Economic Performance in Developing Countries: Comparative Studies Between Sub-Saharan, and East and South East Asian countries

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ABSTRACT

The relationship between Foreign Direct Investment (FDI) and economic growth in developing countries has received considerable attention in development literature during recent decades. However, little interest has been devoted to the simultaneous role of institutions (in particular, the role of property rights and rule of law) and the stock of human capital. This paper tries to fill that gap, by using an innovative econometric methodology to empirically test the relationship between FDI and economic growth in the context of 50 African, and East and South East Asian countries covering the period of 1965-85. We emphasize the growth-effects of FDI that depends on the stock of human capital

and the quality of institutions that protect property rights and ensure that contracts are enforced. We found that financial institutions and political institutions such as property rights play the same role in reducing transaction costs.

***Keywords*:** Foreign direct investment; Economic growth; human capital, legal system

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INTRODUCTION

Tremendous differences in incomes and standards of living exist today between rich and poor countries of the world. Explaining the huge difference in average incomes between the world's richest and poorest nations is one of the most fundamental issues in development economics. The past decade has witnessed a dramatic increase in economic growth of East and South East Asian countries (ESEA). East Asia has a remarkable record of high and sustained economic growth. From 1965 to 1990 the twenty-three economies of East Asia grew faster than all other regions in the world. Most of this achievement is attributable to seemingly miraculous growth in just eight economies: Japan; the «Four Tigers» (Hong Kong, The Republic of Korea, Singapore, and Taiwan); China; and the three newly industrialized economies (NIEs) of South East Asia, Indonesia, Malaysia, and Thailand. Since 1960, these Asian economies have grown more than twice as fast as the rest of East Asia, roughly three times as fast as Latin America and South Asia and five times faster than Sub-Saharan Africa. They also significantly outperformed the industrial economies and the oil-rich Middle East-North Africa region. Between 1960 and 1985, real income per capita increased more than four times in Japan and the Four Tigers and more than double in Southeast Asian NIEs (see The World Bank, 1993, pp. 2). Average income per capita in Sub-Saharan Africa, for example is less than one-third of that of East and South East Asian economies. The poverty of Sub-Saharan Africa is one of the most obdurate features of the world economy. Since the industrial revolution, this has been the world's poorest and slowest growing region. Maddison estimates that Africa's per capita income in 1992 was approximately that of Western Europe in 1820: $1,284 in Africa compared with $1,292 in Europe, in purchasing power parity (PPP) 1990 international dollars. Maddison's data show that Africa's per capita income has increased by a factor of almost 2.5 between 1820 and 1992. Africa's poor economic growth has been chronic rather than episodic. Maddison examines five major subperiods for Africa: 1820-70 (the precolonial era); 1870-1913 (the onset of colonial rule up to World War 1); 1914-50 (the World Wars and the Great Depression); 1950-73 (late colonial rule and early independence); and 1973-92 (the recent period). He

estimates that Africa has had slow growth during each of these subperiods. GDP per capita growth patterns have diverged dramatically between African and East and South East Asian countries in the last four decades. While Asia has grown consistently well, Africa's growth has averaged near zero. The key challenge for economists is to understand why growth outcomes differ so much and, hopefully, to use this knowledge to recommend policy changes that would increase the chances of ladding countries to perform better. How did vast gulf emerge, and can anything be done to reduce it? Since the early 1960s, why have ESEA countries grown faster than Sub-Saharan Africa economies? What explains growth differential between these developing countries?

OBJECTIVE OF THE PAPER

The purpose of this paper is to examine channels through FDI affect economic growth in developing countries. Empirically we test whether the relationship between FDI and economic growth depends simultaneously on the level of human capital and institutional quality of the host country in protecting property rights of foreign investors against expropriation or nationalization risk and in ensuring that contracts are enforced. This study focuses on the role of FDI in explaining growth differential between East and South East Asian, and Sub-Saharan economies. Unlike existing empirical work, this paper emphasizes growth effects of FDI through its interaction with human capital and institutional quality. I motivate the empirical work by a model of endogenous growth, in which the rate of technological progress is the main determinant of long-term growth rate of income. Technological progress takes place through a process of 'capital deepening' in the form of the introduction of new varieties of capital goods. Multinational corporations possess more advanced knowledge, which allows them to introduce new capital goods at lower costs. However, the application of these more advanced technologies also requires the presence of a sufficient level of human capital and good institutions, and better property rights in the host economy. The low levels of human capital and weak institutions and insecure property rights in the host country, therefore, limit the absorption capability of a developing country, as in Nelson and Phelps (1966). Hence, the model highlights the roles of both the introduction of more advanced technology and the requirement of absorptive capability in the host country as determinants of economic growth, and suggests the empirical investigation of the complementarity relationship between FDI, human capital and institutional quality in the process of productivity growth. Economists have long debated whether different countries and regions within countries are converging over time in terms of per capita income. Following the convergence debate of the 1980s which captured the attention of mainstream macroeconomic theorists of endogenous growth, We argue that the failure of Sub-Saharan African countries that are converging toward the world economy can be explained by

its poor institutions or weak protection of property rights of foreign investors, and the lack of human capital in exploiting new technologies from advanced economies. We argue that the process of economic convergence based on the international migration of foreign capital on which neo-classical growth theory emphasizes, cannot occur because of weak institutions and the low levels of human capital. Many growth theories have stressed the positive influences of human capital on the ability to absorb new technologies, but the role of the institutions that protect property rights of foreign investors against expropriation risk and ensure that contracts are enforced should not be understated.

The macroeconomic findings on growth and FDI must be viewed skeptically. Existing studies do not fully control for simultaneity bias, country-specific effects, and the routine use of lagged dependent variables in growth regressions (Carkovic and Levine, 2002). These weaknesses can bias the coefficient estimates as well as the coefficient standard errors. Thus, the profession needs to reassess the macroeconomic evidence with econometric procedures that eliminate these potential biases. We use regression analysis to examine the relationship between FDI and growth for a sample of 50 developing countries during 1965-85. The paper is divided into six sections. Section 3 presents a brief review of literature and Section 4 explains a simple model to motivate our empirical investigations; Section 5 provides an account of the data used in the empirical analysis; Section 5 describes the regression results, and Section 6 presents some concluding remarks.

REVIEW OF LITERATURE

Attempts to explain growth differential between high-performing Asian economies (HPAEs) and Sub-Saharan countries abound in the Development Economics literature. The source of East Asian extraordinary growth performance has been a highly controversial topic. The controversy opposed accumulationists who claimed that growth in Asia was mainly input-driven (see e.g., Young, 1992a, 1994a, 1994b; Kim and Lau, 1994; Krugman, 1994; Collins and Bosworth, 1997), and assimilationists (Pack and Page, 1994a, 1994b) who argued that the essential component of Asia's success was the acquisition and mastery of foreign technologies, and the capacity to put ideas into practice captured by total factor productivity (TFP). The success of many of the economies in East Asia in achieving rapid and equitable growth, often in the context of activist public policies, raises complex questions about the relationship between government, the private sector, and the market. As well, several papers have attempted to explain the African failure. Various arguments have been used to explain Sub-Saharan Africa's economic decline. In recent debate, many sets of factors have frequently been invoked to account for Africa's poor economic performance : external conditions (the legacy of centuries of slave trading and colonial rule, as well as the manipulation of African politics during the Cold War); heavy

dependence on a small number of primary exports, with declines and volatility in terms of trade); internal politics (characterized by authoritarianism, corruption, and political instability); economic policies (protectionism, statism, and fiscal profligacy); demographic change (in particular, rapid population growth); social conditions (deep ethnic divisions, indicated by high levels of ethnolinguistic and religious diversity and low levels of 'social capital'); disadvantageous geography (which has helped to shape its societies and its interactions with the rest of the world); the failure of policy to promote technological capabilities and to invest in human capital (see e.g., The World Bank, 1988; Dosi et al., 1990; Dollar, 1992; Lall et al., 1994; Sachs and Warner, 1995a, 1995b; Collier, 1995; Easterly and Levine, 1997; Rodrick, 1997; Bloom and Sachs, 1998; Collier and Gunning, 1999a, 1999b) However, very few empirical analyses, most of them using aggregate data, have compared the sources of economic growth between Africa and Asia. Nehru and Dhareshwar (1993) did not find any significant difference between East Asia and African in terms of capital accumulation (growth rates of 7.4 and 5.3 % respectively).

