FOREIGN DIRECT INVESTMENT AND NEIGHBOURING INFLUENCES

by

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Abstract

Countries that do not participate in the process of globalisation, or those having inferior or inadequate policies compared to developed or other developing countries, run the risk of becoming comparatively less competitive in the global economy.

With the goals set out in the United Nations Millennium Declaration and NEPAD initiatives, and given the advantages of foreign direct investment (FDI) to developing countries, the aim of this study is to evaluate the influences of a number of economic and socio-political determinants of a host country in attracting FDI. It also includes an assessment of the influences of neighbouring countries on the host country's FDI attractiveness. Panel data econometric tools are used in the estimation and evaluation of empirical results. Three groups, consisting of developed, emerging and African countries are evaluated, with the main emphasis on African countries. Results, in general, indicate that an improvement in civil liberties and political rights, improved infrastructure, higher growth rates and a higher degree of openness of the host country, lead to increases in FDI; higher levels of human capital attract FDI to the developed countries but deter FDI in emerging and African countries – indicating cheap labour as a determinant of FDI. Oil-endowed countries in Africa's attract more FDI than non-oil endowed countries – emphasising the importance of natural resources in Africa.

Empirical results of the influences of neighbouring countries on the host country's FDI show that, if civil liberties and political rights of neighbouring countries in the developed and emerging country sample worsen, the FDI in the host country improves. However, the opposite is true in the African sample – if civil liberties and political risk in the neighbouring countries worsen, host country's FDI decreases.

In reaching higher levels of sustainable growth, poverty reduction, improved living standards and sustainable investment, policy recommendations need to emphasise the responsibility of African countries in boosting long-term confidence in their economies. This can be done through a number of policies aimed at stabilisation and privatisation. Neighbouring countries also need to strive towards stability in their own countries and thereby improving regional FDI attractiveness.

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LIST OF ABBREVIATIONS

BOP	Balance of Payment
CPI	Consumer Price Index
DF	Dickey-Fuller
ECI	Entry Concentration Index
EU	European Union
FDI	Foreign Direct Investment
FH	Freedom House
FP	Factors of production
GFS	Government Financial Statistics
GDP	Gross Domestic Product
GLS	Generalised Least Squares
GNP	Gross National Product
ICRG	International Country Risk Guide
IFS	International Financial Statistics
IICRI	Institutional Investors Credit Rating Index
IMF	International Monetary Fund
IPS	Im, Pasaran and Shin
LOS	Level of significance
LSDV	Least Square Dummy Variable
M&As	Mergers and acquisitions
MNEs	Multinational Enterprises
MW	Maddala-Wu
OLS	Ordinary least squares
OIC	Ownership, internalisation and locational advantages
PIT	Personal income tax
PP	Phillips-Perron
PSSI	Political System Stability Index
R	Rand
R&D	Research and development
SSA	Sub-Saharan Africa
SUR	Seemingly Unrelated Regression
TR	Total revenue
TC	Total cost
TNCs	Transnational corporations
UNCTAD	United Nations Conference on Trade and Development
US$	United States Dollar
WDI	World Development Index
WIR	World Investment Report
WOS	Wholly owned subsidiary
WPRF	World Political Risk Forecast

CHAPTER 1

INTRODUCTION AND BACKGROUND

1.1   INTRODUCTION

Countries that do not participate in the process of globalisation, or those having inferior or inadequate policies compared to developed or other developing countries, run the risk of becoming comparatively less competitive in the global economy. It is argued by the World Bank, amongst others, that those countries that integrate faster into the global economy exhibit faster economic growth and *vice versa* (Abugre, 1997). It is further stated in the United Nations' Millennium Declaration (2000: 5) that UN members resolve: "To halve, by the year 2015, the proportion of the world's people whose income is less than one dollar a day…". However it is estimated that if Africa wants to reduce the number of people living in poverty by 50 per cent by 2015, and thereby achieve the same quality of life as other developing countries, a sustained annual growth rate of above 7 per cent per annum[1] is needed and a resource gap of US$64 billion needs to be breached (Abugre, 1997 and Asiedu, 2004: 41). To reach the goal of faster sustainable growth, poverty reduction, improved living standards and sustainable investment, international confidence in the economies of Africa needs to be boosted.

Over the last decade there has been renewed interest in foreign direct investment[2] (FDI), due to the changing global economic and political environment. FDI is seen as a means of financing development and of transferring skills, knowledge and technology between regions and countries. It improves the general welfare of the population by providing employment opportunities, improving trade and accelerating growth and development (Asiedu, 2001: 107). As a result of this, the UN's Millennium Declaration also focuses on increased flows of FDI when stating: "To take special measures to address the challenges of poverty eradication and sustainable development…" in meeting the special needs of Africa. Increasing private

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[1]   The millennium declaration was adopted by the United Nations in September 2000 (Asiedu, 2004: 41).
[2]   Foreign direct investment is defined by *United Nations Conference on Trade and Development* (UNCTAD) as an investment involving management control of a resident entity in one economy by an enterprise resident in another economy. FDI involves a long-term relationship reflecting an investor's lasting interest in a foreign entity.

flows to Africa, as a way to help to overcome the region's resource gap, is also emphasised by the New Partnership for Africa's Development (NEPAD)[3] (Harsch, 2003: 12).

By studying the trends and determinants of FDI as presented in theories, hypotheses, schools of thought and empirical studies, the factors influencing the occurrence of FDI and who the recipients are, can be examined. Such a study assists in the investigation of where FDI is expected to flow and how it is possible for Transnational Corporations (TNCs)[4] to compete in foreign markets. Finally, the challenge for African policy-makers is to direct economic policy to attract increased FDI which will support the resurgence of the African continent.

1.2   OBJECTIVE, MOTIVATION AND RESEARCH METHODOLOGY

The primary objective of this study is to identify the determinants of FDI and in turn empirically test these by making use of panel econometric techniques. This is done with a view to providing a tool for enhancing policy in Africa with regards to FDI which would in turn increase Africa's FDI attractiveness. A further objective is to test neighbouring influences on host[5] country FDI flows.

The methodology of this study comprises:

(i)   An analysis of the trends of FDI flows, regional disaggregation of FDI and an investigation into the socio-economic environment of Africa as a determinant for attracting FDI.

(ii)   An investigation of the theories and case studies on FDI to establish the determinants and hypotheses regarding signs and magnitudes of coefficients as well as functional forms of relationships that influence FDI.

(iii)   The application of panel econometric techniques to estimate the influence of country-specific as well as neighbouring country influences on FDI. The technique is applied on developing, emerging and African countries.

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3   NEPAD is the main development framework for the African continent and was adopted in 2001.
4   The term TNC will be used on a generic basis, which is the term often used in United Nations publications. This could however be substituted with Multinational Corporations (MNCs) or Multinational Enterprises (MNEs)
5   The host country is defined as the country where the foreign affiliates of the corresponding firm are located, while the home country of a TNC is the country where its headquarters are located.

(iv)   An evaluation and comparison of African countries according to the criteria of determinants of FDI as well as the identification of a set of policy recommendations to improve Africa's share of FDI flows.

1.3   CONTRIBUTION OF THIS STUDY

The majority of studies on FDI flows only investigate certain regions or the determinants between certain groups of countries. Ancharaz (2003: 3) mentions that, although the literature on the empirical determinants of FDI flows in developing countries is wide and varied, the empirical work has not directly and fully addressed the question of FDI-bias against sub-Saharan Africa. However, some recent studies (Asiedu, 2003; Ancharaz, 2003 and Lemi and Asefa, 2003) cast some light on FDI in sub-Saharan Africa.

The first contribution made by this study is the estimation and comparison of empirical results for different homogeneous groups of countries or panels – namely a developed country sample, a sample consisting of emerging countries and an African country sample. The second contribution is the empirical estimation of neighbouring influences on the host country, for attracting FDI.

1.4   OUTLINE OF THE STUDY

The study is divided into four sections: (1) FDI trends and magnitudes; (2) theories and case studies on FDI; (3) empirical estimation of determinants of FDI and (4) policy implications. The first section is covered in chapter 2, while chapters 3 and 4 deal with the theories and case studies on FDI. In chapter 5 the data sources and characteristics are discussed. Empirically estimated results, using panel econometric methods, are presented in chapters 6 and 7. Policy recommendations for improved FDI flows are discussed in chapter 8 and in chapter 9 a summary is given and conclusions are drawn.

In chapter 2 an understanding of the environment of FDI is presented, with specific reference to the flow of FDI to different regions. Special emphasis is placed on the flow of FDI to Africa and the role of socio-economic status of African countries in attracting FDI is also examined.

In chapter 3 the theories, hypotheses and schools of thought that contribute to providing a fundamental motivation for the direction and magnitude of FDI flows are summarised. However it is asserted that these theories lack a framework for guiding empirical work on FDI.

Chapter 4 investigates the conflicting empirical literature relating to the determinants of FDI flows. It builds on the discussion of the theories in chapter 3 and investigates how these theories have been applied in empirical research. It guides expectations of signs, magnitudes and economic significance of the explanatory variables.

Chapter 5 provides an exposition of the data used in the empirical estimation, as well as a discussion of the panel econometric techniques being employed. It also includes selection criteria for the models, data and countries used. The estimation results of the different samples for the host country determinants of FDI are discussed and compared in chapter 6. The estimation results for the neighbouring influences are discussed in chapter 7.

Chapter 8 presents FDI criteria for African countries, based on the relevant theories and the empirically validated determinants of FDI. Policy recommendations are finally made to increase the levels of FDI flows to African countries.

The study concludes with a summary and set of final remarks provided in chapter 9.

CHAPTER 2

THE INTERNATIONAL ENVIRONMENT FOR FOREIGN DIRECT INVESTMENT AND REGIONAL DISAGGREGATION

2.1   INTRODUCTION

Foreign direct investment contributes to economic growth by providing additional capital and skills, by reducing the share of risks in large projects and by serving as a vehicle for introducing new technology to a country. Given the nature of foreign direct investment (FDI), it can also create a stable environment and platform for long-term economic growth and job creation (Ancharaz, 2003: 2). Developing countries are increasingly aware of the role of FDI as an engine of growth and are progressively seeking ways to attract larger volumes of FDI flow to their economies. However, a number of factors are hindering these countries from accomplishing their full FDI potential.

The purpose of this chapter is to explain the international and regional environment for FDI, with specific reference to the role of Transnational Corporations (TNCs) and the flow of FDI to different regions. The emphasis is placed on Africa's ability and potential for attracting FDI.

In the first part of the chapter the international environment for FDI, the role of globalisation and the role of TNCs are investigated. In the second section, FDI flows to the different regions in the world are discussed. This is followed by a more in-depth investigation of the flows to Africa. In the third section, Africa's proportion of FDI flows to total FDI flows, as well as relative FDI flows to different African countries is investigated. In the fourth section reasons why African countries do not attract larger volumes of FDI are investigated. The final section presents industries attracting the most FDI.

2.2   THE INTERNATIONAL ENVIRONMENT FOR FOREIGN DIRECT INVESTMENT

2.2.1   Globalisation and foreign direct investment

Globalisation involves a geographical shift of domestic economic activity to other regions around the world. It is multidimensional, affecting all aspects of life, including economic,

cultural, social and environmental activities, as well as relations between governments, private enterprises and nations within countries. Economists, such as Frankel (2000: 2), view globalisation as being one of the most powerful forces to have shaped the world economy during the past 50 years. Globalisation is characterized by a reduction of barriers between countries, with intensified cross-border trade and increased financial and FDI flows. This *borderless world* is typically referred to as the *global village* where distance and space disappear and in which a single community and a common pool of resources exist (Daouas, 2001: 1 and Loots, 2001: 2).

The process of globalisation of production and liberalisation of trade has paradoxical implications: to participants, it promises new opportunities of growth in trade and international investment that can result in improving living standards, job creation and economic growth, and it enables participating countries to play a more active role in the world economy. However, it has also increased the complexity and challenges involved in interdependence. It has heightened the risk of instability, marginalisation and the risk for a number of countries, especially African countries, of being left even further behind (Daouas, 2001: 1 and UNCTAD, 1996). Although the increased mobility of production and regional arrangements have raised the prospects of considerable gains in productivity and wealth creation in all regions, intensified cross-border mergers and acquisitions (M&As) (the main stimulus behind FDI) remain concentrated in developed countries.

2.2.2   The role of Transnational Corporations

Globalisation is characterised by increasingly intensified cross-border trade and increases in investment activities and cross-border M&As by TNCs[6]. This global expansion of trade and investment flows is driven by nearly 64 000 TNCs controlling almost 870 000 foreign affiliates (World Investment Report, 2003: 23)[7]. TNCs seek markets in which they can invest their capital for the purpose of profit maximization and developing countries play an increasingly important role in providing these markets for the TNCs. The challenge for

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[6]   According to UNCTAD's (2001) definition, a TNC is an enterprise that controls assets of other entities in economies other than its home economy, usually by owning a certain capital stake. An equity stake of 10 per cent or more of the ordinary shares or voting power for an incorporated enterprise, or the equivalent for an unincorporated enterprise, is normally considered a threshold for the control of assets.

[7]   Cross-border M&As fell by 48 per cent in 2001and by another 38 per cent in 2002. The share of cross-border M&A deals fell from 80 per cent of total FDI flows in 2001 to 55 per cent in 2002 (World Investment Report 2003: 28).

countries receiving FDI is to ensure that the positive impact of FDI is maximised through transfers of technology, managerial skills, improved linkages to the domestic economy and enhanced access to international financial and export markets (UNCTAD, 1996).

In 1997 the top 500 TNCs accounted for about two-thirds of world trade and the total income of the 10 largest TNCs was larger than that of the world's poorest 100 countries (World Investment Report, 1998). In 2001 TNCs accounted for one tenth of world gross domestic product (GDP) and one third of world exports and they employed about 54 million people (World Investment Report, 2002). Coca-Cola for example, is the largest private employer in Africa (The Economist, 2004: 12). Due to the size and the influence of TNCs in the world economy, they offer host countries several advantages (Lall, 2003: 329):

(i)   Capital that is brought into a country through FDI is much more stable and easier to service than commercial debt or portfolio investment.

(ii)   The projects that TNCs invest in are usually long-term in nature, resulting in TNCs taking risks and repatriating profits only when the projects yield returns.

(iii)   Developing countries tend to lag developed countries in the use of technology and their efficiency in using the available technology is to a large degree relatively low. However, TNCs can bring modern technology into developing countries and thus raise efficiency and productivity.

(iv)   TNCs possess advanced skills and can transfer these to host countries by bringing in expertise and setting up training facilities.

(v)   TNCs can provide market access to export markets, both for existing and new activities.

(vi)   TNCs often possess advanced environmental technologies and can use them in all countries in which they operate.

2.3   INFLOW OF FOREIGN DIRECT INVESTMENT AND REGIONAL DISAGGREGATION

2.3.1   Total external resource flows

FDI flows have remained the largest section of net resource flow to developing and African countries in the last several years. Even though FDI inflows can be volatile, they fluctuate less than portfolio flows and commercial bank loans as measured by the relative variance of these variables (World Investment Report, 2003). This is emphasised in figures 2.1 and 2.2

where commercial bank loans, portfolio flows, FDI inflows and official flows to developing and African countries respectively, are shown. These figures point out the increasing importance of FDI to developing countries and the decreasing share of commercial bank loans as well as portfolio and official flows between 1990 and 2002.

Figure 2.1   Total external resource flows to developing countries, by type of inflow, 1990 to 2002
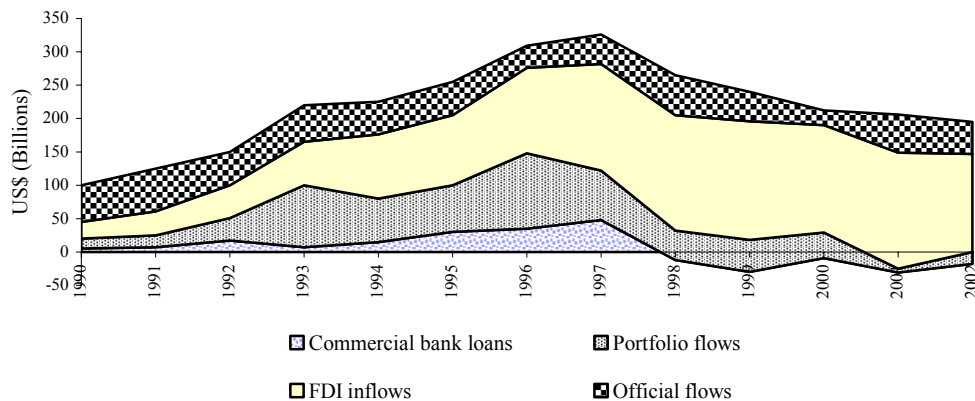
Source: World Investment Report, 2003: 4

Figure 2.2   Total external resource inflows to Africa, by type of inflow, 1990 to 2002
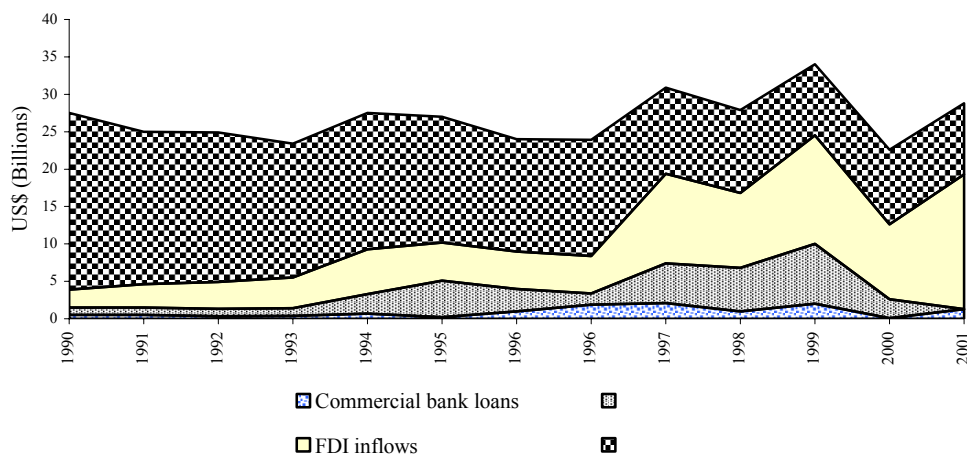
Source: World Investment Report, 2003: 35

2.3.2   Global inflow of foreign direct investment

World FDI flows increased steadily in recent years to reach a peak of US$1 393 billion in 2000[8] (figure 2.3). Table 2.1 presents the actual values in billions of US dollars from 1991 to

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[8]   This increase was faster than other economic aggregates like world production, capital formation and trade (World Investment Report, 2001).

2002 as well as the percentage contribution of each major region or country. However, the expected surge of FDI in developing countries and in particular the least developed countries on the African continent, has not occurred. FDI inflows to developed countries increased to US$1 120.53 billion in 2000, but dropped to lower levels in 2001 and 2002.

Figure 2.3   **FDI inflows for selected regions from 1991 to 2002 expressed in billions of US dollar**
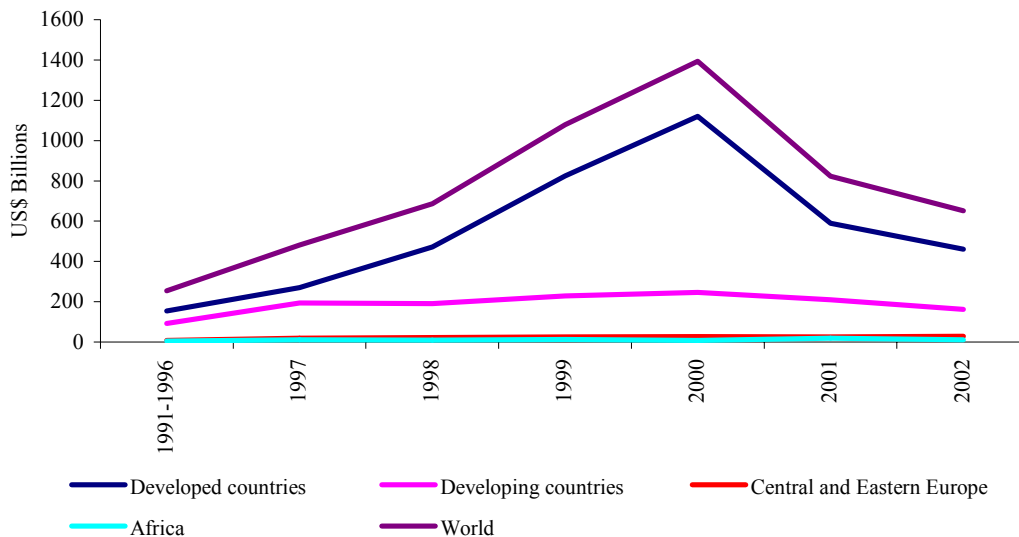
Source: World Investment Report, 2003

FDI flows to developing countries rose in 2000, reaching a record of US$246 billion, followed by a decline in 2001 to US$209 billion and a further decline in 2002 to US$162.15 billion. Africa experienced the steepest decline of any region in 2002: 41 per cent – from US$18.8 billion in 2001 to US$11 billion in 2002[9].

The global decline of FDI, after the peak in 2000, was the most significant downturn in the past three decades and was a response to weak world economic growth, tumbling stock markets and institutional factors such as the winding down of privatisation in several countries[10] (World Investment Report, 2003: 3).

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[9]   The decrease from 2001 to 2002 was the result of abnormal large inflows to South Africa and Morocco during 2001. This is illustrated further in figure 2.6 on p 13.

[10]   According to UNCTAD (World Investment Report, 2003: 17) the increase in profit of a third of the 100 largest TNCs was only 2 per cent in 2002, down from 7 per cent in the late 1990s.

Table 2.1   FDI flows to major regions between 1991 and 2002

Region/Country	(Billions of US dollars) FDI flows							(Percentages) Percentages of FDI flows						
	1991-1996 (Annual average)	1997	1998	1999	2000	2001	2002	1991-1996 (Annual average)	1997	1998	1999	2000	2001	2002
Developed countries	**154.6**	**269.7**	**472.3**	**824.6**	**1120.5**	**589.4**	**460.3**	**60.8**	**56.0**	**68.8**	**76.4**	**80.4**	**71.5**	**70.7**
Western Europe	91.0	139.3	263.0	496.2	709.9	400.8	384.4	35.8	28.9	38.3	46.0	51.0	48.7	59.0
European Union	87.6	127.9	249.9	475.5	683.9	389.4	374.4	34.4	26.5	36.4	44.1	49.1	47.3	57.5
Other Western Europe	3.5	11.4	13.1	20.7	26.0	11.4	10.0	1.4	2.4	1.9	1.9	1.9	1.4	1.5
Japan	0.9	3.2	3.2	12.7	8.3	6.2	9.3	0.3	0.7	0.5	1.2	0.6	0.8	1.4
United States	46.8	103.4	174.4	283.4	314.0	144.0	30.0	18.4	21.5	25.4	26.3	22.5	17.5	4.6
Developing countries and economies	**91.5**	**193.2**	**191.3**	**229.3**	**246.1**	**209.4**	**162.2**	**36.0**	**40.1**	**27.9**	**21.2**	**17.7**	**25.4**	**24.9**
Africa	4.6	10.7	8.9	12.2	8.5	18.8	11.0	1.8	2.2	1.3	1.1	0.6	2.3	1.7
Latin America and the Caribbean	27.1	73.3	82.0	108.3	95.4	83.7	56.0	10.6	15.2	12.0	10.0	6.8	10.2	8.6
Asia and the Pacific	59.8	109.3	100.3	108.8	142.2	106.9	95.1	23.5	22.7	14.6	10.1	10.2	13.0	14.6
Central and Eastern Europe	**8.2**	**19.0**	**22.5**	**25.2**	**26.4**	**25.0**	**28.7**	**3.2**	**3.9**	**3.3**	**2.3**	**1.9**	**3.0**	**4.4**
World	**254.3**	**481.9**	**686.0**	**1079.1**	**1393.0**	**823.8**	**651.2**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source : UNCTAD, World Investment Report, 2003

The share of flows to Africa increased in 2001 to US$18.8 billion or 2.3 per cent as a share of global FDI inflows, but declined again in 2002 to 1.7 per cent or US$11 billion (see figure 2.4 and table 2.1). In 2002 the European Union (EU) had the largest percentage of FDI flows equal to 58 per cent, followed by the Asian and Pacific region with 14.7 per cent[11].

Figure 2.4   FDI inflow in 2002 to 8 selected regions
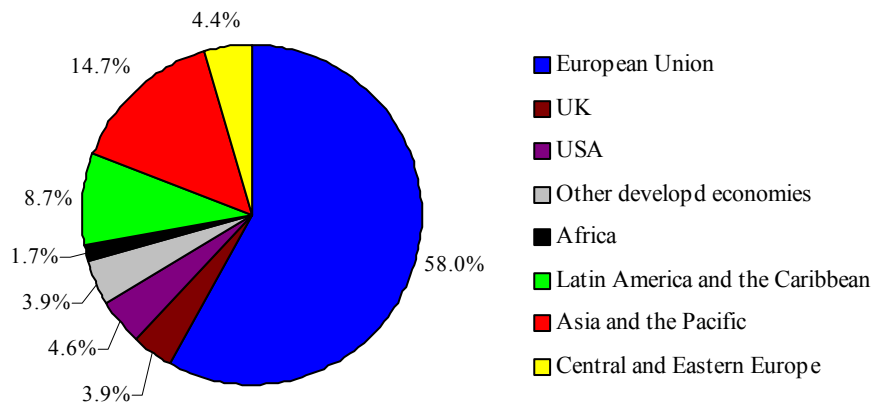
Source: Data from the World Development Indicators, 2003

The small amounts of FDI flows to Africa have to be viewed relative to the small market size of these countries. The total GDP of African countries made up 3 per cent of world GDP in 2003[12]. If FDI flows are standardised by taking market size into account (UNCTAD measure this as the FDI inflows per US$1000 of GDP), the African region compares considerably better with other regions[13]. This is presented in figure 2.5 which shows that during the 1980s, and for a number of periods in the 1990s, the weighted FDI flow to Africa was on par with the rest of the world. However, compared to the rest of the regions, the standardized FDI measure for Africa decreased from 1999 to 2000, resulting in a widening of the gap between Africa and other regions from 1992.

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[11] This also includes China where FDI inflows in 2002 increased to US$ 52.7 billion or 8 per cent of the world total.

[12] World Bank figures are used to calculate Africa's share in world GDP. If South Africa is excluded, this figure drops to 2.57 per cent.

[13] The *Inward FDI Performance index ranking* from UNCTAD (2003) (based on FDI per GDP) show a number of African countries ranked in the top 50, with Angola 2nd, Congo 16th, Mozambique 24th, Namibia 34th, United Republic of Tanzania 40th, Morocco 46th (out of 140 countries for the average for 1999 to 2001). None of the African countries, however, are ranked in the top 50 places, looking at the *Inward FDI Potential index ranking* of UNCTAD. The best performers are Botswana, ranked 59th, Egypt 70th, South Africa 72nd, Tunisia 73rd, and Gabon 77th.

Figure 2.5   FDI inflows per US$1000 of GDP, 1980 to 2000
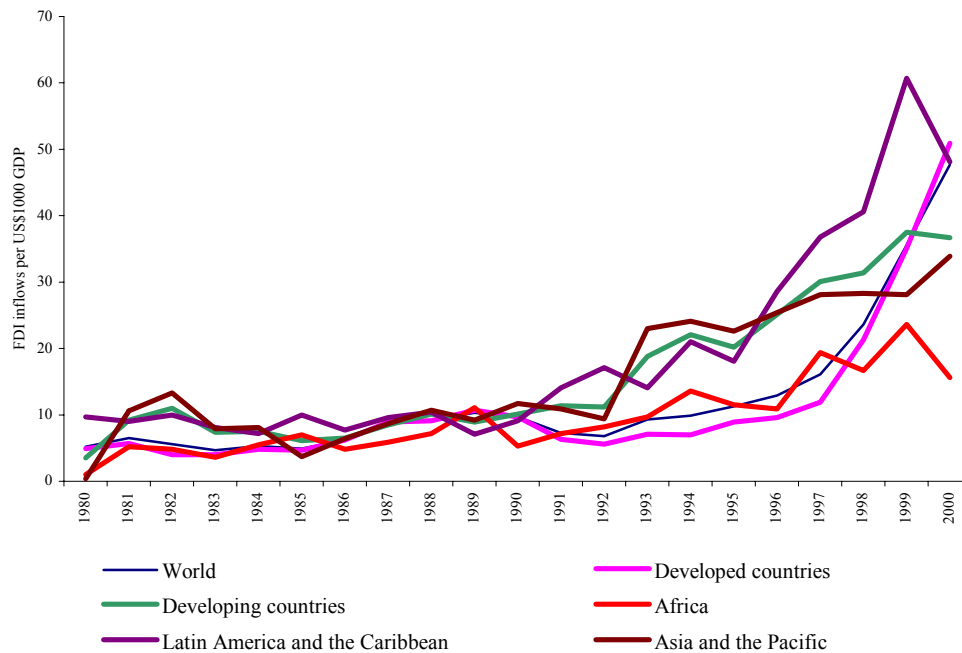
Source: World Investment Report, 2003

2.3.3   Foreign direct investment flows to Africa

The big surge in FDI worldwide has largely bypassed sub-Saharan Africa (SSA). Between 1997 and 2000, SSA annually received less than one per cent of world FDI inflows. A large disparity also exists between the recipients of FDI among African host countries. In 1997 for example, 55 per cent of FDI flows to Africa went to three recipients: Nigeria, South Africa and Egypt (Ancharaz, 2003: 1). In 2002 flows to Africa remained mainly concentrated in Algeria, Angola, Chad, Nigeria, Tunisia and South Africa, accounting for more than 55 per cent of total flows. This is highlighted in figure 2.6 which shows the top 10 recipient countries of FDI (on the basis of the 2002 ranking of FDI inflows) that accounted for more than 75 per cent of total inflows to Africa[14].

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[14]   See appendix 1 for a more detailed presentation of FDI inflows to African countries as well as GDP weighted inflows.

Figure 2.6   FDI inflows to Africa, top 10 countries, 2000, 2001 and 2002[15]
(Billions of US dollars)
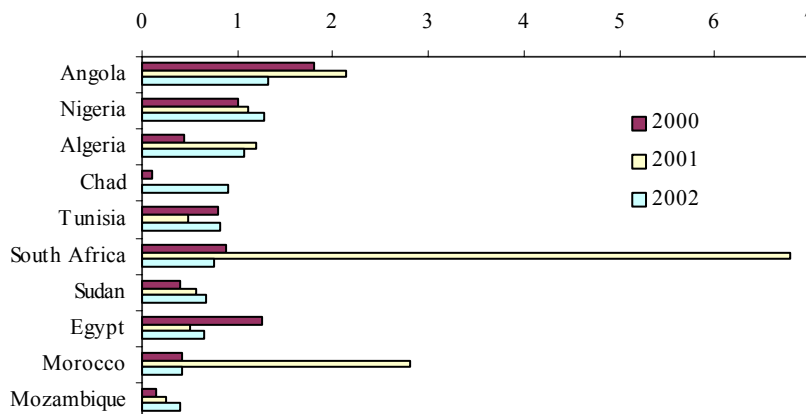
Source: World Investment Report (2002, 2003).
Note: FDI inflow to South Africa in 2001 accounted for more than 36 per cent of total African inflows and was mainly as a result of two cross-border M&As.

According to Ancharaz (2003), the global downturn in FDI in 2002 may be short lived, especially with national efforts and policies to promote FDI and ongoing trade and investment initiatives by the US, EU and Japan. In recent years some parts of Africa have seen significant improvements in the conditions governing FDI such as economic reform, democratisation, privatisation, greater peace and political stability. However, Africa's ability to attract increasing levels of FDI in future will depend on African countries' success in pursuing policies that stimulate domestic economic growth and encourage sustainable flows of FDI (World Investment Report, 2003: 34).

2.4   THE ENVIRONMENT FOR FOREIGN DIRECT INVESTMENT IN AFRICA

In the 1960s Africa's future looked bright: during the first half of the century some African countries had grown considerably more rapidly than Asia. However, during the 1970s both political and economic matters in Africa deteriorated. The leadership of many African nations hardened into autocracy and dictatorship. Since 1980 aggregate per capita GDP in most sub-Saharan African countries has declined: 32 countries were poorer in 1999 than in 1980 (Collier and Gunning, 1999b: 3).

Investment rating services list Africa as the riskiest region in the world. As a result of this, investors show little confidence in investing in Africa. Potential investors disregard the

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[15]   Ranked on the basis of the magnitude of 2002 FDI flows.

African continent as a location for investment. This is due to the negative image of the region as a whole that conceals the complex diversity of economic performance and the existence of investment opportunities in individual countries[16]. Due to the fact that Africa's performance has been markedly worse than that of other regions, these countries find it more difficult to compete in the global process of trade and investment (UNCTAD, 1999). Analysis of global risk ratings shows that while their economic performances are largely explicable in terms of economic fundamentals, Africa as a whole is rated as significantly more risky than is warranted by these fundamentals (Collier and Gunning, 1999a: 20). *The Economist* (Summers, 2000: 345) also recently dubbed Africa "the hopeless continent".

According to UNCTAD the decline in FDI flows to Africa and the poor response by TNCs to Africa's effort to attract FDI, is because "Africa as a whole does not compare favourable with regards to a number of basic determinants of FDI". These determinants include a stable political environment, the size of markets and per capita income, the rate and prospects for economic growth, infrastructure and the overhang of indebtedness. It is also said that Africa has lacked the "driving force" of FDI in other regions, such as debt equity swaps linked to privatisation (ways of subsidising FDI), broad privatisation of firms and the absence of, or poorly developed, capital markets to attract portfolio capital (Aburge, 1997).

Collier and Gunning (1999b) give six reasons[17] for low endogenous growth performance in Africa:

(i)   A lack of social capital in the case of the government as well as the community. Civic social capital is the economic benefit that accrues from social interaction and can arise from building trust. It lowers transaction cost from the knowledge externalities of social networks and from enhanced capacity for accumulated action. Public social capital consists of the institutions of government that facilitate private activity, such as courts. They argue that African governments have behaved in ways that are damaging to the long-term interests of the majority of their populations because they serve narrow constituencies (*op*. c*it*.: 65).

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[16] The UN Economic Commission for Africa (The Economist, 2004: 12) calculates that for Africa as a whole, including North Africa, the average return on FDI is four times that of the G-7 countries and twice as high as in Asia. (According to The Economist this is partly because the continent is considered so risky that investors will sink money only into ventures that promise big and quick profits).

[17] According to them, these are the six main reasons and they strengthen their arguments by including numerous comparisons and statistics. Some of these will be discussed in chapter 8, when a comparison is made between Africa and other regions and policy issues are discussed.

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(ii)   A lack of openness to trade. In the 1980s, Africa had the highest trade restrictions and became even less open than other regions (*op*. c*it*.: 69).

(iii)   The existence of deficient public services. Restrictive trade policies adversely affect public service delivery, thereby lowering the return on public sector projects. Public services have also worsened, due to a lack of civic social capital. This lack of efficient public services also includes a lack of productive spending on health and education (*op*. c*it*.: 70).

(iv)   Geography does not lend itself in a natural way to economic growth and thus increases risk. Africa is distinctive with respect to climate, location and comparative advantage. One third of the continent is too dry for rain-fed agriculture and sub-Saharan Africa is predominantly tropical, with diseases like malaria (*op*. c*it*.: 72).

(v)   Africa has much less financial depth than other developing regions, measured in terms of $\dfrac{M_2}{GDP}$ or $\dfrac{M_2}{M_0}$, where M_2 and M_0 are a broad and the narrow definition of money supply respectively and *GDP* is gross domestic product. According to Collier and Gunning (*op*. c*it*.: 74), low holdings of currency are probably attributable to the large share of the subsistence economy.

(vi)   Africa has a high dependency on aid. In 1997, aid as a percentage of gross national product (GNP) was nearly five times larger (12.4 per cent), as opposed to 2.7 per cent in 1994 and has therefore exerted a powerful effect on African growth (*op*. c*it*.: 74).

2.5   INDUSTRIES ATTRACTING FOREIGN DIRECT INVESTMENT

The rapidly changing international environment is shifting the drivers of FDI. The main traditional factors like markets, the possession of natural resources and access to low-cost unskilled labour, remain relevant, but they are diminishing in importance – particularly for the most dynamic industries and functions (World Investment Report, 2001). As trade barriers are reduced and regional links grow, the significance of many national markets also diminishes. During the past 10 years, services have become more important in international production. In many service industries and some manufacturing industries, where proximity to consumers is important, FDI tends to be spread relatively widely. The more advanced the level of technology in an industry, the higher the level of concentration tends to be. Latter industries include biotechnology and the producers of semiconductors and automobiles that

tend to cluster mainly in Europe and North America in places like Silicon Valley, California, Silicon Fen, Cambridge and Wireless Valley, Stockholm, that have a distinct advantage in attracting (high-value) FDI (*op. cit.*, 2001).

The shift away from the traditional factors driving FDI, such as natural resources, has immense implications for Africa in its striving to increase its share of FDI flows – given Africa's abundant natural resources and high level of dependence on these natural resources. According to UNCTAD (World Investment Report, 2003: 36), this is changing. Recent research conducted in Botswana, Egypt, Ethiopia, Ghana, Lesotho, Mauritius, the United Republic of Tanzania and Uganda has shown that all of these countries are keen to attract FDI in manufacturing. They are also targeting FDI in services exports, including financial, business and professional services for their regions, as well as international information and telecommunication opportunities. Most of the countries have sound FDI-specific standards, but much work needs to be done on general regulatory and fiscal measures for business. Recent efforts to attract FDI in labour-intensive manufacturing for exports and new opportunities for FDI in services have highlighted that:

(i)   Fiscal regimes are not internationally competitive when these countries seek export-oriented business.

(ii)   Good labour regulation, especially an effective industrial dispute resolution framework is lacking.

(iii)   Outdated work and resident permit systems exist and the process of obtaining entry and work permits for expatriates are lengthy, cumbersome and non-transparent.

2.6   CONCLUSION

Globalisation has been one of the major driving forces behind world growth and wealth creation in recent years and has raised the prospects of considerable gains in productivity and wealth creation in all regions. FDI, together with TNCs, play an increasingly important role in providing capital and skills needed, creating markets for exports, sharing risks and transferring technology that is needed to create stable environments for long-term economic growth and employment creation. Developing countries are increasingly aware of the role of FDI as an engine of growth in their economies, and are progressively looking to attract larger volumes of flows to their economies. However, a number of factors still hinder the process.

