates of \( E(y_{it} / Z_{it}) \) and \( E(X_{it} / Z_{it}) \) are used to estimate the parameter vector \( \gamma \).

Such an approach, although very useful if one were interested solely in the parameter vector \( \gamma \) conceals the influence of the individual \( Zs \) in the regression function. For the question at hand, a more useful approach is to try to uncover the shapes of the individual components of \( Z_{it} \), i.e., \( x_{it}, f_{it} \) and \( h_{it} \). In order to accomplish this, we have to impose more structure on equation (2) by assuming an additive structure on the unknown components. In other words, the regression model can now be written as:
\[ y_{it} = \alpha + X_{it}^T \gamma + \sum_{s=1}^{p} g_{s}(Z_{it}) + u_{it} \quad (3) \]


5. EMPIRICAL RESULTS

The parametric estimates of the growth regression are in Table 1. We have tried to split the sample between OECD and non-OECD countries in order to detect possible differentiation. We have also split the sample among countries classified by the World Bank as high income, middle income and low income\(^8\). It is noteworthy that coefficients of regions are quite different under the alternative specifications. That is, whilst with the shares of domestic and foreign investment most of them are positive and significant, they turn out negative and significant at least some of them like Africa, Latin America and Oceania. Three general conclusions could be drawn. First, the coefficient estimates for initial GDP per capita, investment, and population growth are of the anticipated sign and significance and are robust to the alternative sub-samples. Second, estimates of FDI turn out to be positive and statistically significant except for the middle and low-income sub-samples. Third, the estimates for human capital follow the pattern of FDI and are positive and significant except for the middle and low-income countries\(^9\). Our parametric results thus, give definitive results related

\(^8\) We have also separated the middle-income countries between those of upper-middle income and lower-middle income. We then have grouped upper middle income with high income and lower-middle income with low income.

\(^9\) We have also estimated the respective models with lagged values of private investment and FDI to account for possible endogeneity of the variables – these two variables lose their significance in some cases whilst the human capital variable remains the same.
to FDI and human capital and specifically they point towards positive and significant effects. We have also included interaction terms between FDI and human capital according to arguments that FDI needs a threshold of ‘absorptive capacity’ in terms of human capital in order to be beneficial. Nevertheless, results are disappointing or even in contrast to predictions; in some cases the interaction term emerges significantly negative, in others positive but non-significant and there are also cases that FDI or human capital alone turn negative and significant. In this regard, it is really impossible to detect such non-linearities of FDI.
Table 1. LSDV regressions. Dependent variable: GDP per capita growth; white heteroskedastic standard errors in parentheses; trend included

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<td>42.56***</td>
<td>7.448***</td>
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As indicated above though, parametric estimates assume a unique response coefficient for FDI and human capital in growth regressions. Following recent work we proceeded in the estimation of a semiparametric PLR specification that allows for additive semiparametric components, and we obtain graphical representations of the nonparametric components: initial GDP per capita, FDI and human capital. To tackle
possible endogeneity issues between FDI and growth as well between human capital and growth we use lagged values of FDI and human capital instruments. The results are quite similar with and without the lagged values.

Our semiparametric results of the PLR model are presented in Figures 1 to 3. Figure 1 shows a representative semiparametric fit for initial income. The horizontal axis shows the initial income per capita and the vertical axis the growth rate in standardized form. To highlight the differences between the semiparametric and the linear estimates in this, as well as all subsequent graphs, we plot the linear benchmark.

Figure 1. GDP growth and initial GDP

Figure 1 demonstrates the relationship between per capita growth and initial income is clearly non-linear. This is consistent with recent empirical evidence (see Durlauf and Johnson, 1995; Liu and Stengos, 1999; Pack and Page, 1994; Quah, 1996) on convergence. The curvature of the graph implies that, on average, high-income
countries do not necessarily get lower growth rates, but they can rather increase their
growth rates slightly or keep them steady.

Figure 2 shows the estimate of the non-parametric component for FDI share. The horizontal axis shows the share of FDI in GDP and the vertical axis the growth rate of per capita income.

The relationship between economic growth and FDI appears to be nonlinear. In particular, there is a range of FDI share where we observe a negative effect whilst it appears that countries experiencing shares between approximately 1.9% and 4% experience negative effect. However on the whole the effect of FDI appears to be positive even though at differential rates for different groups of countries. Our results are consistent with prior macroeconomic studies that find an overall positive effect of FDI on growth and they also indicate the differential impact of FDI on different economies laid out earlier in the literature review. However, there is no study to date to use non-parametric techniques that allow for varying coefficients of FDI. A
remarkable difference with these studies though regards the fact that contrary to those, when we split the sample into OECD and non-OECD countries we didn’t detect any significant differentiation in the pattern between the two.

Figure 3 shows the estimate of the non-parametric component of human capital. Previous studies suggesting a non-linear relationship to economic growth are confirmed: there are clearly thresholds in the effect of human capital. It is evident that for mean total years of schooling falling between 3 and 9.5, the effect is counterproductive, whilst at low and very high levels it is beneficial. This result is in line with Kalaitzidakis et al (2001) where they found that for mean years of schooling between 0.9 and 4.4 the relationship is positive with a slight differentiation that we find here that the positive effect holds between approximately 1.5 and 3 mean years of schooling. The effect of human capital turns out positive again for above 10 years of schooling. To check the validity of the partial linear specification of the semiparametric formulation of the model we also allowed for interaction terms between human capital and FDI to enter the linear part of the model. However, this term was never significant in any of the specifications that we tried, in agreement with the separable structure of the model.
6. CONCLUSIONS

In this paper we study the influence of FDI on economic growth among a wide set of OECD and non-OECD countries by also allowing for the presence of human capital (captured by total mean years of schooling) to interact with it and jointly affect economic growth. Our objective is to go beyond what has been done so far in the relevant literature regarding FDI and use non-parametric techniques to assess its impact in growth. Furthermore, we verified the non-linear effects of human capital on economic growth suggested earlier in the literature even in the presence of foreign investments.

Our paper parallels the widely discussed issue of non-linearities in convergence. For our purposes, we collected data from the WDI of the World Bank, UNCTAD and the Vikram and Dhareshwar (1993) for twenty five OECD and twenty non-OECD countries over the period 1970-2004. The countries were selected based on their availability of human capital data. In general, our findings support the hypothesis of non-linear effects of human capital and FDI on economic growth. Hence, we confirm here that there exist threshold levels of human capital and FDI and the growth experience of a country may well differ according to which side of the threshold it finds itself in.
REFERENCES


Fan, J., Hardle, W. and E. Mammen (1996). Direct estimation of low dimensional components in additive models,

Fan, Y. and Q. Li (1996a). On estimating additive partially linear models, mimeo


## APPENDIX

### Sample Countries

<table>
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<tr>
<th>OECD -Country</th>
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**Total= 25**

**Total = 20**