Easterly and Levine (1997), in an endogenous growth settings, found that macro policies explain 2.6 of the 3.4 percentage point growth differential between East Asia and Africa between 1960 and 1989, the remaining being explained by «Other». On the other hand, using a growth accounting framework, Dollar and Easterly (1999) compare twenty five African to five East Asian countries and find that : physical capital accumulation was higher in Asia than Africa; Labour force growth was about the same in the two sub-samples; Growth in human capital was higher in Africa. However, the three factors only explain a third of the differential between Asia and Africa, leaving the two third to TFP. Finally, using a panel of 99 developing economies in Africa, Latin America and Asia, for the 1970-94 period, in order to obtain and compare the contribution of each variable explaining the differential performance between East Asia and other regions, on the one hand, and the sub-Saharan African (SSA) region, on the other hand, and also to show why the SSA region has lagged behind, Azam, Fosu and Ndung'u (2002) found that the most important explanations for the growth differential between Africa and East Asia are the higher export shares and local investment in the latter. Although there is some evidence to support each of these explanations, we believe that they miss an even bigger truth. At the root of Africa's poverty lies its failure to attract FDI like Asian countries. Although very interesting, theses studies all fail to consider the FDI as the main factor explaining the growth differential between East and South East Asian countries and SSA region. Ito (1999, pp. 9) found that FDI to Asia has increased steadily during the 1990s. The increases are most significant in China, where it was a 15-fold increase in six years (1990 to 1996 before the East Asian crisis). Other countries, Korea, Singapore, Indonesia, Thailand, and Vietnam saw from a two-fold to a four-fold increase in the first six years of the 1990s. Japan provided the most FDI to a total of nine Asian countries (4 NIEs, ASEAN-4, and

China). In some countries (Korea, Taiwan, Singapore, and Philippines), the US is the number one country for FDI source, while for others, like Japan is number one. Europe collectively was investing into Asia in similar sizes as the US. However, for most countries, impacts of FDI in typical Asian countries are dictated by investors' behaviour of Japan and the United States. As the largest investor in the region, the role of Japan in FDI is important. The largest recipient is Indonesia, closely followed by Hong Kong and China. Japan invested in the NIEs during the 1980s, as well as the 1990s – the ratio of the 1990s investment in all the years is below 60 percent. In contrast, more than 60 percent of Japanese FDI to Thailand, Malaysia, and the Philippines were done in the 1990s, reflecting the rapid rise of these economies, and the sharp rise in Japanese investment in these economies. In the beginning of 1990s, Indonesia, Thailand, and Malaysia were the preferred destinations of Japanese FDI.

Theory provides conflicting predictions concerning the growth effects of FDI. The economic rationale for offering special incentives to attract FDI frequently derives from the belief that foreign investment produces externalities in the form of technology transfers and spillovers. Romer (1993), for example, argues that there are important «idea gaps» between rich and poor countries. He notes that foreign investment can ease the transfer of technological and business know-how to poorer countries. These transfers may have substantial spillover effects for the entire economy. Thus, foreign investment may boost the productivity of all firms (not just those receiving foreign capital). In contrast, some theories predict that FDI in the presence of pre-existing trade, price, financial, and other distortions will hurt resource allocation and slow growth (Brecher and Diaz-Alejandro, 1977; Brecher, 1983; Boyd and Smith, 1999). Thus, the theory produces ambiguous predictions about the growth effects of FDI and some models suggest that FDI will only promote growth under certain policy conditions. Firm-level studies of particular countries often find that FDI does not boost economic growth and these studies frequently do not find positive spillovers running from foreign-owned to domestic-owned firms. Aiken and Harison's (1999) influential study finds that there is no evidence of a positive technology spillover from foreign firms to domestically owned firms in Venezuela between 1979 and 1989. Similarly, findings from Germidis (1977), Haddad and Harrison (1993), and Mansfield and Romeo (1980) show that FDI does not accelerate growth. While Blomstrom (1986) finds that Mexican sectors with a higher degree of foreign ownership exhibit faster productivity growth, the study – and similar studies – suffer from a critical identification problem : if foreign investment gravitates toward more productive industries, the observed positive correlation will overstate the positive impact of FDI on growth. Aitken and Harrison (1999) solve this problem and find no evidence of a positive technology spillover. Taken together, firm-level studies do not lend much support for the view that FDI accelerates overall

economic growth[1]. Unlike the microeconomic evidence, macroeconomic studies – using aggregate FDI flows for a broad cross-section of countries – generally suggest a positive role for FDI in generating economic growth especially in particular environments. For instance, using data on FDI flows from industrial countries to 69 developing countries over the last two decades, Borensztein, De Gregorio, and Lee (1998) argue that FDI has a positive growth-effect when the country has a highly educated workforce that allows it to exploit FDI spillovers. Their results suggest that FDI is an important vehicle for the transfer of technology, contributing relatively more to growth than domestic investment. However, the higher productivity of FDI holds only when the host country has a minimum threshold stock of human capital. While Blomstrom, Lipsey, and Zejan (1994) find no evidence that education is critical, they argue that FDI has a positive growth-effect when the country is sufficiently rich. In turn, Alfaro et al. (2000) find that FDI promote economic growth in economies with sufficiently developed financial markets (they emphazise the role of financial institutions and argue that the lack of development of local financial markets can limit the economy's ability to take advantage of potential FDI spillovers; so that, they show that economies with better-developed financial markets are able to benefit more from FDI to promote their economic growth), while Balasubramanyam, Salisu, and Dapsoford (1996) stress that trade openness is crucial for obtaining the growth-effects of FDI.

Although very interesting, these studies forgot that institutions that protect property rights of foreign investors against expropriation risk and ensure that contracts are enforced can boost a positive growth-effect of FDI. According to Rogoff (2003, pp.56), no matter how much capital is poured into an economy, strong growth is impossible if individuals and companies don't enjoy meaningful property rights, reliable courts, and other basic market institutions. Borensztein, De Gregorio, and Lee (1998) find that there is a strong complementary effect between FDI and human capital, that is, the contribution of FDI to economic growth is enhanced by its interaction with the level of human capital in the host country. They understate the role of institutions in fostering the growth-effect of FDI. The growth-effect of FDI depends simultaneously on the level of human capital that exploits FDI spillovers and the quality of political institutions that protect property rights of foreign investors. Better institutions and better protection of property rights increase investment and foster technological progress, thereby raising income levels. According to the institutions hypothesis (see e.g., Hall and Jones, 1996, 1999; North, 1989, 1990; Acemoglu, 2003; Rodrick, Subramanian, and Trebbi, 2002), some societies have good institutions that encourage investment in machinery, human capital, and better technologies, and consequently, these countries achieve economic prosperity. North (1990) emphasizes the importance of an efficient judicial system to enforce contracts as a crucial determinant

[1] Also, see Aitken, Hanson, and Harrison (1997), De Mello (1997), Harrison (1996), and Wheeler and Mody (1992).

of economic performance. Low security of property rights over physical capital, profits, and patents may reduce incentives and opportunities to invest, innovate, and obtain foreign technology. Cumbersome and dishonest bureaucracies may delay the distribution of permits and licences, thereby slowing down the process by which technological advances become embodied in new equipment or new productive processes. Good institutions have three key characteristics : enforcement of property rights for a broad cross section of society, so that a variety of individuals have incentives to invest and take part in economic life; constraints on the actions of elites, politicians, and other powerful groups, so that these people cannot expropriate the incomes and investments of others or create a highly uneven playing field; and some degree of equal opportunity for broad segments of society, so that individuals can make investments, especially in human capital, and participate in productive economic activities (Acemoglu, 2003). According to Saleh (2004), property rights determine investment by affecting its expected returns. Because property rights are complex and multidimensional, they affect expected returns through a number of distinct but interrelated channels. These include the following: first, security of property rights is the most often cited channel for promoting investment. More secure rights generally lead to lower expected expropriation and higher net returns. Investment may be expropriated through theft, fraud, confiscation or taxation. Insecure property rights also affect the expected variability of expropriation. For any given expected expropriation level, there may be higher or lower variability. Uncertainty of expropriation affects the uncertainty of returns and tends to discourage investment for risk-averse decision maker. When property rights are insecure, potentially less efficient investments may also be undertaken as a means to strengthen the security of property rights. A second factor affecting investment is the degree of transferability of property, through gift, bequest, rent or sale. The types of investments that can be undertaken depends on the ability of owners to borrow capital at relatively low cost.