FDI flows to developing countries and especially Africa are low in absolute terms and unevenly spread. However, if these flows are weighed against the small GDPs of the countries, African countries perform relatively well compared to the rest.

Reasons for low FDI inflows (and small GDP) in African countries include: a lack of social capital, a lack of openness to trade, deficient public services, geography and risks involved, lack of financial depth and high financial-aid dependency.

To worsen the situation in Africa, the international environment for FDI is changing from focusing on traditional factors, like natural resources, to FDI which is aimed at more advanced levels of technology. This has huge implications for Africa which is largely dependent on primary activities and natural recourses.

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CHAPTER 3

THEORIES, HYPOTHESES AND SCHOOLS OF THOUGHT

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3.1   INTRODUCTION

In understanding foreign direct investment (FDI) flows, it is important to recognise the fundamental motivation for a firm or Transnational Corporation (TNC) when investing in another country, rather than exporting its products to that country or selling licenses to the foreign country's firms to perform the business on its behalf.

The purpose of this chapter is to present a summary of the relevant theories, hypotheses and schools of thought that contribute to the understanding and fundamental motivation of FDI flows. A study of these theories will assist in selecting appropriate data series (or proxies); it will give an indication of the expected signs of explanatory variables and it will support arguments to be used in empirical estimation and discussion.

An attempt is made to classify theories not only according to micro and macro principles, but also according to theories of industrial organisation, theories of firms, theories of location and theories of FDI. This classification addresses the questions of *why* FDI is taking place, *where* it is destined to go, *how* it is possible for TNCs to compete successfully in foreign locations and *who* the recipients of FDI are. The first section discusses the classification of FDI and it is followed by a summary of theories of FDI in table format.

3.2   HISTORIC DEVELOPMENT AND CLASSIFICATION OF THEORIES ON FOREIGN DIRECT INVESTMENT

3.2.1   Historical development of theories on foreign direct investment

Dunning (2002: 2) mentions that in the first half of the period 1900 to 2000, most mainstream theories focussed only on explaining particular types of FDI in a positivistic manner (rather than using integrated approaches). Their units of analysis differed – some schools of thought were concerned with the behaviour of the firm or groups of firms (micro analysis) and other schools were concerned with the behaviour of countries (macro oriented).

The second half of the period, 1900 to 2000, saw the introduction of more holistic theories or paradigms of FDI, but partial explanations continued to develop. In the latter part of the 1980s and 1990s more attention was given by trade economists to incorporating variables of foreign-owned production into their models. During this period, renewed interest in FDI as a financial phenomenon and its relationship with foreign portfolio investment developed (Dunning, 2002). However, Chakrabarti (2003: 149) states that the absence of a theoretical framework to guide empirical work on FDI is rather conspicuous.

3.2.2   Classification of theories on foreign direct investment

In studying the theoretical literature on FDI, two factors seem to dominate the debate. One is that no single generally accepted representative theory exists that explains FDI and all of its related facts (except perhaps Dunning's eclectic theory (Moon and Roehl, 1993: 56)). Two, given the various theories and various approaches, it would make sense to categorise them according to similar tenants. However, inconsistency in the classification of the available theories exists.

A wide range of arguments exists in support of the various sets of classifications. Hansen (1998) and Razin (2003) state that the FDI theories can essentially be divided into two categories, namely micro (or industrial) and macro theories (finance or cost of capital theories). Kojima and Ozawa (1984) also support this distinction between micro- and macro models of FDI, but place more emphasis on macro models.

Microeconomic classification of the theories

According to Razin (2003: 4), early literature explaining FDI in microeconomic terms, focuses on market imperfections and on the desire of TNCs to expand their market power. More recent literature concentrates on firm-specific advantages, product superiority or cost advantages flowing from economies of scale, multi-plant economies, advantages in technology and superior marketing and distribution. According to this view, multinational enterprises will find it cheaper to expand directly into a foreign country, rather than by increasing trade, if it is a case where the advantages associated with the cost of production are based on internal, invisible assets that are founded on knowledge and technology. Alternative explanations of FDI have focused on regulatory restrictions, including tariffs and quotas. The micro theories further show that firms may have different objectives when investing abroad.

Profit maximisation (which is of primary importance in the long run) may in the short run be overruled by other objectives such as risk diversification or market access. They may be of alternative or similar importance for the investors' decisions depending on a particular case.

Macroeconomic classification of the theories

Hansen (1998: 24) mentions that the macroeconomic theories on FDI are dominated by the logic of international trade theory. The macro theories concentrate on comparative advantages as well as environmental dimensions, and how the latter may affect comparative advantages. These theories mainly deal with the question of *where* TNCs will locate their operations. However, according to Hansen, theorists ignore the question of *why* TNCs invest in the first place, instead of just exporting their products to these foreign markets. He further more indicates that macro level theories ignore the question of *how* it is possible for TNCs to successfully compete with locally based firms in foreign locations, in spite of disadvantages like knowledge of local market conditions, cultural, institutional and linguistic barriers, as well as communication and transport factors. As a result of these shortcomings, Hymer (1993) accentuates the fact that TNCs must have certain additional advantages not possessed by local firms (under prefect market competition, local firms would have the same access to capital and information as the foreign firms and no FDI would take place). Due to this, the work of Hymer (1993) was the main impetus for the further development of micro level theories, arguing that technological advantages including research and development (R&D) capabilities; organisational advantages such as economies-of-scale, managerial and entrepreneurial advantages; financial and monetary advantages and advantages associated with their privileged access to raw material gave TNCs advantages above local firms.

Micro-and macroeconomic classification of the theories

A more modern theory based on micro- and macroeconomic aspects, which seeks to give a general answer to locational questions related to FDI, is the eclectic theory of Dunning[18] (Agarwal, 1991: 8). Moon and Roehl (1993: 56) emphasise this statement by saying that none of the general theories of FDI, except perhaps Dunning's eclectic theory – which is based on the OLI (ownership, location and internationalisation advantages) paradigm – succeed in satisfactorily explaining the international activities of firms. According to Chakrabarti (2003: 152), Dunning (1980) provides a conceptual framework, to which literature on multinationals

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[18]   See table 3.1 for a discussion.

(transnationals) has converged in recent years. Casson (1987), Ethier (1986), Ethier and Markusen (1991, 1996), Rugman (1986), Teece (1986) and Williamson (1981) have focused on this OLI paradigm. Their studies explain a firm's decision to internalise the production process by investing abroad rather than licensing across borders as an internal response to imperfect markets.

Other classifications of the theories

In addition to distinguishing between micro and macro arguments, theories can also be categorised according to other sets of criteria.

Boddewyn (1985) classifies the theories according to the: 1) conditions, 2) motivations, and 3) precipitating circumstances connected to FDI. He also mentions that these categories are general resulting in the possibility of overlapping and that it is therefore necessary to recognise that, despite common characteristics, "organisation specific" factors influence investment and disinvestment decisions. Any valid theory must consider factors such as changes in transportation and communication facilities, changes in government policies and the advent of a chief executive officer who is willing to invest or disinvest. According to him, many alternative explanations have been offered for foreign investment, rather than accepting the earlier rationale that firms invest abroad, because it is profitable to do so (especially since the post-war period).

Agarwal[19] (1980: 740) classifies the theories[20] of FDI into four groups, namely:

(i)   The hypotheses that assume full or nearly full competition on factor and/or product markets (these include the theories of differential rate of return, portfolio diversification and output and market size).

(ii)   Hypotheses that take market imperfections for granted and assume that the firms investing in foreign countries have one or more comparative advantages over their rivals in the host countries (these include theories of behavioural economics, product cycle, oligopolistic reaction and internalisation).

(iii)   The group that includes some selected hypotheses on the propensities of countries, industries or firms to undertake FDI (liquidity and currency area theories).

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[19]   Lizondo (1994) also based the structure of his study on that employed in the comprehensive survey by Agarwal in 1980.

[20]   Mentioned as 'hypotheses', because of the fact that there is not one, but a number of competing theories with varying degrees of power in explaining FDI.

(iv)   The last group is based on the propensities of countries to attract investments.

Casson (1990) (in Singh and Jun, 1995) views the theories of FDI as a "logical intersection" of three distinct theories namely:

(i)   The theory of international capital markets, which explains financing and risk-sharing arrangement;

(ii)   The theory of the firm, which describes the location of headquarters, management and input utilisation; and

(iii)   Trade theory, which describes location of production and destination of sales.[21]

3.3   THEORIES OF FOREIGN DIRECT INVESTMENT

Table 3.1 to 3.6 summarises the vast range of divergent theories on FDI for identifying a key set of unambiguous determinants of FDI. Apart from the theories/hypotheses, the names of the authors involved in each theory/hypothesis are given as well as a brief description of the main tenets. The framework is to a large extent based on that of Dunning (1988, 2002), addressing the questions of *why* (and *how*) firms of one nationality are able to expand their territorial boundaries and penetrate, through FDI, the territory of firms in another country; *why* firms engage in FDI, rather than expanding trade and *where* firms locate (or *what* determines the location).

Apart from an attempt to distinguish between micro and macro theories, in this analysis of theories of FDI, the theories are classified according to five additional categories namely theories of industrial organisation, theories of the firm, theories of trade, theories of location and theories of FDI. The analysis is concluded with the eclectic approach and integrative school which is based on micro and macro principles.

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[21] According to them, although each theory provides some insight into the complexity of FDI flows, an integrated theory which combines these elements in an analytically persuasive way has not been developed.

Table 3.1   Mainstream Theories, Hypotheses and Schools of Thought on FDI: Theories of Industrial Organisation

Macro theories			Micro theories		
Theory/hypothesis	Authors	Main tenet	Theory/hypothesis	Authors	Main tenet
Main question addressed: Why are firms of one nationality able to penetrate (through FDI) the value added territory of firms of another nationality?					
			Theories of Industrial organisation[C,D]	Hymer (1960, 1968, 1976) Caves (1971, 1974) Teece (1981, 1992) McCullough (1991)	Hymer was the first to systematically analyse issues related to the advantages of TNCs, market imperfections and control in foreign markets with the successful competition between domestic producers and foreign firms (Singh and Jun, 1995 and Jenkins and Thomas, 2002: 5). TNCs investing in foreign markets are, compared to local firms, faced with certain additional risks and costs in terms of knowledge of local market conditions, cultural, institutional and linguistic barriers, and communication and transport costs (Hansen, 1998: 24). Firms that want to invest through FDI in these foreign markets must have specific advantages to gain a competitive edge on local firms in a foreign or destined country. These include advanced technology; R&D capabilities; superior managerial, administrative and marketing skills; access to low-cost funding; and interest and exchange rate differentials (Jenkins and Thomas, 2002).

[C] According to Lizondo (1991) these theories are based on imperfect markets.
[D] From Dunning (2002)

Table 3.2   Mainstream Theories, Hypotheses and Schools of Thought on FDI: Theories of the Firm

Macro theories			Micro theories		
Theory/hypothesis	**Authors**	**Main tenet**	**Theory/hypothesis**	**Authors**	**Main tenet**
Main question addressed: Why (and how do) firms expand their territorial boundaries outside their home countries?					
Product cycle[22,23,A]	Vernon (1966) Hirsch (1967) Vernon (1979) Buckley and Casson (1976)	This hypothesis offers an explanation for both FDI and international trade and focuses on the different stages that a product goes through. In the initial or first stage a new product is developed and produced by the innovating firm in its home country. The second stage is marked by product maturity and an increase in exports of products to higher-income countries. Increased demand and growing competition in local markets lead eventually to FDI. The third stage is characterised by a complete standardisation of the product and its production technique, which is no longer in exclusive possession of the innovator (Agarwal, 1980: 751).	**Transaction related**[D]	Coase (1937) Buckley and Casson (1976) Williamson (1975, 1979) Rugman (1981) Hennart (1982, 2000) Hill and Kim (1988) Prahalad and Doz (1987) Bartlett and Ghoshal (1989) Doz, Awakawa, Santos and Williamson (1997)	A number of authors have developed their own extension of Coase's classical theory of transaction cost analysis. This includes the rationale and nature of firms in transferring business internationally. Williamson (1975) views the TNCs' extension as a hierarchical response to market imperfections in international markets for goods and services. The theory posits that there are economic advantages for a firm in establishing a wholly-owned subsidiary (WOS) through FDI (Hill and Kim, 1988: 94).
Internationalisa-tion process[D]	Johanson and Vahlne (1977, 1990) Eriksson, *et al*. (1997)	Internationalisation is defined as the process of increasing involvement of TNCs in international operations (Edwards, 2003: 28). The internationalisation process is in some sense related to the internalisation and knowledge enhancing theories. Firms' knowledge of local and foreign markets differs, and only firms that are successful in their internationalisation process, with experiential knowledge will benefit from their accumulated experience. Only those firms with enough knowledge will survive in the international markets.	**Resource based**[D]**/Raw materials**	Penrose (1958) Wenerfelt (1984) Nelson and Winter (1982) Cantwell (1989, 1994) Teece, Pissano and Shuen (1997)	Investors, according to this theory, invest abroad to secure a more stable or cheaper supply of inputs. These generally include raw materials and energy sources, but also other factors of production (Jenkins and Thomas, 2002: 6).
			Strategy	Vernon (1966)	Knickerbocker (1973) introduced the

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[22] Originally this theory was purely micro economic, but Vernon introduced it as a theory of the international division of labour. This theory of FDI starts out with the incentives for firms to innovate, mainly with savings on labour (but initially the more expensive the labour, the stronger the R&D incentive (Hansen, 1998: 7).

[23] This theory is grouped by Agarwal (1980: 740) as part of the hypothesis based on market imperfections.

Macro theories			Micro theories		
Theory/hypothesis	Authors	Main tenet	Theory/hypothesis	Authors	Main tenet
			related[D](and Oligopolistic production)[22,A]	Knickerbocker (1973) Graham (1975) Flowers (1976) Vernon (1982) Hostman and Markusen (1987) Graham (1990, 1998)	notion of oligopolistic reaction to explain why firms follow rivals into foreign markets. This includes oligopoly behaviour as well as uncertainty and risk aversion to establish the conditions required to generate "follow-the-leader" behaviour.
			Option theory[D]	Kogut and Kulatilaka (1994) Rivoli and Solaria (1996) Casson (2000)	Option theory relates to hypotheses regarding the effects of uncertainty, differences in technologies and the threat of pre-emptive rivalry. It is based on the idea that FDI is subject to uncertainties ranging from factors in the macro-economic environment, such as political and economic fluctuations and foreign exchange rate volatility, to those in the microeconomic environment, such as uncertainties regarding local market demand and partners' opportunistic behaviours in joint ventures. Furthermore, in evaluating FDI, cash flows need to be considered, as well as managerial flexibility.
			Internalisation[A]	Buckley and Casson (1976)	Markets for key intermediate products such as human capital, knowledge, marketing and management expertise are imperfect, mainly because of a lack of information. As a result of this, linking different inter-national activities through these markets involves significant time

Macro theories			Micro theories		
Theory/hypothesis	**Authors**	**Main tenet**	**Theory/hypothesis**	**Authors**	**Main tenet**
					lags and transaction costs. Firms are encouraged to infiltrate these foreign markets using their own product. This entering of firms across national boundaries to gain access to international markets leads to FDI. This process is continued until the benefits and costs of further internalisation is equalised at the margin. Benefits include: avoidance of time lags, bargaining opportunities (because of the firm's involvement in the foreign market) and a decrease of buyer uncertainty. The impact of government intervention through transfer pricing and the ability to use discriminatory prices are also minimised (Agarwal, 1980: 753).

[A] From Agarwal (1980)
[D] From Dunning (2002)

Table 3.3   Mainstream Theories, Hypotheses and Schools of Thought on FDI: Theories of Trade

Macro theories			Micro theories		
Theory/hypothesis	**Authors**	**Main tenet**	**Theory/hypothesis**	**Authors**	**Main tenet**
Main question addressed: Why do firms engage in FDI rather than trade; and how does FDI effect existing trade theories?					
Macro (country oriented)[D]	Kojima (1973 to 1982) Helpman (1984, 1985) Markusen and Venables (1998)	International trade economics did not originally provide an explicit explanation for FDI, but interpreted the Hecksher-Ohlin model and devised a theory on FDI called the 'factor proportional theory of capital movements'. According to this theory, factors would move whenever the marginal product of the factor in one country exceeded the marginal product in another by more than the cost of movement. The location of specific operations would be determined by the traditional tenets of comparative advantages making allowance for various frictions such as transport cost or government policies (Hansen, 1998: 7). Kojima mentioned two types of FDI: trade-oriented and anti-trade-oriented. FDI is trade oriented if it generates an excess demand for imports and an excess supply of exports at the original terms of trade. The opposite occurs if FDI is anti-trade-oriented (Lizondo, 1991: 86).	**Micro (firm/industry oriented)**[D]	Vernon (1966) Hirsch (1976) Ethier (1986) Batra and Ramachandran (1980) Gray (1982 and 1999) Markusen (1984, 1995, 1998)	Traditional trade theory of comparative advantages suggests that the basis for trade lies in differences in economic structures. Trade should thus be the greatest between countries that are economically dissimilar. Trade should also cause a country to export goods in which it has a comparative advantage in producing and to import those goods that are different from what it produces and exports. International investment can be viewed as a transfer of part of one county's endowment or competitive advantage to its trading partner. Hence, international investment should be stimulated by differences in factor endowments. Partial equilibrium or micro-analytic approaches are mainly used to understand what the multinational firms 'do', how they operate in foreign markets and what their impact is on competitive conditions in other markets.

[D] From Dunning (2002)

Table 3.4 **Mainstream Theories, Hypotheses and Schools of Thought on FDI: Theories of Location**

Macro theories			Micro theories		
Theory/hypothesis	**Authors**	**Main tenet**	**Theory/hypothesis**	**Authors**	**Main tenet**
What determines where firms locate their value added activities?					
Theory of location (General)[D,24]	Vernon (1966) Hirsch (1967) Dunning (1972) Vernon (1974) Root and Ahmed (1979) Davidson (1980) Lipsay and Kravis (1982) Krugman (1991, 1993)	This theory deals with the reasons determining the choice of host country for overseas investment (Jenkins and Thomas, 2002: 5). The determinants include access to local and regional markets, availability of comparatively cheap factors of production, competitive transportation and communication costs, the opportunity to circumvent import restrictions and investment incentives offered by the host country (Jenkins and Thomas, 2002: 6).	**Clustering and agglomeration**[D]	Enright (1991, 1998) Porter (1998) Audretsch (1998) Chen and Chen (1998) Head, Ries, and Swenson (1995) Markusen and Venables (2000)	TNCs and firms tend to cluster together to generate economies of scale, like in Silicon Valley in the USA, where all the large computer hardware and software companies have established their production facilities and head offices.
Internationalisation[25,D]	Johanson and Vahlne (1977, 1990) Schneider and Frey (1985) Welch and Luostarinen (1988)	The internationalisation theory includes a large portion of behavioural approaches. They argue that internationalisation is a logical sequence of increasing international commitment by gradually gaining foreign market knowledge. These schools of FDI are especially concerned with market entry and location strategies in foreign countries. Johanson, *et al* (1977) summarise four different modes when engaging with foreign markets (successive stages represent higher degrees of international involvement): stage 1 – no regular export activities; stage 2 – export via independent agents; stage 3 – establishment of an overseas sales subsidiary; stage 4 – overseas production/ manufacturing units.	**Knowledge enhancing**[D]	Cohen and Levinthal (1990), Levinthal (1990), Kogut and Zander (1992, 1994). Nonaka (1994) Porter (1994, 1998) Dunning (1995, 1997) Kuemmerle (1999)	Knowledge enhancing and sharing is seen as a determinant in improving a firm's capabilities (this has also been discussed in the literature on Organisation theory) (Cohen and Levinthal 1990, Kogut and Zander 1992, Nonaka 1994). Kogut and Zander (1992) argue that the competitive advantage of a firm is derived from the ability of its members to create and share knowledge efficiently. They conceptualise the firm as a repository of socially constructed knowledge that is a product of the firm's accumulated experience. The speed of knowledge creation and transfer is a fundamental determinant of the firm's rate of growth and competitive position. This also implies that firms that have the ability to create knowledge faster will be

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[24] These two strands of thought were brought together in Dunning's Eclectic theory of international production in which three types of advantage must exist for a firm to engage in FDI, namely: owner-specific, locational-specific and internalisation-incentives advantages (Jenkins and Thomas, 2002: 6)

[25] See also *Theories of the firms: transaction related.*

Macro theories			Micro theories		
Theory/hypothesis	Authors	Main tenet	Theory/hypothesis	Authors	Main tenet
					better equipped to adapt and invest, by means of FDI, in foreign countries. The existence of shared language, coding schemes and organising principles, facilitate the firm's ability to create and transfer knowledge. In addition, underlying dimensions of knowledge, such as its complexity and communicability, also influence the ease with which knowledge is transferred in a firm (Zander and Kogut 1995).
Market size[A,B]	Stevens (1969) Kwack (1972) Schwartz (1976)	The market size hypothesis is applied on the macro level, but microeconomic linkages exist between FDI and output that have their roots in the Theory of Domestic Investment. A large market or an increasing market size will create opportunities for increased profits and this will attract increased levels of domestic and foreign investment. Jorgenson (1963) for instance uses a model of profit maximisation and a Cobb-Douglas production function to derive the positive relationship between domestic investment and output in a neoclassical framework (this is a generalised form of the flexible accelerator model by Chenery (1952) and Koyck (1954)).	Output	Stevens (1969) Kwack (1972) Schwartz (1976)	According to Agarwal (1980: 746) output and market size are practically two sides of the same coin. The output hypothesis is applied at the micro level and assumes a positive relationship between FDI of a firm and its output (sales) in the host country. The objective for these foreign firms investing through FDI in a country is to maximize profit or maximize output given the cost of capital and labour.
Exchange rate[26,D] /currency area[A]	Aliber (1971) Cushman (1985) Culem (1988) Froot and Stein (1991) Rangan (1998)	Traditional views are that exchange rate movements should not affect FDI flows because if an asset in particular country is viewed as a claim to a future stream of profits denominated in that country's currency, and if profits are converted back to the domestic currency of the investor at	Spatial transaction cost[D]	Florida (1995) Scott (1996) Storper and Scott (1995)	In territorial innovation models, it is argued that proximity leads to reduced transaction costs. An increased number of external transactions lead to higher costs. In such circumstances the economic value of proximity has a lowering effect on transaction cost. In innovative

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[26] See also *Theories of FDI: exchange rate and market imperfections.*

Macro theories			Micro theories		
Theory/hypothesis	Authors	Main tenet	Theory/hypothesis	Authors	Main tenet
		the same exchange rate, the level of exchange rate does not affect the present discounted value of investment. On the other hand, "common sense" points to the fact that foreign firms are more willing to buy a country's asset when that country's currency is weak.			trajectories it is impossible to anticipate all possible contingencies beforehand. Agglomeration (like in Silicon valley, or car manufacturers in Detroit) is an outcome of the minimisation of transaction costs and a reason for TNCs of a specific industrial sector to cluster together.
			Taxes, subsidies and/or tariffs and incentives[A]	Hines (1996) Devereux and Griffith (1996) Haufler and Wooton (1999) Glass and Saggi (2000)	A host countries policies and institutions can play a prominent role in creating an environment for foreign firms to invest in the country. A high tariff, for example in the host country, may contribute very substantially to the host country's location advantage for an import substituting industry (Gastanaga, *et al.* 1998: 1301).
			Cheap labour[A]	Riedel (1975), Donges (1976, 1980) Juhl (1979)	As far as developing countries are concerned, the availability of cheap labour as a determinant of FDI flows has attracted much attention since the 1970s.

[A] From Agarwal (1980)

[B] According to Lizondo (1991) these theories assume perfect markets.

[D] From Dunning (2002)

Table 3.5   Mainstream Theories, Hypotheses and Schools of Thought on FDI: Theories of FDI

Macro theories			Micro theories		
Theory/hypothesis	Authors	Main tenet	Theory/hypothesis	Authors	Main tenet
Main questions addressed: What explains the extent to which firms finance their foreign activities by equity capital exports from their home country? What determines the location of such FDI?					
Risk uncertainty[D]	Rugman (1975, 1979) Agmon and Lessard (1977) Lessard (1982) Rivoli and Salorio (1996) Rangan (1998)	Although dependence on foreign suppliers is usually thought to increase the risk of adverse exchange rate movements, supply disruptions or even expropriation, FDI can also serve to reduce and diversify risk. Dual or multiple sourcing of companies from different countries reduces the risk of supplies being disrupted due to political or labour causes. By moving components of a firm abroad to the markets it used to export to, a firm can reduce its exposure to volatile exchange rates.	**Portfolio diversification hypothesis[A,B]**	Iversen (1935) Tobin (1958) Markowitz (1959)	Investors do not only consider the rate of return, but also the risk in selecting their portfolios. Investment is a positive function of the former and a negative function of the latter (Agarwal, 1980: 744).
Exchange rate/market imperfections	Aliber (1971) Cushman (1985) Frost and Stein (1991) Bloningen (1997) Rangan (1998)	Foreign firms are more willing to buy a country's asset when that country's currency is weak. Bloningen (1997) supports this argument by saying that exchange rate movements may affect acquisition because they involve firm-specific assets, which can generate returns in currencies.	**Differential rate of return[A,B]**	Popkin (1965) Hufbauer (1975)	This is the first neoclassical model to explain FDI flows, with the basic idea that investors want to maximise their profit by equating their marginal revenue and marginal cost. FDI is a function of international differences in rates of return on capital investment. FDI flows out of countries with low return to those expected to yield higher returns per unit of capital (Agarwal, 1980: 741 and Van der Walt, 1997: 23). The rate of return can be expressed as the ratio of profit to capital stock and profit is defined as the difference between total revenue and total cost. The share of *FDI* in a specific country will depend on the total revenue and the total cost as well as on the probability distribution of the rate of return in the host and the home countries.

Macro theories			Micro theories		
Theory/hypothesis	**Authors**	**Main tenet**	**Theory/hypothesis**	**Authors**	**Main tenet**
Liquidity[A]	Stevens (1969) Stevens (1972)	This hypothesis attempts to apply the liquidity theory of domestic investment to FDI and seeks to establish a positive relationship between internal cash flows or liquidity and investment outlays of a firm (through FDI). This is based on the assumption that the cost of internal funds is viewed by investors to be lower than the cost of external funds (Agarwal, 1980: 755).	**Behavioural**[22,A]	Cyert and March (1963) Aharoni (1966)	They have argued that the three factors of fundamental importance in initial investment decisions are: uncertainty, information and commitment. Managers of a firm tend to overestimate the risk and uncertainty involved in foreign investments; therefore there must be some sort of initial force or forces which impel management to consider the possibility of investing abroad. The initiating forces may be external or internal, such as strong interest rates or one of several high-ranking executives inside the organisation for a particular FDI (Agarwal, 1980: 750).
Radical view Dependency school	Marx	This school flourished between the 1960s and 1980s and tried to achieve more equal wealth, income and power distributions through self-reliant and collective action of developing nations. It emphasised changes in the international division of labour and argued that the growing presence of TNCs in the global economy "launched the Third World" on a dead end route of dependent capitalism" (Hansen and Wilhelms 1998: 10). This school of thought believes that TNCs exploit poorer countries through FDI and therefore hamper opportunities self-development.			

[A] From Agarwal (1980)

[B] According to Lizondo (1991) these theories assume perfect markets.

[D] From Dunning (2002)

Table 3.6   Theories on FDI based on Macro and Micro Principles

Theories based on Macro and Micro principles

Eclectic Approach	Dunning (1977, 1988)

According to Dunning (1977, 1988) FDI emerges because of ownership (O), internalisation (I), and locational (L) advantages. He argues that these three conditions must be adhered to if a firm is to engage in FDI:

(i)   The firm must have some ownership advantage with respect to other firms. These advantages usually arise from the possession of firm-specific intangible assets.
(ii)   It must be more beneficial for the firm to use these advantages rather than to sell or lease them to other independent firms.
(iii)   It must be more profitable to use these advantages in combination with at least some factor inputs located abroad; otherwise foreign markets would be served exclusively by exports.

Recent years have seen the emergence of numerous frameworks that seek to integrate the various theoretical traditions of international production into more general frameworks. The eclectic paradigm is the most well known example of the latter. This paradigm is not a theory in and by itself, but is rather an overall organising paradigm for identifying elements from each approach, which are most relevant in explaining a wide range of various kinds of international production.

Integrative School	Wilhelms (1998)

The Integrative School (Wilhelms 1998: 13) attempts to transform categorical thinking on FDI by analysing it from the perspectives of host countries as well as investors. It integrates the lines of thought of both the dependency and modernisation concepts that are applicable to FDI analysis.

It is mentioned further that the eclectic paradigm, the firm and internalisation theories and industrial organisation theory address FDI determinants from the viewpoint of the firm. The neoclassical and perfect market theories examine FDI from the perspective of free trade. The bargaining approach and the integrative theory shed more light on the perspectives of the host nation without falling into the victimisation trap of the dependency theories. In the study an "Institutional FDI Fitness Theory Model" is developed that is in the tradition of the integrative school.

Wilhelms (1998) further states that an integrative FDI theory considers macro, micro-, and meso-economic variables that determine FDI. The macro-level encompasses the entire economy, the micro-level denotes firms and the meso-level represents institutions linking the two, for example government agencies which determine investment policy applicable to enterprises.

The integrative FDI theory is different from its predecessors in that it accords more importance than previous studies to the meso-level, the sphere where macro- and micro-variables meet, and public and private sectors interact.

3.4   CONCLUSION

There are a number of theories, hypotheses and schools of thought which endeavour to explain FDI, but none of the individual theories is able to successfully explain FDI in its entirety. Theories on FDI are classified in a number of ways, and in this chapter a distinction is made between micro and macro-based theories/hypotheses, although the distinction between them is not always clear. These theories are further classified into theories of industrial organisation, theories of the firm, theories of trade, theories of location and theories of FDI.

The theories, hypotheses and schools of thought on FDI in this chapter include: the theory of industrial organisation, the theory of the product cycle, transaction related FDI theories, the process of internationalisation, resource/raw materials based theory, strategy related (and oligopolistic production) theories, option theory, macro (country oriented) theories, micro (firm/industry oriented) theories, theory of location (in general), clustering and agglomeration theories, internationalisation theories, knowledge enhancing theories, market size theories, output theories, exchange rate and currency area theories, differential rate of return theories, liquidity theories, behavioural theories, the radical view theory, dependency school, the eclectic theory and the integrative school.

The main ideas portrayed by these theories, hypotheses and schools of thought will assist in the selection of appropriate explanatory variables, data series and proxies to be tested in the empirical section. These ideas will further assist in indicating the expected signs and magnitudes of coefficients according to sound theoretical foundations.

Given the vast range of theories, opinions and philosophies of FDI, the challenge now is to identify a set of relevant and empirically significant determinants of FDI as well as the signs and magnitudes of their coefficients.

CHAPTER 4

A SURVEY OF EMPIRICAL RESULTS OF FDI STUDIES

4.1   INTRODUCTION

A vast number of empirical studies have been conducted regarding the forces that determine foreign direct investment (FDI). The literature however is not only extensive, but also confusing and conflicting. Most of the studies utilise multiple numbers of theories or hypotheses in an attempt to investigate the empirical linkages between FDI and a variety of economic variables.

The aim in this chapter is to build on the theories discussed in chapter 3 and investigate how these theories have been applied in empirically estimated models exploring the determinants of FDI. This will assist in the selection of appropriate variables, data and proxies to be tested empirically to determine FDI flows. It will further assist by providing an indication of the expected signs and magnitudes of the coefficients of variables found in the literature.

The first section emphasises the lack of consistency in the empirical findings, it is followed by a discussion of a number of the determinants or proxies used for explaining FDI. These determinants of FDI are categorised according to *economic*, *social*, *political* and *other* variables. The confusing and conflicting empirical results are further categorised by distinguishing between positive-significant, negative-significant and insignificant empirical findings.

4.2   CONFUSING AND CONFLICTING EMPIRICAL RESULTS IN FOREIGN DIRECT INVESTMENT

The lack of consensus in the conclusions drawn by empirical studies[27] and the lack of a generally accepted and representative theoretical model of FDI (chapter 3) have resulted in a wide range of approaches attempting to answer the question of *why* firms should locate production facilities through FDI in another country. These approaches vary in terms of methodology, techniques, focus on country characteristics, as well as choices of independent

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[27]   See table A2.2, appendix 2 for a more in-depth presentation of these results - including the various elasticities found (also see footnote 28)

and dependent variables. Techniques vary from econometric studies, mostly cross-country analyses, to firm level surveys (Bora, 2003: 46). All of these approaches, perspectives, methodologies, sample-selections, analytical tools and techniques, contribute to the investigation of the relevant importance, magnitude and signs of the potential determinants of FDI. However, Chakrabarti (2001: 90) states that in addition to the heterogeneity in the approaches, these empirical studies are examples of 'measurement without theory'. He continues to argue that this is common in many different fields of economics, where variables are used showing a significant influence, but the results are then explained *ex post*. This once again, supports the notion that the lack of a theoretical framework which guides empirical work on FDI is conspicuous. The consequence is a diverse and somewhat unwieldy literature where most investigators have looked at only a small number of explanatory variables in an attempt to establish a statistically significant relationship between FDI and a particular variable or set of variables of interest, thereby ignoring the fundamentals of economic theory. Due to these contradictory results, Chakrabarti (2001: 90) questions the reliability of the conclusions and results of the cross-country FDI regressions.

When undertaking empirical work on FDI, another difficulty is aggregation of determinants of location on a firm level so that they interact at the national level in order to determine cross-border flows. Too much reliance on firm-level determinants ignores the economic significance of national boundaries, but alternatively, too much focus on aggregate variables ignores the contribution and behaviour of affiliates (Bora, 2003: 46).

In his analysis Chakrabarti (2001: 90) divides the potential determinants of FDI into eight categories, namely: market size, labour cost, trade barriers, growth rates, openness, trade deficits, exchange rate and taxes. These variables, according to him, have received the most attention in the empirical literature. Asiedu (2002: 110) on the other hand also presents six variables which are widely used in the empirical literature, these being: real per capita GDP, infrastructure quality, labour cost, openness, taxes and tariffs and political instability.

The absence of a generally accepted and representative theoretical framework to capture FDI is further emphasised by Ioannatos (2003) who mentions that this has led researchers to rely on empirical evidence for explaining the emergence of FDI. The empirical determinants of FDI can, according to him, be classified into demand-side and supply-side determinants where the demand-side variables are aggregate variables grouped into three main categories,

namely: economic, social and political variables, with the primary emphasis on the economic aspects. The supply-side determinants include oligopolistic reaction, intangible assets and the product life cycle. These have been derived from theories that were tested, using microeconomic data. According to Ioannatos (2003) a simultaneous equation-framework that integrates both sides of the market is ideal for studying the emergence of FDI. However, substantial differences in micro and macro levels impose insurmountable obstacles for implementation of such a framework (see also Ragazzi, 1973; Dunning, 1973 and 1980; Agarwal, 1980 and Tsai, 1994).

Table 4.1 presents an overview of a number of the empirical studies mentioned by Asiedu (2002), Ancharaz (2003), Bora (2003), Chakrabarti (2001, 2003), Gastanaga, *et al.* (1998), Jackson & Markowski (1996), Razin (2003), Schneider & Frey (1985), Stevens (2000) and Van der Walt (1997). The table categorises the empirical determinants of FDI into *economic*, *socio/political* and *other* determinants. It further shows *positive-significant*, *negative-significant* and *insignificant* findings. In appendix 2[28], a more detailed table of these determinants in table 4.2 is shown. This is only a brief description and no attempt is made to show all the studies or all of the discrepancies that exist in the literature on FDI. Although this analysis shows the inconsistency in the vast field of variables that have been used in the literature, it is mainly helpful in identifying potential determinants for the empirical estimation undertaken in chapters 6 and 7. It furthermore gives an indication of the signs, magnitudes and significance of variables to be used, and provides a framework for comparing empirical results.

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[28] In table A2.1 in appendix 2 the dependent variables; functional forms and explanatory variables; description and meaning of variables; time period and group of countries in the sample are shown. In table A2.2, the magnitudes of the coefficients are shown as well as the econometric technique used. The differences in the elasticities and signs in this table must however be interpreted with caution because of dissimilar data sets.

Table 4.1   Selected determinants of FDI

Determinants of FDI		Positive-significant[29]	Negative-significant	Insignificant
Economic Determinants				
Market size / **Real GDP**		Ancharaz (2003)		Ancharaz (2003)
Nominal GDP		Lipsey (1999)		
Real GDP (or GNP) per capita	**Host**	Schneider and Frey (1985) Tsai (1994) Lipsey (1999) Chakrabarti (2001) Chakrabarti (2003) Van der Walt (1997)[30]	Edwards (1990) Japersen, Aylward and Knox (2000) Asiedu (2001)[31] Asiedu (1997) Ancharaz (2003)	Loree and Guisinger (1995) Wei (2000) Hausmann and Fernandex-Arias (2000) Ancharaz (2003)[32]
	Rival	Chakrabarti (2003)		
GNP$_{t-1}$		Culem (1988)		
GDP or GNP or per capita / **Growth**		Schneider and Frey (1985) Gastanaga, *et al.* (1998) Culem (1988) Razin (2002)		Asiedu (2001) Razin (2002) Lipsey (1999) Tsai (1994)
Growth$_{t-1}$		Gastanaga, *et al.* (1998)		
Growth$_{t-2}$		Gastanaga, *et al.* (1998) Ancharaz (2003)[33]		Razin (2002)
Growth Differential		Culem (1988)		
Labour / **Labour cost or wage**	**Host**	Wheeler and Mody (1992)	Chakrabarti (2003) Schneider and Frey (1985) Van der Walt[34]	Tsai (1994) Loree and Guisinger (1995) Lipsey (1999)
	Rival	Chakrabarti (2003)		
	Home	Van der Walt (1997)		
Labour productivity				Veugelers (1991)
Unit labour cost differential			Culem (1988)	
Labour cost: wage per worker divided by output per worker		Lipsey and Kravis (1982)		
Skilled work force		Schneider and Frey (1985)		Schneider and Frey (1985)
Capital / **Cost of Capital**	**Host**		Van der Walt (1997)	
	Home	Van der Walt (1997)		
Nominal interest rate differential		Culem (1988)		
Inflation rate			Schneider and Frey (1985)	Asiedu (2001)
Balance of Payments deficit			Schneider and Frey (1985)	

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[29] *Positive-significant* and *Negative-significant* are shown if they is significant between 1 per cent and 10 per cent.