The ability to use property as collateral reduces the cost of borrowing and encourages investments. This ability depends on the degree to which the legal system and social norms protect and enforce financial contracts. Formalization and registration of property rights generally reduce the costs of making and enforcing financial contracts by making it easier to transfer assets in case of default. In addition, formal titles to property lower the cost to lenders for determining the credit-worthiness of borrowers. The return of investment also depends on the degree to which property owners can obtain access to common property resources and public goods at reasonable cost. Laws, regulations and customs determining the conditions for access to common property affect the returns to investment by allowing fuller utilization of resource complementarities. Returns to investment also depend on the ability to make deals with other property owners such as customers, creditors, potential shareholders, workers and suppliers. Some scholars of *institutions hypothesis* have examined the effect of corruption

on FDI and domestic investment. Using a sample covering bilateral investment from fourteen source countries to forty-five host countries during 1990-91, Wei (1997) found that an increase in either the tax rate on multinational firms or the corruption level in a host country reduces inward FDI. An increase in the corruption level from that of Singapore to that of Mexico was equivalent to raising the tax rate by over twenty percentage points. He also found that there was no support for hypothesis that corruption has a smaller effect on FDI to East Asian host countries. American investors were averse to corruption in host countries, but not necessarily more so than average OECD investors, in spite of the U.S. Foreign Corrupt Practice Act of 1997. Wei (1997) emphasizes that corruption discourages FDI and Mansfield (1996) found that perceptions concerning the strength of intellectual property rights affected both the volume and the composition of U.S. FDI. Similarly, Mauro (1995) found that corruption lowers private investment, thereby reducing economic growth, even in subsamples of countries in which bureaucratic regulations are very cumbersome. The negative association between corruption and investment, as well as growth, was significant, both in a statistical and in an economic sense. Gastanaga and al. (1998) found that FDI is negatively correlated with institutional quality. FDI was lower in countries with greater bureaucratic delay and higher nationalization risk. In this paper, I argue that economies with better institutions and the high level of human capital would attract more FDI and benefit more from it to promote their economic growth and therefore tend to grow more rapidly.

AN ILLUSTRATIVE FRAMEWORK

This paper considers an economy where technical progress is the result of 'capital deepening' in the form of an increase in the number of varieties of capital goods available, as in Dixit and Stiglitz (1977); Ethier (1982); Romer (1990); Grossman and Helpman (1991) and Barro and Sala-i-Martin (1995) reported in Borensztein, De Gregorio, and Lee (1998). The economy produces a single consumption good according to the following technology:

$$Y_t = AH_t^{\alpha}K_t^{1-\alpha} \quad (1)$$

Where *A* represents the exogenous state of 'environment', H denotes human capital, and K stands for physical capital. The state of environment comprises various control and policy variables influencing the level of productivity in the economy. We assume that the human capital H is a given endowment. Physical capital consists of an aggregate of different varieties of capital goods; hence capital accumulation takes place through the expansion of the number of varieties. Specifically, at each instant in time, the stock of domestic capital is given by:

$$K = \{\int_0^{\infty} x(j)^{1-\alpha} dj\}^{1/(1-\alpha)} \quad (2)$$

That is, total capital is a composite of a continuum of varieties of capital goods, each one being denoted by *x (j).* The total number of varieties of capital goods is N. There are two types of firms that produce capital goods: domestic and foreign firms that have undertaken a direct investment in the economy. The domestic firms produce n varieties out of the total number *N*, and the foreign firms produce *n** varieties:

$$N = n + n^* \quad (3)$$

We assume that specialized firms produce each variety of good, and rent it out to final goods producers at a rental rate *m*(j). The demand for each variety of capital good, *x*(j), follows from the optimality condition that equates the rental rate to the marginal productivity of capital goods in the production of final good. This condition is:

$$m(j) = A(1-\alpha)H^{\alpha}x(j)^{-\alpha} \quad (4)$$

An increase in the number of capital varieties requires the adaptation of technology available in more advanced countries to permit the introduction of a new type of capital goods. We assume that this process of technology adaptation is costly, requiring a fixed setup cost (*F*) before production of the new type of capital can take place. We assume that the fixed setup cost depends negatively on the ratio of the number of foreign firms operating in the host country to the total number of firms (*n*/N*). This assumption is intended to capture the notion that foreign firms bring to the developing economy an advance in knowledge applicable to the production of new capital goods that may be already available in other countries. Thus, by making it easier to adopt the technology necessary to produce new capital varieties, FDI is the main channel of technological progress in this framework. In addition, we assume the existence of a 'catch-up' effect in technological progress to reflect the fact that it is cheaper to imitate products already in existence for some time than to create new products at the frontier of innovation. (The cost of imitating new products would be cheaper only if there is better institutions in the recipient country which reduce transaction costs. As Edison et al. (2002) point out, international financial integration in the presence of pre-existing distortions can actually retard growth. For example, international financial integration in countries with weak institutions and policies (e.g., weak financial and legal systems) may actually induce a capital outflow from capital-scarce countries to capital-

abundant countries with better institutions. Therefore, we assume the existence of sound institutions and good policies in the host country). This is implemented by assuming that the setup cost depends positively on the number of capital varieties produced domestically compared to those produced in more advanced countries (which we denote by N^*). That is, in countries where lower N/N^* imitation possibilities are larger, hence the cost of adopting new technology is lower. Thus, we postulate the following functional form for the setup cost:

$$F = F(n^*/N, N/N^*) \text{ where } \partial F/\partial(n^*/N) < 0 \text{ et } \partial F/\partial(N^*/N) > 0 \quad (5)$$

An alternative interpretation of Eq. (5) can be given in terms of 'quality ladders' as in Grossman and Helpman (1991). The increase in the number of varieties could be interpreted as an improvement in the quality of existing goods. If the presence of foreign firms reduces the cost of improving the quality of existing goods, it will generate the same negative relationship between FDI and setup costs. Moreover, the catch-up assumption could be reinterpreted as the cost of improving an existing capital good is that is small and lowest in its quality. In addition to the fixed setup cost, once a capital good is introduced, the owner must spend a constant maintenance per period of time. This is analogous to assume that there is a constant marginal cost of production of $x(j)$ equal to 1, and that capital goods depreciate fully. Assuming a steady state where the interest rate (r) is constant, profits for the producer of a new variety of capital j are:

$$\Pi(j)_t = -F(n_t^*/N_t, N/N_t^*) + \int_t^{\infty}[m(j)x(j) - x(j)]e^{-r(s-t)}ds \quad (6)$$

Maximization of Eq.(6) subject to the demand Eq.(4) generates the following equilibrium level for the production of each capital good $x(j)$:

$$x(j) = HA^{1/\alpha}(1-\alpha)^{2/\alpha} \quad (7)$$

Note that x(j) is independent of time, that is, at every instant, the level of production of each new good is the same. Moreover, the level of production of the different varieties is also the same due to the symmetry among producers. Substituting Eq.(7) into the demand function Eq.(4), we obtain the following expression for the rental rate :

$$m(j) = 1/(1-\alpha) \quad (8)$$

which gives the rental rate as a markup over maintenance costs. Finally, we assume that there is free entry, hence the rate of return will be such that the profits are equal to zero. Solving for a zero profits condition we obtain:

$$r = A^{1/\alpha}\,\Phi F(n^*/N, N/N^*)^{-1} H \quad \text{where} \quad \Phi = \alpha(1-\alpha)^{(2-\alpha)/\alpha} \tag{9}$$

To close the model, we need to describe the process of capital accumulation, which is driven by saving behaviour. We assume that individuals maximize the following standard intertemporal utility function:

$$U_t = \int_t^{\infty} [C_s^{1-\sigma}/1-\sigma] e^{-\rho(s-t)} ds \tag{10}$$

Where C denotes units of consumption of the final good Y. Given a rate of return equal to r, the optimal consumption path is given by the standard condition:

$$C_t^*/C_t = 1/\sigma(1-\rho) \tag{11}$$

It is easy to verify that the rate of growth of consumption must, in a steady state equilibrium, be equal growth rate of output, which we denote by g. Finally, substituting Eq. (9) into Eq. (11), we obtain the following expression for the growth rate of economy:

$$g = 1/\sigma\,[A^{1/\alpha}\,\Phi F(n^*/N,\, N/N^*)^{-1} H - \rho] \tag{12}$$

Eq.(12) shows that FDI, which is measured by the fraction of products produced by foreign firms in the total number of products (n^*/N), reduces the costs of introducing new varieties of capital goods, thus increasing the rate at which new capital goods are introduced. The cost of introducing new capital goods is also smaller for more backward countries; that is, countries that produce fewer varieties of capital goods than the leading countries (countries with lower N/N^*) enjoy lower costs of adoption of technology, and will tend to grow faster. Furthermore, the effect of FDI on the growth rate of the economy is positively associated with the level of human capital, that is, the higher the level of human capital in the host country, the higher the effect of FDI on the growth rate of the economy. To empirically assess the effect of FDI on economic growth, I utilize the following basic formula:

$$g = \beta_o + \beta_1 FDI + \beta_2 FDI \times H \times INST + \beta_3 H + \beta_4 Y_0 + \beta_5 A \tag{13}$$

Where FDI is foreign direct investment, H, the stock of human capital, INST, the institutional quality, Y_o, initial GDP per capita, and A is a set of other variables that affect economic growth. The variable FDI is measured as a ratio to GDP, and is conceptually analogous to the fraction of goods produced by foreign firms in the model, (n^*/N). The initial GDP variable (Y_0) captures the role of the 'catch-up' effect (N/N^*). The group of variables A comprises the control and policy variables that are frequently included as determinants of growth in cross-country studies. Theses variables include government consumption, the black market premium on foreign exchange, a measure of political instability (political assassinations and wars), a measure of political rights, a proxy for financial development and the inflation rate. I next study the empirical evidence of the relationship between FDI and economic growth.

DATA AND EMPIRICAL ANALYSIS

In this section, we will firstly describe the data used in the empirical analysis, and then discuss the econometric model and finally present the results.

Data

The data come from various sources. Most of the data come from the World Development Indicators CD-ROM (WDI, 2003, 2004) and databases from Barro and Lee (1994). In this section I study the empirical determinants of growth. We use a sample of 50 countries, that is, 8 East and South East Asia countries and 42 Sub-Saharan Africa economies, listed in appendix A, which provides a wide array of experiences from developing countries. We have included countries according to the availability of data. We study growth rates over two decades, 1965-75 and 1975-85. Thus, our panel data set includes a limited amount of times-series variation. To assess the link between FDI and economic growth and its sources, We control for other growth determinants. We use the standard U.N. numbers on life expectancy at birth to represent the initial level of health. The growth rate measure is the average annual rate of per capita real GDP over each decade in constant dollars, and the data are obtained from WDI. FDI equals gross FDI inflows as a share of GDP. Government consumption is measured by the average share of real government consumption in real GDP. For the human capital stock variable, we use data of the initial-year level of average years of secondary and higher schooling in the male population aged 25 and over constructed by Barro and Lee (1994). Data for the other explanatory variables such as the domestic investment rate, the foreign exchange parallel market premium, the ratio of FDI to GDP and the measures of political instability and financial development

are also taken from Barro and Lee (1994). The financial-sector development is measured by the ratio of liquid liabilities of financial system to GDP (M2/GDP). Inflation, measured as the percentage change in the GDP deflator, is used as a proxy for macroeconomic stability. The data are from WDI (2003, 2004). The political instability is measured by two variables: the average number of successful and unsuccessful revolutions per year and the number of assassinations per million populations per year. We view these variables as representing the probability of revolution; in this sense, they influence property rights, and thereby affecting the incentive to invest in various activities. To capture openness to international trade, we use the ratio of the sum of exports plus imports to GDP. This paper focuses on the interaction of FDI, human capital and institutional quality. The interaction term is constructed as a product of the FDI (deviation from the mean of all observations over each subperiod) by the stock of capital human (deviation from the mean of all observations over each subperiod) and by the institutional quality index (deviation from the mean of all observations over each subperiod). The institutional quality is measured by two indexes. First, the political rights index ranging from 1 (none freedom) to 7 (most freedom) and the civil liberties index from 1 (most freedom) to 7 (none freedom). The data comes from Barro and Lee (1994).

Empirical Analysis

Table 1 presents a summary of statistics and correlation using data averaged over the 1965-85 period, one observation per country. There is considerable variation in GDP across countries. For example, the mean per capita growth rate for the sample is 1.9 % per annum, with a standard deviation of 0.5 %.

Table 1
Descriptive statistics

Variables	No. Observations	Mean	S.D	Min	MAX
Real per capita GDP rate	100	0.0186	0.005	-0.10	0.331
Openness to trade	100	1.75	0.23	1.25	2.56
Black market premium	100	0.23	0.36	0.00	2.11
Government consumption/GDP	100	1.17	0.18	0.83	1.62
Inflation rate	100	-0.0093	0.069	-0.13	0.25
Terms of trade	100	-0.003	0.032	-0.0921	0.12
Index of Malaria	100	0.84	0.32	0.000	1.00
Latitude	100	0.134	0.096	0.000	0.12
Population near the coast	100	0.26	0.27	0.000	0.99
Natural resources endowment/exports	100	1.70	0.30	0.44	1.99
Civil liberties index	100	5.35	1.22	2.00	7
Political rights index	100	5.32	1.18	2.00	7
Number of revolutions	100	0.34	0.58	0.000	4.50
Number of assassinations	100	0.013	0.029	0.000	0.16
Average schooling years	100	0.68	0.67	0.011	4.5
Domestic investment/GDP	100	1.059	0.37	0.10	1.6

FDI/GDP	100	-0.195	0.777	-2.59	1.23
Interaction: FDI, capital hu. and inst.	100	-0.081	0.62	-3.73	2.08
Liquid liabilities /GPD	100	1.14	0.41	0.078	1.7
Life expectancy at birth	100	1.68	0.084	1.49	1.88

Correlation Matrix

	Growth rate	Inter. FDI	A. School	FDI	Life exp	Ci. freedom	P. rights
Growth rate	1						
Interaction :FDI, human capital an institutions	0.23	1					
Average schooling	-0.007	-0.035	1				
FDI	0.069	0.32	0.0727	1			
Life expectancy	0.222	-0.13	0.57	0.27	1		
Civil freedom index	-0.17	0.094	-0.27	-0.066	-0.425	1	
Political rights index	-0.138	0.17	-0.23	-0.084	-0.35	0.77	1

The maximum growth rate was enjoyed by South Korea (5.2), while Eritrea suffered with a per capita growth rate of -10.6 % per annum during the 1965-75 period. In contrast, during the 1975-85 period, the maximum growth rate was also enjoyed by South Korea (5.5) compared with -3.3 % per annum in Mozambique. The data also suggest that there is large variation in FDI. The average was -19.5 % of GDP. Countries such as Hong Kong, South Korea, Malaysia, and Singapore had FDI inflows more than ten times of those of all the Sub-Saharan countries. Table 1 also suggests a positive relationship between growth and the interaction term between FDI, capital human and institutional quality. The average per capita growth rate is also positively associated with FDI and the life expectancy at birth while the negative relationship is observed between growth and the institutional quality index.