[30] Uses combined GDP of the home and host country. Van der Walt does not make use of a cross-section but of time series cointegration and error correction methodology as illustrated by Engle and Yoo (1987) (in this case between South African and the US).

[31] The inverse of the real GDP per capita is used to measure the return on capital; this inverse relationship may also reflect a perception that investment risk rises as per capita GDP declines. As a consequence, investors may require higher returns to offset the perceived greater risk.

[32] The results are insignificant except for the SSA sample.

[33] The results are significant except for the SSA sample.

[34] Home refers to the source country, or country where headquarters are located. Host country refers to the FDI receiving country and rival, mentioned by Chakrabarti (2003), refer to a second host country that is in competition with the first host country.

	Determinants of FDI		Positive-significant[29]	Negative-significant	Insignificant
	Per capita trade account balance			Tsai (1994)	
	Domestic investment		Razin (2002)		
	Exchange rate or Δ (Exchange rate)		Chakrabarti (2003)	Chakrabarti (2003) Ancharaz (2003) Van der Walt (1997)	
	GDPOPEN		Veugelers (1991)		
	Openness (X + Z)/GDP		Edwards (1990) Gastanaga, *et al.* (1990) Hausmann and Fernandez-Arias (2000) Asiedu (2001) Gastanga, *et al.* (1998) Ancharaz (2003)		
	FDL$_{-1}$		Gastanaga *et al* (1998) Razin (2002)		
	Taxes and tariffs	Host		Loree and Guisinger (1995) Wei (2000) Chakrabarti (2003) Gastanaga, *et al.* (1998)	Wheeler and Mody (1992) Lipsey (1999) Gastanaga, *et al.* (1998) Veugelers (1991)
		Rival		Chakrabarti (2003)	
Social/political	Political instability or policy instability	Host		Schneider and Frey (1985) Edwards (1990) Chakrabarti (2003) Ancharaz (2003)	Loree and Guisinger (1995) Jaspersen, *et al.* (2000) Hausmann and Fernandez-Arias (2000) Asiedu (2001)
		Rival		Chakrabarti (2003)	
	Government consumption or size			Ancharaz (2003)	Asiedu (2001)
	Language (dummy, 1 if the same language is shared)		Veugelers (1991)		
	Neighbour (dummy, 1 if a common border)		Veugelers (1991)		
Other	*Distance* (ticketed point mileages between the key airports of countries)		Veugelers (1991) Lipsey and Weiss (1981)	Lipsey and Weiss (1981)	
	Transportations cost		Chakrabarti (2003)	Chakrabarti (2003)	
	Demand uncertainty			Van der Walt (1997)	
	African dummy for SSA			Asiedu (2001)	Ancharaz (2003)
	Institutional quality		Ancharaz (2003)		
	Black market premium				Gastanaga, *et al.* (1998)
	Infrastructure quality		Wheeler and Mody (1992) Kumar (1994) Loree and Guisinger (1995) Asiedu (2001)		
	Trend		Schmitz and Bieri (1972)		

4.3   DATA AND METHODS

The following section discusses the dependent and independent variables that have been used in a number of empirical studies[35] on the determinants of FDI. It also includes references to the data sources as well as the signs and significance of the coefficients and their economic interpretation. This is done in order to assist in the selection of appropriate variables, data and proxies to be tested empirically to determine FDI flows.

4.3.1   Dependent variable

The dependent variable in most studies is some measure of the ratio of FDI to GDP, but the definition of FDI and the data sources differ. Gastanaga (1998) uses the total inward flows of FDI as a percentage of GDP for a pooled cross-section and time-series for 49 less-developed countries (this data is from the *Balance of Payment Statistics* (BOP) and from *International Financial Statistics* (IFS) both IMF data). Tsai (1994) in his study of less-developed and developing countries uses the 'flow of direct foreign investment' also from the BOP. Asiedu (2002) uses the ratio of FDI flows to GDP 'as is the standard in the literature', from World Bank data sources. This net flow is also employed by Ancharaz (2003), Chakrabarti (2001), Culem (1988), Razin (2003) and Asiedu (2002). Schneider and Frey (1985) use net foreign direct investment per capita in US dollars and obtained this data from the *United Nations Statistical* yearbook and from the *World Development Report*.

4.3.2   Independent variables

4.3.2.1   Real GDP/GNP per capita or market size

In most studies (see table 4.2), either real GDP per capita or real gross national product (GNP) per capita (or a one-period lagged form of either one) is used as a proxy for the market size of a country or the income within the country. The notion is that FDI will move to countries with larger and expanding markets and greater purchasing power, where firms can potentially receive a higher return on their capital and by implication receive higher profit from their investments. Schneider and Frey (1985: 165) come to the conclusion that the higher the GNP per capita, the better the nation's economic health and the better the prospects for profitable FDI.

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[35]   See appendix 2 for detailed information on the empirical estimation and findings.

According to the theoretical model of Chakrabarti (2003), an expansion in the market size of a location leads to an increase in the amount of direct investment through increased demand. This is also consistent with the market-size hypothesis where foreign investors are likely to be attracted by large markets allowing them to internalise profits from sales within the host country.

Asiedu (2002: 110) argues that testing this hypothesis is very difficult, due to the lack of a proper and appropriate measure for return on investment, especially in the case of developing countries. Chakrabarti (2001: 96) mentions that per capita GDP is normally chosen on the basis of its general acceptance in past empirical studies and economic theory. He further states that the market-size variable has by far been the single most widely accepted significant determinant of FDI flows and that the hypothesis of the market size has appeared as an explanatory variable in nearly all empirical studies determining FDI.

Asiedu (2002: 110) argues that to overcome the problem of measurement, one must assume that the marginal product of capital is equal to the return on capital. This has the implication that investments in capital-scarce countries (poor countries) tend to have a higher return. He uses the inverse of the real GDP per capita to measure the return on capital. This implies, *ceteris paribus,* that investments in countries with a higher per capita income, should yield a lower return and therefore real GDP per capita should be inversely related to FDI. Results mentioned in the literature are far from being unanimous (*op cit.:* 111). Edwards (1990) and Jaspersen, *et al.* (2000) use the inverse of income per capita as a proxy for the return on capital and conclude that real GDP per capita is inversely related to FDI/GDP, but Schneider and Fry (1985), Tsai (1994) and Asiedu (2001) find a positive relationship between the two variables. They argue that a higher GDP per capita implies better prospects for FDI in the host country.

Chakrabarti (2001: 98) mentions that there may be some statistical and conceptual problems regarding the market-size variable. GDP per capita has served as a proxy for market size in most empirical work on the determinants of FDI and has by far been the most widely accepted variable with a significant positive impact on FDI. However, some studies use absolute GDP as an alternative measure, but it has been pointed out that absolute GDP is a relatively poor indicator of market potential for the products of foreign investors; particularly

in many developing countries since it reflects population size rather than income. On the other hand, although reflecting the income level of a country, using GDP per capita data may introduce bias, because a country with a large population will be put into a less-attractive category.

Chakrabarti (2001: 98) further states, that some studies have used GNP or GNP per capita as measures of market size as an alternative to GDP. However GNP appears to be a less appropriate measure of market size, because GNP captures earnings by nationals in foreign locations and therefore overestimates the market for products of multinationals located in the host country and excludes the earnings of foreigners located in the host country.

4.3.2.2   Wage or labour cost

According to theory, a higher wage corresponds to a lower level of FDI in any location and is reflected in a higher price of all varieties produced in that location, making them less competitive both at home and in foreign markets (Chakrabarti, 2003: 161).

According to Chakrabarti (2001: 161) and Agarwal (1980: 762), wage has been the most confusing of all the potential determinants of FDI. The importance of low-cost labour in attracting FDI to developing countries (as one of their comparative advantages) is agreed upon by the proponents of international trade theories, the dependency hypothesis and by those advocating the modernisation hypothesis[36]. However, there is no unanimity in the studies regarding the role of wages in attracting FDI. Chakrabarti also mentions that Goldsrough (1997), Saunders (1982), Flamm (1994), Schneider and Frey (1985), Culem (1988), Shamsuddin (1994), and Pistoresi (2000) demonstrate that higher wages discourage FDI. Tsai (1994) obtains strong support for the cheap-labour hypothesis over the period 1983 to 1986, but weak support from 1975 to 1978.

Chakrabarti (2001) uses the industrial wage rate, measured in US dollars at current market prices. Schneider and Frey (1985) also use the industrial wage rate (monthly) in US dollars,

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[36]   The dependency theorists agree that TNCs create "international division of labour" in a way that "high-paying white collar jobs" are located in the host country. The modernisation theorists do not refute the possibility of such an international division of labour – they argue that all international economic activity creates a division of labour and it is indeed from the resulting specialisation that mutual gains from trade are generated (Chakrabarti, 2001: 99).

but with a one-year lag (data from the *United Nations Statistical Yearbook*). Tsai (1994) uses the nominal hourly rate of pay in the manufacturing sector, calculated from the *Year Book of Labour Statistics* (from the International Labour Organisation) and the *Statistical Yearbook* of the United Nations.

4.3.2.3   Cost of capital

Culem (1988) argues that foreign investors have the possibility of raising funds elsewhere than in their home countries. They can also borrow (or issue bonds or contract bank loans) where their assets are located if they want to avoid any exchange rate risk. However they can also borrow in a third market where the interest rate is lower (this will make sense in the case of imperfect capital mobility). To capture this effect Culem introduced the nominal interest rate differential between the host country and the rest of the world.

Van der Walt (1997) used the user cost of capital that is the minimum rate of return that would attract investors. The rental price for capital has to be constructed, since no such price exists and because taxes raise the pre-tax rate of return that must be paid to investors, the user cost of capital r_i is:

$$r_i = \text{ price of } capital_i \frac{i_i - \pi_i + \delta_i + \rho}{1 - \tau_i} \tag{4.1}$$

where i_i is the nominal long-term interest rate, π_i is the inflation rate, δ_i the rate of depreciation, τ_i a tax ratio (between the pre-tax and the after-tax return) and ρ is a risk premium.

4.3.2.4   Openness

Mixed evidence exists in the literature regarding the significance of openness, which is normally measured by the ratio of trade (expressed as imports plus exports divided by GDP). This measures the openness of an economy and is also sometimes interpreted as a measure of trade restriction. Sachs and Warner (1995) make use of an openness indicator that takes into account different ways that governments shut out imports. They classified economies as closed if they displayed any of five features: high import tariffs, high non-tariff barriers, a

socialist economic system, a state monopoly on important exports, or a big gap between official and black-market exchange rates

It is argued (Asiedu, 2001: 111) that the impact of openness on FDI depends on the type of investment and a distinction is made between investments that are market seeking and investments that are export-oriented.

Market seeking industries

The idea that a less open economy with trade restrictions can have a positive effect on FDI, stems from the "tariff jumping" hypothesis, which argues that foreign firms will decide to locate to a country if it is difficult to export their products to that country. However, openness as a significant determinant of FDI, is weakening as a result of globalisation, integration of world markets and lower tariff structures. Weeler and Mody (1992), for instance, observe a strong positive support for the hypothesis in the manufacturing sector, but a weak negative link in the electronic sector.

Export-oriented industries

In contrast, multinational firms that are export-oriented may prefer to locate to a more open economy since increased imperfections that accompany trade protection, generally imply higher transaction costs associated with exporting. Kravis and Lipsey (1982), Culem (1988), Edward (1990) and Pistoresi (2000) find a strong positive effect of openness on FDI and Schmitz and Bieri (1972) obtain a weak positive link. Ancharaz (2003) also finds a strong positive relation for the "all countries" and "non-SSA country" samples but an insignificant effect for SSA countries.

4.3.2.5 Exchange rate

A strong exchange rate is often interpreted in the empirical literature as an indicator of greater "competitiveness" of the host country. In the model proposed by Chakrabarti (2003), an appreciating currency can lead to either a rise or a fall in the level and share of FDI, depending on whether the revenue or the cost effect is larger. When a currency becomes stronger relative to that of the home country, sales become more attractive to TNCs. On the other hand, immobile factors in the location with a stronger currency become costlier, leading to a rise in the price of products produced and making them less competitive at home as well

as in foreign markets. If the revenue effect dominates the cost effect, the level of FDI in a host country will rise with a stronger currency and *vice versa*. The host share in FDI will also fall with a strong currency since FDI in the other location would increase.

An exchange rate is often cited as a critical determinant of FDI and it is argued by the currency area hypothesis that the weaker the currency of a country, the less likely it is that foreign firms will invest in that location. A bias in the capital market exists, assuming to arise because an income stream from a country with a weak currency is associated with exchange rate risk; therefore the income stream is capitalised by the market at a higher rate, when it is owned by a weak currency firm (Aliber, 1970 in Chakrabarti, 2001: 100). A more elaborate theory, based on capital market imperfections with similar implications, was developed by Froot and Stein (1998).

Chakrabarti (2001: 100) mentions that Caves (1988), Froot and Stein (1991), Bloinigen (1995) and Bloinigen and Feenstra (1996) observe strong negative correlations between a country's exchange rate (foreign currency per domestic currency) and FDI. Edwards (1990) reports a significant positive effect of the exchange rate on FDI and Tuman and Emmert (1999) observe that the exchange rate has an insignificant effect on FDI in a share regression but a significant negative impact in a per-capita regression.

Chakrabarti (2001) uses the real exchange rate in terms of US dollars and mentions that most studies report a positive significant coefficient of real exchange rate combined with openness, domestic investment and government consumption. Ancharaz (2003) uses the change in real exchange rate between year *t* and *t-1*. The real exchange rate for a country *i* is defined as:

$$RER_i = E_i \cdot \frac{P_{US}}{P_i} \tag{4.2}$$

where E is the exchange rate (local currency per US$), P_{us} is the US wholesale price index, and P_i is country *i*'s consumer price index. Increases in RER mean a real depreciation in the currency of country *i* against the US dollar. Ancharaz reports a significant negative coefficient for the change in the real exchange rate on FDI.

4.3.2.6   Trade barriers

The effect of trade barriers, according to Chakrabarti (2001) has widely been debated. The tariff discrimination hypothesis states that FDI takes place in countries to which it is difficult to export due to the imposition of tariff obstacles on trade. Trade liberalisation allows goods to move more freely and, hence, is expected to reduce the amount of international investment as a trade-off between trade and foreign production (FDI). Schmitz and Bieri (1972) and Lunn (1980) observe a significantly positive effect of trade barriers on FDI, but Beaurdeau (1986) and Blonigen, as well as Feenstra (1996), find that trade barriers play an insignificant role in attracting FDI.

4.3.2.7   Trade deficit or balance of payment deficit

The notion of the trade deficit being an important determinant of FDI, is that in the case of a trade surplus it is indicative of a dynamic and healthy economy with export potential and the country is therefore likely to attract FDI. On the other hand, a large deficit in the balance of payments indicates that the country "lives beyond its means" (Schneider and Frey, 1985). Torissi (1985), Schneider and Frey (1985), Hein (1992), Dollar (1992) and Lucas (1993) report a strong positive correlation between trade surpluses and FDI, while Culen (1988), Tsai (1994), and Shamsuddin (1994) observe a significantly negative effect of a per capita trade account balance on FDI.

Schneider and Frey (1985: 174) use the balance on the current account (a positive balance represents a surplus and a negative balance a deficit) in US dollar per capita with a one-year lag, by using data from the IMF's *Balance of Payment Statistics*.   They also find a significantly negative effect between the balance on the current account (if in deficit) and FDI.

4.3.2.8   Growth

The growth hypothesis is also not without controversy, but in general it maintains that a rapidly growing economy provides relatively better profit-making opportunities or acts as an indicator of good development potential (Chakrabarti, 2001 and Lim, 1983). Bandera and White (1968), Lunn (1980), Schneider and Frey (1985), Culem (1988) and Billington (1999) find a significantly positive effect of growth on FDI, while Tsai (1994) obtains a strong

support for the hypothesis over the period 1983 to 1986, but only a weak link from 1975 to 1978. On the other hand, Nigh (1988) reports a weak positive correlation for the less developed economies and a weak negative correlation for the developed countries. Ancharaz (2003) finds a positive effect with lagged growth for the full sample and for the non-SSA countries, but an insignificant effect for the SSA sample.

Razin (2003) uses the annual percentage growth rate of GDP at market prices based on constant local currencies from the *WDI* (World Bank) data sources. Gastanaga, *et al.* (1998) calculate the growth rate by using the real GDP from the UN's Macroeconomic Data System (MEDS) and the IFS of the IMF. Schneider and Frey (1985:174) use a one-year lag of the percentage yearly rate of growth of GNP per capita from the *World Development Reports*. Razin (2003), Gastanaga, *et al.* (1998) and Schneider and Frey (1985) found positive significant effects of growth on FDI.

4.3.2.9   Tax (and tariffs) or incentives

Chakrabarti (2001) mentions that with respect to taxes and the effects of tax incentives on FDI, the literature remains fairly inconclusive. He mentions that Hartman (1984), Grubert and Mutti (1991), Hines and Rice (1994), Loree and Guisinger (1995), Guisinger (1995), Cassou (1997), Kemsley (1998) and Billionton (1999) find that host country corporate taxes (corporate and income) have a significant negative effect on attracting FDI flows. However, Root and Ahmed (1987), Lim (1983), Wheeler and Mody (1992), Jackson and Markowski (1995), Yulin and Reed (1995) and Porcano and Price (1996) conclude that taxes do not have a significant effect on FDI. Swenson (1994) reports a positive correlation.

The evidence of the influence of tax incentives on the flow of FDI according to Agarwal (1980: 761), is clearer than the influence of political stability, but does not support the hypothesis that tax incentives and FDI would necessarily be positively correlated with each other. Agarwal mentions that from Aharoni's (1966) survey, evidence exists that firms do not consider incentives during the initial stages of their foreign investment decisions. Income tax exemptions were found to be unimportant.

According to Agarwal (1980: 762) the main reason for the divergence between the targets and the results of incentive schemes, is that the incentives provided by developing countries,

are generally accompanied by a host of disincentives. Restrictions on ownership, size, location, dividends, royalties, fees, entry into certain industries and mandatory provisions for local purchases as well as exports, form part of this. The result is that the likely positive effects of tax incentives are cancelled out by the negative effect of disincentives.

Gastanaga, *et al.* (1998) uses the corporate tax from *Price Waterhouse's Country Books* and the tariff revenue from the IMF's *Governments Financial Statistics* (GFS) Yearbook, as a fraction of the value of imports in domestic currency and find negative significant relationships.

4.3.2.10   Infrastructure quality

Good quality, well-developed infrastructure increases the productivity potential of investments in a country and therefore stimulates FDI flows towards the country. According to Asiedu (2001: 111) and Ancharaz (2003), the number of telephones per 1000 of population is a standard measurement in the literature for infrastructure development. However, according to Asiedu (2001) this measure falls short, because it only captures the availability and not the reliability of the infrastructure. Furthermore, it only includes fixed line infrastructure and not cellular (mobile) telephones.

4.3.2.11   Political instability or risk

Greater political stability in a location is reflected in a higher probability of revenues being appropriated by TNCs from sales generated in that location. This lowers the mark-up for the varieties produced in that location, making them more competitive. Political instability on the other hand is likely to disrupt the economic process and discourage the inflow of FDI; thus one would expect that these two variables are negatively correlated (Chakrabarti, 2003, Agarwal, 1980: 760 and Schneider and Frey, 1985: 166).

The relationship between political instability and FDI flows in the empirical work is unclear and is primarily related to the proxies employed for political instability. Jaspersen, *et al.* (2000) and Hausmann and Fernandez-Arias (2000) construct their own risk measure on the basis of country assessments by the *Business International Inc.* and find no relationship between political instability and FDI. Schneider and Frey (1985) come to the conclusion that

the *Institutional Investor's* country credit ratings have a significant effect on net foreign direct investment (inverse relationship). Loree and Guisinger (1995) find that political risk had a negative impact on FDI in 1982 but had no effect in 1977. Edwards (1990) uses two indices, namely political instability and political violence to measure political risk. Political instability (which measures the probability of a change of government) was found to be significant, while political violence (that is the sum of the frequency of political assassinations, violent riots and politically motivated strikes), was found to be insignificant. Asiedu (2001) uses the average number of assassinations and revolutions (as in Barro and Lee, 1993) to measure political instability.

It is argued (Harms, 2002: 377) that the lack of conclusive empirical evidence regarding the importance of political risk can be attributed to two factors. Firstly, most studies consider panels that mainly consist of high and middle-income countries and thus neglect the countries where political risk is most pronounced. Secondly, the normalisation of investment data by dividing-through GDP or GNP is not innocuous. This is because the expected deterioration of the business climate is likely to affect both aggregate output and FDI and it is thus not surprising that the ratio of the two variables is not affected by indicators of political risk.

Gastanaga (1998), Chakrabarti (2001: 101) and Schneider and Frey (1985: 164) use the *Nationalisation Risk Index* from Business Environment Risk Intelligence (BERI), which ranges from "0" if risk is high to "4" when it is low, while Ancharaz (2003) uses the *Index of Policy Instability,* which is defined as the standard deviation of the share of government consumption in GDP over the previous 4 years (including the current year). He also uses the *Index of Institutional Quality* which is defined as the product of the *International Country Risk Guides' (ICRGs')* "rule of law" and "corruption in government" indices. Schneider and Frey (1985: 164) also include in their list of 'risk' variables the *World Political Risk Forecast* (WPRF), the *Political System Stability Index* (PSSI) and the *Institutional Investors Credit Rating* (IICRI).

Kaufman *et al.* (2003) make use of governance index that is constructed from indicators from 199 countries that range from 1996 to 2000. It include: Voice and Accountability, Political Stability and Absence of Violence, Government Effectiveness, Regulatory Quality, Rule of Law and Control of Corruption.

4.3.2.12   Other variables

Apart from the above list of determinants, which emerged from empirical research, a number of other variables[37] that determine FDI are also mentioned:

(i)   The inflation rate (annual percentage change in consumer price inflation (CPI)) as a measure of the overall economic stability of the country. The hypothesis states that lower inflation fosters FDI (Asiedu, 2002, Chakrabarti, 2001: 101 and Jenkins and Thomas, 2002) and a high rate of inflation is a sign of internal economic tension and inability of or unwillingness by the government and the central bank to balance the budget and to restrict money supply (Schneider and Frey, 1985). Schneider and Frey make use of the percentage change of the GNP-deflator with a one-year lag (from the *World Development Report)*.

(ii)   Financial depth in a country (defined as a ratio of liquid liabilities like money supply over GDP), along with financial development are said to foster FDI. The notion is that there is less cost associated with capital transactions in countries with well-developed financial markets (Asiedu, 2001: 10).

(iii)   A larger budget deficit and external debt imply fiscal and balance of payment instability and may result in higher future tax rates, which may defer FDI.

(iv)   Higher rates of domestic investment show a willingness to invest, a culture of investment and confidence in the future of the economy by local people. It may therefore also reflect potentially higher growth.

(v)   Ancharaz (2003) expresses government consumption as per capita government consumption in US dollars at current prices. He finds a significantly positive relationship between government consumption and FDI for the sample of non-SSA and SSA countries as well as non-SSA countries, but finds the relationship insignificant for the SSA sample. Asiedu (2002) uses the ratio of government consumption to GDP as a measure of the size of government, with the hypothesis that a smaller government promotes FDI, but none-the-less finds an insignificant result.

(vi)   Schneider and Frey (1985) mention that a skilled work force is needed for FDI to take place. They hypothesise that the larger the share of the working-age population

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[37] Chakrabarti (2001: 101) calls these variables which are of lesser or "doubtful" importance, "Z- variables".

with secondary education, the more direct investment will *ceteris paribus* flow into the country. They find a weak positive result.

(vii) Transportation cost (Chakrabarti, 2003) affects FDI through two channels. Firstly, an increase in internal transportation cost dampens TNCs activity by making domestic production relatively more expensive and less competitive. Higher transportation costs reduce receiving countries' share in FDI. Secondly, a rise in external transportation costs encourages a host country to increase FDI in other countries in order to enter their markets, but discourages FDI with the aim of exporting manufactured products. The net effect remains ambiguous on both the level and share of FDI.

(viii) The effect of neighbouring countries is tested by Veugelers (1991). He constructs a dummy, which takes on the value of 1 if country *i* and *j* are neighbours and 0 otherwise and finds a significant positive impact of neighbours. He further mentions that an interesting observation from the regression coefficient is the highly significant coefficient of the combination of the size and neighbour. This coefficient indicates that the size of market is an extra stimulus if the market is in a neighbouring economy. If the market is located further away, the size of market is less stimulating.

4.3.5   Data availability

As in all empirical studies, when choosing independent variables and estimating FDI determinants empirically, data availability and data quality is very important. Data of a poor quality or lack of data sometimes forces researchers to make use of proxies for data that may result in poor and inconsistent results. This is mainly true for data in developing countries, especially African countries. Asiedu (2002: 110) for example states that data on important factors such as real wage, trade policies and tax legislation is not readily available for developing countries, particularly for countries in SSA. This may explain why only a few African countries have been included in previous studies.

4.4   CONCLUSION

A vast amount of empirical literature has been developed on the determinants of FDI in a country, but the results on empirical linkages are inconsistent and ambiguous. These inconsistencies are shown in table 4.1.

This table categorises the empirical determinants of FDI into *economic*, *socio/political* and *other* determinants. It further shows *positive-significant*, *negative-significant* and *insignificant* findings. Variables identified which are often used include: the market size (GDP or GNP per capita), the growth in the economy of the country, the cost of labour, openness, exchange rates, trade barriers, trade deficits, taxes and tariffs, infrastructure and political risk. Furthermore, a number of less important variables are also identified. These include: inflation, domestic investment, financial liquidity, external debt, government consumption, education, transport costs and the effect of neighbouring economies.

Although this analysis shows the inconsistency of this vast range of variables that have been used in the literature, it is mainly helpful in identifying potential determinants for the empirical estimation undertaken in chapter 6 and 7. It further gives an indication of the signs, magnitudes and significance of variables to be used, and provides a framework for comparing the empirical results.

Given the literature on the methods of analysis identified in the current chapter, and the variables identified which are used in the empirical literature in estimating the determinants of FDI; the next chapter present a discussion of panel data econometrics which will be used in the analysis in chapters 6 and 7 as well as a discussion of the data and variables that will be used in the analysis.

CHAPTER 5

PANEL DATA ECONOMETRIC METHODOLOGY AND AN EXPOSITION OF THE DATA USED

5.1   INTRODUCTION

A number of the empirical studies of the determinants of foreign direct investment (FDI) discussed in chapter 4 only focused on cross-section data for a range of countries for a specific year or only time-series data for a specific country. However, a few studies like Anchraz (2003) and Asiedu (2001) Culem (1988), Gastenaga, *et al.* (1998) and Razin (2002) made use of panel estimations, where they applied panel data econometric techniques for a number of countries over time.

The purpose of this chapter is to present the methodology and the advantages of panel data econometric techniques which will be applied in the empirical analysis in chapters 6 and 7. It further provides a discussion of the data employed in the empirical analysis.

The first section of this chapter discusses the advantages of using panel data as well as the criteria used in selecting data and countries. It is followed by a number of theoretical models and an attempt to estimate these models empirically. This also includes proxies used to capture the ideology of the theory, as well as the expected signs of coefficients. In the third section, an exposition of the data, acronyms used and definitions of the data are given. Average magnitudes of the data series from 1980 to 2000, and the standard deviations of the data over countries and over time are also provided. The data is further compared by dividing it into two sub-periods − one period from 1980 to 1989 and a second period from 1990 to 2000.

5.2   PANEL MODELS

Panel data combines cross-section data, for example data for 20 countries for one year, with time-series data, for example data for one county over 20 years. This then results in data for 20 countries over a time-span of 20 years.

Panel data econometric techniques[38] are used in chapters 6 and 7 to estimate the significance and elasticities of a number of determinants of FDI. There is a range of advantages which support the use of panel data and panel techniques (Baltagi, 2001: 6 and 7 and Hsiao, 1986: 3 and 5):

(i)   Panel data gives a large number of data points that result in more information available, greater variability, less collinearity amongst variables, more degrees of freedom and more efficiency.

(ii)   Panel data is better able to study the dynamics of adjustment compared to just cross-sectional data.

(iii)   Panel data is better able to identify and measure effects that are simply not detectable in pure cross-section or pure time-series data.

(iv)   Panel data models allow the construction and testing of more complicated behavioural models than purely cross-section or time-series data.

(v)   In the case of panel data models, adjustments can more be easily and naturally made when data is missing by utilising more information.

The use of panel data also decreases the effect of unobserved heterogeneity that is a major reason why simple cross country analysis are problematic in the identification of determinants of FDI in cross-country studies.

5.3   DATA, MODEL AND COUNTRY SELECTION

Variables and data used to determine FDI must comply with a number of criteria. They must be aligned with theory or hypotheses of why the variable(s) and proxies may be useful in determining FDI, together with expected signs and possible magnitudes of coefficients in the empirical literature. The availability and quality of data and empirical estimation methods are of further important, since they will have an impact on the quality of the results.

The following criteria and guidelines are used to select variables/proxies, data and techniques to be used in each specification of the panel:

(i)   Variable selection and model specification are done according to theoretical and empirical guidelines (theories used are presented in chapter 3 and models tested empirically and variables are shown in appendix 2).

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[38]   See appendix 3 for a discussion of the panel data techniques.

(ii)   Variables used in the panels are determined according to data availability. It is desirable to use as many time periods as possible for as many countries as possible. However not all data series used are balanced data sets, but the estimation software is able to accommodate unbalanced data sets. It was decided in this case that if more than 10 per cent of the data for a specific variable over the panel is not available the data series is not used.

(iii)   A specific data series for all countries is obtained from a single data source to ensure maximum data consistency, (for instance FDI data for all countries is sourced from UNCTAD, and if data for a specific country is not available from this source, the country is excluded from the sample group instead of referring to other data sources, like the World Bank or International Monetary Fund).

(iv)   In a number of cases, countries (or a specific neighbouring country) are excluded due to unavailability of data. In some cases a trade-off has to be made between excluding a country and including a specific variable in a sample, or rather excluding a specific variable, but including a specific country in the sample. Variables are in some cases only shown for a specific group of countries for which data are available (like the personal income tax variable (PIT) that is only included in the emerging group of countries. A detailed list of countries used as well as neighbouring countries and the average weights assigned[39] to these countries are shown in table A6.2, appendix 6).

(v)   A number of variables are used as ratios or indices to increase the probability of the variables being stationary in the long run (appendix 4 shows the panel stationarity tests results).

(vi)   Model specification depends on the data, theory and empirical literature.

(vii)   A technical discussion of panel estimation techniques are shown in appendix 3 and include pooled, fixed effects (LSDV and *Within* estimation) and seemingly unrelated (SUR) models. Models are tested for fixed effects, serial correlation and heteroscedastisity (these techniques and the results are presented in appendix 5).

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[39] This table shows only the average over the time-span from 1980 to 2000, but in the construction of the average for neighbouring countries data was estimated for each year and not only the averages were used – for a more detailed discussion see chapter 7.

5.4   AN EXPOSITION OF THE DATA

5.4.1   Data sources

Variables are chosen according to the theories on FDI discussed in chapter 3 and the empirical studies in chapter 4. Macro-based data and proxies are used rather than firm specific data, although the foundation of some of the theories and the functional form are based on micro foundations. Table 5.1 shows the variables used to determine FDI flow in this study. Data were drawn from a number of data sources, including the *World Bank Development Indicators* (WB), *World Bank African Database*, *International Financial Statistics* (IMF), *United Nations Conference on Trade and Development* (UNCTAD), *Institutional Investor's Country Credit ratings* and *Freedom House* (FH) indices. The sample period is from 1980 to 2000 but a number of cross-section data sets are incomplete for this time span, especially data for Africa. Variables are taken in natural logarithmic form where possible, except for data series that contain negative values.

5.4.2   Theories, hypotheses and school of thought used in empirical estimation

Theories, to be tested, together with the *idea captured in the theory*, *proxies used* and *expected signs* are shown in table 5.1. These theories and hypotheses include: the market size and output theory as presented by Stevens (1969), Kwack (1972) and Schwartz (1976); the process of internationalisation (Johanson and Vahlne, 1977 and Buckley and Casson, 1976); resource based and raw material theory (Penrose, 1958, Wenerfelt, 1984 and Cantwell 1989); theory of location (Vernon, 1966, Hirsch, 1967, Dunning, 1972); exchange rate theory by Aliber (1971), Cushman (1985) and Culem (1988); theories on taxes and tariffs (Hines, 1996, and Devereux and Griffith, 1996); the cheap labour argument by Riedel (1975) and Donges (1977, 1980) and theories on risk and uncertainty (Rugman, 1975 and Agmon & Lessard, 1996).

Table 5.1   Theory and Proxies Used to Capture Theory

Theory/hypothesis	Idea captured in theory[40]	Proxy used[41]	Expected sign
Internationalisation process	Human capital (HC), knowledge, marketing, management expertise. Bargaining and buyer uncertainty, minimisation of the impact of government.	ET/EP	+
		FH	-
Resource based/Raw materials	Cheaper supply of inputs. Raw materials and energy sources, but also factors of production.	DOIL	+
Theory of location (General)	Access to local and regional markets. Comparatively cheap factors of production. Competitive transportation and communication cost. Import restrictions and investment incentives.	T	+
		OPN	+
		PURB	+
Knowledge enhancing	Knowledge creation speed and transfer is a fundamental determinant of the firm's rate of growth and competitive position. Shared language, coding schemes, and organising principles facilitates the firm's ability to create and transfer knowledge.	ET/EP	+
Market size/Output	Profit maximisation and sales potential in the host country.	CC/MS	+
		G	+
Exchange rate/currency area	Transaction cost.	REE	- or +
Tariffs and incentives	Tariffs, import substituting.	PIT	- or +
Cheap labour argument	Inexpensive labour.	ET/EP	-
		PIT	-
Risk uncertainty	Uncertain environments.	CC/MS	+
		R	-
Differential rate of return	Difference in the rate of return.	R	-
Neighbourhood	Growth potential, risk.	N_CC/N_MS N_FH	Unknown

Source: Own

Table 5.2 shows a list of the variables that have been used in the panel regressions. It includes the abbreviations that have been used in the models, the definition of the variables, whether the data is used in unitary (*units*) or logarithmic (*log*) form, data availability, proxy to be tested and data source. The data availability is shown for developed (Dev), emerging (Emg) and African (Afr) countries.

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[40] Detailed information is included in tables 3.1 to 3.6 as well as in the discussion of table 4.1.
[41] See table 5.2 for an exposition of variables used.

Table 5.2   Variables Used

| Variable | Measure/Proxy | Definition | Scale | Data availability | | | Source |
				Dev	Emg	Afr[42]	
FDI	Foreign direct investment	Constant FDI inflows/GDP in US$	Normal	Yes	Yes	Yes	UNCTAD & WB
EP	Education (low level)	Gross enrolment ratio, primary level: the ratio of total enrolment, regardless of age, to the age group of the population that officially corresponds to the primary level of education.	Log	Yes	Yes	Yes	WB
ES	Education (medium level)	Gross enrolment ratio, secondary level: the ratio of total enrolment, regardless of age, to the age group of the population that officially corresponds to the secondary level of education.	Log	Yes	Yes	Yes	WB
ET	Human capital	Gross enrolment ratio, tertiary level: the sum of all tertiary level students enrolled at the beginning of the school year, expressed as a percentage of the mid-year population in the 5-year age group after the official secondary school leaving age.	Log	Yes	Yes	Yes	WB
G	Growth	GDP growth.	Normal	Yes	Yes	Yes	WB
T	Infrastructure	Number of telephone mainlines per thousand of the population.	Log	Yes	Yes	Yes	WB
OPN	Openness	(Exports + Imports)/GDP*100	Log	Yes	Yes	Yes	WB
FH	Political risk/corruption	An index combining the Civil Liberty Index and the Political Rights Index (1 to 10, higher represents more risk).	Log	Yes	Yes	Yes	Freedom House
MS	Market size	GDP/population*100	Log	Yes	Yes	Yes	WB
N_MS	Market size of neighbours	Average GDP/population*100 of neighbours.	Log	Yes	Yes	Yes	WB
CC	Risk	Institutional Investor ratings (0 to 100, higher represents less risk).	Log	Yes	Yes	Yes	Institutional Investor
N_CC	Risk of Neighbours	Average institutional Investor ratings (0 to 100, higher represents less risk) of the neighbours.	Log	Yes	Yes	Yes	Institutional Investor
INFL	Market volatility	Consumer price inflation.	Normal	Yes	No	No	WB
PURB	Stage of Development	Urbanisation: Urban population as percentage of total.	Log	Yes	Yes	Yes	WB
REE	Market volatility	Real effective exchange rate.	Log	Yes	No	No	WB
R	Market volatility/return potential	Long term real interest rate.	Normal	Yes	No	No	WB
PIT	Tax and cost of labour	Tax on income, profits and capital gains in US$ (percentage of current revenue)	Log	No	Yes	No	WB
DOIL	Natural resources	Dummy for oil countries (1 = natural oil resources).	Dummy	-	-	Yes	See appendix 6

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[42] Dev = Developing countries, Emg = Emerging countries and Afr = African countries

5.4.3   Data exposition

Table 5.3 shows the means of the variables used in the empirical estimation in chapters 6 and 7 over the time span 1980 to 2000. The sample is divided into developed, emerging and African sub-samples and shows the means over the time span and the standard deviation across the countries and over the time span.

Table 5.3   An Exposition of Data for Developed, Emerging and African from 1980 to 2000

	Developed (1980 to 2000)			Emerging (1980 to 2000)			African (1980 to 2000)		
	Mean	$\overline{\sigma}_i$	$\overline{\sigma}_t$	Mean	$\overline{\sigma}_i$	$\overline{\sigma}_t$	Mean	$\overline{\sigma}_i$	$\overline{\sigma}_t$
FDI	1.8	2.3	2.5	2.4	2.8	1.9	1.6	3.4	1.9
MS	25799.8	7316.1	2912.7	4596.1	5012.0	739.3	839.3	1088.9	80.7
G	2.3	1.6	1.8	4.6	4.2	4.0	2.9	5.2	4.6
GC	1.8	1.5	1.8	2.7	4.3	3.9	-0.03	5.7	5.1
OPN1	0.6	0.3	0.1	0.67	0.5	0.2	0.7	0.4	0.1
OPN2	24579.3	42966.2	5132.1	4800	11065.8	2174.3	530.7	703.2	86.4
T	458.3	76.7	74.3	108.5	118.4	35.5	11.7	17.6	4.6
EP	101.3	4.9	2.8	104.1	11.8	4.6	74.6	32.3	10.2
ES	101.2	12.6	12.4	59.3	17.6	8.3	24.1	19.8	4.6
ET	42.4	14.3	11.2	19.8	8.8	4.4	3.1	4	0.9
FH	1.14	0.3	0.09	3.9	1.6	0.9	5.2	1.3	0.9
CC	83.8	7.8	3.7	43.5	18.1	7.7	23	13.2	3.6
R	5.9	2.5	2.4	7.8	9.0	6.4	3.9	13.9	10.5
INLF	4.8	2.8	3.5	72.3	189.5	118.4	80.1	345.6	204
PURB	75.3	11.9	1.6	59.8	26.2	3.7	31.9	16.2	3.5
PIT	-	-	-	28.3	15.7	6.8	-	-	-

Source: Own calculations

$\overline{\sigma}_i$ represent the average standard deviation over countries.

$\overline{\sigma}_t$ represent the average standard deviation over time.

Table 5.4 shows the means, as well as the average standard deviation across countries and the average standard deviation across time of variables for the sample groups that are subdivided into two shorter periods, one from 1980 to 1989 and the other from 1990 to 2000. This subdivision is made in order to gain more information about the data in the sub-periods as well as the growth in the variable between the two different periods.

Table 5.4   An Exposition of Data for Developed, Emerging and African samples from 1980 to 1989 and 1990 to 2000, respectively.

	Developed 1980 to 1989			Developed 1990 to 2000			% change between periods	Emerging 1980 to 1989			Emerging 1990 to 2000			% change between periods	African 1980 to 1989			African 1990 to 2000			% change between periods
	Mean	$\bar\sigma_i$	$\bar\sigma_t$	Mean	$\bar\sigma_i$	$\bar\sigma_t$		Mean	$\bar\sigma_i$	$\bar\sigma_t$	Mean	$\bar\sigma_i$	$\bar\sigma_t$		Mean	$\bar\sigma_i$	$\bar\sigma_t$	Mean	$\bar\sigma_i$	$\bar\sigma_t$	
FDI	0.8	0.8	0.5	2.8	3.64	3.1	273.3	1.5	2.1	0.8	3.3	3.4	2.1	124.5	1.1	2.3	1.4	2.2	4.5	1.7	100.7
MS	23389.1	6690.5	1609.9	27419.1	7884.8	1744.4	17.2	3921.6	4261.5	370.2	5096.6	5841.3	436.4	30.0	839.3	1088.9	80.7	724.5	904.3	43.3	-13.7
G	2.5	1.6	1.8	2.1	1.6	1.7	-17.5	4.5	4.6	3.9	5.1	3.8	3.8	13.7	3	5.6	5	2.6	5.2	4.2	-13.3
GC	2.0	1.5	1.8	1.5	1.5	1.7	-27.7	2.4	4.6	3.8	3.1	3.9	3.8	27.0	0.1	5.8	5.2	-0.6	6.1	4.7	-42
OPN1	0.5	0.2	0.03	0.6	0.29	0.07	25.0	0.5	0.3	0.06	0.7	0.7	0.1	45.8	0.7	0.4	0.1	0.6	0.4	0.07	-15.7
OPN2	20743.2	40195.9	1820.3	26596.3	45484.6	4433.6	28.2	5499.4	4800	728.6	6716.8	16126.2	1339	22.1	540	669.8	90.7	522.2	733.5	68.9	-3.3
T	416.7	79.7	41.5	529.6	73.9	35.4	27.1	75	97	76.6	130.4	142.1	26.2	75.1	8.1	12.9	1.4	14.4	21.1	3.2	78.9
EP	100.4	5.8	1.3	102.2	4.3	2.7	1.8	103.5	8.2	2.2	104.6	13.3	3.3	1.0	72.2	34.3	5.5	77.3	30.5	7.9	7.1
ES	91.7	9.4	2.2	111.7	14.9	12.3	21.8	53.9	18.3	3.4	65.3	16.7	7.2	21.2	24.1	18.1	2.6	27.1	21.8	2.4	12.7
ET	33.7	13.2	3.7	52	15.6	8.6	54.5	16.6	10.4	2.3	23.3	9.4	3.2	40.2	2.5	3.2	0.4	3.9	4.9	0.7	55.5
FH	1.16	0.2	0.03	1.16	0.25	0.05	0.0	4.1	1.6	0.6	3.63	1.5	0.5	-11.9	5.6	1.2	0.4	4.9	1.4	0.7	-1.2
CC	84	8.5	2.8	83.6	7.16	3.4	-0.5	44.7	18.2	8	42.6	18	5.4	-4.6	24.7	15.1	4.4	21.5	11.6	3.1	-10
R	5.3	2.7	2.6	6.3	2.4	2.1	18.6	6.5	9.2	6.6	6.2	11.3	6	-4.0	1.3	12.3	8.1	6.34	15.3	8.5	387
INFL	7.1	4.2	3.5	2.7	1.4	1.8	-61.9	69.6	162.9	96.8	71	213.7	124.9	2.0	21.0	27.6	11.8	133.8	634.6	255.2	537.9
PURB	74	13.4	0.6	76.5	10.5	0.9	3.4	56.6	26.3	2.1	62.8	26	1.6	10.9	28.4	15.3	1.9	35.2	16.9	2.1	22.9
PIT	-	-	-	-	-	-	-	27.6	18.2	4.2	-	-	-	-	-	-	-	-	-	-	-

Note: - no values

Source: Own calculations

$\bar\sigma_i$ represents the average standard deviation over countries.

$\bar\sigma_t$ represents the average standard deviation over time.

5.4.3.1   Foreign direct investment

FDI is expressed as constant FDI flows as a percentage of GDP (both FDI and GDP are measured in US dollar terms). Africa, with an average FDI flow of 1.6 per cent of GDP, has received the lowest FDI during the period 1980 to 2000. This is compared to 1.8 and 2.4 per cent for developed and emerging countries respectively. The increasing trend of FDI flows for all three groups is visible from the increase in the averages from 1980 to 1989 and 1990 to 2000. The increase between these periods is the highest for developed countries, with 273.3 per cent and is the lowest for African countries with 103.7 per cent. The emerging market sample still received the highest inflows of 3.3 per cent between the period 1990 to 2000, followed by developed countries with 2.8 per cent and lastly African countries with 2.2 per cent. Even though the average for African countries increased, the increase was still lower than that of the other groups. These average FDI flows to Africa relative to GDP were 24 per cent less than the developed sample and about 35 per cent less than the emerging sample.

The average standard deviation across countries is the highest in the African sample emphasising the unequal distribution of FDI to these countries. However, the African sample has the lowest average standard deviation over time, emphasising the relatively small change in FDI flows during this period.

5.4.3.2   Market size

Market size, as expressed by GDP per capita in US dollar terms, is by far the largest for the developed sample and the lowest for the African sample. The GDP per capita of the developed sample is on average 38 times larger than in the African sample, between 1990 to 2000, and more than 7 times larger than the emerging sample. The dismal situation in African countries is further emphasised by the fact that average GDP per capita for the period 1990 to 2000, is 13.7 per cent lower than the average from 1980 to 1989, while average GDP per capita increased by 12.2 percent and 30 per cent between the same two periods, for developed countries and emerging countries respectively.

5.4.3.3   Economic growth

The decrease in GDP per capita of African countries is confirmed by low economic growth rates. The average growth rate was the highest in the emerging sample – almost twice as

much as the African sample. The average standard deviation across time and across countries for the African sample is much larger than that of the developed sample and the emerging sample. In both the developed and the emerging samples the average growth rate is larger than the standard deviations – this is not the case in the African sample. This gives an indication of the high volatility and instability in the growth of African countries and also emphasises the dissimilarities in growth between them.

The average growth between the two periods also decreased in the developed sample, but increased by 13.7 per cent in the emerging sample.

If the population growth rate is accounted for as in the per capita growth rate of these countries, the African sample again shows on average a negative growth rate with a large standard deviation. This data confirms the situation of underlying volatility in African growth.

5.4.3.4 Openness

Looking at the average degree of openness, as expressed by the sum of exports and imports divided by the GDP of individual countries, Africa seems to be slightly more open than developed countries and only slightly less open than the emerging sample. Emerging countries have the highest standard deviation across countries (some countries are much more open than others). The opening up of emerging market economies is emphasised by looking at the averages between 1980 to 1989 and 1990 to 2000, which increased by 45.8 per cent between these two periods. The reverse situation is visible in African countries, showing a decrease of 16.7 per cent between the averages of the two periods.

If this ratio is expressed as imports plus exports over population, a similar outcome results as that for GDP per capita, with the averages for the African sample decreasing. The figure of 24579.3 for developed countries is 51 times greater than the 839.3 for African countries and the 4596.1 for emerging countries is 12.8 times greater.

5.4.3.5   **Infrastructure**

Comparing infrastructure (using telephone mainlines per 1000 people) Africa seems to be at a greater disadvantage than the other groups. There are on average only 11.7 telephones per thousand people in the African sample (from 1980 to 2000), compared to 108.5 in the emerging sample and the 458.3 in the developed sample. The very low average standard deviation across time for the African sample of 4.64 indicates that there is no significant improvement in the number of telephone lines during the sample period (compared to the 74.3 and 35.5 for the developed sample and the emerging sample respectively).

The percentage increase between the two periods for African countries when compared to the other samples is the highest, with 76.9 per cent, followed closely by the increase in the emerging sample with 75.1 per cent.

5.4.3.6   **School enrolment**

The school enrolment on primary, secondary and tertiary level gives a clear indication of the low levels of education in the African sample, especially on tertiary level, where the average enrolment is 3.1 per cent (as a percentage of the age group). This is compared to 42.4 per cent and 19.8 per cent for the developed and emerging samples respectively. The average change of 53.5 percent in tertiary enrolment in Africa between the two periods is only slightly less than the 54.5 per cent change in the developed sample, but the increase to 3.9 percent for the period 1990 to 2000 is still from a very low base of 2.54.

The change in the average secondary education levels of 12.7 per cent in the African sample, however, is much lower than the 21.2 per cent for the emerging group and the 21.8 per cent for the developed group.

5.4.3.7   **Civil liberty, political rights and risk**

The average of 5.2 for the African sample (where 7 is the most unfavourable), according to the civil liberty rights and political rights index as expressed in the *Freedom House* index, represents a much higher level of corruption and lower level of civil liberty accompanied by less political rights. This is compared to 1.3 and 3.8 in the developed and emerging samples

respectively. The average decrease of 12.2 per cent from 5.58 to 4.9 in Africa is only marginally lower than the 11.9 percent (from 4.12 to 3.63) in the emerging sample.

This high risk perception is also reflected in the *Country Credit risk* index compiled by *Institutional Investor* that shows on average a much higher risk of 21.5 (out of 100) in African countries and a much lower risk of 83.8 in the developed countries (100 represents the lowest risk). This is compared to 43.5 in the emerging sample. The averages between 1980 to 1989 and 1990 to 2000 show a slight decrease of only 0.5 per cent for the developed sample, but show a 4.6 per cent decrease and a 13 per cent decrease for the emerging and the African sample respectively.

5.4.3.8   Real interest rate

The average real interest rate (with high standard deviation) also supports the volatility in the African sample and hints at the risk and instability involved. While the average real interest rate across the sample for the period 1990 to 2000 is more or less in parity between the groups (6.34 in the African sample compared to 6.3 in the developed sample and 6.2 in the emerging sample), the standard deviation of 15.3 across countries and 8.46 across time in the African sample is much higher – especially compared to the 2.4 across countries and 2.05 across time in the developed sample. The very low real interest rate of 1.3 for Africa between 1980 and 1989 decreases the average real interest rate for African countries between 1980 and 2000 to 3.94, a figure that is much lower than the 5.9 for developed countries and the 7.8 for emerging countries.

5.4.3.9   Inflation

Average inflation in the African sample increased between 1980 and 1989 and 1990 and 2000 from 21.04 to 133.8, or by 535.9 per cent. This is much higher than the 2 per cent increase in emerging countries. The average inflation rate in developed countries decreased by 61.9 per cent between the sample periods. The standard deviations of inflation across countries for the African sample from 1990 to 2000 are 634.6 and 255.2 across time. These figures are much higher compared to the 1.4 and 1.8 in the developed sample and emerging sample respectively.

5.4.3.10   Percentage of population urbanised

On average 75.3 per cent of the population in the developed sample is urbanised compared to 59.8 percent in the emerging sample and 31.9 per cent in the African sample. The urbanised population in the African sample increased the most between 1980 and 1989 and 1990 and 2000, the increase being 23.9 per cent, compared to 10.9 per cent in emerging countries and 3.4 per cent in developed countries.

5.4.4   Lessons learned from the data

The data presented in tables 5.3 and 5.4 shows that African countries are on average in a really dismal position. The determinants for attracting FDI are much weaker in the African sample compared to other countries. A number of variables also decreased over time, examples being growth in GDP per capita. These changes send a negative message to potential investors. The variance of data over time and across the African sample is also much higher, compared to the developed and emerging samples. High variances in data can be statistically interpreted as higher volatility, more uncertainty and higher risk in these countries. Higher variances in data for the African sample also indicate poor empirical results, which will follow in chapters 6 and 7.

5.5   UNIT ROOT TESTS FOR PANEL DATA

In time-series econometric studies, testing for unit roots and cointegration, is done by making use of the (augmented) Dickey-Fuller (DF) and Phillips-Perron (PP) tests, and is standard practice. However, according to Maddala (1999: 631) the use of these tests lacks power in distinguishing the unit root from stationary alternatives, and by using panel data unit root tests, the power of unit root tests based on a single time series can be increased.

Banerjee (1999: 607) states that the literature on unit roots and cointegration in panel data has turned out to be a rich area of study. It mainly focuses on combining information from the time-series dimension with data from the cross-sections dimension. This is done in the hope that inference about the existence of unit roots and cointegration can be made in a more straightforward and precise manner, by taking account of the cross-section dimension, especially in environments where the time span for the data may not be very long, but similar

data may be available across a cross-section of units such as countries, regions, firms or industries.

The most widely used panel unit root tests that have emerged from the literature are those developed by Levin and Lin (LL) (1992, 1993); Im, Pesaran and Shin (IPS) (1997) and Maddala and Wu (MW) (1999).

Appendix 4, table A4.1 shows the results of the IPS unit root test performed on the developed, emerging and African data sets and appendix 4, table A4.2 shows the result of the IPS panel unit root test performed on neighbouring countries. Tables A4.3 and A4.4 contain the McCoskey and Koa test for cointegration results.

Data over a time-span of only 21 periods (1980 to 2000) have been tested, but due to problems of unavailability, some of the data series tested contain observations for fewer periods. Ratios of data were taken where possible, to smooth the data and to increase the possibility of testing for stationarity. In a number of cases the tests for stationarity gave conflicting results. The dependent variable, FDI/GDP, tested non-stationary for both the developed and emerging samples using the IPS tests, but indicated stationarity in the African sample. Strazicich, *et al.* (2001: 410) also, reported IPS panel unit root tests for 44 developing countries[43] for the period 1971 to 1992. The results for the ratio of FDI to gross national product (GNP) for all the countries in their sample, contrary to the analysis of this research '…clearly reject the null hypothesis of a unit root[44]…'.

As a result of the conflicting non-stationary results in tables A4.1 and A4.2, which have the implication of spurious regression[45], the McCoskey and Kao test for cointegration was performed on the residuals. A discussion of the test and results are included in appendix 4.

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[43] Of which 19 are African countries.

[44] Failure to reject the null hypothesis of a unit root implies that the ratio of foreign direct investment to GNP is a non-stationary series and rejection of the null hypothesis supports the alternative hypothesis that the ratio of FDI to GNP is stationary (it was rejected at a 1% level and critical values comes from an asymptotic distribution for a one-tailed test).

[45] Due to this, the results of the panel output must be interpreted with caution. As a result of this an indication using ***(**)[*] for a 1(5)[10] per cent level of significance, which is standard practice in literature, is not used in the panel output results.

5.6   CONCLUSION

The main purpose of this chapter is to provide an exposition of the data used. This includes the variables and definitions of the data that have been used, together with a detailed analysis of the averages of the different groups over different periods. The developed, emerging and African data characteristics are shown for: FDI, GDP per capita, growth, growth per capita, openness, infrastructure, education, a political and credit rating variable, real interest rates, inflation and urbanisation. This is done by calculating the averages from 1980 to 2000, but the data set is also subdivided to show the averages for 1980 to 1989 and 1990 to 2000; and also the percentage changes between these two periods.

From the data it can be concluded that African countries are on average in a really dismal position. The factors for attracting FDI are much weaker or poorer in the African sample compared to other countries. Data shows that FDI, expressed as a percentage of GDP, as well as growth in FDI are on average lower in the African sample than in other samples. The market size (GDP per capita) is much lower in the African sample, as are the infrastructure variable and levels of education. The economic growth rate in the emerging sample is much higher than in the African sample, and the per capita growth rate in the African sample is negative over the whole period, further emphasising the lack of international confidence in gaining high returns on investment.

The country credit rating for Africa is much less favourable than that of developed and emerging countries. This is also supported by the *Freedom House* index. Real interest rates in Africa, over the total time span, are much lower than in the other groups, and are much more volatile. This volatility and inconsistency is also evident in the inflation data for Africa which is much higher. Openness in Africa (total trade expressed as a percentage of GDP), does not differ much from the rest of the groups, but if it is expressed as total trade over the population, the result for Africa is much lower. This large variance in the African sample over time and across countries, indicates more uncertainty and higher risk in African countries. The higher variance in the data for the African sample also points to poorer empirical results to follow in chapters 6 and 7.

CHAPTER 6

EMPIRICAL RESULTS FOR COUNTRY SPECIFIC DETERMINANTS

6.1   INTRODUCTION

Empirical results[46] obtained for the period 1980 to 1998 for the developed, emerging and African panels are presented and discussed in the next section. The presentation and discussion includes *pooled* estimation, results from *least square dummy variable*s (LSDV)[47] and cross-section *seemingly unrelated regressions* (SUR).

Empirical results for country specific determinants are shown and discussed. The discussion includes results presented in two tables with the first table consisting of five determinants of FDI namely: a risk return ratio, an education ratio, an infrastructure variable, an openness variable and a civil liberty variable. The second table includes a number of additional control variables, including growth, percentage urbanisation, real effective exchange rate, real interest rate, personal income tax and an oil dummy.

The variables used in the empirical estimation in this section are discussed and described in the theoretical and empirical discussion of determinant of FDI in chapters 3 and 4 respectively. The data and the methodology of empirical estimation are discussed in chapter 5.

6.2   DISCUSSION OF EMPIRICAL RESULTS

6.2.1   Empirical estimation

Tables 6.1 and 6.2 show the empirical results obtained for developed, emerging and African countries from 1980 to 1998. *Pooled*, *least square dummy variable* (LSDV) and cross-section *seemingly unrelated regression* (CS SUR)[48] techniques were applied in the estimation of the empirical results.

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[46]   For a brief discussion of the estimation techniques, see appendix 3.
[47]   This estimation gives the same results as the *"within"* estimation.
[48]   The cross-section specific coefficients of the *SUR* model are included in the estimation if there are discrepancies between the results of the sign found according to the p*ooled* and *LSDV* methods.

Table 6.1 shows the empirical results for the sample groups using regression equation 6.1. Equations 6.2, 6.3 and 6.4 represent regression equations tested for the developed, emerging and African country samples, respectively. These empirical results obtained are shown in table 6.2. Cross-section specific coefficients for the *SUR* estimation are shown in appendix 8.

$$\left(\frac{fdi}{gdp}\right)_{it} = b_1 + b_2 \ln\left(\frac{cc}{ms}\right)_{it} + b_3 \ln(fh_{it}) + b_4 \ln\left(\frac{et}{ep}\right)_{it} + b_5 \ln(t_{it}) + b_6 \ln(opn_{it}) + \varepsilon_{it} \qquad (6.1)$$

$$\left(\frac{fdi}{gdp}\right)_{it} = b_1 + b_2 \ln\left(\frac{cc}{ms}\right)_{it} + b_3 \ln(fh_{it}) + b_4 \ln\left(\frac{et}{ep}\right)_{it} + b_5 \ln(t_{it}) + b_6 \ln(opn_{it}) + b_7(g_{it})$$
$$+ b_8 \ln(purb_{it}) + b_9 \ln(ree_{it}) + b_{10}(r_{it}) + \varepsilon_{it} \qquad (6.2)$$

$$\left(\frac{fdi}{gdp}\right)_{it} = b_1 + b_2 \ln\left(\frac{cc}{ms}\right)_{it} + b_3 \ln(fh_{it}) + b_4 \ln\left(\frac{et}{ep}\right)_{it} + b_5 \ln(t_{it}) + b_6 \ln(opn_{it}) + b_7(g_{it})$$
$$+ b_8 \ln(purb_{it}) + b_{11}(pit_{it}) + \varepsilon_{it} \qquad (6.3)$$

$$\left(\frac{fdi}{gdp}\right)_{it} = b_1 + b_2 \ln\left(\frac{cc}{ms}\right)_{it} + b_3 \ln(fh_{it}) + b_4 \ln\left(\frac{et}{ep}\right)_{it} + b_5 \ln(t_{it}) + b_6 \ln(opn_{it}) + b_7(g_{it})$$
$$+ b_8 \ln(purb_{it}) + b_{12}(doil) + \varepsilon_{it} \qquad (6.4)$$

where: fdi_{it} is the foreign direct investment for country i at time t.

gdp_{it} is the gross domestic product for country i at time t.

cc_{it} is the country credit rating for country i at time t.

ms_{it} is the gross domestic product per capita for country i, at time t.

fh_{it} is a combination of the civil liberty index and the political rights index for country i, at time t.

et_{it} represents the percentage of tertiary students enrolled as a percentage of the potential amount of students, for country i at time t.

ep_{it} represents the percentage of primary students enrolled as a percentage of the potential amount of students, for country i at time t.

t_{it} represents the amount of telephones per 1000 of the population, for country i at time t.

opn_{it} represents the openness (imports plus exports relative to gross domestic product) for county i at time t.

g_{it} represents the growth in GDP for country i at time t.

$purb_{it}$ represents the urbanized percentage of population for county i at time t.

ree_{it} is the real effective exchange rate for country i at time t.

r_{it} is the real interest rate for country i at time t.

pit_{it} is the personal income tax rate for country i at time t.

$doil$ is an oil dummy for African countries that are net oil exporters (net oil exporter =1).

ε_{it} is the stochastic error term.

6.2.2   Empirical results

The empirical results reported in tables 6.1 and 6.2 are for 16 developed countries, 13 emerging countries, an African sample consisting of 36 countries and an additional African sample for the top ten[49] FDI receiving countries (all over a time span of 19 years). Equation 6.1 was used to estimate table 6.1 and equations 6.2, 6.3 and 6.4 were used to the estimate values in table 6.2. In equations 6.2, 6.3 and 6.4, growth (G) and percentage urbanised (PURB) are additional variables included for all the sample groups, but real effective exchange rate (REE) and real interest rate (R) are only added in regression equation 6.2, personal income tax (PIT) in equation 6.3 and an oil dummy (DOIL) in equation 6.4. The pooled model, which is the most restrictive panel model applied, shows: the lowest adjusted R^2; lowest F-statistics; insignificant t-values; and that positive serial correlation and heteroskedasticity (appendix 5) are present, while the *CS SUR*[50] model, which makes use of *general least squares* (GLS), presents the least restrictive results, and shows the highest adjusted R^2. However serial correlation and heteroskedasticity are still present.

As expected, the risk (country credit) per market size (CC/MS) as shown in table 6.1, has a positive sign for most of the samples. If country credit per market size increases (an improved rating per market size), FDI will increase. The magnitude of these coefficients, according to table 6.1 is the largest for developed countries with pooled estimation, but an insignificant

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[49]   The top ten ranking is done according to the ratio of FDI per GDP (appendix 1).
[50]   See appendix 3 for a discussion of these models.

negative result is visible using *LSDV* in the developed sample and African top-ten sample. Negative results are also visible for the country credit over market size (CC/MS) variable using the *SUR* model using the CC/MS as a specific coefficient (appendix 8).

Table 6.1   Estimation Outputs 1 (Dependent Variable is FDI/GDP)

	Developed			Emerging			Africa (Total sample)		Africa (Top ten FDI sample)		
	Eq 6.1	Eq 6.1	Eq 6.1	Eq 6.1	Eq 6.1	Eq 6.1	Eq 6.1	Eq 6.1	Eq 6.1	Eq 6.1	Eq 6.1
	Pooled	LSDV	CS SUR[51]	Pooled	LSDV	CS SUR	Pooled	LSDV	Pooled	LSDV	CS SUR
Log(CC/MS)	1.947 (6.011)	-0.372 (-0.367)	See A8	0.488 (2.557)	0.921 (2.396)	1.234 (4.848)	0.508 (1.889)	0.511 (0.790)	0.659 (0.674)	-2.932 (-1.778)	See A8
Log(ET/EP)	0.195 (0.843)	0.592 (1.479)	-0.339 (-2.13)	-0.777 (-4.358)	0.568 (1.214)	See A8	-0.429 (-2.309)	0.982 (2.429)	-2.671 (-4.896)	4.513 (3.174)	See A8
Log(T)	5.470 (4.676)	-4.128 (-1.998)	See A8	2.606 (7.201)	3.080 (5.104)	0.681 (2.229)	0.632 (3.910)	0.472 (1.209)	2.224 (3.718)	2.461 (1.944)	-0.023 (-0.05)
Log(OPN)	1.203 (3.772)	9.376 (5.86)	11.975 (27.674)	3.053 (8.754)	3.051 (3.041)	6.552 (12.294)	0.738 (3.230)	0.688 (1.089)	1.505 (3.433)	3.900 (2.415)	0.594 (1.430)
Log(FH)	-0.686 (-2.633)	-0.580 (-1.90)	-0.137 (-2.204)	-0.322 (-1.224)	0.010 (0.033)	See A8	-0.433 (-0.864)	-1.401 (-2.556)	-9.948 (-3.959)	-8.551 (-3.563)	-2.409 (-4.058)
C	-1.036 (-0.388)	See A7	See A8	-0.489 (-0.678)	See A7	See A8	1.850 (1.889)	See A8	10.04 (2.248)	See A7	See A8
Method	OLS	OLS	GLS	OLS	OLS	GLS	OLS	OLS	OLS	OLS	GLS
R^2 adj	0.24	0.52	0.97	0.49	0.62	0.93	0.04	0.37	0.19	0.47	0.87
F stat	20.44	17.55	220.53	44.64	23.87	84.02	6.44	10.2	9.12	11.85	30.16
N	16	16	16	12	12	12	36	36	10	10	10
T	19	19	19	19	19	19	19	19	19	19	19
Number of Observations	301	301	301	225	225	225	622	622	161	161	161

Source: Own Calculations

Notes: t-statistics are shown in parentheses, country fixed effects are omitted from the table and are shown in appendix 7.

See A8: The country specific results are shown in appendix 8.

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[51] The cross-country specific effects for the *SUR* model are shown in appendix 8 and are included on the basis of inconsistency in the signs between the *pooled* and *LDSV* estimation.

The education ratio, education tertiary over education primary, (ET/EP) shows conflicting results between the different panel methods used. The pooled models in the emerging and African samples have negative signs that may support the cheap labour argument. If the relative tertiary portions increase, wages increase and FDI can flow to places where cheaper labour is available (relatively less educated people). In all three the samples, however, if cross-country specific effects are allowed for, the sign is positive, although only the African samples seems significant. This may indicate that the cheap labour argument is not valid for all emerging and African countries. The *SUR* model emphasises this as shown in appendix 8.

As expected, the infrastructure proxy (T) is positive in almost all cases in the emerging and African samples, but this is not the case in the developed sample. All countries pooled together in the developed sample show a positive sign, but when allowing for cross-country differences, negative signs are found that may indicate that infrastructure is no longer a major determinant in attracting FDI to developed countries; possibly because most of the infrastructure that is needed, is already in place. These findings for developed countries are not in line with the findings of Asiedu (2001) who found positive results. Country specific results, by making use of the *SUR* model show negative results for a larger number of developed countries.

The openness variable (OPN) is positive for all the groups of countries and all the methods used as would be expected, and this is aligned with findings of other studies like Asiedu (2001), Gastanga, *et al.* (1998) and Ancharaz[52]. The coefficients are largest in the case of the developed and emerging sample, and may imply that these countries would gain most from further opening their economies to international trade and expanding their markets. This finding of the developed country sample is in line with the data in table 5.4 which shows that according to this measure of openness developed countries are less open than emerging countries and almost on par with African countries.

The combined Freedom House (FH) variable including the civil liberty and political rights index, shows negative signs, as expected, for all coefficients except one (the *within* method) for the emerging sample. These coefficients appear to be more or less of the same magnitude except for the top-ten FDI countries in Africa showing much larger coefficients. This may

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[52]   See appendix 2 for a detailed presentation of these findings.

indicate that these countries can attract more FDI if their political situations improve. These findings (sign and magnitude) are in line with those found in the literature (Schneider and Frey, 1985, Edwards, 1990, Chakrabarti, 2003 and Ancharaz, 2003). In the emerging sample group, Brazil, China, Columbia, India, Mexico and Venezuela show insignificant results. Argentina, Malaysia, the Philippines and Thailand show negative significant results and only Chile and India show positive significant results.

Table 6.2 shows consistent coefficients and signs, compared to table 6.1, after the inclusion of a number of other variables, namely growth (G), percentage urbanised (PURB), real effective exchange rate (REE), real interest rate (R), personal income tax (PIT), and the oil dummy (DOIL). Growth (G) shows a positive sign as expected, for all coefficients except for one (an insignificant coefficient using the *LSDV* technique for the top-ten African FDI countries). The sign and magnitude of these elasticities are aligned with the findings in the literature and vary between 0.01 and 0.09 (Schneider and Frey, 1985, Gastanaga, *et al*., 1998, Culem, 1988 and Razin, 2002).

The percentage urbanisation (PURB) variable is positive as expected (except in the case where the total African sample is pooled and the results are negative and insignificant). The magnitudes of these coefficients are the lowest in the emerging sample and the highest in the African top-ten FDI sample. This may reflect a higher degree of development and higher concentration of people in urban areas with higher purchasing power and greater availability of labour.

Table 6.2   Estimation Outputs 2 (Dependent Variable is FDI/GDP)

	Developed			Emerging			Africa (Total sample)	Africa (Top ten FDI sample)		
	Eq 6.2	Eq 6.2	Eq 6.2	Eq 6.3	Eq 6.3	Eq 6.3	Eq 6.4	Eq 6.4	Eq 6.4	Eq 6.4
	Pooled	LSDV	CS SUR	Pooled	LSDV	CS SUR	Pooled	Pooled	LSDV	CS SUR
Log(CC/MS)	1.795 (4.109)	-0.296 (-0.275)	See A8	0.841 (5.620)	1.509 (3.975)	2.058 (8.847)	0.508 (1.867)	-0.298 (-0.231)	-2.607 (-1.681)	-0.319 (-0.638)
Log(ET/EP)	0.270 (1.086)	0.578 (1.374)	-0.941 (-3.738)	-1.830 (-5.964)	0.991 (1.221)	See A8	-0.551 (-2.630)	-3.133 (-5.025)	-0.257 (-0.144)	0.914 (1.745)
Log(T)	4.585 (3.036)	-4.352 (-1.846)	See A8	2.881 (9.966)	1.879 (3.104)	-1.121 (-2.409)	0.655 (3.993)	1.311 (1.380)	-0.700 (-0.526)	See A8
Log(OPN1)	1.575 (4.494)	9.220 (4.862)	8.234 (8.397)	4.763 (13.11)	5.351 (4.968)	7.904 (11.487)	0.834 (3.583)	1.839 (3.456)	3.868 (2.503)	0.78 (2.198)
Log(FH)	-0.686 (-2.508)	-0.516 (-1.429)	0.214 (1.294)	0.038 (0.179)	-0.114 (-0.388)	See A8	-0.528 (-1.025)	-10.54 (-4.021)	-5.795 (-2.527)	-2.676 (-4.785)
G	0.090 (2.521)	0.050 (1.644)	0.029 (2.629)	0.021 (1.216)	0.027 (1.460)	0.0009 (1.492)	0.083 (3.155)	0.104 (1.199)	-0.008 (-0.125)	See A8
Log(PURB)	1.206 (1.664)	4.950 (1.371)	9.338 (2.029)	0.869 (5.268)	2.565 (2.050)	5.533 (4.587)	-0.075 (-0.190)	2.663 (1.274)	23.35 (5.168)	14.097 (5.99)
Log(REE)	-0.738 (-0.718)	0.899 (0.686)	See A8	-	-	-	-	-	-	-
R	-0.025 (-0.992)	-0.010 (-0.418)	-0.026 (-3.089)	-	-	-	-	-	-	-
Log(PIT)	-	-	-	-1.214 (-8.312)	-1.084 (-3.957)	-0.691 (-6.763)	-	-	-	-
DOIL	-	-	-	-	-	-	0.905 (2.285)	-	-	-
C	-3.091 (-0.666)	See A7	See A8	1.570 (1.581)	See A7	See A8	1.382 (0.640)	-0.908 (-0.099)	See A7	See A8
Method	OLS	OLS	GLS	OLS	OLS	GLS	OLS	OLS	OLS	GLS
R^2 adj	0.26	0.51	0.91	0.66	0.68	0.93	0.06	0.19	0.55	0.83
F stat	12.08	13.25	46.144	56.7	25.85	77.102	5.98	6.9	13.8	25.03
N	16	16	16	13	13	13	36	10	10	10
T	19	19	19	19	19	19	19	19	19	19
Number of observations	281	281	281	230	230	230	622	169	169	169

Source: Own calculations

Notes: t-statistics are shown in parentheses, country fixed effects are omitted from this table and are shown in appendix 7.

See A8: The country specific results are shown in appendix 8.

The real effective exchange rate (REE) in the developed sample shows insignificant results that are negative using *pooled* estimation and positive results using the *LSDV* method. The detail of the SUR method is shown in appendix 8 and also indicates insignificant results for most of the countries. Real interest rates (R) show negative signs in this sample and indicate that an increase in real interest rate causes FDI to decrease. This may point towards higher risk or more expensive borrowing in the economy.

Personal income tax (PIT) in the emerging sample shows negative significant results, supporting the cheap labour argument (higher portion of total tax coming from personal income tax may indicate a higher percentage of the working force receiving higher wages, which in turn results in lower FDI). This argument is supported by findings of Chakrabarti (2003), Schneider and Frey (1985) and Van der Walt (1997). Other taxes have not been included in this sample due to a lack of data.

The oil dummy (DOIL) has only been included in the total African sample and shows a significant result that may support the fact that natural resources, in this case oil, are a determinant for FDI in Africa.

6.2.3   Lessons learned from empirical estimation of determinants of foreign direct investment

Lessons that can be learned from the empirical estimation of determinants of FDI are as follows:

(i)   Availability of data for testing theories poses a problem and in many cases proxies must be used which do not adequately capture the theories, but are the best available.

(ii)   Signs and size of coefficients differ between different sample groups and different estimation methods used. This could also be one of the reasons for inconsistency in the empirical findings as discussed in chapter 4.

(iii)   Given the large number of theories and hypothesis on FDI as discussed in chapter 3 it is evident that not all of the theories can be explained using one single equation for all of the countries in the sample and across sample groups. The relatively poor fit of the models shown in this chapter, but also in the literature (chapter 4 and appendix 3) support this.

(iv)   There are some empirical findings that are fairly consistent in the empirical literature and theory on FDI that are applicable for policy suggestions. These policy suggestions will be discussed in chapter 8.

6.3   CONCLUSION

This chapter shows empirical results obtained, using different panel data econometric techniques for a number of determinants of FDI. These results are compared across a sample of 16 developed countries, 13 emerging countries, 36 African countries and a sample consisting of the top-ten FDI receiving countries in Africa. The results are compared with available literature on the determinants of FDI and similar results are obtained.

The size and signs of coefficients differ between different panels and different estimation techniques used. The emerging sample gives the best fit for the models while African data has the poorest fit.

In general the results indicate that decreasing risks, improved infrastructure, a higher degree of openness, higher levels of urbanisation and higher growth rates lead to increases in FDI. Higher levels of human capital attract FDI to developed countries but decrease FDI to emerging and African countries. In Africa, the elasticities with respect to the freedom house variable, which measures civil liberty and political rights is much larger compared to developed and emerging country elasticities. This implies that an improvement in this index may result in an increase in FDI. African countries endowed with natural resources, especially oil, seem to explain part of the FDI inflows.

The next chapter will empirically test a number of variables in determining FDI from the neighbouring countries to a specific host country.

CHAPTER 7

EMPIRICAL RESULTS FOR NEIGHBOURING INFLUENCES

7.1   INTRODUCTION

In the previous chapter a set of host-country specific determinants of FDI were tested empirically. Distinction was made between different panels and different estimation techniques, which resulted in differences between signs and magnitudes for specific panels, but also between different panels.

In this chapter the hypothesis of neighbouring influences on a host country are tested empirically by making use of panel econometric techniques. In a globalised world with more regional integration with respect to policy, as well as political, economic and social matters, neighbouring countries are becoming more important. Neighbours and regions may affect individual country growth or may influence investment decisions.

Two different regression specifications are proposed, one in which two of the country determinants, as presented in equation 6.1 in chapter 6, are replaced by neighbouring variables – while the rest of the variables remain own country variables; and a second specification where only neighbouring variables are included as exogenous variables, together with the host country dependent variable. Empirical results are compared between samples consisting of developed, emerging and African countries, respectively.

7.2   EMPIRICAL RESULTS

7.2.1   Empirical literature

A number of authors have tested the effect of neighbouring countries on FDI or on growth, and found a significant influence.

By making use of cross-section analysis, Veugelers (1991) tested the influence of neighbouring countries on host countries by introducing a neighbour dummy (1 if a country shares a common border and 0 otherwise). In this study he found that neighbours have a significantly positive influence on the host country.