Model specification

The purpose of our analysis is to examine the channel through which FDI may be beneficial for growth. In an influential paper, Mankiw et al. (1992) derive an empirical specification based on the assumption that countries are unlikely to be at their steady states and therefore transitional dynamics should be more important. We employ a specification similar to theirs. We look at the direct effect of FDI on economic growth and estimate the following equation:

$$g_{i,o,0+T} = \beta_0 + \beta_1 Y_{i,0} + \beta_2 X_{i0} + \beta_3 X_{i1} + \beta_4 X_{i2+} \ldots + \beta_n X_{in} + \mu_{it} \quad (12)$$

where $g_{i,o,0+T}$ is the average annual rate of real per capita GDP in country i over the (0, 0+T) period, $Y_{i,0;}$ real per capita of GDP (in natural log form) measured at the beginning of each period; X_{i0}, the initial-year level of average years of the male secondary and higher schooling ; X_{i1} …. X_{in}, the control or environmental variables which determine the steady-state; β_0 …β_n, coefficients to be estimated and μ_{it}, an error term. The basic empirical framework relates the real per capita growth rate to two kinds of variables : first, initial levels of state variables, such as the stock of physical capital and the stock of human capital (X_{i0}), the log of the initial-year of real per capita of GDP ($Y_{i,0}$) and second, control or environmental variables (some of which are chosen by governments or private agents), such as the ratio of government consumption to GDP, the ratio of domestic investment to GDP, fertility rate, the black-market premium on foreign exchange, changes in terms of exchange, measures of political instability, the amounts of political freedom and civil liberties, the ratio of FDI to GDP, and so on. In estimating the relationship between FDI and economic growth, it is important to control for other determinants of growth, to ensure that estimated coefficients capture the effects of FDI on growth and not the influence of some other variables. The control variables used were selected based on the fact that they have been identified in the literature as important determinants of growth rates across countries. Two of the variables employed in the estimation are measured at the beginning of each period, thus would proxy for initial conditions in a neo-classical model. The first is real per capita income (in natural log form). In the neo-classical growth theory, the effects of control and environmental variables on the growth rate can be ascertained from their influences on the steady-state position. For example, a higher value of the ratio of domestic investment to GDP raises the steady-state ratio of output to effective worker: the growth rate accordingly tends to rise for given values of the state variables. According to the neo-classical theory, the coefficient on per capital income represents the convergence effect and thus should be negative. If convergence can hold, then a country with a relatively lower level of initial per capita GDP will grow faster, since it is that much farther away from its steady state and must catch-up. In endogenous-growth models, there is no convergence effect, since economies do not depart from their steady states; therefore the coefficient is expected to be zero. The second variable is a measure of the stock of human capital. Growth theory, whether neo-classical or endogenous, predicts that the coefficient on the stock of human capital should be positive, as countries that have more human capital tend to have higher growth rates. The other control variables are measured as averages each over a ten-year period, and include the real share of government consumption, a measure of openness to international trade, the real domestic investment rate, the FDI rate, the interaction between FDI, human capital and institutional quality, a measure of geography, political instability, and a measure of financial-sector development. As Barro and Sala-i-Martin (1995) point out, the government consumption variable is intended to capture public expenditures that do not directly affect productivity,

but will entail distortions of private decisions. These distortions can reflect governmental activities themselves, including effects from political corruption, as well as employing the adverse effects of the associated public finances. The coefficient on that variable is thus expected to be negative. On the other hand, the anticipated effect of international trade on growth is positive. As discussed by Sachs and Warner (1995a), the literature on endogenous growth emphasizes economies that are more open to international trade and can grow more rapidly by taking advantage of larger markets, furthermore becoming more efficient. Finally, as the endogenous-growth model in Section 4 showed the increase in domestic investment rate, FDI rate, the interaction between FDI, human capital and institutional quality and in the level of financial-sector development are expected to lead to higher economic growth. As Barro and Lee (1994), we view the black-market premium on foreign exchange as a proxy for market distortions, whether it is due to exogenous government policies or to reactions to external shocks, such as changes in terms of trade. Thus, we anticipate that a higher black-market premium, like other government distortions, lowers the steady-state level of output per effective worker, therefore reducing the growth rate for given values of the state variables. We view the increase in political instability, as the propensity to experience revolutions and equivalently as a decline in the security of property rights. As to an increase in tax rates or other governmental distortions, the worsening of property rights tends to lower the steady-state level of output per effective worker, consequently, reducing the growth rate of given values of the state value. Finally, our one variable of interest, that is, the interaction between FDI, human capital and institutional quality is seen as means to promote the growth effect of FDI on the steady-state level of output per effective worker and, consequently, increase the growth rate for given values of the state value. Many growth theories have stressed the positive influences of human capital on the ability to absorb new technologies, influencing the per capita growth rate to rise when there is a increase of stock of human capital. As Bloom and Sachs (1998), we would like to add two kinds of geographic variables, one related to the tropics and the other, which is also demographic in nature, related to transport conditions. In particular, we introduce the share of a country's land area in the geographic tropics as an explanatory variable, expecting that tropical land area will be associated with lower steady-state per capita income, therefore lower growth. we also introduce population density near the coast (within 100 km) and density away from the coast (further than 100 km), the latitude, the index of malaria, the ratio of natural resources endowment to the total exports as additional geographic variables.

Empirical results

This paper estimates the effects of FDI inflows on economic growth after controlling for other growth determinants and the potential biases induced by endogeneity, country-specific effects, and the inclusion of initial income as a repressors. Moreover, we examine whether the growth-effects of FDI depend on the level of human capital of the recipient country, the level of economic development of the host country, the level of financial development of the host country, the institutional quality and the level of human capital of the recipient country, and trade openness. In fact, the purpose of our empirical investigation is to estimate the effects of FDI on economic growth, and to investigate the channel through which FDI may be beneficial for growth. In particular, we examine whether FDI interacts with the stock of human capital and the institutional quality to affect growth rate. The main regression results indicate that FDI has a positive overall effect on economic growth, although the magnitude of this effect depends on the stock of human capital and the institutional quality available in the host economy. However, the nature of the interaction of FDI with human capital and institutional quality is such that for countries with very low levels of human capital and weak quality of political institutions, direct effect of FDI is negative. All regressions are based on panel data for two decades 1965-75 and 1975-85. This paper uses new statistical techniques to reassess the relationship between economic growth and FDI. Methodologically, we use four statistical techniques. we first use simple ordinary least squares (OLS) regressions with two observations per country over the 1965-85 (two subperiods: 1965-75, and 1975-85) period. Second, we use the seemingly-unrelated regression (SUR) technique. This procedure allows for country random effects that are correlated over time. Third, we use instrumental variable techniques to capture the endogeneity problem of some explanatory variables such as FDI and the institutional quality. Finally, we use the Generalized Method of Moments (GMM) panel estimator designed by Arellano and Bover (1995) to extract consistent and efficient estimates of impact of FDI flows on economic growth. Unlike past works, GMM panel estimator exploits the time-series variation in the data, and account for unobserved country-specific effects, which allows the inclusion of lagged dependent variables as regressors, and controls for endogeneity of all explanatory variables.

A. Regression Results for growth rate

Table 2 contains the regression results for the growth rate of real per capita GDP. The system has two equations, where the dependent variables are the real per capita GDP growth rates over each decade. For the basic formulation, 50 countries are included for 1965-75 and for the period of 1975-85.