Easterly and Levine (2000) concentrated on the impact of neighbouring countries on growth. They found that "Favourable or unfavourable growth performance of one's neighbours tends to influence one's own long-run growth rate. Policy choices are also contagious across borders. While improving policies alone boost growth substantially, the growth effects are much larger if neighbouring countries act together." In this analysis they change the definition of neighbours of Chau (1993) by weighting each neighbour by the size of its total GDP, as opposed to using equal weights. They further put the averages of the neighbours' growth rates themselves into the regression, instead of putting the averages of the neighbours' right-hand-side variables into the growth regression. This allows them to test directly for contagion effects of growth successes and failures[53].

Collier and Gunning (1999b: 75) further state, "A third limitation is that no allowance is made for neighbouring effects such as policy contagion." Dunning (2002), however, concludes that "…locations – regions, countries or sub-regions – are likely to increase in significance in the future as a determinant of FDI."

7.2.2   Empirical estimation

Empirical estimation of equation 7.1 was used to construct table 7.1. *Pooled*, *LSDV* and *CS SUR* techniques were applied in this estimation. The country credit over market size ratio (CC/MS) and the freedom house (FH) variable from equation 6.1 in chapter 6 are replaced with the neighbouring variables: neighbouring country credit over neighbouring market size (N_CC/N_MS) and neighbouring freedom house (N_FH), while the rest of the equation is unchanged. In this estimation:

$$\left(\frac{fdi}{gdp}\right)_{it} = b_1 + b_2 \ln\left(\frac{n\_cc}{n\_ms}\right)_{it} + b_3 \ln\left(n\_fh_{it}\right) + b_4 \ln\left(\frac{et_{it}}{ep_{it}}\right)_{it} + b_5 \ln\left(t_{it}\right) +$$
$$b_6 \ln\left(opn_{it}\right) + \varepsilon_{it} \tag{7.1}$$

where: fdi_{it} is foreign direct investment for country *i* at time *t*.

gdp_{it} is the gross domestic product for country *i* at time *t*.

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[53]   Because of simultaneity (a country affects its neighbours and its neighbours affect it back) they instrument the neighbour's growth rate with the neighbours' right hand variables.

n_cc_{it} is the weighted[54] average of the neighbouring countries of country i's credit ratings over time t.

n_ms_{it} is the weighted average of the neighbouring countries of country i's gross domestic product per capita, for time t.

n_fh_{it} represents a weighted average of the neighbouring countries of country i, for a combination of the civil liberty index and the political rights index, for time t.

et_{it} represents the percentage of tertiary students enrolled as a percentage of the potential number of students, for country i at time t.

ep_{it} represents the percentage of primary students enrolled as a percentage of the potential number of students, for the country i at time t.

t_{it} represents the number of telephones per 1000 of population, for country i at time t.

opn_{it} represent the openness (imports plus exports relative to gross domestic product) for county i at time t.

ε_{it} is the stochastic error term.

The neighbouring effects were calculated using equation 7.2:

$$n\_x_{it} = \sum_{\substack{j=1 \\ i \neq j}}^{N} \left(\frac{gdp_{jt}^{n}}{\sum_{j=1}^{N}\left(gdp_{jt}^{n}\right)} \left(x_{jt}^{n}\right) \right) \tag{7.2}$$

where: n_x_{it} represents a specific exogenous variable capturing the neighbouring effect for host county i over time t.

gdp_{jt}^{n} represents a specific neighbouring country j's GDP over time t.

$\sum_{j=1}^{N} gdp_{jt}^{n}$ represents the summation of the individual neighbouring GDP over time t.

x_{jt}^{n} represents an exogenous variable for a specific country j over time t.

i represents the host countries.

j represents the neighbouring countries.

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[54] See equation 7.2 for the weighting of neighbouring countries.

7.2.3   Empirical results

Empirical results shown in table 7.1 are for 16 developed countries over a period of 19 years, 13 emerging countries over a period of 20 years, an African sample consisting of 36 countries over a 19 year period and an African sample for the top-ten FDI receiving countries, also over a 19 year period (the top-ten ranking is done on the basis of FDI per GDP). The pooled model consistently shows the poorest results (lowest adjusted R^2, lowest F-statistics, positive serial correlation and insignificant t-values), while the *CS SUR* model, which applies *general least squares* (GLS), performs the best (highest adjusted R^2, highest F-statistics).

The signs of the coefficients, as shown in table 7.1, for neighbouring country-credit over neighbouring market size (N_CC/N_MS) show conflicting results for the different methods and different panels.

The findings for the neighbouring freedom house (N_FH) index variable present positive results, with coefficients of a small magnitude in the developed and emerging sample. This may imply that the civil liberty and political rights index does not play an important role in emerging markets and if this index in the developed neighbouring countries increases (gets worse), the host country's FDI increases. However, the opposite result is visible in the African sample. Negative, statistically significant coefficients, with large magnitudes resulted from the African sample. This entails that an increase of one per cent in the neighbouring freedom house (N_FH) variable, reduces FDI to the host country by between 2.4 and 6.2 units of FDI/GDP. This has the implication that foreign investors may perceive African countries as a whole and to a greater extent as grouped together than the other sample groups, and it is therefore more likely that events in neighbouring countries may have a much larger impact.

Other variables included in table 7.1 show comparatively similar results to those in table 6.1 except for the signs for the education ratio education tertiary over education primary (ET/EP), which show positive results for the pooled, and *CS SUR* models for the emerging and African top-ten FDI samples. The sign of the coefficient for the infrastructure proxy (T) is negative.

Table 7.1   Estimation Output 3 – Neighbouring countries (Dependent variable FDI/GDP of host country)

	Developed			Emerging			Africa (Total sample)		Africa (Top ten FDI sample)		
	Eq 7.1	Eq 7.1	Eq 7.1	Eq 7.1	Eq 7.1	Eq 7.1	Eq 7.1	Eq 7.1	Eq 7.1	Eq 7.1	Eq 7.1
	Pooled	LSDV	CS SUR	Pooled	LSDV	CS SUR	Pooled	LSDV	Pooled	LSDV	CS SUR
Log(N_CC/N_MS)	-0.072 (-0.634)	-0.145 (-0.588)	0.193 (4.521)	0.367 (2.745)	1.265 (2.756)	0.546 (3.542)	-0.266 (-2.065)	0.033 (0.271)	-3.324 (-3.015)	0.896 (0.394)	See A8
Log(N_FH)	0.269 (1.974)	0.176 (1.587)	0.153 (5.862)	0.051 (0.104)	0.579 (0.529)	2.066 (7.460)	-3.058 (-6.871)	-2.416 (-5.494)	-6.228 (-5.242)	-3.964 (-3.348)	0.60 (0.904)
Log(ET/EP)	0.726 (3.125)	0.699 (1.767)	-0.316 (-2.61)	-0.545 (-3.833)	0.533 (1.589)	See A8	-0.334 (-1.906)	0.715 (1.761)	0.090 (0.132)	4.579 (3.243)	2.97 (5.123)
Log(T)	1.359 (1.367)	-4.111 (-2.362)	See A8	2.00 (7.208)	2.840 (5.732)	0.451 (1.372)	0.200 (1.394)	0.308 (0.818)	-0.602 (-0.928)	1.659 (1.170)	See A8
Log(OPN)	1.160 (2.607)	9.318 (5.891)	14.575 (35.24)	2.760 (8.330)	4.201 (3.914)	6.554 (15.149)	0.499 (2.269)	0.670 (1.084)	0.115 (0.237)	2.360 (1.448)	0.413 (1.41)
C	-1.853 (-0.625)	See A7	See A8	2.702 (8.330)	See A7	See A8	4.754 (3.876)	See A8	3.214 (0.752)	See A7	See A8
Method	OLS	OLS	GLS	OLS	OLS	GLS	OLS	OLS	OLS	OLS	GLS
R^2 adj	0.14	0.52	0.99	0.50	0.64	0.96	0.11	0.50	0.28	0.47	0.79
F-stat	10.55	17.45	739.41	50.18	26.59	196.93	16.37	11.06	14.46	11.92	21.49
N	16	16	16	13	13	13	36	36	10	10	10
T	19	19	19	19	19	19	19	19	19	19	19
Number of observations	301	301	301	244	244	244	616	616	171	171	171

Source: Own calculations

Notes: t-statistics are shown in parentheses, country-fixed effects are omitted from this table and are shown in appendix 7.

See A8: The country specific results are shown in appendix 8.

The argument of the influences of neighbouring countries on host countries is tested further in table 7.2 by combining more information on the neighbouring countries with the host country's FDI (equation 7.3).

$$\left(\frac{fdi}{gdp}\right)_{it} = b_1 + b_2 \ln\left(\frac{n\_cc}{n\_ms}\right)_{it} + b_3 \ln(n\_fh_{it}) + b_4 \ln\left(\frac{n\_et}{n\_ep}\right)_{it} + b_5 \ln(n\_t_{it})$$
$$+ b_6 \ln(n\_opn_{it}) + b_7(n\_g_{it}) + \varepsilon_{it}$$

$$(7.3)$$

where: fdi_{it} is the foreign direct investment for country i at time t.

gdp_{it} is the gross domestic product for country i at time t.

n_cc_{it} is the weighted[55] average of the neighbouring countries of country i's credit ratings over time t.

n_ms_{it} is the weighted average of the neighbouring countries of country i's gross domestic product per capita, at time t.

n_fh_{it} represents a weighted average of the neighbouring countries of country i, for a combination of the civil liberty index and the political rights index, at time t.

n_et_{it} represents the percentage of the weighted average of the neighbouring countries' tertiary students enrolled as a percentage of the potential amount of students, for the country i at time t.

n_ep_{it} represents the percentage of the weighted average of the neighbouring countries primary students enrolled as a percentage of the potential amount of students, for the country i at time t.

n_t_{it} represents the weighted average of the neighbouring countries' sum of telephones per 1000 of the population, for country i at time t.

opn_{it} represents the weighted average of the neighbouring countries' openness (imports plus exports relative to gross domestic product) for county i at time t.

n_g_{it} represents the weighted average of the neighbouring countries' growth in GDP, for country i at time t.

ε_{it} is the stochastic error term.

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[55]   See equation 7.2.

Consistent results compared to table 7.1 are shown for the neighbouring freedom house (N_FH) variable, but results vary for the neighbouring country credit over neighbouring market size (N_CC/N_MS), although not as much in table 7.1. Most of the results for the neighbouring country credit over neighbouring market size N_CC/N_MS are negative, emphasising the competition argument that increases in country credit ratings per market size in the neighbouring countries, result in the decrease of FDI to the host countries. This competition effect is further emphasised in the neighbouring freedom house (N_FH) variable for the developed and emerging countries, with an increase in the neighbouring freedom house (N_FH) variable (an increase represent a worse result) leading to an increase of FDI in the host country. In the African sample, strong negative results are shown (although not as large as in table 7.1), implying that a worsening of civil liberty and political rights in neighbouring countries results in a decrease of FDI to the host country.

The education variable shows mostly positive results, implying that if neighbouring countries have better educated people, the host country's FDI increase is correlated with this.

The neighbouring openness (N_OPN) variable shows negative results in the case of the developed countries and positive results in the emerging sample and African sample (see also appendix 7). If neighbouring countries are increasingly open in the developed world, host country FDI decreases, the opposite, however is true in the African and emerging sample where an increase in neighbouring countries' openness, also increases host country FDI.

From the results further reported in table 7.2, it can be deducted that an improvement in neighbouring infrastructure as well as a higher neighbouring growth rate, decrease the host country's FDI in the developed sample. In the emerging sample pooled and LSDV estimations results in negative results for the neighbouring infrastructure proxy (N_T) but a common coefficient for N_T using the SUR model shows a positive result. Neighbouring growth (N_G) shows mainly insignificant but positive results using *pool* and country specific *SUR* results (appendix 8) and negative results using *LSDV*. This positive result may imply that growth in neighbouring countries results in an increase in host country FDI. In the African sample, neighbouring infrastructure (N_T) shows insignificant results while neighbouring growth (N_G) is positively related, but results are mainly insignificant.

Table 7.2   Estimation Output 4 – Neighbouring Countries (Dependent Variable FDI/GDP of Host Country)

	Developed			Emerging			Africa (Total sample)		Africa (Top ten FDI sample)		
	Eq 7.3	Eq 7.3	Eq 7.3	Eq 7.3	Eq 7.3	Eq 7.3	Eq 7.3	Eq 7.3	Eq 7.3	Eq 7.3	Eq 7.3
	Pooled	**LSDV**	**CS SUR**	**Pooled**	**LSDV**	**CS SUR**	**Pooled**	**LSDV**	**Pooled**	**LSDV**	**CS SUR**
Log(N_CC/N_MS)	-0.621 (-4.552)	-3.132 (-3.25)	-0.735 (-32.034)	-0.584 (-5.354)	1.074 (2.157)	See A8	-0.496 (1.584)	-0.477 (-0.844)	-4.522 (-3.53)	2.553 (1.186)	See A8
Log(N_ET/N_EP)	1.118 (4.891)	1.435 (3.15)	1.599 (20.415)	4.384 (5.594)	-3.843 (-2.510)	See A8	-0.048 (-0.212)	1.707 (3.969)	1.338 (1.481)	7.782 (5.984)	6.99 (8.99)
Log(N_OPN)	-0.226 (-0.931)	-1.250 (-1.68)	1.076 (7.676)	2.482 (4.955)	6.501 (4.978)	See A8	-0.498 (-1.428)	1.852 (2.299)	0.843 (0.966)	5.863 (2.575)	4.142 (4.867)
Log(N_FH)	1.392 (2.586)	1.681 (1.483)	0.757 (3.676)	2.032 (2.218)	0.439 (0.400)	1.361 (1.771)	-2.810 (-6.344)	-1.511 (-2.925)	-6.472 (-5.58)	-0.569 (-0.445)	0.376 (0.498)
Log(N_T)	-1.307 (-1.589)	-1.759 (-1.364)	-3.087 (-13.022)	-1.793 (-6.029)	4.189 (6.462)	0.782 (1.736)	0.362 (2.055)	-0.073 (-0.192)	-1.156 (-1.78)	-1.45 (-1.059)	-1.412 (-2.905)
Log(N_G)	-0.008 (-1.27)	-0.009 (-0.598)	See A8	0.041 (1.291)	-0.044 (1.811)	See A8	0.013 (1.226)	0.016 (0.987)	-0.089 (-0.912)	-0.05 (-0.65)	0.01 (0.515)
C	2.069 (1.06)	See A7	See A8	5.124 (5.093)	See A7	-0.007 (-0.985)	3.415 (2.283)	See A7	5.296 (1.079)	See A7	See A8
Method	OLS	OLS	GLS	OLS	OLS	GLS	OLS	OLS	OLS	OLS	GLS
R^2 adj	0.10	0.49	0.98	0.27	0.49	0.95	0.12	0.38	0.28	0.54	0.78
F-stat	6.83	14.73	623.39	15.9	14.73	72.47	15.68	10.87	12.7	14.92	26.85
N	16	16	16	13	13	13	36	36	10	10	10
T	19	19	19	20	20	20	19	19	19	19	19
Number of observations	301	301	301	248	248	248	648	648	176	176	176

Source: Own calculations

Notes: t-statistics are shown in parentheses, country fixed effects are omitted from this table and are shown in appendix 7.

See A8: The country specific results are shown in appendix 8.

7.2.4   Lessons learned of neighbouring effects

Including neighbouring effects introduces more noise to the data, resulting in a poorer fit for the models, especially in the African sample. However, the coefficients in these models are important for showing the correlation between the host country and its neighbours with respect to FDI. Again a large amount of inconsistency is visible between the different sample panels as well as between the different estimation methods. It is also clear that the results differ between the developed, emerging and African countries, especially with respect to neighbouring risk (as in the freedom house (FH) variable).

7.3   CONCLUSION

In the developed country sample, the influence of neighbouring country variables on the host country's FDI, after the inclusion of neighbouring country credit over neighbouring market size (N_CC/N_MS) and the neighbouring freedom house variable (N_FH), indicates that if the country credit risk levels per market size of the neighbouring countries improve, FDI in the host country decreases. The opposite is true in the emerging and African samples, if the country credit risk levels per market size in neighbouring countries improves, the host country's FDI increases. If the *Freedom House* index of neighbouring countries in the developed sample worsens, host country FDI improves and a worsening of this index for neighbours in the African sample leads to a decrease of FDI in the African sample. The results for the emerging sample are insignificant.

The inclusion of additional neighbouring variables indicates that improved credit ratings relative to market size in the neighbouring countries decrease FDI in host countries (the African sample gives conflicting results). This may reflect competition regarding the credit ratings between countries. Higher levels of education in neighbouring countries increase host country FDI. If the openness of neighbours in the developed sample increases, FDI in the host country decreases, the opposite is true in the emerging and African sample. If the *Freedom House* index in neighbouring countries in the African samples worsens, FDI in the host country decreases. The opposite is true in developed and emerging countries. This may indicate competition in developed and emerging countries and neighbouring contagion in African countries. If infrastructure in neighbouring countries improves, FDI in the host country decreases.   The African sample, however shows conflicting results. If growth in

neighbouring countries increases, FDI in the developed sample declines. The opposite is true for emerging countries – if growth in the neighbouring countries increases, FDI in the host country increases. The results in the African samples show statistically insignificant results.

To conclude, the results show that there is a tendency for competition and for contagion between host country and neighbouring countries. Developed countries are more competitive and the influence of neighbours seems to play a larger contagion role in Africa, while this is true to a lesser extent for emerging countries. It seems as if bad "neighbourhoods" have a negative influence on African countries.

CHAPTER 8

POLICIES FOR ATTRACTING FOREIGN DIRECT INVESTMENT

8.1   INTRODUCTION

Foreign direct investment (FDI) has developed panacea status involving an increasing number of policy makers who attempt to improve policy for attracting larger quantities of FDI. Policy-makers expect FDI to bring new skills and technology to an economy, increase the host country's access to external markets, broaden the domestic capital base, result in shared project risk, provide employment and increase tax revenues which governments can reinvest in the social sectors and infrastructure improvements. Several policy implications flow from the theoretical investigation of the determinants of FDI discussed in chapter 4, the empirical literature and the empirical analysis on FDI discussed in chapter 5 and the empirical results from chapters 6 and 7.

The focus of this chapter is to identify and design general policies that will enable a country to attract increased FDI flows. The emphasis is on Africa and policies to ensure an environment able to attract increased volumes of FDI to Africa which will ultimately improve standards of living on the continent. The discussion also includes a critical analysis of relative African performance, given the criteria on determinants of FDI flows.

8.2   POLICIES FOR ATTRACTING FOREIGN DIRECT INVESTMENT TO AFRICA

8.2.1   Environment for attracting foreign direct investment in Africa

Several changes are needed in the economic policy environment to improve the current social-economic situation in Africa as presented in chapters 2 and 5. These include structural reforms to improve the efficiency of markets, privatisation and macroeconomic stability – through appropriate fiscal, monetary and exchange rate policies. Abugre (1997) points out that even where countries have undertaken massive privatisation projects and introduced policies for growth, FDI response has remained poor, mainly because of the continued lack of investment confidence in African economies. The key to attracting FDI is to improve investors' confidence and to ensure an attractive FDI environment. This can only be achieved

through a wide range of policies with the long-term aim of stabilisation and decreasing risk, and by creating opportunities for investors to make long-term profits. It is further argued by Asiedu (2004: 41) that despite improvements in the policy environment in African countries, the continent's share of FDI continues to decline. Although sub-Saharan Africa (SSA) has reformed its institutions, improved its infrastructure and liberalised its FDI regulatory framework, the degree of reform has been mediocre compared with the reform implemented in other developing countries[56].

Policy measures to attract FDI include a broad spectrum of laws and codes that define the investment framework for foreign investors, as well as general standards and policies that affect investment activity. In addition, countries can also employ proactive measures like marketing, FDI targeting, after-care investment services and preferential market access to strengthen the country's advantages of attracting FDI (UNCTAD, 2003: 2).

Table 8.1 presents determinants of FDI from theories, hypotheses and empirical studies as presented in chapters 3, 4 and 5. The table also compares the situation in Africa to other regions and presents several arguments in support of theory. The argument is made that Africa has performed better in recent years with respect to some of the determinants mentioned, but relative to developed and emerging countries is performing more poorly.

Sections 8.2.1 and 8.2.2, which form the key emphasis of this chapter, follow the arguments presented in table 8.1. In these sections policies aimed at increasing FDI flows, especially for Africa, are discussed.

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[56]   See Asiedu (2004) for a comparison of a number of variables between five groups of developing countries. Data include FDI flows to developing countries, openness to foreign investment, infrastructure development and quality of institutions.

Table 8.1   Determinants of FDI, a critical analysis

	Determinants of FDI (from theories, hypotheses and empirical studies)	Situation in Africa compared to other regions	Argument
Economic determinants	Market size (GDP or GDP per capita)	Smaller	It is stated in table 5.4 that GDP per capita in Africa is much lower than in other regions. The difference in GDP between the periods under consideration in table 5.4 in Africa is 13.7 per cent lower, compared to a 30 per cent increase in emerging markets.
	Growth (GDP or GDP per capita)	Lower	The average growth in GDP (2.6 per cent for 1990 to 2000) and growth in GDP per capita for Africa (-0.6 per cent for 1990 to 2000) is much lower compared to the emerging sample (5.1 per cent and 3.1 per cent respectively for the same period) (table 5.4).
	Labour productivity	Lower	It is shown that output per worker during the period 1960 to 1973 in Africa was slightly higher than that of South Asia (1.9 compared to 1.8), but it deteriorated to -0.6 in Africa compared to 2.6 in South Asia during the period 1973 to 1994 (resulting also in much lower total factor productivity) (Collins and Bosworth, 1996 in Collier and Gunning 1999a: 75).
	Knowledge	Lower	If tertiary education (see definition in table 5.2) can be used as a proxy for knowledge, levels in Africa of 3.9 per cent are much worse than the 23.3 per cent in the emerging sample and the 52 per cent in developed countries (figures are averages from 1990 to 2000) (table 5.4).
	Cheap labour	Lower	Two views exist. Firstly, the view exists that African wage levels are too high and insensitive to profit shocks, and second, that labour markets are flexible and contribute towards Africa's comparative advantage. There is, however, more evidence to support of the first view (Collier and Gunning, 1999a: 93).
	Financial stability — Inflation	Higher and more unstable	Inflation in Africa is much higher and more volatile when compared to the emerging market countries (133.8 per cent in Africa, compared to 70.98 per cent in the emerging and 2.7 per cent for the developed sample – for the period 1990 to 2000) (table 5.4).
	Financial stability — Interest rate	More volatile	Real interest rates in Africa are fractionally higher, but much more volatile (tables 5.3 and 5.4).
	Financial stability — Domestic investment	Lower	Gross fixed capital formation as a share of total output in SSA declined by 13 per cent on average between the period from 1980 to 1998 and 1990 to 1999, while it increased by 3 per cent for the developing country sample (Asiedu, 2004: 46).
	Financial stability — Exchange rate	More unstable and volatile	According to Collier and Gunning (1999a: 73) African real exchange rates have been atypically volatile.

	Determinants of FDI (from theories, hypotheses and empirical studies)	Situation in Africa compared to other regions	Argument
	Financial depth	Lower	Africa has less financial depth, measured as money supply over gross domestic product, than other developing countries (M2/GDP is 37 per cent lower) (Collier and Gunning, 1999a: 73).
	Openness	Slightly less open in Africa	Table 5.4 shows that the degree of openness during the period 1990 to 2000, measured as imports plus exports relative to GDP was higher in the emerging countries than in Africa. Africa furthermore had a decrease in the degree of openness from the period 1980 to 1989 to the period 1990 to 2000. The emerging and developed samples on the other hand, had an increase between the respective periods. According to Asiedu (2004: 45) the pace of liberalisation in Africa is slow compared to other developing countries. Examples are the restrictions on trade and investment and the average rating for SSA which improved by 18 per cent, while it increased by 30 per cent for all developing countries. According to Collier and Gunning (1999a: 68) quotas, tariffs and export taxes (or indirect measures such as foreign exchange controls and marketing boards), together with poor access to the sea and Dutch disease, resulted in Africa becoming less open. Tables 6.1 and 6.2 show that FDI has a larger positive semi-elasticity with regard to openness in the case of the emerging country sample than that of the developed and African samples. This indicates that an opening up of markets can have a larger impact on the FDI received in emerging countries.
	Taxes, tariffs and incentives	Higher (and more) tariffs and taxes	Tax revenue as a percentage of GDP in Africa is higher than other developing regions (for the period 1974 to 1989 it was 3.3 in Africa, compared to 1.7 in South Asia, 1.7 in East Asia, 2.2 in Latin America and 1.2 in the Middle East) (Collier and Gunning, 1999a: 73).
Socio/ political	Political (and policy) stability	More unstable	The 'freedom house' index is much higher for Africa than for emerging and developed countries (where higher is worse) (see table 5.4). The partial elasticities in tables 6.1 and 6.2 show that an increase in the freedom house index in the African sample resulted in a much greater decrease in FDI compared to any of the other samples or groups.
Socio/ political	Risk and uncertainty	Higher risk and uncertainty	The 'rule of law' strengthened in SSA in the 1990s, but progress was only in absolute terms. Compared to other developing countries, African countries showed a relative decline (the rule of law improved by 11 per cent for SSA, compared to 58 per cent in the Middle East, 77 per cent in South Asia and 29 per cent in all developing countries) (Asiedu, 2004: 47).

	Determinants of FDI (from theories, hypotheses and empirical studies)	Situation in Africa compared to other regions	Argument
	Size of government	Larger	The share of public expenditure to GDP is generally higher in Africa than in other developing regions, and although governments have allocated a higher percentage of GDP to potentially productive public expenditure compared to other developing countries, the actual delivery of public services has been poor (Collier and Gunning, 1999: 71).
	Language	More diverse	Jordaan, *et al*. (2001) mention that no continent has such a variety and diversity of nations, tribes and cultures as are found in Africa, where more than 800 languages and dialects are spoken. This is supported by Collier and Gunning (1999a: 67), who mention that Africa has strikingly high levels of fractionalisation. According to the measure used by a Soviet anthropologist, the average African country is more than twice as fractionalised as other developing countries.
	Institutional quality	Lower quality	The International Country Risk Guide (ICRG) indicates that, with regard to corruption and bureaucratic quality, SSA's institutions deteriorated in the 1990s, and in contrast, corruption declined in developing countries as a whole and the quality of bureaucracy improved (Asiedu, 2004: 47).
	Neighbouring	Neighbours who perform relatively worse and larger impact from neighbours	Tables 7.1 and 7.2 show neighbouring influences with regards to host country FDI. A number of statistically insignificant results are observed in the African sample, but an increased (worsening) freedom house index of neighbouring countries in the African sample, in comparison to the other samples, has the largest impact on the host country's FDI. The impact of neighbouring influences is supported by Ades and Chua (1997), who mention that regional instability, defined as political instability in neighbouring countries, has a strong negative effect on a country's economic performance. They found that the magnitude of this negative externality is similar in size to that of an equivalent increase in domestic political stability. Easterly and Levine (2000) argue that favourable or unfavourable growth performance of one's neighbours tends to influence one's own long-run growth rate and that policy choices are also contagious across borders.
Other	Distance, spatial transaction cost and agglomeration	Africa worse off	Research on regional integration has shown that whenever the distance between capital cities is less than 3312 kilometres, regional integration agreements result in an increase in the magnitude of FDI flows, while a relatively greater distance results in a diminished flow (Balasubramanyam, *et al*., 2002: 475).

	Determinants of FDI (from theories, hypotheses and empirical studies)	Situation in Africa compared to other regions	Argument
	Infrastructure quality	Poorer infrastructure quality	According to Asiedu (2004) the number of telephones (not only fixed lines) per 1000 of the population increased by 71 per cent for SSA between the periods 1980 and 1989 and 1990 and 1999. This figure should be contrasted with 490 per cent for East Asia and 158 per cent for developing countries. This argument is supported by Collier and Gunning (1999a: 71).
	Geography	Worse in Africa	Africa, with a landmass of 24 million km^2 is much larger than the 3 million-km2 landmass of Western Europe or East Asia's 14 million km^2. Only 19 per cent of the population of 580 million in Africa live within 100 km of the coast; this compares with 53 per cent in Western Europe (with a population of 383 million) and 43 per cent in East Asia (with a population of 1 819 million) (Van Zyl, 2004) The implications are that transport costs are higher in Africa while the benefits from economies of scale are lower. The population that is urbanised in Africa is also much lower, 35.2 per cent for the period 1990 to 2000, compared to 62.8 per cent and 76.5 per cent in the emerging and developed samples respectively (table 5.4). The semi-elasticity of FDI with respect to urbanisation is higher in Africa compared to the emerging and developed sample, an indication that an increase in urbanization in Africa may attract FDI (table 6.2).
	Raw materials and natural resources	Abundant	According to *The Economist* (2004: 12) oil firms are flocking to explore the waters off the west cost of Africa and it is expected that Africa will supply a quarter of America's oil imports by 2015. Mining firms dig for gold, cobalt and diamonds and some non-extractive industries are booming as well. This is supported by table 6.2, showing a statistical significant oil dummy in Africa. It indicates that countries in Africa, that are net exporters of oil, receive higher FDI. The Southern African Development Community (SADC) is richly endowed with abundant agriculture, mineral and human recourses. It has vast reserves of some of the world's most precious minerals, many of which have not been exploited to their full potential (it is estimated to have 92 per cent of the world's chromite minerals, 87.9 per cent of the platinum group, 83.2 per cent of manganese, 53 per cent of gold, etc.) (Ramsamy, 2003). Tourism is one of the fastest growing industries in SADC and its market share in global context reached a record of 1.88 per cent in 1999, compared to 0.86 per cent in 1990 (Ramsamy, 2003).

Determinants of FDI (from theories, hypotheses and empirical studies)	Situation in Africa compared to other regions	Argument
Portfolio diversification	FDI weight according to GDP on average almost on par (slightly lower)	It is mentioned by Versi (2003) and shown by UNCTAD (2003) that Africa does exceptionally well in terms of the GDP performance index. This index ranks countries according to the FDI they receive relative to their economic size, calculated as a ratio of a country's share in global FDI flow to its share in global GDP. A value of greater than one indicates that a country receives more FDI than its relative economic size and a value of less than one shows that it receives less. A negative value implies that foreign investors disinvested in the period under consideration. According to the 2002 rating of UNCTAD, Angola ranks second, Gambia 12th, the Congo Republic 14th, Mozambique is 24th and Namibia is 34th. Zimbabwe (124th) and the Democratic Republic of the Congo (127th) are ranked at the bottom of the list (World Investment Report, 2003). In comparison, table 5.4 shows that the African country sample receives on average less FDI, expressed as a percentage of GDP. This figure is 2.2 for Africa for the period 1990 to 2000, compared to 3.3 for the emerging sample and 2.8 for the developed sample (table 5.4). According to this hypothesis, if FDI diversification of companies is based only on GDP, African countries are lagging behind, and can expect a larger inflow.

8.2.2   First, second and third generation policies

After presenting the various arguments for determinants of FDI and stating the case that African countries are performing relatively poorer with respect to these key determinants than other regions, policy suggestions for increasing FDI will be discussed in this section.

According to the World Investment Report (UNCTAD, 2001: 14), the use and strengthening of agglomeration advantages of countries for attracting FDI calls for 'new approaches' that go beyond 'first and second generations' of investment promotion policies.

In the first policy generation, countries liberalise their FDI regimes and adopt policies that have a long-term focus and are attractive for foreign investors. Most African countries are in this stage of policy liberalisation and more attention and focus will be given to this stage in the next section.

In the second stage, or second generation of policies, governments or private industries go one step further and actively seek to attract FDI by using proactive measures. These include measures such as marketing their countries and setting up national investment promotion agencies. There are currently 35 African countries whose Investment Promotion Agencies (IPAs) are members of the World Association of Investment Promotion Agencies (WAIPA). In recent years most IPAs in Africa have been struggling to transform from the old-style of setting regulations and granting licenses – to a new-style of IPAs which promote and advertise opportunities for FDI (WAIPA and Pigato, 2001). These agencies can be government organisations, quasi-government organisations and private organisations. The effectiveness of FDI promotion agencies in Africa is generally low. They often lack the authority to help investors cope with the myriad of ministries, departments and agencies. They are also often under-funded with insufficient private sector participation.

In the third generation of investment promotion policies the focus is much more on a micro level. Investors are targeted on a firm or industry level by municipalities or local investment promotion agencies and services are delivered to meet these investors' specific needs in light of local authority and country development needs. A critical

element of third generation investment promotion strategies is the improvement and marketing of particular locations to potential investors for specific activities. However, a big challenge for most African countries is that this approach requires fairly sophisticated institutional capacity. Furthermore, it takes time to develop locational "brand names". But despite difficulties, investment promotion agencies are improving with practice, even at municipality levels. This however gives rise to other challenges such as policy coordination across various administrative levels in a country, to avoid 'fiscal wars' between different regions.

Some fundamental factors that determine the inflow of FDI to a country, like geographical location, resource endowment and size of domestic market, are largely outside the direct control of national policy. Government, however, has authority and responsibility over a number of factors for creating the right conditions and environment for attracting FDI.

8.2.3 Inconsistency in literature on foreign direct investment and policy implications

In chapter 3 the point has been made that there are a number of theories, hypotheses and schools of thought which endeavour to explain FDI, but none of the individual theories is able to successfully explain FDI in its entirety and in chapter 4 that a vast amount of empirical literature has been developed on the determinants of FDI in a country, but the results on empirical linkages are inconsistent and ambiguous.

These inconsistencies need to be taken into account when dealing with policy on FDI and when policies for a specific country or region are recommended.

The next section discusses more general policies that must be taken into account.

8.2.4 Policy for attracting foreign direct investment

A number of key policy issues need to be addressed before the international community will seriously commit itself to the long-term investment that is required for improving prospects of attracting high quality FDI in support of sustainable growth and poverty reduction in Africa. A key objective for attracting FDI is to create an environment with

favourable conditions for private investment and to establish the necessary confidence in the economy. Policies and other measures to create an environment conducive to FDI include:

(i)   Maintenance of macroeconomic stability.

> a. Pro-investment fiscal policies which are attractive to executives and to firms through efficient and globally competitive tax regimes, transparent expenditures and measures to combat corruption.
>
> b. Monetary policies that secure price stability and a stable cost of capital.
>
> c. Foreign exchange policies with the aim of stable exchange rates. This has an impact on the value of transferred profits, acquired assets and export earnings. Foreign exchange must also be readily available for investors.

(ii)   Improved infrastructure.

(iii)   A well-developed legal and regulatory framework is very important for creating an environment where people, property (land, buildings and intellectual property) and the natural environment are safe and protected.

(iv)   Competition policy and other regulatory measures are relevant for maintaining cost competitiveness and for decreasing monopolistic power. Such policy also improves the quality of technological transfers and ensures the regular upgrade of technological capabilities. Countries can also introduce policies and regulatory measures to increase local skills and human resources (more investment in human capital), and allow firms to recruit skilled staff internationally. This increases the level of productivity, as well as technical, supervisory and management skills.

(v)   Low deregulated wages and a deregulated labour market. Governments need to focus on the development of sound labour market institutions and regulations that include effective minimum wages and other employment benefits, realistic union rights, regulation of working conditions, rights of employers to 'hire and fire' and procedures for the settlement of industrial disputes.

(vi)   A deregulated and liberal policy environment, where there is reduced state ownership of firms, and reduced administrative control in pricing and marketing. The role of the state must be redefined to improve efficiency in the business climate and to introduce a transparent legal and regulatory framework that encourages private investment and removes bottlenecks with regard to entry and utilisation of goods, services and capital.

(vii)   Promotion of openness in domestic and foreign trade with the focus on removing import constraints (e.g. the elimination of import quotas and tariffs and the removal or simplification of licensing requirements).

(viii)   Government should focus on social development, particularly health and education, to decrease the large backlogs that most African countries have in these areas.

(ix)   Governments must be more transparent and more accountable, and implement measures to eliminate corruption and also incorporate international accounting standards.

(x)   Implementation and sustainability of successful reform of the financial sector. This includes the consolidation, restructuring and modernisation of the banking sector and the development of capital and financial institutions which support a realistic exchange rate.

(xi)   In a globalised environment strong regions are important. Taking into account the fact that the performance of neighbouring countries plays an increasingly important role in the stability and welfare of countries and regions, regional integration must be promoted. As a result, policies must be promoted which support intervention in countries with political turmoil or unstable environments, thereby ensuring greater stability for neighbouring countries and the region. More attention must be devoted to the development of a type of effective and workable peer review system (IMF Staff, 2000, Abugre, 1997, Daouas, 2001, UNCTAD, 1998 and 2003 and OECD, 2003).

The negative influence of neighbouring countries seems to be especially problematic in Africa where empirical results of FDI and especially risk differ from that of the developed and emerging countries. If stable, low risk neighbours in Africa are of great importance to host country FDI, and if strong regions are important, policy should be directed to creating an environment where host countries can maximise their potential. This environment can be created:

a)   By increased cooperation and collaboration among neighbouring countries for policy development, improvement and coherence

b)   Through economic and political pressure on the neighbouring countries, by the host countries and the international community if countries explicitly

hinder host country and regional potential. This can for instance be as a result of war; political instability or policies that differ to a great extend from the international accepted norm – for example policies that are against international human rights.

c) Through effective support from the international community.

d) By creating a more positive image of Africa – by changing the negative perception of Africa and by enlightening and educating the rest of the world with more positive information from Africa and specific regions in Africa. This can be done through marketing countries and region for its socio, economic and environmental potential and by limiting bad publicity.

(xii) Extending on point XI d) by improved targeting and improved investment promotion strategies to market Africa as a potential FDI destination. This must go together with a one-stop service for foreign investors where they can be assists on a micro level from step one of setting up the business to the point where the new business, company or industry is operational. This also implies that countries must decrease transaction costs and red tape, and provide efficient and effective institutions with good administrative capabilities and political stability to support these agencies in effective marketing and in providing efficient professional services.

Investors ideally seek countries with a sound track record, with strong investment protection laws and practices. Developing countries seeking FDI, must be able to provide a strong complementary regime in national law and by treaty. A factor that must be kept in mind is that investors compare regions and countries when considering investment. Africa needs to improve its offerings in comparison to other regions.

8.3   CONCLUSION

Many challenges exist for African economies that need to be effectively addressed to enable them to benefit from globalisation and increased integration in the world economy. One of these challenges is to attract larger volumes of FDI, enabling African economies to reap the benefits of FDI. These benefits include improved knowledge and skill transfers, new technology, increased access to external markets, increased capital and tax base and increased levels of employment.

In a critical analysis, evaluating Africa according to criteria of determinants for attracting higher volumes of FDI, Africa does not perform very well. Even though Africa is performing better in the majority of determinants for attracting FDI (presented in table 8.1), African economies perform relatively poorly when compared to emerging and developed countries.

Policy changes and improvements are needed in Africa, spurring the improvement in economic stability, improved infrastructure, an effective legal, financial and regulatory framework, deregulated labour markets, privatisation, promotion of openness to international trade, improved regional policies and the lowering of subsidies on imported products from Africa to developed countries.

CHAPTER 9

SUMMARY AND CONCLUSION

9.1   INTRODUCTION

Developing countries which are not participating in the process of globalisation, or those having poorer policies compared to other countries, run the risk of becoming comparatively less competitive in the global economy. The World Bank, amongst others, argues that those countries that integrate faster in the global economy produce faster growth and *vice versa* (Abugre, 1997). If Africa wants to reduce the number of people living in poverty by 50 per cent by 2015, and thereby achieve the same quality of life as other developing countries, a sustained annual growth rate of above 7 per cent per year is needed and a resource gap of US$64 billion must be filled (Abugre, 1997 and Asiedu, 2004: 41). To reach the goal of faster sustainable growth, poverty reduction, improved living standards and most importantly sustainable investment, international confidence in the economies of Africa needs to be improved.

Over the last decade there has been renewed interest in foreign direct investment (FDI), due to the changing global economic and political environment. FDI is seen as a means of financing development and of transferring skills, knowledge and technology between regions and countries. It improves the general welfare of the population by providing employment opportunities, improving trade and accelerates growth and development (Asiedu, 2001: 107). Given these positive impacts that FDI can have in a country and given the development goals in Africa, FDI can play a major role in uplifting socio-economic conditions in Africa.

The first part of this chapter outlines the contributions made by this study as well as outlining future research opportunities in the field of study. It is followed by a summary of globalisation, theories and empirical literature, data and results and policy implications.

9.2   CONTRIBUTION OF THIS STUDY

The majority of studies on FDI flows investigate only certain regions or the determinants between certain groups of countries. Ancharaz (2003: 3) mentions that, although literature

on the empirical determinants of FDI flows in developing countries is wide and varied, the empirical work has not directly and fully addressed the question of FDI-bias against sub-Saharan Africa. However, some recent studies (Asiedu, 2003; Ancharaz, 2003 and Lemi and Asefa, 2003) shed some light on FDI in Sub-Saharan Africa.

The first contribution made in this study is the estimation of empirical results for different groups of panels that are compared to each other. In most previous studies only a specific group was tested, for instance only developing or developed countries, or large samples including a large number of countries with dummy variables for the different groups of countries (for instance an African dummy to estimate the African impact). This has limited estimation in a number of ways for example *LSDV* which makes use of dummy variables cannot be used in estimations. *SUR* estimation also cannot be used when there are a large number of countries in the sample and when there is a relatively short time span of data.

The second contribution is the empirical estimation of neighbouring influences on host country FDI and comparing the different groups of panels to each other. This influence has been tested to a lesser extent, by making used of dummy variables, in previous studies on FDI. However, this study has tried to emphasis the importance of neighbouring countries, that is especially their risk, in a more systematic way.

9.3   FUTURE RESEARCH OPPORTUNITIES IN THIS FIELD OF STUDY

Due to the broad field of study of FDI the opportunities for future work with respect to this study are endless. Possible future research which has been identified is:

(i)   The inclusion of a distance parameter in the estimation.

(ii)   To include the estimation of land locked countries, compared to non-land locked countries.

(iii)   The estimation of an instrumental variable for neighbouring influences and comparing this variable to the results found.

9.4   GLOBALISATION

Globalisation has been one of the major driving forces behind world growth and wealth creation in recent years and has raised the prospects of considerable gains in productivity and wealth creation in all regions. FDI, together with TNCs, play an increasingly important role in providing the capital and skills needed, creating markets for exports, sharing risks and transferring technology which is needed to create stable environments for long-term economic growth and employment creation. Developing countries are increasingly aware of the role of FDI as an engine of growth in their economies, and are progressively looking to attract larger volumes of flows to their economies. However, factors which hinder the process abound.

FDI flows to developing countries and especially Africa are low in absolute terms and unevenly spread. However, if these flows are weighed against the small GDPs of the countries, African economies perform relatively well compared to the rest.

Reasons for low FDI inflows (and small GDP) in African economies include a lack of social capital, a lack of openness to trade, deficient public services, geography and risks involved, lack of financial depth and high financial-aid dependency.

To worsen the situation in Africa, the international environment for FDI is changing from an emphasis on traditional factors, such as natural resources, to FDI in more advanced levels of technologies. This has huge implications for Africa which is more dependent on primary activities and natural recourses.

9.5   THEORIES AND EMPIRICAL LITERATURE

A number of theories, hypotheses and schools of thought exist which endeavour to explain FDI, but none of the individual theories successfully explains FDI on their own. Theories of FDI are classified in a number of ways, and in this chapter a distinction is made between micro and macro-based theories/hypotheses, although the distinction between them is not always clear. These theories are furthermore classified into theories of industrial organisation, theories of the firm, theories of trade, theories of location and theories of FDI.

The theories, hypotheses and schools of thought on FDI in this chapter include: the theory of industrial organisation, the theory of the product cycle, transaction related FDI theories, the process of internationalisation, resource/raw materials based theory, strategy related (and oligopolistic production) theories, option theory, macro (country oriented) theories, micro (firm/industry oriented) theories, theory of location (in general), clustering and agglomeration theories, internationalisation theories, knowledge enhancing theories, market size theories, output theories, exchange rate and currency area theories, differential rate of return theories, liquidity theories, behavioural theories, the radical view theory, dependency school, the eclectic theory and the integrative school.

The main ideas portrayed by these theories, hypotheses and schools of thought assist in the selection of appropriate explanatory variables, data series and proxies tested in the empirical section. They further assist in giving an indication of the expected signs and magnitudes of coefficients according to theoretical foundations.

Given the vast range of theories, opinions and philosophies of FDI, the challenge now is to identify a set of relevant and empirically significant determinants of FDI as well as the signs and magnitude of the coefficients.

9.6   DATA AND RESULTS

9.6.1   Data

The main purpose of chapter 5 is to provide an exposition of the data used. This includes the variables and definitions of the data that have been used, together with a detailed analysis of the averages of the different groups over different periods. The developed, emerging and African data characteristics are shown for: FDI, GDP per capita, growth, growth per capita, openness, infrastructure, education, a political and credit rating variable, real interest rates, inflation and urbanisation. This is done by calculating the averages from 1980 to 2000, but the data set is also subdivided to show the averages for 1980 to 1989 and 1990 to 2000; and also the percentage changes between these two periods.

From the data it can be concluded that African countries are on average in a really dismal position. The determinants of FDI are much weaker or poorer in the African sample compared to other countries. Data show that FDI, expressed as a percentage of GDP, as well as growth in FDI, are on average lower in the African sample than in other samples. Market size (GDP per capita) is much lower in the African sample, as is the infrastructure variable, and levels of education. The growth rate in the emerging sample is much higher than in the African sample, and the per capita growth rate in the African sample is negative over the whole period, further emphasising the lack of international confidence in gaining high returns on investment.

The country credit rating for Africa is much less favourable than that of the developed and the emerging countries. This is also supported by the *freedom house* index. Real interest rates in Africa, over the total time span, are much lower than in the other groups, and they are much more volatile. This volatility and inconsistency is also evident in the inflation data for Africa which is much higher. Openness in Africa (total trade expressed as a percentage of GDP), does not differ much from the other groups, but if it is expressed as total trade over the population, the result for Africa is much lower. This large variance in the African sample over time and across countries indicates more uncertainty and higher risk in these countries. This higher variance in the data for the African sample also points to poorer empirical results outlined in chapters 6 and 7.

9.6.2   Empirically estimated results

This chapter shows the empirical results obtained, using different panel data econometric techniques for a number of determinants of FDI. These results are compared across a sample of 16 developed countries, 13 emerging countries, 36 African countries and a sample consisting of the top-ten FDI receiving countries in Africa. The results are compared with available literature on the determinants of FDI and similar results are obtained.

The size and signs of coefficients differ between different panels and different estimation techniques used. The emerging sample gives the best fit for the models while the African data has the poorest fit.

In general the results indicate that decreasing risks, improved infrastructure, a higher degree of openness, higher levels of urbanisation and higher growth rates, lead to increases in FDI. Higher levels of human capital attract FDI to the developed countries but decrease FDI to emerging and African countries. In Africa, the elasticities with respect to the freedom house variable, which measures civil liberty and political rights is much larger compared to developed and emerging country elasticities. This implies that an improvement in this index may result in an increase in FDI. African countries endowed with natural resources, especially oil, seem to explain part of the FDI inflows.

9.6.3 Empirical results for neighbouring influences

In the developed country sample, the influence of neighbouring country variables on the host country's FDI, after the inclusion of neighbouring country credit over neighbouring market size (N_CC/N_MS) and the neighbouring freedom house variable (N_FH), indicates that if the country credit risk levels per market size of the neighbouring countries improve, FDI in the host country decreases. The opposite is true in the emerging and African samples – if country credit risk levels per market size in neighbouring countries improve the host country's FDI increases. If the *Freedom House* index of neighbouring countries in the developed sample worsens, host country FDI improves. A worsening of this index for neighbours in the African sample leads to a decrease in FDI for the African sample. The results for the emerging sample are insignificant.

The inclusion of additional neighbouring variables indicates that improved credit ratings relative to market size in neighbouring countries decreases FDI in host countries (the African sample gives conflicting results). This may reflect competition regarding credit ratings between countries. Higher levels of education in neighbouring countries increase host country FDI. If the openness of neighbours in the developed sample increases, FDI in the host country decreases. The opposite is true for the emerging and African sample. If the *Freedom House* index in neighbouring countries in the African samples worsens, FDI in the host country decreases. The opposite is true in developed and emerging countries. This may indicate competition in developed and emerging countries and neighbouring contagion in African countries. If infrastructure in neighbouring countries improves, FDI in host countries decreases. The African sample, however, shows conflicting results. If growth in neighbouring countries increases, FDI in the developed

sample declines. The opposite is true for emerging countries. If growth in neighbouring countries increases, FDI in the host country increases. The results in the African sample show statistically insignificant results.

To conclude, the results show that there is a tendency for competition and for contagion between the host country and neighbouring countries. The developed countries are more competitive and the influence of neighbours seems to play a larger contagion role in Africa, while to a lesser extent that is true for emerging countries. It seems as if bad neighbourhoods have a negative influence on African countries.

9.7   POLICY IMPLICATIONS

Many challenges exist for African economies which need to be effectively addressed to enable them to benefit from globalisation and increased integration into the world economy. One of these challenges is to attract larger volumes of FDI, enabling African economies to reap the benefits of FDI. These benefits include improved knowledge and skill transfers, new technology, increased access to external markets, increased capital and tax bases and increased levels of employment.

In a critical analysis, evaluating Africa according to criteria of determinants for attracting higher volumes of FDI, Africa does not perform well. Even though Africa has shown improved performance for the majority of determinants for attracting FDI (presented in table 8.1), it is performing relatively poorly when compared to emerging and developed countries.

Policy changes and improvements are needed in Africa, spurring improvement in economic stability; improved infrastructure; an effective legal, financial and regulatory framework; deregulated labour markets; privatisation; promotion of openness to international trade; improved regional policies; and the lowering of subsidies on imported products from Africa to developed countries.

9.8   CONCLUSION

Given the goals set out by the United Nations in its Millennium Goals, and the estimation that if Africa wants to reduce the number of people living in poverty by 50 per cent by 2015, a sustained annual growth rate of above 7 per cent per year needs to be achieved and a resource gap of US$64 billion needs to be filled. FDI is seen as an integral part of achieving these goals.

Looking at current trends in FDI, Africa is receiving a very small percentage of FDI, but when measured as FDI over GDP these percentages improve. Although Africa still receives less than other regions, the gap is getting smaller. The challenge, however, is to increase the levels of FDI that African countries receive.

In this study the theories on FDI as well as the empirical studies are investigated to find determinants of FDI. Given these determinants a set of data and proxies for different panels including developed, emerging and African countries are discussed. Empirical estimations on FDI, using panel econometrics, are done for host countries. These empirical estimations are extended to include neighbouring country influences on each host country.

Lastly, policy recommendations are made for African countries that will improve their current situation and result in increased FDI flows.

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APPENDIX 1

FOREIGN DIRECT INVESTMENT FLOWS TO AFRICA

A.1   FOREIGN DIRECT INVESTMENT INFLOW AS A PERCENTAGE OF TOTAL INFLOW TO AFRICA

Figure A.1 and A.2 show the average FDI inflow to Africa as a percentage of the total inflow to Africa, in the periods 1980 to 1990 and 1990 to 2000 respectively. Only a few countries receive the major part of the FDI. From 1980 to 1990, nine countries, namely: Algeria, Angola, Botswana, Cameroon, Egypt, Gabon, Morocco, Nigeria and Tunisia received more than 85 per cent of these inflows. This list of top receivers didn't change much from 1990 to 2000, with Botswana, Cameroon and Gabon not appearing on this list and Lesotho and South Africa are added. These countries received more than 76 per cent of the total FDI inflows.

Figure A.1   **FDI inflow to Africa as a percentage of the total inflow to Africa from 1980 to 1990**
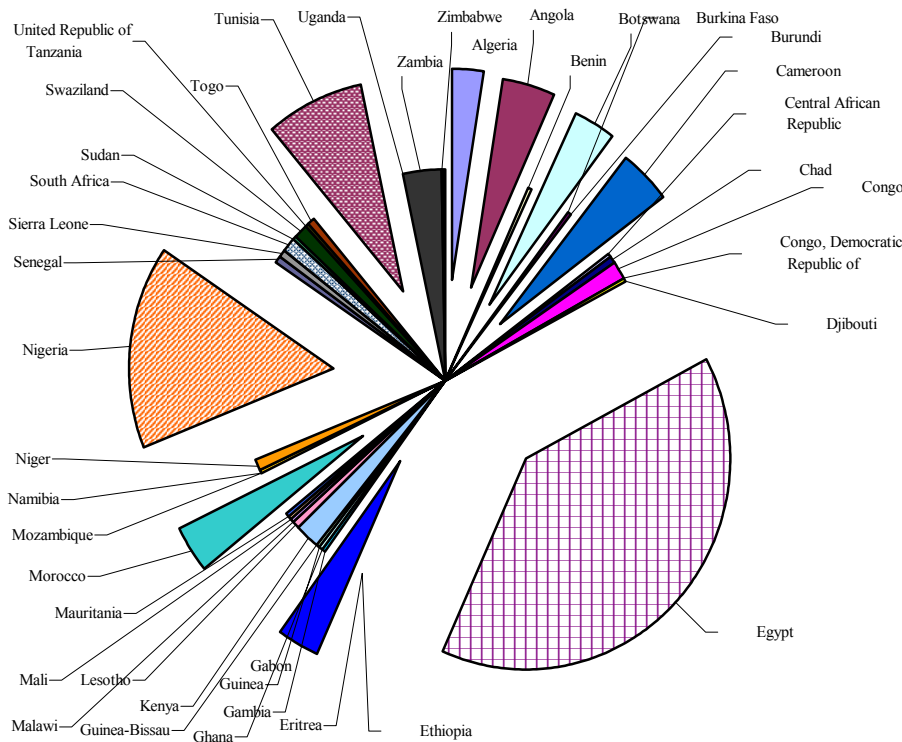
Source: Own Calculations (UNCTAD and WB data)

Figure A.2   FDI inflow to Africa as a percentage of the total inflow to Africa from 1990 to 2000.
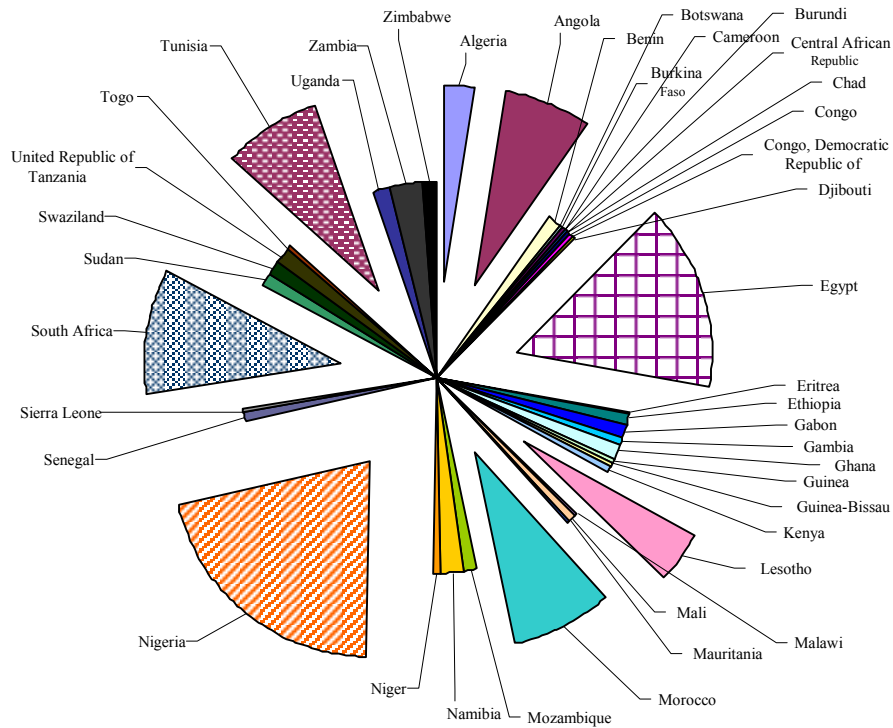
Source: Own Calculations (UNCTAD and WB data)

A.2 FOREIGN DIRECT INVESTMENT FLOWS TO AFRICA AS A PERCENTAGE OF GDP

Figure A.3   FDI inflows per GDP in Africa from 1980 to 1990
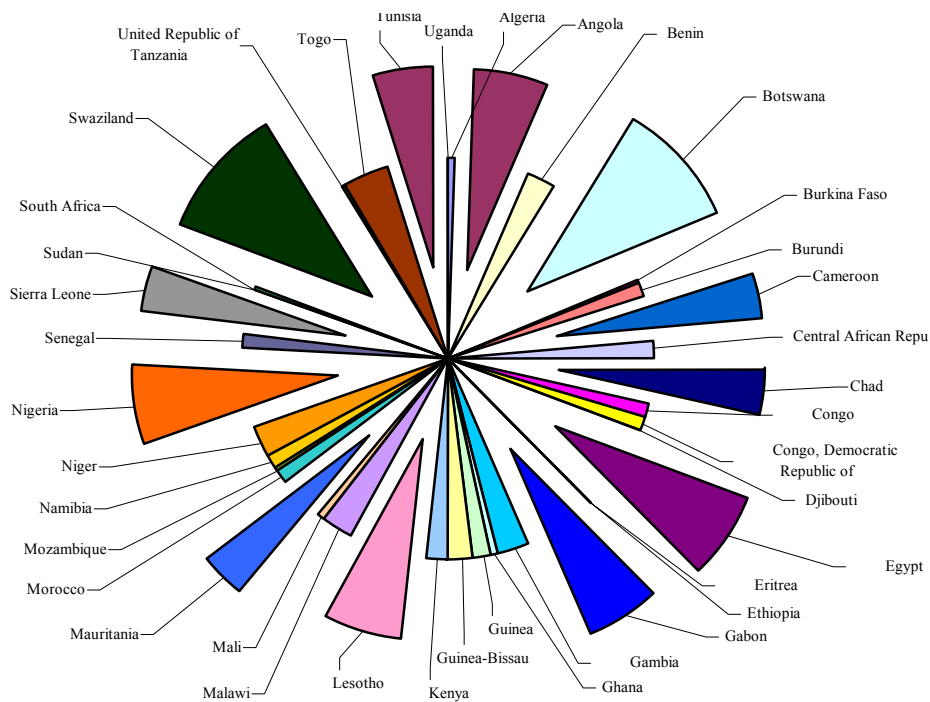
Source: Own Calculations (UNCTAD and WB data)

Figure A.4   FDI inflows per GDP in Africa from 1990 to 2000

Source: Own Calculations (UNCTAD and WB data)

A3
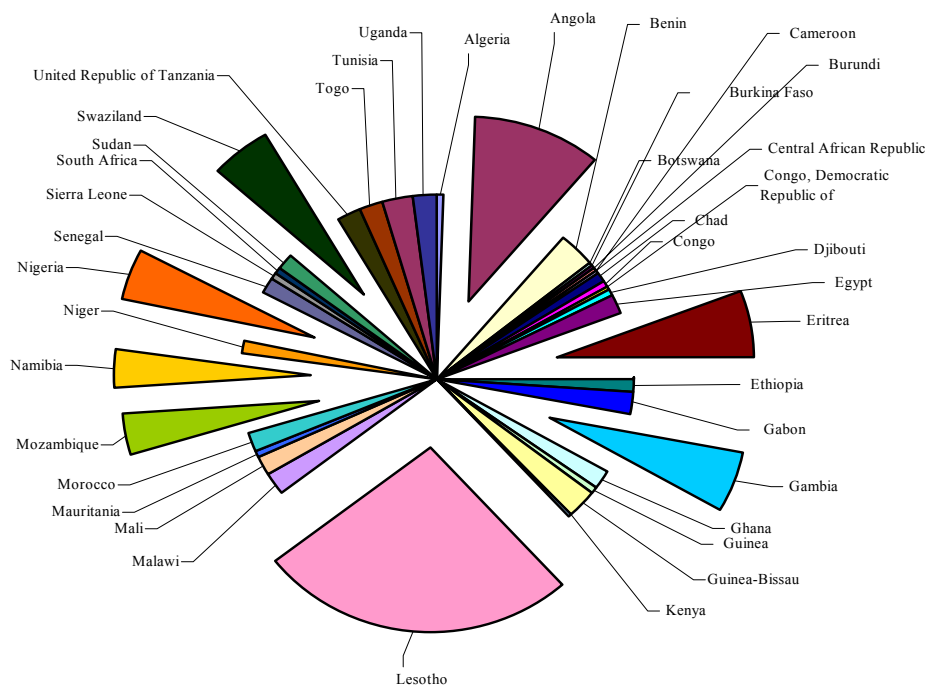
Figure A.3 and figure A.4 show the FDI inflow as a percentage of the GDP for the period 1980 to 1990 and for the 1990 to 2000 respectively. In the period 1980 to 1990 this weighted FDI was distributed relatively evenly with almost 13 countries that received 4 per cent or more of the net inflows. Between the periods 1990 to 2000 this figure looked more screwed with two countries, namely Angola and Lesotho[57] receiving almost 30 per cent of the weighted net FDI inflows. Four neighbouring countries of South Africa, namely Swaziland, Namibia, Mozambique and Lesotho received 32 per cent of these inflows.

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[57] The inflow to Angola was mainly concentrated in investments in petroleum activities after the civil war in the country and the large inflow to Lesotho was the result of large scale government privitasation during this period.

APPENDIX 2

EMPIRICAL LITERATURE AND CASE STUDIES ON FOREIGN DIRECT INVESTMENT

Table A2.1   List of dependent variables, functional form and explanatory variables used

Dependent variables	Functional form and explanatory variables	Description and meaning of variables	Sources and comments
y = Net FDI,	$y = \alpha + \beta X + \gamma I + \delta Z + \varepsilon$ Chakrabarti (2001) calculates weights through a likelihood function to estimate for instance a mean γ ($\gamma = \sum_{j} \omega_{j} \gamma_{j}$) X = a set of explanatory variables that have been relatively less controversial (market size – GDP, gdp) I = variables of interest (wage (W), openness (OP), real exchange rate (REX), tariff (TAR), trade balance (NX), growth rate of real GDP ($GRGDP$) and tax rate (TAX)). Z = are according to Chakrabarti (2001) 'doubtful' variables (inflation (INF), budget deficit (DEF), domestic investment (di), external debt (ed), government consumption (GC) and political stability (PS))	$NET\ FDI$ = Per-capita net FDI in US dollars at current market prices. gdp = Per capita gross domestic product in US dollars at current market prices. GDP = Gross domestic product in US dollars at current market prices. TAX = Tax on income, profits and capital gains (% of current revenue). W = Industrial wage rate measured in US dollars at current market prices. OP = Ratio of exports and imports to GDP. REX = Real exchange rate in terms of US dollars. def = Per-capita budget deficit in US dollars at current market prices. INF = Annual percentage change in consumer price index (CPI). TAR = Average tariff on imports. $GRGDP$ = Annual percentage change in GDP. nx = Per-capita value of exports less imports in US dollars at current market prices. di = Per-capita domestic investment in US dollars at current market prices. ed = Per-capita external debt in US dollars at current market prices. PS = Business Environmental Risk Intelligence (BERI) political stability index.	Chakrabarti (2001) R^2 = 0.112 N = 135

Dependent variables	Functional form and explanatory variables	Description and meaning of variables	Sources and comments
(FDI/GDP)$_t$ the share of foreign direct investment (as per balance of payment) in *GDP*	$$\left(\frac{FDI}{GDP}\right)_{it} = g(GDP_{it}, GDPPC_{it}, GR3_{it-1}, INV_{it}, GSIZE_{it}, \Delta RER_{it},$$ $$INST_{it}, POL_{it}, SKILL_{it}, INFR_{it}, OPEN_{it})$$	where *i* indexes country and *t* year. With: GDP_t = real GDP_t, $GDPPC_t$ = real *GDP* per capita, . $GR(3)_{t-1}$ = the average real *GDP* growth rates over past 3 years. INV_t = the share of gross domestic investment in *GDP*. $GSIZE_t$ = the share of government consumption in *GDP* (proxy for government size), $\Delta(RER)_t$ is the change in real exchange rate between year *t* and year *t-1*. The real exchange rate for country *i* is defined as $RER_i = E_{i/\$} \cdot \frac{P_{US}}{P_i}$, where *E* is the exchange rate (local currency per US$), P_{US} is the US wholesale price index, and P_i is country *i*'s consumer price index. Increases in *RER* means real depreciation. DSX_t = the debt-service ratio (a proxy for transfer risk). $INST_t$ = an index of institutional quality, defined as the product of ICRG's "rule of law" and "corruption in government" indices and POL_t is a index of policy instability, defined as the standard deviation of *GSIZE* over the past 4 year, including the current year. $SKILL_t$ = the secondary school gross enrolment ratio (a proxy for national skill level), $INFRA_t$ is the number of telephone mainlines per thousand of the population (a proxy for telecommunication infrastructure), and $OPEN_t$ = trade openness that is defined as the value of exports plus imports divided by *GDP*.	Ancharaz (2003) Use an unbalanced panel R^2 = 0.22 to 0.34 Estimation methods = Fixed effects, GLS Total sample of 84 counties Period 1980 to 1997 N = 21 to 55
USFDI Total US FDI from the US Department of Commerce	(No specific functional form were specified)	*TAX* = corporate tax rate from Price Waterhouse's country books. *INFDI* = index of the degree of general openness to capital flows constructed from the IMF's Annual Report on Exchange Rate Arrangements and	Gastanaga, *et al* (1998) 7 panels are used and are specified

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Dependent variables	Functional form and explanatory variables	Description and meaning of variables	Sources and comments
Bureau of Economic Analysis (BEA) as a % of GDP *USMAN* Manufacturing US FDI from US BEA as a % of GDP (use the ratio)		Restrictions, which ranges from "0" if restrictions are high to "10" if low or non-existent. *CORRUP* = index of absence of corruption from Mauro (1995), which ranges from "0" (most corrupt) to "10" (least corrupt). *BMP* = black Market Premium from the World Bank. Growth = rate of growth of real GDP, calculated using real GDP from the UN's MEDS and from the IMF's IFS. *TARIFF* = tariff revenue as a fraction of the value of imports, in domestic currency. Tariff revenue is from the IMF's Government Financial statistics (GFS) Yearbook, imports from the IMF's IFS. *CONTRACT* = contract Enforcement index from BERI, which ranges from "0" if enforcement is poor to "4" if good". *BURDELAY* = bureaucratic delay index from BERI, which ranges from "0" if delay is high to "4" if low. *NATRISK* = nationalization Risk index from BERI, which ranges from "0" if risk is high to "4" if low. *OILPRICE* = dummy variable for oil exporter multiplied by an index of real oil prices.	as follows: - Cross-section OLS = R^2 0.38 to 0.52 - Pooled OLS R^2 = 0.57 to 0.79 - Fixed effects estimation R^2 = 0.55 to 0.85 - Pooled OLS BEA manufacturing R^2 = 0.11 to 0.15 - Pooled OLS BEA total FDI data R^2 = 0.039 to 0.18 49 less-developed countries Period 1970 to 1995
*FDI = (FDI/GDP)*100*	No specific functional form	*OPEN* = (Imports + Exports)/GDP*100 This is also used as a measure of trade restriction (sign depend on type of investment). *INFRAC* = log(Phones per 1000 population) (+) *RETURN* = log(1/real GDP per capita) to measure the return on capital (an by implication higher per capita income should yield a lower return and therefore real GDP per capita should be inversely related to FDI). Africa dummy Africa =1 *GDP* growth as a measure of the attractiveness of the host country's market. Government consumption/GDP*100 as a measure of	Asiedu (2002) 4 Cross country regressions - average from 1988 to 1997 OLS estimation with different combinations of the independent variables and one panel estimation

Dependent variables	Functional form and explanatory variables	Description and meaning of variables	Sources and comments
		the size of government (smaller +). Inflation rate as a measure of the overall economic stability of the country (lower +). $M2/GDP*100$ to measure the financial depth (+). Political Stability – used the average number of assassinations and revolutions as in Barro and Lee (1993) (sign not a priori determined). OPEN*AFRICA INFRAC*AFRICA RETURN*AFRICA	$R^2 = 0.57$ to 0.71

Net FDI/Population	No specific functional form
	- Political model
	- Economic model
	- Amalgamated model
	- Political-economic model
		Economic Determinants
		 - Real GNP per capita
		 - Growth of real GNP
		 - Rate of inflation
		 - Balance of payments deficit
		 - Wage cost
		 - Skilled work force
		Political Determinants
		 - Institutional Investors credit rating
		 - Political instability
		 - Government ideology (right = 1, left = 0)
		 - Bilateral aid received
		   - *From communist countries*
		   - *From Western countries*
		Political and economic multi lateral aid
			Schneider and Frey (1985)
			
			Different Cross-sections for 1976, 1979 and 1980
			
			Comparison of 54 less developed countries
			
			$R^2 = 0.38$ to 0.75

FDI/population	$PCFDI = a_{11}+a_{12}PCGDPGR + a_{13}PCGDP + a_{14}PCTB + a_{15}NW + e_1$ $PCGDPGR = a_{21} + a_{22}(PCFDI/PCGDP) + a_{23}GDSGDP$ $\quad\quad = a_{24}EMPLGR + a_{25}FDISGDP + a_{26}EXGR +$ $\quad\quad a_{27}(PCFDI/PCGDP) \times D(i) + a_{28}(PCFDI/PCGDP)$ $\quad\quad \times D(i + 1)(or\ a_{27}FDISGDP \times D(i) + a_{28}FDISGDP$ $\quad\quad \times D(I + I)) +e_2,\ i = 1,\ 3$	Where: $PCFDI$ = per capita FDI. $PCGDP$ = per capita gross domestic product. $PCGDPGR$ = annual growth rate of PCGDP. $PCTB$ = per capita trade account balance. NW = nominal hourly rate of pay in manufacturing sector. $GDSGDP$ = gross domestic savings as proportion of GDP. $FDISGDP$ = stock of FDI as proportion of GDP. $EMPLGR$ = rate of growth of employment. $EXGR$ = rate of growth of employment.	Tsai (1994) Use 2SLS to estimate the parameters (R^2 doesn't have the normal interpretation) Include less developed and developing

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Dependent variables	Functional form and explanatory variables	Description and meaning of variables	Sources and comments
		$D(1)$ = high income LDC's, PCGDP exceeds US$1300 in 1975-1978 (US$1500 in 1983-1986), dummy variable. $D(2)$ = median income LDCs, PCGDP lies between US$600 and 1300 in 1975-1978 (US$700 and 1500 in 1983-1986), dummy variable. $D(3)$ = African LDCs, dummy variable. $D(4)$ = Asian LDCs, dummy variable. e_1, e_2 = stochastic disturbance terms.	countries. Their samples size for each period is determined by the availability of data. 62 countries are included the seventies and 51 in the eighties.
FDI_{ij}—foreign affiliates of country j in country i as a per cent of total foreign affiliates of country j.	$FDI_{ij} = FDI_{ij}(LANGUAGE_{ij}, NEIGHBOUR_{ij}, GDPOPEN_j,$ $LABPROD_j, GDCGF_j, DISTANCE_{ij}, TARIFF_{ij})$	$GDPOPEN_j$ =GDP of 1980 in constant prices of 1975 of country j, corrected for openness of the country. $$GDPOPEN_j = GDP_j + \sum \frac{X_{ij}}{GDP_j} GDP_i$$ $LANGUAGE_{ij}$= Dummy, 1 if country i and j share the same language, o otherwise. $NEIGHBOUR_{ij}$ = Dummy, 1 if country i an j are neigbours 0 otherwise. $LABPROD_j$ = hourly wages in US $ divided by labour productivity. $CFCF_j$ = Gross fixed capital formation as a % of GDP (this include transport, machinery, equipment and residential construction, as a proxy for the presence of an adequate infrastructure. $DISTANCE_{ij}$ = Ticketed point mileage between the most important airport of country i and country j. $TARIF_{ij}$ = Tariff average (of all industrial products) between country i and country j).	Veugelers (1991) County cross section for 1980 Including OECD countries OLS $R^2 = 0.46$
EXP_{ij}—exports of country j to country i as a per cent of total exports of country j.	$EXP_{ij} = EXP_{ij}(LANGUAGE_{ij}, NEIGHBOUR_{ij}, GDP_j,$ $LABPROD_j, GDCGF_j, DISTANCE_{ij}, TARIFF_{ij})$		Exports regarded as a substitute or complement to local production in serving foreign markets. Thus, both FDI_{ij} and

Dependent variables	Functional form and explanatory variables	Description and meaning of variables	Sources and comments
			EXP_{ij} are entered as measures of foreign enetration of country i by country j. $R^2 = 56$
$FDI_{ab}/GNP_a =$ the share of *FDI* in money terms that flow from country a to country b.	$$\frac{FDIab}{Ya} = a_0 + a_1 yb_{-1} + a_2 \delta yb + a_3 STRb$$ $$+ a_4 ULCb + a_5 \left(\frac{Xab}{Ya}\right)_{-1} + a_6 (INTb - INTw) + \varepsilon$$ According to Culem (1988) except for the introduction of three new variables $ULCb, \left(\frac{Xab}{Ya}\right)_{-1}$ and $(INTb - INTw)$ this correspond to the 'usual specification of the models of FDI determinants as demand equations. Where: yb_{-1} is a measure of the market size (lagged GNP) (+) δyb is a measure of the market growth (percent growth in the real GNP) (+) $STRb$ is a measure of the tariff barriers (proxied by share in % of 1968 tariffs applied on industrial imports. $ULCb$ unit labour cost (-) $\left(\frac{Xab}{Ya}\right)_{-1}$ to test the impact of prior exports on current FDIs (the lagged share of exports from country a ti country b in the GNP of country a) (+) $(INTb - INTw)$ is the nominal interest rate differential between the host country and the rest of the world. $$\frac{FDIab}{Ya} = b_0 + b_1 yb_{-1} + b_2 (\delta yb - \delta ya) + b_3 STRb$$ $$+ b_4 (ULCb - ULCa) + b_5 \left(\frac{Xab}{Ya}\right)_{-1} + b_6 (INTb - INTw) + \gamma$$	GNP is introduced to control for the size of the investing country, except when the sample covers only one investing country. Generally, larger countries are expected to invest abroad more than smaller ones. Recorded *FDI*s are pure financial flows. That is, they are neither equivalent to foreign financial involvement in domestic industries, nor to the growth of the net assets of foreign affiliates, nor to capital expenditure on fixed assets.	Culem (1988) FDI flows among 6 industrialised countries. Estimations by GLS and all regression coefficients are to be divided by 10^5) $R^2 = 0.37$ to 0.38

Dependent variables	Functional form and explanatory variables	Description and meaning of variables	Sources and comments
	Culem (1988) also developed a second model to test the difference between unit labour cost of the host and the source country and the difference in the real GNP growth rate between host and source country.		
FDI as a % of GDP	$FDI = \beta_{f1j} + \beta_{f2}FDI(-1) + \beta_{f3}\ I + \beta_{f4}DY + \beta_{f5}DY(-1) +$ $\beta_{f6}\ \mathrm{Re}\ s2$	FDI = foreign direct investment, net inflows (% of GDP) (+). I = Gross Domestic Investment (% of GDP) (+) DY = Annual percentage growth rate of GDP at market prices based on constant local currency (+) $Res2$ = Restrictions on Current Account (+) Transaction (No controls = 0, Controls = 1) j = Country index.	Razin (2002) Make use of 4 equations for a gravity model of which one is the FDI equation. Estimate OLS and TSLS R^2 = 0.13 to 0.29 64 developing countries from 1976 to 1997
K_2 = *stock of foreign direct capital held by the US (home) in South Africa (host)*	$\ln(K_2^*) = \beta_0 + \beta_1\ln(w_1) + \beta_2\ln(r_1) + \beta_3\ln(w_2) + \beta_4\ln(r_2)$ $+ \beta_5\ln(Q_T) + \beta_6\ln(m) + \beta_7\ln(n)$ $\beta_1 > 0;\ \beta_2 > 0;\ \beta_3 < 0;\ \beta_4 < 0;\ \beta_5 > 0;\ \beta_6 < 0\ and\ \beta_7 < 0$ Estimated as: $LFDI = \beta_0 + \beta_1 LWAGERSA + \beta_2 LUCRSA + \beta_3 LWAGERUSA +$ $\beta_4 LUCUSA + \beta_5 Q + \beta_6 LUNCREV + \beta_7 LUNCEX$	w_i = cost of labour, nominal wage bill of the investor – approximated by an index for nominal wages $WAGERSA$ wage rate SA and $WAGEUSA$ wage rate USA. r_1 = cost of capital r_i = price of capital ((interest $rate_i$)-inflation $rate_i$)+(rate of $depreciation_i$)+(risk $premium_i$))/(1-tax $ratio_i$). $(LUCRSA$ = user cost of capital in SA and $LUCUSA$ is user cost in US. Q = market size, this can be substituted by $LQTOT$ that is the total output requirement. m or LUNCREV = the demand uncertainty. n or LUNCEX = exchange rate uncertainty. Everything is estimated in log form	Van der Walt (1997) 1970 to 1994 OLS cointegration time series estimations for US FDI in SA UK FDI in SA R^2 = 0.98 R^2 = 0.99

Table A2.2   Selected determinants of FDI

Determinants of FDI			Positive significant (Significance level between 1% and 10%)	Range of Coefficients[58]		Cross-section, time series or Panel	Negative significant (Significance level between 1% and 10%)	Range of Coefficients[1]		Cross-section, time series or Panel	Insignificant
Economic Determinants	Market size	**Real GDP**	Ancharaz (2003)								Ancharaz (2003)
		Nominal GDP	Lipsey (1999)	17.2	Unit Δ	CS					
		Real GDP (or GNP) per capita — Host	Schneider and Frey (1985) Tsai (1994) Lipsey (1999) Chakrabarti (2001) Chakrabarti (2003) Van der Walt (1997)[59]	0.06 to 0.07 0.02 0.367 to 0.454 0.01 (+) 2.23 (B$_5$ > 0)	Unit Δ Unit Δ Unit Δ Log	CS CS CS CS	Edwards (1990) Japersen, Aylward and Knox (2000) Asiedu (2001)[60] Asiedu (1997) Ancharaz (2003)	0.91 to 2.22 -2.1 -4.66 to -6.47 -0.00187	Log Log Log Unit Δ	CS Panel Panel Panel	Loree and Guisinger (1995) Wei (2000) Hausmann and Fernandex-Arias (2000) Ancharaz (2003[61])
		Real GDP (or GNP) per capita — Rival	Chakrabarti (2003)	(+)							
		Lagged GNP	Culem (1988)	0.105 to 0.115	Unit Δ	Panel					
	GDP or GNP or per capita	**Growth**	Schneider and Frey (1985) Gastanaga et al. (1998) Culem (1988) Razin (2002)	5.06 to 5.47 0.328 to 0.718 1.07 0.01 to 0.02	Unit Δ Unit Δ Unit Δ	CS CS Panel Panel					Asiedu (2001) Razin (2002) Lipsey (1999) Tsai (1994)
		Growth$_{t-1}$	Gastanaga et al. (1998)	0.025 to 0.033 0.022 to 0.041		Panel Panel^B					
		Growth$_{t-2}$	Gastanaga et al. (1998) Ancharaz (2003)[62]	0.029 to 0.030 0.033 to 0.034 0.05$^{C, D}$		Panel Panel^B Panel					Razin (2002)
		Growth Differential	Culem (1988)	1.803	Unit Δ	Panel					

[58] Coefficients depend on type of analysis and variables used in specific regression.