We use a panel procedure with data averaged over ten-year periods which involves two possible observations per countries over the 1965-85 periods. To ensure the stability of coefficient estimates over time, Chow's test has been done. With F-statistic = 1.058 (p-value: 0.415), we cannot reject the null hypothesis of none structural changes over time. We also tested the autocorrelation of error term over sample by using the Serial Correlation LM or Correlogram Q-statistic) and the null hypothesis of none autocorrelation did not rejected. Finally, the null hypothesis of homokedasticity of error terms cannot be rejected by doing White's test (F = 0.96 and p-value: 0.54). Table 2 reveals several interesting results for growth-effects of FDI. Co1umn 1 shows the regression results of real per capita GDP growth by using OLS regression. The estimated coefficient of the interaction term between FDI, human capital and political rights index is positive (0.035662) (p-value: 0.0333) and statistically significant at 5%. Because the OLS's estimated coefficients are biased and do not converge due to possible omission of some explanatory variables, measurement error and endogeneity, we re-ran other regressions techniques. Column 2 shows the regression results which use the SUR technique. The results of column 2 are almost similar to those of Column 1, except for the estimated coefficients of initial real per capita GDP and the black market premium becoming significant. The estimated coefficient of the interaction term between FDI, human capital and political rights index is always positive (0.0356620 (p-value: 0.0176) and statistically significant at 1 % level of significance. The model of Column 3 replaces FDI by domestic investment rate and R^2 remains similar. Column 4 replace the ratio of natural resources to total exports and the indicator for openness to trade ((exports + imports)/GDP) by the ratio of manufactured exports to total exports because of possible multicollinearity problem between those variables. This evolves a decrease of coefficient of determination which passes from 0.32 to 0.31. Models from Columns 4 and 5 include two measures of political institutions individually which are statistically insignificant. The model from Column 5 replaces the civil freedom index by the political instability index to determine whether the lack of significance is due to the correlation between those variables, however. These variables are still insignificant. Note that after controlling various variables and checking for specification of the regression and the estimation technique, the estimated coefficient of interaction term between FDI, human capital and the political rights index still remains positive and strongly significant. In columns 6 through 10 of Table 2, we also assess whether the impact of FDI on growth depends mainly on other variables evidenced in the current literature. For example, Column 6 assess whether the impact of FDI on growth depends on the stock of human capital. Borensztein et al. (1998) find that in countries with low levels of human capital the direct effect of FDI on growth is negative, though sometimes insignificant. But once human capital passes a threshold, they find that FDI has a positive growth-effect. The rationale is that only countries with sufficiently high levels of human capital can exploit the

technological spillovers associated with FDI. Thus, we included the term FDI*(deviation from the mean of average years of schooling of all observations). The estimated coefficient of the interaction term between FDI and the human capital is positive (0.0023) (p-value: 0.86), but does not enter significantly in the regression. This result shows that the human capital is a necessary condition but not sufficient to allow FDI to exert a positive effect on economic growth. This can be demonstrated by the fact that the estimated coefficient of FDI is negative and statistically significant at 1% level. Carkovic and Levine (2002) also found that the lack of an impact of FDI on growth does not depend on the stock of human capital. They found that in the OLS regressions, FDI and the interaction term do not significantly enter in any of the six regressions. In their panel regression, FDI and the interaction term occasionally enter significantly, but even here the results do not confirm the theory. Namely, when FDI and the interaction do enter significantly, the term on FDI is significant and the coefficient on the interaction term is negative. They concluded that this suggests that FDI is only growth enhancing in countries with low educational attainment. Similarly, we examine whether the link between FDI and growth depends only on the institutional quality. In Column 7, FDI is interacted with the political rights index and the estimated coefficient is negative (-0.0033) (p-value: 0.53) and does not significantly enter the regression. In contrast, the estimated coefficient of FDI is negative (- 0.016) (p-value: 0.023) and statistically significant. Results from Columns 6 and 7 indicate that in the context of low levels of human capital and weak political institutions, the direct growth-effects of FDI should be negative. I also examine the growth-effects of FDI through absorption ability of the host country. Column 8 of Table 2 test whether the link between FDI and growth depends on the level of economic development of the host country. We interact FDI with GPD (product of per capita GDP by the deviation of FDI from the mean of the sample). Blomstrom, Lipsey and Zejan (1994) argue that FDI positively affect growth only in the richest countries. They stressed that very poor countries – countries that are very technologically backward – are unable to exploit FDI. We found that the estimated coefficient of that interaction term is negative (-0.38) (p-value: 0.0003) and strongly significant. The result shows that a low level of economic development of the host country tends to discourage FDI. In contrast, Carkovic and Levine (2002) found that there is not a reliable link between growth and FDI when allowing for the impact of FDI on growth to depend on the level on income per capita. Column 9 of table 2 assesses whether the relationship between FDI and growth varies by the degree of trade openness. Balasubramanyam, Salisu and Sapsford find evidence that FDI is particularly good for economic growth in countries with open trade regimes. Thus, we include an interaction term of FDI and openness to trade in the table 2 regressions. As Carkovic and Levine (2002), we found that the FDI-trade interaction term does not enter significantly in any of the SUR technique. The estimated coefficient of FDI-interaction term was positive (0.014) (p-value: 0.11) but not statistically significant. Finally, Column 10 of Table 2 assesses

whether the level of financial development in the recipient country influences the growth-FDI relationship. Better-developed financial systems improve capital allocation and stimulate growth (Alfaro et al., 2000; Bailliu, 2000; Edison et al., 2002; Glaeser et al., 2004). Capital inflows to a country with a well developed financial sector may, therefore, produce substantial growth effects. Thus, we re-ran regressions using the interaction term (M2/GDP*deviation of FDI from the mean of the sample). The estimated coefficient of the interaction term is negative (-0.0028) (p-value: 0.81) and does not significantly enter in SUR regression. Carkovic and Levine (2002) also found that the OLS regressions suggest that FDI has a positive growth effect, especially in financially developed economies while their panel evidence does not confirm this finding. It is possible that the finding of FDI-growth link using OLS and SUR regressions produce estimate coefficients biased because of endogeneity, omission of explanatory variables, measurement error and so on. To overcome those econometrical problems, we use two other sophisticated regressions techniques.

B. Sensitivity Analysis

We conducted a number of sensitivity analyses to assess the robustness of the results. First, we used a standard instrumental variable estimator (VI) in a panel data context (two observations per country) and re-examined the channel through FDI affect economic growth. We also used GMM regression. As Carkovic and Levine (2002) point out, the dynamic panel approach offers advantages to OLS and also improves on previous efforts to examine the FDI-growth link using panel procedure. First, estimation using panel data (that is pooled cross-section and time-series data) allows us to exploit the time-series nature of the relationship between FDI and growth. Second in a pure cross-country instrumental variable regression, any unobserved country-specific effect becomes part of the error term, which may bias the coefficient estimates. Our panel procedures control for country-specific effects by using time dummies. Third, unlike existing cross-country studies, our panel estimator controls for the potential endogeneity of all explanatory variables and accounts explicitly for the biases induced by including initial real per capita GDP in the growth regression. Columns 1 through 10 of Table 3 follow the recent literature which uses an instrumental variable estimator to overcome the endogeneity problems of some explanatory variables such as FDI, institutional quality, the demographic growth rate and so on. Estimations were done by using two-stage least squares regression. Because of country-specific effects that instrumental variable estimator fails to take in account, we also use GMM which solve this econometrical problem. As Barro and Sala-i-Martin (1995), we use lagged values of some explanatory as instruments. The instruments are the five-year lag of log (GDP) (the 1960 value in the first decade and the 1970 value in the second), and the averages of FDI/GDP and governments consumption/GDP

during the five years preceding each decade. We also use the real values of average years of schooling, the log of life expectancy, the terms of trade, the log of black market premium in the beginning of each decade as the complementary instruments. For example, in regression for 1965-75 periods, we use the average of fertility rate over the period of 1960-64. The square of FDI inflows for 1970 and 1975 are used as the instruments for periods of 1965-75 and 1975-85 periods. In columns 1 and 2 of table 3 which use the VI and GMM regressions, we assess whether the level of human capital and the institutional quality of the recipient country simultaneously influence the growth-FDI relationship. We have also found in previous regressions that FDI positively affects the economic growth through this channel. The estimated coefficients of the interaction term between FDI, human capital and political rights index are always positive but does not significantly enter in VI and GMM regressions. Edison et al. (2002, pp.20) also found that in the OLS regression, the flow of capital and inflow of capital measures are positively associated with growth. However, in the two-stage least square regression that controls for the endogeneity of capital flows, none of the international financial integration measures are significantly associated with growth. This suggests that OLS results may be driven by reverse causality. Columns 3 and 4 assess whether the level of economic development in the host country influences the growth-FDI relationship. Unlike the OLS and SUR results, the estimated coefficients interaction term are positive but do not enter significantly in the regression. These results suggest that developed countries are more able to exploit opportunities associated to FDI than developing countries. Columns 5 and 6 assess whether the level of human capital in the host country influences the growth-FDI relationship. As in previous regressions using OLS and SUR techniques, the estimated coefficients on FDI-human capital interaction term are negative and statistically insignificant suggesting that the level of human capital itself is insufficient enough to allow FDI to exert its full impacts on economic growth. In Columns 7 and 8 of Table 3, we assess whether the institutional quality of the host country influences the growth-FDI relationship and found that this variable exerts a strong impact on FDI, which allows it to stimulate economic growth. The estimated coefficients on FDI-political rights index interaction term are positive (6.74) (p-value: 0.99) (col.7) and 0.0034 (p-value: 0.41) (col.8). FDI positively affects economic growth through the institutional quality, but this impact is insufficient to allow it to exert a significant effect. Columns 9 and 10 of Table 2 which assess whether the level of financial development of the host country influences the growth-FDI relationship suggest the most interesting results of this paper. The estimated coefficients on FDI-level of financial development interaction term are positive in Column 9 (0.017) (p-value: 0.060) and in Column 10 (0.014020) (p-value: 0.0231). Results in Column 10 which uses GMM regression and shows a positive coefficient statistically significant at 5% level suggest, finally, that FDI affects economic growth through the level of financial development of the recipient country. This result indicates that the FDI-level of financial

development interaction term explains 14% of economic divergence between ESEA and SSA economies over the period of 1965-85. Financial development plays the same role as political institutions in reducing transactions costs. International financial integration facilitates risk-sharing, thereby enhancing production specialization, capital allocation, and economic growth. Furthermore, in the standard neo-classical growth model, international financial integration eases the flow of capital to capital-scarce countries with positive output effects. Also, it may enhance the functioning of domestic financial systems, through the intensification of competition and the importation of financial services, with positive growth effects.

CONCLUSION

This paper has examined the role of FDI in explaining economic divergence between Sub-Saharan Africa and East and South East Asian countries over 1965-85. The results from OLS and SUR regressions indicate that FDI explains the most important growth differential between ESEA and SSA economies. Specifically we found that the impact of the FDI, capital human and political rights index interaction term explain almost 4% of economic growth in ESEA and SSA countries. This implies that to reach the current level of economic development in ESEA, the SSA countries must improve the quality of their legal system and invest more in human capital. SSA has been relatively unsuccessful in attracting FDI despite policy reform because of the lack of institutions that protect the property rights of foreign investors against expropriation or nationalization risk and ensure that contracts are enforced, and that low levels of human capital in exploiting the technological spillovers are associated with FDI. In contrast, when we used new statistical techniques such as VI and GMM regressions to reassess the relationship between economic growth and FDI, we found that the level of financial development of the recipient country is the best way through FDI to be affected positively and significantly economic growth. The estimated coefficient on FDI-level of financial development interaction term was positive (0.014020) (p-value: 0.0231) and statistically significant at 5 % level. This result suggest that after controlling for other explanatory variables included in the economic growth regressions, the interaction between FDI and the level of financial development explains almost 14 % of the economic divergence between ESEA and SSA countries over 1965-85.

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Appendix A

Table A1

List of developing countries included in the growth rate regressions

Angola	Mali
Benin	Malaysia
Burkina Faso	Mauritius
Botswana	Mauritania
Cameroon	Mozambique
Chad	Namibia
Central African Republic	Niger
Congo	Nigeria
Côte d'Ivoire	Philippines
Democratic Republic of the Congo	Rwanda
Equatorial Guinea	Sao Tome and Principe
Eritrea	Senegal
Ethiopia	Seychelles
Gambia	Sierra Leone
Gabon	Singapore
Ghana	South Africa
Guinea	South Korea
Guinea Bissau	Swaziland
Hong Kong	Taiwan
Indonesia	Tanzania
Kenya	Thailand
Lesotho	Togo
Liberia	Uganda
Madagascar	Zambia
Malawi	Zimbabwe

Table 2. Regression for the growth rate of real per capita GDP

Dependent variables: growth rate of real per capita GDP over 1965-75 and 1975-85 periods

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Est. Method	MCO	SUR	SUR	SUR	SUR	SUR	SUR	SUR	SUR	SUR
Log (GDP)	-0.028	-0.0282	-0.024	-0.025	-0.025	-0.020	-0.020	-0.022	-0.020	-0.020
	(0.820)[2]	(0.052)**	(0.091)	(0.077)	(0.055)**	(0.16)	(0.136)	(0.080)	(0.147)	(0.131)
Male secondary and	-0.018	-0.018	-0.019	-0.030	-0.028	-0.020	-0.020	-0.022	-0.021	-0.020
High school aged 25	(0.340)	(0.287)	(0.270)	(0.060)	(0.060)	(0.18)	(0.195)	(0.121)	(0.172)	(0.180)
Foreign direct invest-	-0.015	-0.015	-	-0.013	-0.013	-0.016	-0.016	-0.006	-0.044	-0.014
ment/GDP	(0.049)**	(0.028)**		(0.058)**	(0.050)**	(0.004)*	(0.023)**	(0.342)	(0.392)	(0.274)
Log (life expectancy)	0.328	0.324	0.274	0.283	0.300	0.273	0.282	0.288	0.279	0.271
	(0.002)*	(0.0008)*	(0.004)*	(0.004)*	(0.001)*	(0.001)*	(0.003)**	(0.001)**	(0.004)*	(0.005)**
Political rights	-0.001	-0.001	-0.001	-0.003	-	-	-	-	-	-
index	(0.82)	(0.800)	(0.754)	(0.538)						
Inflation rate	-0.190	-0.190	-0.170	-0.205	-0.201	-0.213	-0.214	-0.173	-0.219	-0.210
	(0.022)**	(0.011)**	(0.027)**	(0.007)**	(0.007)**	(0.006)*	(0.006)*	(0.019)*	(0.005)*	(0.008)*
Government	0.00412	0.004	-0.007	0.009	0.009	0.009	-0.006	0.009	-0.006	-0.008
consumption/GDP	(0.9484)	(0.913)	(0.841)	(0.809)	(0.805)	(0.810)	(0.858)	(0.796)	(0.869)	(0.816)
Growth rate of	-0.058	-0.058	-0.045	-0.048	-0.054	-0.084	-0.083	-0.097	-0.086	-0.081
population	(0.381)	(0.328)	(0.458)	(0.418)	(0.33)	(0.144)	(0.148)	(0.073)	(0.137)	(0.161)
Financial development	-0.001	-0.001	-0.045	-0.0002	-	-	-	-	-	-
indicator	(0.915)	(0.905)	(0.737)	(0.986)						
Growth rate of terms of	-0.115	-0.115	-0.932	-0.095	-0.088	-0.125	-0.111	-0.059	-0.108	-0.121
trade	(0.532)	(0.485)	(0.579)	(0.563)	(0.590)	(0.475)	(0.516)	(0.796)	(0.526)	(0.478)
Political instability	-0.007	-0.007	-0.002	-	-0.004	-	-	-	-	-
index	(0.879)	(0.865)	(0.959)		(0.925)					
Number of	0.102	0.102	0.122	0.130	0.130	0.067	0.068	0.103	0.076	0.065
assassinations	(0.609)	(0.56)	(0.504)	(0.466)	(0.466)	(0.714)	(0.711)	(0.55)	(0.679)	(0.724)
Number of political	0.014	0.014	0.011	0.013	0.013	0.014	0.014	0.010	0.076	0.015
revolution	(0.163)	(0.119)	(0.222)	(0.123)	(0.136)	(0.121)	(0.106)	(0.236)	(0.679)	(0.099)
Interaction : FDI and	-	-	-	-	-	-	-	-	-	-0.002
financial development										(0.811)
Interaction : FDI and									0.014	-
openness to trade	-	-	-	-	-	-	-	-	(0.116)	
Interaction : FDI and	-	-	-	-	-	-	-0.003	-	-	-
political rights index							(0.539)			
Interaction : FDI and	-	-	-	-	-	-	-	-0.382	-	-
GDP								(0.0003)*		
Interaction : FDI and	-	-	-	-	-	0.002	-	-	-	-
schooling						(0.863)				
Black market	-0.026	-0.026	-0.027	-0.022	-0.023	-0.022	-0.022	-0.022	-0.022	-0.022
premium	(0.089)	(0.058)**	(0.050)**	(0.115)	(0.094)	(0.123)	(0.123)	(0.104)	(0.123)	(0.124)
Interaction : FDI,	0.035	0.035	0.041	0.038	0.040	-	-	-	-	-
human capital and inst.	(0.033)**	(0.017)*	(0.006)*	(0.010)*	(0.006)*					
Openness to trade	-0.002	-0.002	-0.026	-	-	-	-	-	-	-