[59] Uses combined GDP of the home and host country and Van der Walt does not make use of Cross-section but of OLS time series and in this case between South African and the US by making use of and ECM as illustrated by Engle and Yoo, 1987).

[60] The inverse of the real GDP per capita is used to measure the return on capital; this inverse relationship may also reflect a perception that investment risk rises as per capita GDP declines. As a consequence investors may require higher returns to offset the perceived greater risk.

[61] The results are insignificant except for the SSA sample.

[62] The results are significant except for the SSA sample.

Determinants of FDI			Positive significant (Significance level between 1% and 10%)	Range of Coefficients[58]		Cross-section, time series or Panel	significant (Significance level between 1% and 10%)	Range of Coefficients[1]		Cross-section, time series or Panel	Insignificant
Labour	Labour cost or wage	Host	Wheeler and Mody (1992)				Chakrabarti (2003) Schneider and Frey (1985) Van der Walt	(-) -0.74 to -0.76 -1.883 (w_2<0)	Unit Δ Log	CS TS	Tsai (1994) Loree and Guisinger (1995) Lipsey (1999)
		Rival	Chakrabarti (2003)	(+)							
		Home	Van der Walt (1997)	2.164 (B_1>0)	Log	TS					
	Labour productivity										Veugelers (1991)
	Unit labour cost differential						Culem (1988)	-0.134	Unit Δ	Panel	
	Labour cost wage per worker divided by output per worker		Lipsey and Kravis (1982)								
	Skilled work force		Schneider and Frey (1985)	0.64 to 0.71	Unit Δ	CS					Schneider and Frey (1985)
Capital	Cost of Capital	Host	Van der Walt (1997)		Log			-0.278 (B_2 < 0)		TS	
		Home	Van der Walt (1997)	0.193 (B_1 > 0)	Log	TS					
	Nominal interest rate differential		Culem (1988)	18 to 19.536	Unit Δ	Panel					
Inflation rate							Schneider and Frey (1985)	-1.27 to -1.31	Unit Δ	*CS*	Asiedu (2001)
Balance of Payments deficit							Schneider and Frey (1985)	-0.50 to -0.54	Unit Δ	*CS*	
Per capita trade account balance							Tsai (1994)	-0.04	Unit Δ	CS	
Domestic investment			Razin (2002)	0.03 (OLS) 0.07 (TSLS)		Panel Panel					
Exchange rate or Δ (Exchange rate)			Chakrabart (2003)	(+)			Chakrabart (2003) Ancharaz (2003) Van der Walt (1997)	(-) -0.01E-4[C] -7.13E-4[D] -0.006 (B_7 < 0)	Log	CS CS	

Determinants of FDI		Positive significant (Significance level between 1% and 10%)	Range of Coefficients[58]		Cross-section, time series or Panel	Negative significant (Significance level between 1% and 10%)	Range of Coefficients[1]		Cross-section, time series or Panel	Insignificant
GDPOPEN		Veugelers (1991)	0.004	Unit Δ	CS					
Openness (X +Z)/GDP		Edwards (1990) Gastanaga *et al.* (1990) Hausmann and Fernandez-Arias (2000) Asiedu (2001)			CS & Panel					
			0.03 to 0.035	Unit Δ	CS					
		Gastanga *et al.* (1998)	0.18 to 0.47, 0.07 0.059 to 0.078[D]		Panel					
		Ancharaz (2003)	0.03[C], 0.04[D]		Panel[B] Panel					
FDI₋₁		Gastanga *et al.* (1998)	0.74 to 0.84 0.32 to 0.43 0.60 (OLS)		Panel[A] Panel[B] Panel					
		Razin (2002)	0.50 (TSLS)		Panel					
Taxes and tariffs	**Host**					Loree and Guisinger (1995) Wei (2000) Chakrabarti (2003) Gastanga *et al.* (1998)	(-) -2.090 -3.313 to -3.425		Panel Panel[B]	Wheeler and Mody (1992) Lipsey (1999) Gastanaga *et al.* (1998) Veugelers (1991)
	Rival					Chakrabart (2003)	(-)			
Political instability or Policy instability	**Host**					Schneider and Frey (1985) Edwards (1990) Chakrabart (2003) Ancharaz (2003)	-0.50 to -0.55 (-) -0.09[C], -0.07[D]	Unit Δ	CS CS	Loree and Guisinger (1995) Jaspersen *et al* (2000) Hausmann and Fernandez-Arias (2000) Asiedu (2001)
	Rival					Chakrabart (2003)	(-)			
Government consumption or size						Ancharaz (2003)	-0.08[C], -0.06[D]		Panel	Asiedu (2001)
Languageᵢⱼ (dummy, 1 if the same language is shared)		Veugelers (1991)	5.598	Unit Δ	CS					

(Left vertical label spanning lower rows: **Social/political**)

	Determinants of FDI	Positive significant (Significance level between 1% and 10%)	Range of Coefficients[58]		Cross-section, time series or Panel	Negative significant (Significance level between 1% and 10%)	Range of Coefficients[1]		Cross-section, time series or Panel	Insignificant
	Neighbour$_{ij}$ **(dummy, 1 if a common border)**	Veugelers (1991)	5.67	Unit Δ	CS					
Other	*Distance$_{ij}$* **(ticketed point mileages between the key airports of countries)**	Veugelers (1991) Lipsey and Weiss (1981)	1.243	Unit Δ	CS	Lipsey and Weiss (1981)				
	Transportations cost	Chakrabart (2003)	(+)			Chakrabart (2003)	(-)			
	Demand uncertainty					Van der Walt (1997)	-0.0360 ($B_6 < 0$)	Log	TS	
	African dummy/(SSA)					Asiedu (2001)	-1.34 to -1.45 -1.52	Unit Δ	CS Panel	Ancharaz (2003)
	Institutional quality	Ancharaz (2003)	0.03[C], 0.04[D]		Panel					
	BMP									Gastanga *et al* (1998)
	Infrastructure quality	Wheeler and Mody (1992) Kumar (1994) Loree and Guisinger (1995) Asiedu (2001)	0.574 to 1.399	Log	CS					
	Trend	Schmitz and Bieri (1972)								

[A] Pooled OLS estimation
[B] Fullest potential panel with fixed effects
[C] Fixed Effects
[D] GLS

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APPENDIX 3

TECHNICAL DISCUSSION

A3.1   PANEL DATA

Panel data models can be estimated as

$$y_{it} = \alpha_{it} + X_{it}^{'}\beta + \varepsilon_{it} \qquad\qquad\text{(A3.1)}$$

where y_{it} is the dependent variable and x_{it} and β_i are k-vectors of non-constant regressors and parameters for $i = 1, 2, \ldots, N$ cross-sectional units; each for a period $t = 1, 2, \ldots, T$.

Most panel data applications utilize a one-way error component model for the disturbances, with

$$\varepsilon_{it} = \varepsilon_i + v_{it} \qquad\qquad\text{(A3.2)}$$

where ε_i denotes the unobservable individual specific effect that must be estimated and v_{it} denotes the remainder disturbance (v_{it} is $IID(0, \sigma_v^2)$).

The basic specification treats the pool specification as a system of equations and estimates the model using systems OLS. This specification is appropriate when the residuals are contemporaneously uncorrelated and time-period and cross-section homoskedastic

$$\Omega = \sigma^2 I_N \otimes I_T \qquad\qquad\text{(A3.3)}$$

the residual covariance matrix is given as

$$\Omega = E(\varepsilon\varepsilon^{'}) = E\begin{pmatrix} \varepsilon_1\varepsilon_1^{'} & \varepsilon_2\varepsilon_1^{'} & \cdots & \varepsilon_N\varepsilon_1^{'} \\ \varepsilon_2\varepsilon_1^{'} & \varepsilon_2\varepsilon_2^{'} & & \vdots \\ & & \ddots & \\ \varepsilon_N\varepsilon_1^{'} & \cdots & & \varepsilon_N\varepsilon_N^{'} \end{pmatrix} \qquad\qquad\text{(A3.4)}$$

A3.2   FIXED EFFECTS (*Within* and LSDV)

The fixed effects estimator allows α_i to differ across cross-section units by estimating different constants for each cross-section. The fixed effects can be computed by subtracting the *within* mean from each variable and estimating OLS using the transformed data

$$y_i - \bar{x}_i = (x_i - \bar{x}_i)'\beta + (\varepsilon_i - \bar{\varepsilon}_i) \tag{A3.5}$$

where $\bar{y}_i = \dfrac{\sum_t y_{it}}{N}, \bar{x}_i = \dfrac{\sum_t x_{it}}{N}$, and $\bar{\varepsilon}_i = \dfrac{\sum_t \varepsilon_{it}}{N}$ $\qquad$ (A3.6)

The OLS covariance formula applied to

$$\text{var}(b_{FE}) = \hat{\sigma}^2 w(\widetilde{X}'\widetilde{X})^{-1} \tag{A3.7}$$

gives the coefficient covariance matrix estimates, where $\widetilde{X}$ represents the mean difference X, and

$$\hat{\sigma}_W^2 = \frac{e_{FE}'e_{FE}}{NT - N - K} = \frac{\sum_{it}(\widetilde{y}_{it} - \widetilde{x}_{it}'b_{FE})^2}{NT - N - K} \tag{A3.8}$$

$e_{FE}'e_{FE}$ is the sum of squared residuals (SSR) from the fixed effects model.

The fixed effects are not estimated directly, but are computed from

$$\hat{\sigma}_i = \frac{\sum_t (\bar{y}_i - \bar{x}_i'b_{FE})}{N} \tag{A3.9}$$

The *within* method gives the same results as the LSDV with the major difference – the t statistics of the *within* model are not present, because the cross-section specific effects are estimated, but computed.

A disadvantage with the w*ithin* method is that *demeaning* the data means that X-regressors which are themselves dummy variables, cannot be used.

The total individual effect is the sum of the common constant and the constructed individual component (Baltagi, 2001: 11-13 and EViews Help file).

A3.3   CROSS -SECTION WEIGHTING

The Cross-section weighted regression is appropriate when the residuals are cross-section heteroskedastic and contemporaneously uncorrelated:

$$\Omega = E(\varepsilon\varepsilon^{'}) = E\begin{pmatrix} \sigma_1^2 I_{T_1} & 0 & \cdots & 0 \\ 0 & \sigma_2^2 I_{T_2} & & \vdots \\ & & \ddots & \\ 0 & \cdots & & \sigma_N^2 I_{T_N} \end{pmatrix} \qquad (A3.10)$$

A FGLS is performed where $\hat{\sigma}_i^2$ is estimated from the first-stage pooled OLS regression; and the estimated variances are computed as

$$\hat{\sigma}_i^2 = \frac{\sum_{t=1}^{T_1}(y_{it}-\hat{y}_{it})^2}{T_i} \qquad (A3.11)$$

where $\hat{y}_{it}$ are the OLS fitted values.

A3.4   SEEMING UNRELATED REGRESSIONS (SUR)

A SUR model is popular because it makes use of a set of equations, which allows for different coefficient vectors that capture the efficiency due to the correlation of the disturbances across equations. According to Baltagi (2001: 105), Avery (1977) was the first to consider the SUR model with error component disturbances. This method estimates a set of equations, which allow different coefficient vectors to capture efficiency due to the correlation of disturbances across equations.

One of the pitfalls is that it can not be used for a large number of cross-sections or a small number of time periods. The average number of periods used to estimate, must at least be as large as the number of cross-sections used (EViews Help file).

The SUR weighted least squares are estimated by using a feasible GLS specification assuming the presence of cross-section heteroskedasticity and contemporaneous correlation.

$$\Omega = E(\varepsilon\varepsilon^{'}) = \begin{pmatrix} \sigma_{11}I_T & \sigma_{12}I_T & \cdots & \sigma_{1N}I_T \\ \sigma_{21}I_T & \sigma_{22}I_T & & \vdots \\ & & \ddots & \\ \sigma_{N1}I_T & \cdots & & \sigma_{NN}I_T \end{pmatrix} = \Sigma \otimes I_T \tag{A3.11}$$

where Σ is the symmetric matrix of contemporaneous correlations

$$\Sigma = \begin{pmatrix} \sigma_{11} & \sigma_{12} & \cdots & \sigma_{1N} \\ \sigma_{21} & \sigma_{22} & & \vdots \\ & & \ddots & \\ \sigma_{N1} & \cdots & & \sigma_{NN} \end{pmatrix} \tag{A3.12}$$

with typical element $\hat{\sigma}_{ij} = \dfrac{\sum\limits_{t}(y_{it} - \hat{y}_{it})^2}{\max(T_i, T_j)}$ \hfill (A3.13)

According to the *EViews* help file, the *max* function is used in the case of unbalanced data by down-weighting the covariance terms.

APPENDIX 4

A4.1   UNIT ROOT TESTS FOR PANEL DATA

A4.1.1 Introduction

In time-series econometric studies, testing for unit roots in time series – by making use of the (augmented) Dickey-Fuller (DF) and Phillips-Perron (PP) tests – is standard practice. However according to Maddala (1999: 631) the use of these tests lacks power in distinguishing the unit root from stationary alternatives and in using panel data unit root tests, power of unit root tests based on a single time series can be increased.

Banerjee (1999: 607) states that the literature on unit roots and cointegration in panel data is a recent trend that has turned out to be a rich study area. It mainly focuses to combine information from the time-series dimension with data from cross-sections. This is done in the hope that inference about the existence of unit roots and cointegration can be made more straightforward and precise by taking account of the cross-section dimension, especially in environments where the time series for the data may not be very long, but similar data may be available across a cross-section of units such as countries, regions, firms or industries.

The most widely used panel unit root tests that have emerged from the literature, are those developed by Levin and Lin (1992, 1993), Im, Pesaran and Shin (1997) and Maddala and Wu (1999).

A4.1.2 Levin and Lins's LL test

Levin and Lin (1993), consider a stochastic process $\{y_{it}\}$ for $i = 1,\ldots,N$ and $t = 1,\ldots,T$ which can be generated by one of the following three models:

$$\text{Model} 1 : \quad \Delta y_{it} = \beta_i y_{it-1} + \varepsilon_{it} \qquad\qquad\qquad (A4.1)$$

$$\text{Model} 2 : \quad \Delta y_{it} = \alpha_i + \beta_i y_{it-1} + \varepsilon_{it} \qquad\qquad (A4.2)$$

$$\text{Model} 3 : \quad \Delta y_{it} = \alpha_i + \delta_i t + \beta_i y_{it-1} + \varepsilon_{it} \qquad (A4.3)$$

where Δy_{it} follows a stationary ARMA process for each cross-section unit and

$$\varepsilon_{it} \sim IID(0, \sigma^2)$$

The null and alternative hypotheses are expressed by

$$H_o : \beta_i = 0 \text{ for all } i$$
$$H_A : \beta_i < 0 \text{ for all } i$$

(A4.4)

The LL test requires β_i to be homogenous across i for this hypothesis. This implies testing a null hypothesis of all series in the panel being generated by a unit root process versus the alternative that not even one of the series is stationary. This homogeneity requirement is a disadvantage of the LL test. Levin and Lin (1993) show that the test has a standard normal limiting distribution. According to Maddala and Wu (1999: 635) the null makes sense under some circumstances, but it does not make sense to assume that all the countries in the sample will converge at the same rate if they do converge.

A4.1.3 Im, Pesaran and Shins's IPS Test

Im *et al.* (1997) propose a *t*-bar statistic to examine the unit root hypothesis for panel data that is based on the average of the individual ADF *t*-statistics. The IPS test achieves more accurate size and higher power relative to the LL test, when allowance is made for heterogeneity across groups (Im *et al.*, 2003). For a sample of N groups observed over T time periods, the panel unit root regression of the conventional ADF test is written as:

$$\Delta y_{it} = \alpha_i + \beta_i y_{it-1} + \sum_{j=1}^{P_i} \gamma_{ij} \Delta y_{it-j} + \varepsilon_{it}, \quad i = 1, \dots, N; \quad t = 1, \dots, T$$

(A4.5)

The null and alternative hypotheses are defined as:

$$H_o : \beta_i = 0 \text{ for all } i$$
$$H_A : \beta_i < 0 \text{ for at least one of the cross-sections}$$

(A4.6)

The IPS test, tests the null hypothesis of a unit root against the alternative of stationarity and allows for heterogeneity, which is not allowed in the LL test.   Two alternative specifications are tested by IPS, the first being that of a unit root with an intercept, as in equation A4.5, or a unit root around a trend and intercept, which would require the inclusion of a trend variable $\{\delta_i t\}$ in equation A4.5. The final test statistic is given by equation A4.7.

$$Z_{\widetilde{t}\,bar} = \frac{\sqrt{N}\{\widetilde{t}\,bar_{NT} - N^{-1}\sum_{i=1}^{N} E(\widetilde{t}_{T\,i})\}}{\sqrt{N^{-1}\sum_{i=1}^{N} Var(\widetilde{t}_{T_i})}} \Rightarrow N(0,1) \qquad (A4.7)$$

where $\widetilde{t}\,bar_{NT}$ is the average ADF t-statistic, while $E(\widetilde{t}_{T\,i})$ and $Var(\widetilde{t}_{T_i})$ are the respective mean and variance. The means and variances are computed based on Monte-Carlo simulated moments and depend on the lag order, time dimension and deterministic structure of the performed ADF test.   These mean and variance values are tabulated in Im *et al.* (2003). The IPS test is a one-sided lower tail test, which asymptotically approaches the standard normal distribution. A test statistic which is less than the standard normal critical value, would lead to the rejection of the null of non-stationarity and render the relevant panel variable stationary.

According to Maddala and Wu (1999: 635) the IPS test is proposed as a generalisation of the LL test, but the IPS test is a way of combining the evidence on the unit root hypothesis from the N unit root tests performed on the N cross-section units. In theory only balanced panel data is considered, but in practice, if unbalanced data is used, more simulations have to be carried out to get critical values.

A4.1.4 Maddala and Wu's Fisher test

The test statistic proposed by Maddala and Wu (1999) is based on combining the *P*-values of the test statistics of *N* independent ADF regressions from equation A4.8. The test is non-parametric and is based on Fisher (1932). This test is similar to the IPS test in the sense that is allows for different first-order autoregressive coefficients and tests the null of non-stationarity. Apart from testing for a unit root around an intercept or trend, as is the case with the IPS test, the Fisher test also tests for a unit root without including a trend or intercept. The Fisher test statistic is given by

$$P(\lambda) = -2\sum_{i=1}^{N} \ln(\pi_i) \qquad\qquad (A4.8)$$

where π_i is the P-value of the ADF test statistic for cross-section i.   The Fisher test statistic $P(\lambda)$ follows a chi-squared distribution with $2N$ degrees of freedom. The test achieves more accurate size and higher power relative to the LL test (Maddala and Wu, 1999).   The advantage it has over the IPS test, is that it allows for a specification of the ADF equation in A4.8, which does not include a trend or an intercept. The main conclusion from Maddala and Wu (1999: 650) "…is that the Fisher test is simple and straightforward to use and is a better test than the LL and IPS tests".

Results of the IPS test performed on the data used in the empirical estimation in the developed, emerging and African panels, are shown and discussed in the following section.

A4.2   TESTS FOR STATIONARITY

Table A4.1 shows the results of the IPS test performed on the developed, emerging and African data sets.   Table A4.2 shows the result of the IPS test performed on the host-neighbouring country data.

Table A4.1   IPS-test on variables from Developed, Emerging and African Countries

Variable	Developed		Emerging		Africa	
	Individual intercept	Individual intercept and trend	Individual intercept	Individual intercept and trend	Individual intercept	Individual intercept and trend
FDI	10.54	7.51	3.72	0.34	-8.22***	-9.42***
EP	1.99	-0.55	-0.71	0.72	1.93	4.22
ES	2.84	1.44	6.16	2.22	3.45	1.64
ET	5.45	1.91	4.47	0.84	2.25	3.56
ET/EP	5.99	1.96	4.16	0.94	0.31	0.66
MS	5.55	-2.06**	1.99	-1.12	2.50	-0.45
G	-5.97***	-3.62***	-7.84***	-6.71***	-16.38***	-13.92***
T	0.47	0.59	6.75	2.69	20.58	11.30
OPN1	9.90	-0.90	3.19	-1.81**	0.069	-3.72***
OPN2	9.77	-1.74**	3.68	-2.29**	-2.26***	-0.45
FH	-0.17	0.48	-0.035	0.69	-10.48***	-2.68***
CC/MS	-3.34***	2.49	-3.12	-1.75**	-2.68***	-1.42*
CC	1.08	2.47	-2.76***	-2.37***	-1.51*	-1.57*
R	-4.02***	-1.43*	-	-	-	-
INFL	-5.70***	-2.56***	-	-	-	-

	Developed		Emerging		Africa	
PURB	4.5	5.86	-3.68***	3.21	-8.75***	4.26
PIT	-	-	1.74	-0.67	-	-
REE	1.07	-1.17	-	-	-	-

***(**)[*] Significant at 1(5)[10] per cent

Table A4.2   IPS-test performed on variables form neighbouring countries

Variable	Developed neighbours		Emerging neighbours		African neighbours	
	Individual intercept	Individual intercept and trend	Individual intercept	Individual intercept and trend	Individual intercept	Individual intercept and trend
N_MS	4.04	-1.08	2.12	-3.63***	0.008	-0.67
N_CC/ N_MS	-0.56	-0.93	-2.30***	-6.81***	-4.49***	-3.14***
N_CC	-0.71	-0.70	-3.67***	-1.92**	-2.31**	1.94
N_G	-6.98***	-4.23***	-7.26***	-4.94***	-56.25***	-51.50***
N_ET/ N_EP	1.48	1.39	-0.79	-2.37***	6.48	2.75
N_EP	1.50	-3.52***	4.99	6.17	7.2	2.06
N_ES	-0.15	-0.59	11.94	6.31	1.94	2.87
N_ET	1.99	2.52	4.26	-0.46	5.67	0.18
N_FH	1.08	0.96	-1.05	-2.52**	-0.29	-3.37***

***(**)[*] Significant at 1(5)[10] per cent

A4.3   TEST FOR COINTEGRATION

According to McCoskey and Kao (1999) this test of the null hypothesis was first introduced in the time series literature as a response to some critiques of the null hypothesis of no cointegration. They state that the test for the null of cointegration rather than the null of no cointegration could be very appealing in applications where cointegration is predicted a priori by economic theory. Failure to reject the null of no cointegration could be caused in many cases by the low power of the test and not by the true nature of the data.

It follows that:

H_0: None of the relationships is cointegrated.

H_A: At least one of the relationships is cointegrated.

The model presented allows for varying slopes and intercepts:

$$y_{i,t} = \alpha_i + \delta_i t + \beta_i x_{i,t} + e_{i,t}, \quad t = 1,...,T \quad \text{and} \quad i = 1,...,N \tag{A4.9}$$

$$x_{it} = x_{it-1} + \varepsilon_{it} \tag{A4.10}$$

$$e_{it} = \gamma_{it} + u_{it}, \tag{A4.11}$$

and

$$\gamma_{it}\gamma_{it-1} + \theta u_{it} \tag{A4.12}$$

The null of hypothesis of cointegration is equivalent to $\theta = 0$

The LM statistic that follows:

$$\overline{LM} = \frac{\frac{1}{N}\sum_{}^{N} \frac{1}{T^2}\sum_{t=1}^{T} S_{i,t}^{+2}}{\hat{\overline{\varpi}}_{1.2}^2} \tag{A4.13}$$

where $\hat{\overline{\varpi}}_{1.2}$ estimates $\overline{\varpi}_{1.2}^2 = \overline{\varpi}_1^2 - \overline{\varpi}_{12}\Omega_{22}^{-1}\overline{\varpi}_{12}$

and

$S_{i,t}^+$ is a partial sum of the residuals

$$S_{i,t}^+ = \sum_{k=1}^{t} \hat{e}_{i,t} \tag{A4.14}$$

In this case, the system must be estimated under H_0 using a consistent estimator of cointegrated regressions such as Fully Modified.

$$LM^+ = \frac{\sqrt{N}\left(L\overline{M} - \mu_v\right)}{\sigma_v} \Rightarrow N(0,1) \tag{A4.15}$$

The final test statistic is based on a one-tailed test, upper tail of the distribution.

The results (table A4.3) show that the residuals of the developed sample (Res_dev), residuals of the emerging sample (Res_em) and the residuals of the African sample (Res-afr) reject the null hypothesis that none of the relationships is cointegrated. In equation 6.1, where the relationship in the African top-10 (Res_afr_top10) FDI per GDP receiving countries is shown, the null hypothesis is not rejected.

Table A4.3   McCoskey and Kao cointegration tests on the host countries

	Res_dev	Res_em	Res_afr	Res_afr_top10
Equation 6.1	-7.302***	-4.302*	-7.537***	-2.735
Equation 6.2	-9.640***	NA	NA	NA
Equation 6.3	NA	-11.102***	NA	NA
Equation 6.4	NA	NA	-10.206***	-5.977***

***(**)[*] Significant at 1(5)[10] per cent

Equations 7.1 and 7.2 (table A4.4) include the influence of the neighbouring countries. In equation 7.1 the null hypothesis of no cointegration, is not rejected in the African top 10-countries (Res_n_afr_top10) sample. In equation 7.3 the null hypothesis is not rejected in the developed country sample (Res_n_dev) as well as in the emerging country sample (Res_n_em)

Table A4.4   McCoskey and Kao cointegration test on the equations including neighbouring countries

	Res_n_dev	Res_n_em	Res_n_afr	Res_n_afr_top10
Equation 7.1	-6.663***	-5.268***	-10.628***	-4.118
Equation 7.3	-4.270	-3.278	-7.918***	-5.081***

***(**)[*] Significant at 1(5)[10] per cent

APPENDIX 5

HYPOTHESIS TESTING

A5.1. CROSS-SECTION SPECIFIC FIXED EFFECTS

This test performs an F-test (simple Chow test) to test for the joint significance of the dummies, given the simple panel data regression with N cross-sections and T time periods:

$$y_{it} = \alpha + X_{it}'\beta + \mu_{it} \qquad i = 1,...,N; \quad t = 1,...,T \tag{A5.1}$$

and

$$\mu_{it} = \mu_i + v_{it} \tag{A5.2}$$

where μ_i is a dummy variable denoting the unobservable individual cross-section specific effect and v_{it} denotes the remainder disturbance, the aim is to test whether μ_i is significant. The μ_i's are assumed to be time-invariant fixed parameters to be estimated and the remainder disturbances stochastic with $v_{it} \sim \text{IID}(0, \sigma_v^2)$. A panel regression with a disturbance structure as in equation A5.2 is commonly known as the Least Square Dummy Variable (LSDV) regression.

The null and alternative hypotheses are given by equation A5.3.

$$
\begin{aligned}
&H_0 : \mu_1 = \mu_2 = ... = \mu_{N-1} = 0 \\
&H_A : \text{not all equal to zero}
\end{aligned}
\tag{A5.3}
$$

From equation A5.3 it is evident that rejection of the null would imply that there are significant individual effects across countries. The joint significance of these cross-section specific fixed effects can be tested by means of the F-test with a test statistic as stipulated in equation A5.4.

$$F = \frac{(RRSS - URSS)/(N-1)}{URSS/(NT - N - K)} \sim F_{N-1, N(T-1)-K} \qquad \text{under } H_0.$$ (A5.4)

This is a Chow test with the restricted residual sum of squares (RRSS) being that of the simple OLS pooled model, while the unrestricted residual sum of squares (URSS) is taken from the *LSDV* model.

The null hypothesis of no fixed effects is rejected if the calculated *F*-statistic is greater than the corresponding table value.

Table A5.1 shows the F-statistics for cross-section specific effects with equations as specified in chapters 6 and 7.

Table A5.1   Validity of fixed effects

Cross-section specific fixed effects		Equation	F –statistic
	Developed	Eq 6.1	12.716***
	Emerging	Eq 6.1	7.767***
	Africa	Eq 6.1	11.343***
	African top-ten	Eq 6.1	12***
	Developed	Eq 6.2	11.164***
	Emerging	Eq 6.3	2.23***
	Africa	Eq 6.4	NA
$F_{N-1, N(T-1)-K}$	African top-ten	Eq 6.4	17.54***
$H_0 : \mu_1 = \mu_2 = ... = \mu_{N-1} = 0$ $H_A : not\ all\ equal\ to\ zero$	Developed	Eg 7.1	8.832***
	Emerging	Eq 7.1	8.832***
	Africa	Eq 7.1	10.287***
	African top-ten	Eq 7.1	8.54***
	Developed	Eg 7.3	18.26***
	Emerging	Eq 7.3	20.824***
	Africa	Eq 7.3	9.417***
	African top-ten	Eq 7.3	12.635***

***(**)[*] Significant at 1(5)[10] per cent

A5.2. DURBIN-WATSON (DW) AND LAGRANGE MULTIPLIER (LM) SERIAL CORRELATION TEST FOR PANEL DATA

The panel data DW-test is an extension of the time-series DW-test, and the null and alternative hypothesis are given by

$$H_0 : \rho = 0$$
$$H_A : |\rho| < 1$$

(A5.5)

The null of no serial correlation is evaluated against an alternative of positive serial correlation. The DW_ρ test statistic is given by:

$$DW_\rho = \frac{\sum_{i=1}^{N}\sum_{t=2}^{T}\left(\widetilde{v}_{it} - \widetilde{v}_{i,t-1}\right)^2}{\sum_{t=1}^{N}\sum_{t=2}^{T}\widetilde{v}_{it}^2}$$

(A5.6)

where $\widetilde{v}$ is a vector of stacked *within* residuals.

The DW_ρ statistics are shown in table A5.2 and do not follow a well-known distribution and critical values need to be calculated. This is a major disadvantage of the DW_ρ test compared to the LM test. As a rule of thumb, a DW_ρ value of less than 2 is an indication of positive serial correlation.

The LM test for first order serial correlation given fixed effects, is constructed under:

$$H_0 : \rho = 0 \text{ (given } \mu_i \text{ are fixed)}$$

(A5.7)

where

$$LM = \sqrt{NT^2/(T-1)(\widetilde{v}_1 - \widetilde{v}_{-1}/\widetilde{v}'\widetilde{v})} \sim N(0,1)$$

(A5.8)

and $\widetilde{v}$ are the *within* residual.

Table A5.2 shows that there are positive serial correlation in the data.

Table A5.2   Serial correlation tests: Panel Durbin-Watson (DW) and Lagrange Multiplier (LM)

		Equations					
	Estimation Method	Eq 6.1	Eq 6.2	Eq 6.3	Eq 6.4	Eq 7.1	Eq 7.3
Developed country sample							
DW$_\rho$	Pool	0.658	0.687	NA	NA	0.575	0.566
DW$_\rho$	LSDV	1.07	1.08	NA	NA	1.05	1.05
LM	Pool	9.06	8.54	NA	NA	9.864	9.308
LM	LSDV	4.11	3.65	NA	NA	4.047	4.128
Emerging country sample							
DW$_\rho$	Pool	0.499	NA	0.836	NA	0.589	0.44
DW$_\rho$	LSDV	0.72	NA	0.868	NA	0.85	0.936
LM	Pool	10.4	NA	7.931	NA	9.718	10.61
LM	LSDV	8.49	NA	7.525	NA	7.685	7.402
African country sample							
DW$_\rho$	Pool	0.23	NA	NA	0.246	0.44	0.445
DW$_\rho$	LSDV	1.362	NA	NA	NA	0.71	0.709
LM	Pool	14.96	NA	NA	794.21	19.18	19.1
LM	LSDV	1.1	NA	NA	NA	15.161	15.16
African top-ten sample							
DW$_\rho$	Pool	0.278	NA	NA	NA	0.343	0.363
DW$_\rho$	LSDV	1.447	NA	NA	NA	1.515	1.483
LM	Pool	7.249	NA	NA	NA	7.035	6.975
LM	LSDV	-0.5	NA	NA	NA	-0.562	-0.045

A5.3. TESTING FOR HETEROSKEDASTICITY

Estimations with heteroskedastic errors under the assumption of homoskedasticity will yield consistent but inefficient coefficients. If it is expected that heteroskedasticity among the residuals is generated by the remainder of disturbance, v_{it}, in equation A5.7, then the error variance is expected to change over time between the cross-sections, irrespective of the significance of the time-period specific fixed effect.

$$\mu_{it} = \mu_i + \lambda_t + v_{it} \tag{A5.9}$$

$$v_{it} \sim \text{IID}(0, \sigma_i^2)$$

The hypothesis for the testing of heteroskedasticity is

$H_0 : \sigma_1^2 = \sigma^2$ for all i

$H_A : \sigma_1^2 \neq \sigma^2$ for all i (A5.10)

The LM test is

$$LM = \frac{T}{2} \sum_{i=1}^{N} \left[\frac{\hat{\sigma}_i^2}{\hat{\sigma}^2} - 1 \right]^2 \sim \chi_{(n-1)}^2$$ (A5.11)

where

$$\hat{\sigma}_i^2 = \frac{1}{T} \sigma_i^2 \text{ and } \hat{\sigma}^2 = \frac{1}{NT} \sigma^2$$ (A5.12)

If the null hypothesis of homoskedasticity is true, the $\frac{\hat{\sigma}_i^2}{\hat{\sigma}^2}$ ratios should be approximately unity and this statistic should be very small. It is distributed as a chi-square with *N-1* degree of freedom.

From table A5.3 it seems as if the residuals are heteroskedastistic distributed.

Table A5.3   LM test for heteroskedasticity

		Equations					
	method	Eq 6.1	Eq 6.2	Eq 6.3	Eq 6.4	Eq 7.1	Eq 7.3
Developed country sample							
LM	Pool	123.436	100.282	NA	NA	91.595	91.494
LM	LSDV	126.44	104.324	NA	NA	127.279	119.331
Emerging country sample							
LM	Pool	62.385	NA	82.277	NA	80.704	70.892
LM	LSDV	8.723	NA	84.746	NA	131.297	130.01
African country sample							
LM	Pool	1516.422	NA	NA	276.54	1253.601	1155.198
LM	LSDV	3310.69	NA	NA	NA	2862.364	2112.653
African top-ten sample							
LM	Pool	234.579	NA	NA	225.269	198.477	144.942
LM	LSDV	243.802	NA	NA	199.926	268.859	207.686

APPENDIX 6

A6.1   COUNTRIES

The countries used in the panel estimation, were chosen on the basis of data availability. The developed countries were taken from the HDI 2001 list of top 20 countries.

Table A6. 1   Countries used

Africa		Emerging		Developed	
Algeria	DZA	Argentina	ARG	Australia	AUS
Angola	AGO	Brazil	BRA	Austria	AUT
Benin	BEN	Chile	CHL	Canada	CAN
Botswana	BWA	China	CHN	Denmark	DNK
Burkina Faso	HVO	Colombia	COL	Finland	FIN
Burundi	BDI	China, Hong Kong SAR	HKG	France	FRA
Cameroon	CMR	India	IND	Germany	GER
Central African Republic	CAF	Indonesia	IDN	Italy	ITA
Chad	TCD	Malaysia	MYS	Japan	JPN
Congo	DRC	Mexico	MEX	Netherlands	NLD
Congo, Democratic Republic of	COG	Philippines	PHL	New Zealand	NZL
Egypt	EGY	Thailand	THA	Norway	NOR
Ethiopia	ETH	Venezuela	VEN	Sweden	SWE
Gabon	GMB			Switzerland	SWT
Ghana	GHA			United Kingdom	UNK
Guinea	GIN			United States	USA
Guinea-Bissau	GNB				
Kenya	KEN				
Lesotho	LSO				
Malawi	MWI				
Mali	MLI				
Mauritania	MRT				
Morocco	MAR				
Mozambique	MOZ				
Namibia	NAM				
Niger	NER				
Nigeria	NGA				
Senegal	SEN				
Sierra Leone	SLE				
South Africa	ZAF				
Sudan	SDN				
Swaziland	SWZ				
United Republic of Tanzania	TZA				
Togo	TGO				
Tunisia	TUN				
Uganda	UGA				

Table A6.2 presents a list of countries and their neighbouring countries and average weight that was used to construct the data set for each host county's neighbouring countries. All the data for the different variables are weighted from 1980 to 1998 by making use of the specific years' GDP weighting structure. The average of the GDP weights of the neighbouring countries are shown in brackets. The neighbouring countries are chosen as countries adjoining. If countries do not have common borders with neighbours, the nearest countries were chosen to be neighbours.