indicator	(0.195)	(0.148)	(0.203)	-	-	-	-	-	-	-
Fertility rate	0.001	0.001	-0.006	-0.008	-	-	-	-	-	-
	(0.987)	(0.986)	(0.927)	(0.899)						
Natural resources	0.0149	0.014	0.005	-	-	-	-	-	-	-
endowment	(0.512)	(0.464)	(0.779)							
Domestic investment	-	-	0.009	-	-	-	-	-	-	-
rate			(0.534)							
Civil liberties index	-	-	-	-	-0.001	-0.002	-0.002	-0.002	-0.002	-0.002
					(0.802)	(0.560)	(0.612)	(0.533)	(0.32)	(0.587)
Manufactured exports/	-	-	-	0.008	0.006	0.005	0.004	0.004	0.004	0,004
total exports				(0.39)	(0.460)	(0.575)	(0.589)	(0.587)	(0.98)	(0,595)
Constancy	-0.405	-0.405	-0.311	-0.336	-0.379	-0.324	-0.344	-0.349	-0.38	-0,320
	(0.050)**	(0.028)**	(0.089)	(0.070)	(0.023)**	(0.059)**	(0.049)**	(0.031)**	(0.51)**	(0,064)
Sub-Saharan Africa	-0.020	-0.020	-0.013	-0.004	-0.004	0.012	0.013	0.005	0.14	0,010
(Dummy)	(0.473)	(0.423)	(0.604)	(0.848)	(0.848)	(0.580)	(0.543)	(0.784)	(0.528)	(0.644)
R^2	0.32	0.32	0.32	0.31	0.30	0.25	0.25	0.34	0.25	0.25
Durbin-Watson	2.20	2.20	2.20	2.11	2.12	2.13	2.12	2.11	2.12	2.13
Number of observation	100	100	100	100	100	100	100	100	100	100

Notes: p-value in parentheses ** and * denote 1% and 5% levels of significance respectively

Table 3. Regression for the growth rate of real per capita GDP

Dependent variables : growth rate of real per capita GDP over 1965-75 and 1975-85 periods

Est. Method	(1) VI[3]	(2) GMM[4]	(3) VI	(4) GMM	(5) VI	(6) GMM	(7) VI	(8) GMM	(9) VI	(10) GMM
Constancy	-0.538	-0.296	-0.528	-0.377	-0.480	-0.299	-0.562	-0.350	-0.624	-0.371
	(0.107)	(0.186)	(0.112)	(0.089)	(0.145)	(0.159)	(0.091)	(0.108)	(0.061)	(0.126)
Log (GDP)	-0.015	-0.019	-0.017	-0.022	-0.010	-0.017	-0.016	-0.022	-0.015	-0.018
	(0.498)	(0.047)**	(0.398)	(0.023)**	(0.627)	(0.040)**	(0.431)	(0.016)*	(0.452)	(0.037)**
Male secondary and	-0.008	-0.017	-0.008	-0.019	-0.016	-0.025	-0.008	-0.020	-0.012	-0.017
high schooling	(0.706)	(0.148)	(0.663)	(0.133)	(0.482)	(0.095)	(0.682)	(0.124)	(0.565)	(0.090)
/GDP	-0.023	-0.016	-0.023	-0.023	-0.017	-0.013	-0.028	-0.020	-0.027	-0.024
	(0.557)	(0.351)	(0.538)	(0.157)	(0.628)	(0.358)	(0.452)	(0.222)	(0.465)	(0.114)
Log (life expectancy)	0.376	0.260	0.374	0.307	0.362	0.278	0.389	0.297	0.421	0.292
	(0.029)**	(0.068)	(0.028)**	(0.029)**	(0.035)**	(0.038)**	(0.022)**	(0.032)**	(0.016)*	(0.047)**
Political rights index	0.004	0.002	0.005	0.006	0.003	0.003	0.005	0.006	0.005	0.002
	(0.645)	(0.701)	(0.603)	(0.415)	(0.711)	(0.598)	(0.627)	(0.412)	(0.604)	(0.730)
Inflation rate	-0.096	-0.078	-0.106	-0.098	-0.100	-0.084	-0.101	-0.087	-0.093	-0.074
	(0.437)	(0.169)	(0.363)	(0.104)	(0.404)	(0.172)	(0.403)	(0.158)	(0.4218)	(0.095)
Government	-0.078	-0.076	-0.065	-0.082	-0.084	-0.074	-0.074	-0.080	-0.055	-0.054
consumption/GDP	(0.645)	(0.407)	(0.690)	(0.442)	(0.623)	(0.464)	(0.656)	(0.433)	(0.735)	(0.440)
Financial	0.015	0.009	0.017	0.015	0.010	0.006	0.017	0.0139	0.012	0.002
development indicat.	(0.511)	(0.293)	(0.476)	(0.119)	(0.656)	(0.410)	(0.450)	(0.118)	(0.601)	(0.742)
Growth rate of terms	-0.607	-0.338	-0.489	-0.332	-0.710	-0.531	-0.566	0.385	-0.372	-0.066
of trade	(0.354)	(0.238)	(0.425)	(0.321)	(0.288)	(0.149)	(0.364)	(0.239)	(0.517)	(0.818)
Black market	-0.078	-0.047	-0.077	-0.054	-0.080	-0.054	-0.070	-0.050	-0.082	-0.038
premium	(0.107)	(0.044)**	(0.114)	(0.067)	(0.106)	(0.043)**	(0.141)	(0.064)	(0.095)	(0.092)
Fertility rate	-0.055	-0.077	-0.058	-0.082	-0.081	-0.098	-0.052	-0.087	-0.035	-0.043
	(0.552)	(0.049)**	(0.520)	(0.075)	(0.386)	(0.043)**	(0.568)	(0.058)**	(0.694)	(0.205)
Interaction : FDI and	-	-	-	-	-	-	6.740	0.003	-	-
political rights index							(0.993)	(0.413)		
Interaction : FDI and	-	-	0.108	0.084	-	-	-	-	-	-
GDP			(0.390)	(0.091)						
Interaction : IDE et									0.017	0.0140
sector financier	-	-	-	-	-	-	-	-	(0.060)	(0.023)**
Interaction : FDI and	-	-	-		-0.025	-0.021	-	-	-	-
human capital				-	(0.252)	(0.099)				
Interaction : FDI, hu-	0.001	0.006	-	-	-	-	-	-	-	-

[3]Instrumental variable technique

[4] Generalized Method of Moment panel estimator

man capital institutio	(0.962)	(0.618)								
Manufactured	-0.021	-0.008	-0.024	-0.015	-0.024	-0.012	-0.023	-0.014	-0.025	-0.009
export/total exports	(0.362)	(0.560)	(0.461)	(0.415)	(0.465)	(0.501)	(0.484)	(0.418)	(0.448)	(0.528)
Sub-Saharan Africa	0.029	0.010	0.026	0.007	0.020	0.001	0.026	0.004	0.031	0.007
(Dummy)	(0.838)	(0.402	(0.422)	(0.585)	(0.520)	(0.928)	(0.435)	(0.769)	(0.326)	(0.545)
R^2	0.0076	0.16	0.031	0.12	0.008	0.12	0.023	0.13	0.064	0.17
Durbin-Watson	2.16	2.20	2.14	2.17	2.24	2.26	2.15	2.23	2.24	2.17
No of observations	100	100	100	100	100	100	100	100	100	100

Notes: p-value in parentheses ** and * denote 1% and 5% levels of significance respectively