Table A6.2   Neighbouring countries for which data were collected (weights in parenthesis)

African	Neighbouring countries	Weights	Developed Countries	Neighbouring countries	Weights	Emerging	Neighbouring countries	Weights
Algeria	Tunisia	(0.30)	**Australia**	New Zealand	(0.44)	**China**	Pakistan	(0.12)
	Niger	(0.04)		Indonesia	(0.56)		India	(0.67)
	Mali	(0.04)					Nepal	(0.01)
	Mauritania	(0.02)	**Austria**	Germany	(0.63)		Vietnam	(0.03)
	Morocco	(0.60)		Italy	(0.29)		Lao PDR	(0.001)
				Switzerland	(0.08)		Philippines	(0.17)
Angola	Namibia	(0.29)						
	DRC	(0.71)	**Canada**	Alaska	(0)	**Hong Kong**	China	(0.86)
				USA	(1)		Philippines	(0.14)
Benin	Nigeria	(0.83)						
	Niger	(0.06)	**Denmark**	Germany	(0.91)	**India**	Pakistan	(0.1)
	Burkina Faso	(0.06)		Swede	(0.09)		China	(0.89)
	Togo	(0.04)					Nepal	(0.01)
			Finland	Spain	(0.1)			
Botswana	Namibia	(0.02)		Italy	(0.19)	**Indonesia**	Philippines	(0.15)
	South Africa	(0.98)		Switzerland	(0.06)		Malaysia	(0.13)
				Germany	(0.42)		Australia	(0.72)
Burkina Faso	Mali	(0.18)		Belgium	(0.05)			
	Niger	(0.15)		England	(0.19)	**Malaysia**	Thailand	(1)
	Benin	(0.14)						
	Togo	(0.10)	**France**	Spain	(0.10)	**Philippines**	China	(0.86)
	Ghana	(0.42)		Italy	(0.19)		Indonesia	(0.14)
				Switzerland	(0.06)		Hong Kong	(0)
Burundi	Tanzania	(0.25)		Germany	(0.42)			
	DRC	(0.75)		Belgium & Luxembourg	(0.05)	**Singapore**	Malaysia	(0.47)
				England	(0.19)		Indonesia	(0.14)
Cameroon	Central African Republic	(0.04)						
	Chad	(0.04)	**Germany**	Denmark	(0.06)	**Taiwan**	Japan	(0.89)
	Nigeria	(0.83)		Austria	(0.08)		China	(0.02)
	Congo	(0.08)		Switzerland	(0.11)		Hong Kong	(0.09)
				France	(0.52)			
Central African	Chad	(0.05)		Belgium	(0.09)	**Thailand**	Lao PDR	(0.02)

African	Neighbouring countries	Weights	Developed Countries	Neighbouring countries	Weights	Emerging	Neighbouring countries	Weights
Republic								
	Sudan	(0.22)		Netherlands	(0.14)		Cambodia	(0.02)
	DRC	(0.29)					Malaysia	(0.96)
	Congo	(0.09)	**Italy**	France	(0.74)			
	Cameroon	(0.34)		Switzerland	(0.15)	**Argentina**	Chile	(0.07)
				Austria	(0.11)		Uruguay	(0.01)
				Joego-Slawia			Paraguay	(0.01)
Chad	Sudan	(0.13)					Brazil	(0.90)
	Central African Republic	(0.03)					Bolivia	(0.01)
	Cameroon	(0.22)	**Japan**	Korea-North				
	Nigeria	(0.58)		Korea- South	(1)	**Brazil**	Uruguay	(0.02)
	Niger	(0.05)					Argentina	(0.53)
			Netherlands	Germany	(0.64)		Paraguay	(0.02)
DRC	Angola	(0.26)		Belgium	(0.07)		Bolivia	(0.001)
	Tanzania	(0.11)		England	(0.29)		Peru	(0.11)
	Burundi	(0.05)						
	Uganda	(0.17)	**New Zealand**	Australia	(1)		Colombia	(0.17)
	Sudan	(0.25)					Venezuela	(0.16)
	Central African Republic	(0.05)	**Norway**	Sweden	(0.44)		Guyana	(0.001)
	Congo	(0.11)		Finland	(0.24)			
				Denmark	(0.32)	**Chile**	Argentina	(0.81)
Congo	DRC	(0.43)					Bolivia	(0.02)
	Central African Republic	(0.06)	**Sweden**	Germany	(0.88)		Peru	(0.17)
	Cameroon	(0.51)		Denmark	(0.07)			
				Finland	(0.05)	**Colombia**	Ecuador	(0.02)
Egypt	Sudan	(1)					Peru	(0.06)
			Switzerland	France	(0.29)		Brazil	(0.82)
Ethiopia	Kenya	(0.58)		Germany	(0.46)		Venezuela	(0.09)
	Sudan	(0.42)		Austria	(0.04)		Panama	(0.01)
				Italy	(0.21)			
Ghana	Togo	(0.41)				**Mexico**	Guatemala	(0.001)
	Burkina Faso	(0.59)	**United Kingdom**	France	(0.7)		US	(1)
				Belgium & Luxembourg	(0.12)	**Venezuela**	Colombia	(0.11)
Guinea	Sierra Leone	(0.13)		Netherlands	(0.18)		Brazil	(0.89)
	Mali	(0.30)					Guyana	(0)
	Senegal	(0.54)	**United States**	Canada	(0.66)			
	Guinea Bissau	(0.03)		Mexico	(0.34)			
Guinea Bissau	Guinea	(0.29)						
	Senegal	(0.73)						
Kenya	Ethiopia	(0.29)						
	Sudan	(0.36)						
	Tanzania	(0.14)						
	Uganda	(0.22)						

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African	Neighbouring countries	Weights	Developed Countries	countries	Weights	Emerging	Neighbouring countries	Weights
Lesotho	South Africa	(1)						
Malawi	Mozambique	(0.60)						
	Tanzania	(0.40)						
Mali	Algeria	(0.80)						
	Niger	(0.04)						
	Burkina Faso	(0.04)						
	Guinea	(0.04)						
	Senegal	(0.08)						
Mauritania	Algeria	(0.87)						
	Mali	(0.05)						
	Senegal	(0.09)						
Morocco	Algeria	(1)						
Mozam-bique	South Africa	(0.97)						
	Malawi	(0.01)						
	Tanzania	(0.02)						
	Swaziland	(0.01)						
Namibia	South Africa	(0.94)						
	Botswana	(0.02)						
	Angola	(0.04)						
Niger	Chad	(0.02)						
	Nigeria	(0.30)						
	Algeria	(0.50)						
	Tunisia	(0.19)						
Nigeria	Benin	(0.12)						
	Niger	(0.13)						
	Chad	(0.09)						
	Central African Republic	(0.07)						
	Cameroon	(0.60)						
Senegal	Gambia	(0.06)						
	Guinea Bissau	(0.04)						
	Guinea	(0.32)						
	Mali	(0.41)						
	Mauritania	(0.17)						
Sierra Leone	Guinea	(1)						
South Africa	Namibia	(0.29)						

African	Neighbouring countries	Weights	Developed Countries	Neighbouring countries	Weights	Emerging	Neighbouring countries	Weights
	Botswana	(0.34)						
	Mozambique	(0.20)						
	Swaziland	(0.10)						
	Lesotho	(0.07)						
Sudan	Egypt	(0.72)						
	Chad	(0.02)						
	Central African Republic	(0.02)						
	DRC	(0.12)						
	Ethiopia	(0.07)						
	Uganda	(0.06)						
Swaziland	South Africa	(0.99)						
	Mozambique	(0.01)						
Tanzania	Mozambique	(0.09)						
	Malawi	(0.05)						
	DRC	(0.32)						
	Burundi	(0.04)						
	Uganda	(0.16)						
	Kenya	(0.33)						
Togo	Benin	(0.20)						
	Burkina Faso	(0.21)						
	Ghana	(0.59)						
Tunisia	Algeria	(0.96)						
	Niger	(0.04)						
Uganda	Sudan	(0.24)						
	Kenya	(0.33)						
	Tanzania	(0.11)						
	DRC	(0.33)						

Table A6.3 shows the list of top oil exporting countries and the number of barrels these countries export, are shown in the second column.

Table A6.3   List of top oil producing countries in Africa

	Country	Description
1.	Nigeria	1.9 million barrels per day
2.	Libya	1.25 million barrels per day
3.	Algeria	1.25 million barrels per day
4.	Gabon	283,000 barrels per day
5.	Congo, Democratic Republic of the	255,000 barrels per day
6.	Egypt	219,213 barrels per day
7.	Sudan	194,500 barrels per day
8.	Equatorial Guinea	180,000 barrels per day
9.	Cameroon	50,167 barrels per day
	Total	5.58 million barrels per day
	Weighted Average	951,353.54 barrels per day

Source: http://www.nationmaster.com/graph-T/ene_oil_exp_net/AFR

Table A6.4 represents the ranking of the developed countries according to the Human Development Index.

Table A6.4   Countries According to the Human Development Index

	Country	Ranking
1	Norway	0.942
2.	Sweden	0.941
3.	Canada	0.940
4.	Belgium	0.939
5.	Australia	0.939
6.	United States	0.939
7.	Iceland	0.936
8.	Netherlands	0.935
9.	Japan	0.933
10.	Finland	0.930
11.	Switzerland	0.928
12.	United Kingdom	0.928
13.	France	0.928
14.	Austria	0.926
15.	Denmark	0.926
16.	Germany	0.925
17.	Ireland	0.925
18.	Luxembourg	0.925
19.	New Zealand	0.917

Source: http://www.nationmaster.com/graph-T/eco_hum_dev_ind

APPENDIX 7

MODELS WITH COUNTRY SPECIFIC EFFECTS

A7.1   DEVELOPED COUNTRIES

Table A7.1   CC/MS as a Cross-country specific coefficient

Dependent Variable: FDI2?
Method: Pooled EGLS (Cross-section SUR)
Sample (adjusted): 1980 1998
Included observations: 19 after adjustments
Cross-sections included: 16
Total pool (unbalanced) observations: 301
Linear estimation after one-step weighting matrix

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(ET?/EP2?)	0.772749	0.065268	11.83969	0.0000
T?	-3.057636	0.301128	-10.15394	0.0000
OPN1?	8.000852	0.203001	39.41288	0.0000
FHA?	-0.485265	0.077704	-6.245039	0.0000
C	13.99586	1.195866	11.70354	0.0000
_AUS--LOG(CC2_AUS/MS2_AUS)	-0.190946	0.177826	-1.073776	0.2838
_AUT--LOG(CC2_AUT/MS2_AUT)	0.485747	0.161659	3.004772	0.0029
_CAN--LOG(CC2_CAN/MS2_CAN)	0.304952	0.182048	1.675118	0.0950
_DNK--LOG(CC2_DNK/MS2_DNK)	0.279576	0.157342	1.776863	0.0767
_FIN--LOG(CC2_FIN/MS2_FIN)	0.275113	0.174683	1.574929	0.1164
_FRA--LOG(CC2_FRA/MS2_FRA)	0.005903	0.170785	0.034566	0.9725
_GER--LOG(CC2_GER/MS2_GER)	0.254730	0.168595	1.510895	0.1319
_ITA--LOG(CC2_ITA/MS2_ITA)	0.218970	0.175756	1.245875	0.2139
_JPN--LOG(CC2_JPN/MS2_JPN)	-0.352662	0.163327	-2.159233	0.0317
_NLD--LOG(CC2_NLD/MS2_NLD)	0.446062	0.174285	2.559384	0.0110
_NOR--LOG(CC2_NOR/MS2_NOR)	0.429314	0.161470	2.658792	0.0083
_SWE--LOG(CC2_SWE/MS2_SWE)	0.125501	0.171974	0.729769	0.4661
_SWT--LOG(CC2_SWT/MS2_SWT)	0.249926	0.151562	1.649006	0.1003
_UNK--LOG(CC2_UNK/MS2_UNK)	-0.428053	0.185799	-2.303849	0.0220
_USA--LOG(CC2_USA/MS2_USA)	-0.326932	0.178067	-1.836009	0.0674
_NZL--LOG(CC2_NZL/MS2_NZL)	-0.156027	0.180495	-0.864436	0.3881

Weighted Statistics

R-squared	0.972451	Mean dependent var	2.598884
Adjusted R-squared	0.970484	S.D. dependent var	5.869000
S.E. of regression	1.008313	Sum squared resid	284.6746
F-statistic	494.1931	Durbin-Watson stat	1.975012
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.549821	Mean dependent var	1.117922

Sum squared resid	231.2875	Durbin-Watson stat	1.111781

Table A7.2   Open as a Cross-country specific coefficient

Dependent Variable: FDI2?
Method: Pooled EGLS (Cross-section SUR)
Sample (adjusted): 1980 1998
Included observations: 19 after adjustments
Cross-sections included: 16
Total pool (unbalanced) observations: 301
Linear estimation after one-step weighting matrix

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(CC2?/MS2?)	-0.664055	0.129932	-5.110794	0.0000
LOG(ET2?/EP2?)	0.572733	0.076797	7.457760	0.0000
T?	-0.974544	0.303512	-3.210887	0.0015
FHA?	-0.187800	0.047271	-3.972828	0.0001
C	2.276520	0.882714	2.579002	0.0104
_AUS--OPN1_AUS	1.441194	0.400014	3.602864	0.0004
_AUT--OPN1_AUT	11.49535	0.704293	16.32184	0.0000
_CAN--OPN1_CAN	5.434486	0.545395	9.964311	0.0000
_DNK--OPN1_DNK	9.041429	0.666239	13.57086	0.0000
_FIN--OPN1_FIN	7.234870	0.676020	10.70216	0.0000
_FRA--OPN1_FRA	4.081477	0.251941	16.20013	0.0000
_GER--OPN1_GER	6.800201	0.288047	23.60794	0.0000
_ITA--OPN1_ITA	5.168488	0.341280	15.14441	0.0000
_JPN--OPN1_JPN	3.317423	0.141958	23.36899	0.0000
_NLD--OPN1_NLD	24.94835	2.208966	11.29413	0.0000
_NOR--OPN1_NOR	11.37286	0.810210	14.03692	0.0000
_SWE--OPN1_SWE	6.108395	1.520750	4.016699	0.0001
_SWT--OPN1_SWT	8.950156	0.709377	12.61693	0.0000
_UNK--OPN1_UNK	0.614840	0.343575	1.789536	0.0746
_USA--OPN1_USA	2.734218	0.134105	20.38864	0.0000
_NZL--OPN1_NZL	-0.514987	1.043483	-0.493527	0.6220

Weighted Statistics

R-squared	0.956690	Mean dependent var	1.806017
Adjusted R-squared	0.953596	S.D. dependent var	4.596579
S.E. of regression	0.990175	Sum squared resid	274.5252
F-statistic	309.2486	Durbin-Watson stat	1.890055
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.553222	Mean dependent var	1.117922
Sum squared resid	229.5399	Durbin-Watson stat	1.104677

Table A7.3   FH as a Cross-country specific coefficient

Dependent Variable: FDI2?

Method: Pooled EGLS (Cross-section SUR)

Sample (adjusted): 1980 1998

Included observations: 19 after adjustments

Cross-sections included: 16

Total pool (unbalanced) observations: 301

Linear estimation after one-step weighting matrix

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(CC2?/MS2?)	-0.423837	0.200496	-2.113936	0.0354
LOG(ET2?/EP2?)	0.493815	0.068003	7.261711	0.0000
T?	-2.634635	0.333353	-7.903451	0.0000
OPN1?	6.504900	0.217443	29.91549	0.0000
C	9.537989	1.182623	8.065113	0.0000
_AUS--FHA_AUS	0.453958	0.177526	2.557140	0.0111
_AUT--FHA_AUT	-2.888834	0.175421	-16.46798	0.0000
_CAN--FHA_CAN	-1.577746	0.180873	-8.722948	0.0000
_DNK--FHA_DNK	-1.984779	0.263733	-7.525715	0.0000
_FIN--FHA_FIN	-1.345096	0.170335	-7.896754	0.0000
_FRA--FHA_FRA	-0.511455	0.093653	-5.461178	0.0000
_GER--FHA_GER	-1.371573	0.085950	-15.95774	0.0000
_ITA--FHA_ITA	-1.242010	0.098759	-12.57621	0.0000
_JPN--FHA_JPN	0.575811	0.078524	7.332945	0.0000
_NLD--FHA_NLD	-2.302446	0.341692	-6.738375	0.0000
_NOR--FHA_NOR	-2.677606	0.218815	-12.23688	0.0000
_SWE--FHA_SWE	-0.934825	0.412427	-2.266644	0.0242
_SWT--FHA_SWT	-1.990964	0.225923	-8.812585	0.0000
_UNK--FHA_UNK	1.167757	0.151242	7.721120	0.0000
_USA--FHA_USA	1.055121	0.113424	9.302425	0.0000
_NZL--FHA_NZL	0.645187	0.322519	2.000458	0.0464

Weighted Statistics

R-squared	0.960094	Mean dependent var	2.272834
Adjusted R-squared	0.957243	S.D. dependent var	4.742466
S.E. of regression	0.980630	Sum squared resid	269.2581
F-statistic	336.8237	Durbin-Watson stat	1.964930
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.533471	Mean dependent var	1.117922
Sum squared resid	239.6872	Durbin-Watson stat	1.087683

A7.2   EMERGING COUNTRIES

Table A7.4   CC/MS as a Cross-country specific coefficient

Dependent Variable: FDI2?
Method: Pooled EGLS (Cross-section SUR)
Sample (adjusted): 1980 1998
Included observations: 19 after adjustments
Cross-sections included: 12
Total pool (unbalanced) observations: 225
Linear estimation after one-step weighting matrix

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(ET2?/EP2?)	0.375329	0.120167	3.123391	0.0020
T?	2.724545	0.159246	17.10903	0.0000
OPN1?	3.805371	0.282666	13.46241	0.0000
LOG(FHA?)	-0.182242	0.078547	-2.320161	0.0213
C	3.281321	0.438701	7.479627	0.0000
_ARG--LOG(CC_ARG/MS2_ARG)	0.719207	0.085843	8.378142	0.0000
_BRA--LOG(CC_BRA/MS2_BRA)	0.611234	0.095449	6.403804	0.0000
_CHL--LOG(CC_CHL/MS2_CHL)	0.774760	0.102676	7.545674	0.0000
_CHN--LOG(CC_CHN/MS2_CHN)	0.034169	0.168826	0.202390	0.8398
_COL--LOG(CC_COL/MS2_COL)	0.938496	0.113595	8.261796	0.0000
_IDN--LOG(CC_IDN/MS2_IDN)	1.208186	0.101712	11.87844	0.0000
_IND--LOG(CC_IND/MS2_IND)	0.811718	0.152407	5.325982	0.0000
_MEX--LOG(CC_MEX/MS2_MEX)	0.890918	0.099908	8.917341	0.0000
_MYS--LOG(CC_MYS/MS2_MYS)	0.696482	0.132292	5.264754	0.0000
_PHL--LOG(CC_PHL/MS2_PHL)	1.000600	0.095579	10.46878	0.0000
_THA--LOG(CC_THA/MS2_THA)	1.261834	0.106970	11.79610	0.0000
_VEN--LOG(CC_VEN/MS2_VEN)	1.137423	0.126811	8.969464	0.0000

Weighted Statistics

R-squared	0.965288	Mean dependent var	2.034195
Adjusted R-squared	0.962617	S.D. dependent var	5.083224
S.E. of regression	0.982819	Sum squared resid	200.9141
F-statistic	361.5067	Durbin-Watson stat	1.557640
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.651945	Mean dependent var	1.767192
Sum squared resid	262.5951	Durbin-Watson stat	0.790595

Table A7.5 OPN1 as a Cross-country specific coefficient

Dependent Variable: FDI2?
Method: Pooled EGLS (Cross-section SUR)
Sample (adjusted): 1980 1998
Included observations: 19 after adjustments
Cross-sections included: 12
Total pool (unbalanced) observations: 225
Linear estimation after one-step weighting matrix

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(CC?/MS2?)	0.574457	0.120864	4.752931	0.0000
LOG(ET2?/EP2?)	-0.466270	0.106283	-4.387069	0.0000
T?	3.974026	0.140477	28.28947	0.0000
LOG(FHA?)	-0.234030	0.105551	-2.217214	0.0277
C	-2.040550	0.486694	-4.192676	0.0000
_ARG--OPN1_ARG	2.491898	0.224831	11.08342	0.0000
_BRA--OPN1_BRA	2.897923	0.266362	10.87963	0.0000
_CHL--OPN1_CHL	1.654718	0.955794	1.731249	0.0849
_CHN--OPN1_CHN	-0.787170	0.585258	-1.344997	0.1801
_COL--OPN1_COL	3.902884	0.418005	9.336930	0.0000
_IDN--OPN1_IDN	18.02991	1.641295	10.98517	0.0000
_IND--OPN1_IND	1.168100	0.337180	3.464321	0.0006
_MEX--OPN1_MEX	3.518099	0.377724	9.313946	0.0000
_MYS--OPN1_MYS	6.223766	1.524700	4.081962	0.0001
_PHL--OPN1_PHL	-1.305725	0.590126	-2.212622	0.0280
_THA--OPN1_THA	2.026287	0.928069	2.183336	0.0301
_VEN--OPN1_VEN	6.037776	1.053156	5.733033	0.0000

Weighted Statistics

R-squared	0.969030	Mean dependent var	2.359369
Adjusted R-squared	0.966648	S.D. dependent var	5.269420
S.E. of regression	0.962336	Sum squared resid	192.6270
F-statistic	406.7589	Durbin-Watson stat	1.543031
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.654368	Mean dependent var	1.767192
Sum squared resid	260.7666	Durbin-Watson stat	0.795360

Table A7.6   FH as a Cross-country specific coefficient

Dependent Variable: FDI2?
Method: Pooled EGLS (Cross-section SUR)
Sample (adjusted): 1980 1998
Included observations: 19 after adjustments
Cross-sections included: 12
Total pool (unbalanced) observations: 225
Linear estimation after one-step weighting matrix

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(CC?/MS2?)	0.788065	0.088121	8.942997	0.0000
LOG(ET2?/EP2?)	0.334343	0.103633	3.226220	0.0015
T?	3.089341	0.141277	21.86732	0.0000
OPN1?	2.746812	0.259970	10.56588	0.0000
C	1.600271	0.350174	4.569932	0.0000
_ARG--LOG(FHA_ARG)	0.207756	0.155954	1.332158	0.1843
_BRA--LOG(FHA_BRA)	0.691192	0.157670	4.383778	0.0000
_CHL--LOG(FHA_CHL)	0.372100	0.172923	2.151823	0.0326
_CHN--LOG(FHA_CHN)	0.866095	0.168172	5.150064	0.0000
_COL--LOG(FHA_COL)	-0.374800	0.189364	-1.979256	0.0491
_IDN--LOG(FHA_IDN)	-1.331546	0.212141	-6.276699	0.0000
_IND--LOG(FHA_IND)	0.342163	0.179811	1.902902	0.0584
_MEX--LOG(FHA_MEX)	-0.107335	0.159059	-0.674809	0.5005
_MYS--LOG(FHA_MYS)	0.810393	0.363165	2.231475	0.0267
_PHL--LOG(FHA_PHL)	-0.067084	0.181332	-0.369953	0.7118
_THA--LOG(FHA_THA)	-0.688170	0.183699	-3.746185	0.0002
_VEN--LOG(FHA_VEN)	-1.546379	0.461328	-3.352019	0.0010

Weighted Statistics

R-squared	0.959593	Mean dependent var		3.500340
Adjusted R-squared	0.956484	S.D. dependent var		4.603289
S.E. of regression	0.960264	Sum squared resid		191.7984
F-statistic	308.7236	Durbin-Watson stat		1.458774
Prob(F-statistic)	0.000000			

Unweighted Statistics

R-squared	0.617857	Mean dependent var		1.767192
Sum squared resid	288.3129	Durbin-Watson stat		0.722116

A7.3   AFRICA

Table A7.7   CC/MS as a Cross-country specific coefficient

Dependent Variable: FDI2?
Method: Pooled EGLS (Cross-section SUR)
Sample (adjusted): 1980 1998
Included observations: 19 after adjustments
Cross-sections included: 10
Total pool (unbalanced) observations: 171
Linear estimation after one-step weighting matrix

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(ET?/EP?)	2.929108	0.551259	5.313486	0.0000
LOG(T?)	1.479287	0.459041	3.222558	0.0015
LOG(OPN1?)	0.773416	0.555238	1.392944	0.1656
LOG(FHA?)	-5.778236	0.951168	-6.074885	0.0000
C	16.48315	2.264113	7.280180	0.0000
_AGO--LOG(CCB_AGO/MS_AGO)	-3.403541	0.733735	-4.638649	0.0000
_DZA--LOG(CCB_DZA/MS_DZA)	1.069500	0.429832	2.488181	0.0139
_EGY--LOG(CCB_EGY/MS_EGY)	1.336492	0.454915	2.937893	0.0038
_LSO--LOG(CCB_LSO/MS_LSO)	-5.283640	0.932465	-5.666314	0.0000
_NER--LOG(CCB_NER/MS_NER)	-2.045240	0.699321	-2.924610	0.0040
_NGA--LOG(CCB_NGA/MS_NGA)	-2.034373	0.697376	-2.917184	0.0041
_SWZ--LOG(CCB_SWZ/MS_SWZ)	-0.716824	0.458311	-1.564055	0.1198
_TUN--LOG(CCB_TUN/MS_TUN)	0.092737	0.545709	0.169939	0.8653
_TZA--LOG(CCB_TZA/MS_TZA)	-3.216090	0.877867	-3.663527	0.0003
_UGA--LOG(CCB_UGA/MS_UGA)	-1.607088	0.585136	-2.746521	0.0067

Weighted Statistics

R-squared	0.734908	Mean dependent var	1.450642
Adjusted R-squared	0.711117	S.D. dependent var	1.700105
S.E. of regression	0.913769	Sum squared resid	130.2560
F-statistic	30.89101	Durbin-Watson stat	1.417476
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.514705	Mean dependent var	3.604368
Sum squared resid	2957.571	Durbin-Watson stat	0.610524

Table A7.8   OPN1 as a Cross-country specific coefficient

Dependent Variable: FDI2?
Method: Pooled EGLS (Cross-section SUR)
Sample (adjusted): 1980 1998
Included observations: 19 after adjustments
Cross-sections included: 10
Total pool (unbalanced) observations: 171
Linear estimation after one-step weighting matrix

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(CCB?/MS?)	0.231745	0.555302	0.417331	0.6770
LOG(ET?/EP?)	1.311166	0.388198	3.377573	0.0009
LOG(T?)	0.822124	0.413170	1.989795	0.0484
LOG(FHA?)	-5.242696	1.098008	-4.774733	0.0000
C	15.66136	2.037751	7.685608	0.0000
_AGO--LOG(OPN1_AGO)	-2.232126	0.607441	-3.674637	0.0003
_DZA--LOG(OPN1_DZA)	13.04780	2.775353	4.701313	0.0000
_EGY--LOG(OPN1_EGY)	7.930154	1.954463	4.057460	0.0001
_LSO--LOG(OPN1_LSO)	28.46175	6.876394	4.139052	0.0001
_NER--LOG(OPN1_NER)	-0.761096	1.178178	-0.645994	0.5192
_NGA--LOG(OPN1_NGA)	-7.890944	2.573907	-3.065746	0.0026
_SWZ--LOG(OPN1_SWZ)	1.368584	2.965891	0.461441	0.6451
_TUN--LOG(OPN1_TUN)	1.259756	0.527920	2.386266	0.0182
_TZA--LOG(OPN1_TZA)	-0.750134	1.047027	-0.716442	0.4748
_UGA--LOG(OPN1_UGA)	0.690403	0.604108	1.142848	0.2549

Weighted Statistics

R-squared	0.541539	Mean dependent var	1.197345
Adjusted R-squared	0.500396	S.D. dependent var	1.235553
S.E. of regression	0.873323	Sum squared resid	118.9800
F-statistic	13.16208	Durbin-Watson stat	1.333264
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.414588	Mean dependent var	3.604368
Sum squared resid	3567.722	Durbin-Watson stat	0.509175

Table A7.9   FH as a Cross-country specific coefficient

Dependent Variable: FDI2?
Method: Pooled EGLS (Cross-section SUR)
Sample (adjusted): 1980 1998
Included observations: 19 after adjustments
Cross-sections included: 10
Total pool (unbalanced) observations: 171
Linear estimation after one-step weighting matrix

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(CCB?/MS?)	-1.083575	0.555160	-1.951826	0.0527
LOG(ET?/EP?)	1.623876	0.528769	3.071048	0.0025
LOG(T?)	2.120182	0.554298	3.824988	0.0002
LOG(OPN1?)	2.163413	0.676749	3.196775	0.0017
C	12.18414	1.985349	6.137023	0.0000
_AGO--LOG(FHA_AGO)	-1.443176	1.343519	-1.074176	0.2844
_DZA--LOG(FHA_DZA)	-10.46086	1.573457	-6.648331	0.0000
_EGY--LOG(FHA_EGY)	-10.30402	1.605671	-6.417266	0.0000
_LSO--LOG(FHA_LSO)	-0.548558	1.914005	-0.286602	0.7748
_NER--LOG(FHA_NER)	-4.136266	0.947315	-4.366305	0.0000
_NGA--LOG(FHA_NGA)	-4.712046	1.054631	-4.467958	0.0000
_SWZ--LOG(FHA_SWZ)	-7.966670	1.719591	-4.632886	0.0000
_TUN--LOG(FHA_TUN)	-6.955083	1.614131	-4.308871	0.0000
_TZA--LOG(FHA_TZA)	-3.620632	1.164075	-3.110308	0.0022
_UGA--LOG(FHA_UGA)	-4.474787	1.156307	-3.869896	0.0002

Weighted Statistics

R-squared	0.551519	Mean dependent var	1.008168
Adjusted R-squared	0.511270	S.D. dependent var	1.276777
S.E. of regression	0.892585	Sum squared resid	124.2864
F-statistic	13.70290	Durbin-Watson stat	1.400927
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.437557	Mean dependent var	3.604368
Sum squared resid	3427.740	Durbin-Watson stat	0.547182

APPENDIX 8

MODELS WITH NEIGHBOURING INFLUENCES

A8.1   DEVELOPED COUNTRY SAMPLE

Table A8.1   N_CC/N_MS as a fixed country specific variable in a SUR model

Dependent Variable: FDI2?
Method: Pooled EGLS (Cross-section SUR)
Sample (adjusted): 1980 1998
Included observations: 19 after adjustments
Cross-sections included: 16
Total pool (unbalanced) observations: 301
Linear estimation after one-step weighting matrix

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(N_ET2?/N_EP2?)	1.732950	0.037546	46.15509	0.0000
N_OPN1?	-0.471998	0.095310	-4.952255	0.0000
N_FH?	2.452806	0.163413	15.00985	0.0000
N_T?	-0.618635	0.209089	-2.958715	0.0034
N_G?	-0.017860	0.002192	-8.147716	0.0000
C	-1.476572	0.542742	-2.720578	0.0069
_AUS--LOG(N_CC2_AUS/N_MS_AUS)	-1.219660	0.085471	-14.26986	0.0000
_AUT--LOG(N_CC2_AUT/N_MS_AUT)	-0.930988	0.074622	-12.47612	0.0000
_CAN--LOG(N_CC2_CAN/N_MS_CAN)	-0.818436	0.079649	-10.27553	0.0000
_DNK--LOG(N_CC2_DNK/N_MS_DNK)	-0.982910	0.081369	-12.07959	0.0000
_FIN--LOG(N_CC2_FIN/N_MS_FIN)	-0.973966	0.097091	-10.03144	0.0000
_FRA--LOG(N_CC2_FRA/N_MS_FRA)	-0.994521	0.074548	-13.34062	0.0000
_GER--LOG(N_CC2_GER/N_MS_GER)	-0.851455	0.073459	-11.59090	0.0000
_ITA--LOG(N_CC2_ITA/N_MS_ITA)	-0.868059	0.072366	-11.99536	0.0000
_JPN--LOG(N_CC2_JPN/N_MS_JPN)	-1.387418	0.158482	-8.754431	0.0000
_NLD--LOG(N_CC2_NLD/N_MS_NLD)	-1.215361	0.092310	-13.16608	0.0000
_NOR--LOG(N_CC2_NOR/N_MS_NOR)	-0.891061	0.078119	-11.40640	0.0000
_SWE--LOG(N_CC2_SWE/N_MS_SWE)	-1.118426	0.105509	-10.60034	0.0000
_SWT--LOG(N_CC2_SWT/N_MS_SWT)	-0.973978	0.077620	-12.54797	0.0000
_UNK--LOG(N_CC2_UNK/N_MS_UNK)	-1.153922	0.084913	-13.58947	0.0000
_USA--LOG(N_CC2_USA/N_MS_USA)	-0.788751	0.082561	-9.553564	0.0000
_NZL--LOG(N_CC2_NZL/N_MS_NZL)	-1.391881	0.090636	-15.35688	0.0000

Weighted Statistics

R-squared	0.989992	Mean dependent var	-0.228714
Adjusted R-squared	0.989239	S.D. dependent var	9.781827
S.E. of regression	1.014742	Sum squared resid	287.2865
F-statistic	1314.203	Durbin-Watson stat	1.975535
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.517795	Mean dependent var	1.117922
Sum squared resid	247.7411	Durbin-Watson stat	1.082023

Table A8.2   Opn1 as a fixed country specific variable in a SUR model

Dependent Variable: FDI2?
Method: Pooled EGLS (Cross-section SUR)
Sample (adjusted): 1980 1998
Included observations: 19 after adjustments
Cross-sections included: 16
Total pool (unbalanced) observations: 301
Linear estimation after one-step weighting matrix

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(N_CC2?/N_MS?)	-1.342820	0.028384	-47.30913	0.0000
LOG(N_ET2?/N_EP2?)	1.539659	0.073851	20.84823	0.0000
N_FH?	-0.678540	0.182042	-3.727389	0.0002
N_T?	-1.078541	0.224475	-4.804717	0.0000
N_G?	0.016658	0.002474	6.732171	0.0000
C	-1.490435	0.703952	-2.117240	0.0351
_AUS--N_OPN1_AUS	-6.721656	0.627038	-10.71970	0.0000
_AUT--N_OPN1_AUT	2.825968	0.374588	7.544196	0.0000
_CAN--N_OPN1_CAN	1.171184	0.149037	7.858344	0.0000
_DNK--N_OPN1_DNK	2.151497	0.475219	4.527375	0.0000
_FIN--N_OPN1_FIN	3.857784	0.797740	4.835892	0.0000
_FRA--N_OPN1_FRA	1.674048	0.344118	4.864742	0.0000
_GER--N_OPN1_GER	6.254804	0.722219	8.660533	0.0000
_ITA--N_OPN1_ITA	3.625242	0.476707	7.604760	0.0000
_JPN--N_OPN1_JPN	-7.644277	0.259593	-29.44713	0.0000
_NLD--N_OPN1_NLD	-1.776786	0.114389	-15.53279	0.0000
_NOR--N_OPN1_NOR	5.363453	0.795316	6.743804	0.0000
_SWE--N_OPN1_SWE	0.037935	0.876807	0.043265	0.9655
_SWT--N_OPN1_SWT	2.005144	0.473912	4.231042	0.0000
_UNK--N_OPN1_UNK	-0.943395	0.642865	-1.467487	0.1434
_USA--N_OPN1_USA	2.324493	0.405802	5.728147	0.0000
_NZL--N_OPN1_NZL	-2.867152	0.602533	-4.758498	0.0000

Weighted Statistics

R-squared	0.986447	Mean dependent var	0.845801
Adjusted R-squared	0.985427	S.D. dependent var	8.134239
S.E. of regression	0.981969	Sum squared resid	269.0292
F-statistic	966.9728	Durbin-Watson stat	1.959136
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.525057	Mean dependent var	1.117922
Sum squared resid	244.0103	Durbin-Watson stat	1.067140

Table A8.3   N_FH as a fixed country specific variable in a SUR model

Dependent Variable: FDI2?
Method: Pooled EGLS (Cross-section SUR)
Sample (adjusted): 1980 1998
Included observations: 19 after adjustments
Cross-sections included: 16
Total pool (unbalanced) observations: 301
Linear estimation after one-step weighting matrix

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(N_CC2?/N_MS?)	-0.732541	0.047893	-15.29536	0.0000
LOG(N_ET2?/N_EP2?)	1.812931	0.102437	17.69801	0.0000
N_OPN1?	0.056742	0.148398	0.382363	0.7025
N_T?	-1.342205	0.326274	-4.113733	0.0001
N_G?	-0.027944	0.003261	-8.568434	0.0000
C	2.174622	1.043209	2.084550	0.0380
_AUS--N_FH_AUS	3.342937	0.244309	13.68321	0.0000
_AUT--N_FH_AUT	-1.919327	1.224489	-1.567452	0.1181
_CAN--N_FH_CAN	-10.92923	5.244091	-2.084104	0.0381
_DNK--N_FH_DNK	2.966942	2.137867	1.387805	0.1663
_FIN--N_FH_FIN	6.121366	6.817550	0.897884	0.3700
_FRA--N_FH_FRA	2.568156	1.085583	2.365693	0.0187
_GER--N_FH_GER	-10.72582	1.307856	-8.201076	0.0000
_ITA--N_FH_ITA	-7.334727	1.584912	-4.627844	0.0000
_JPN--N_FH_JPN	2.361281	0.339425	6.956718	0.0000
_NLD--N_FH_NLD	21.67505	3.404528	6.366535	0.0000
_NOR--N_FH_NOR	-4.414027	1.439841	-3.065636	0.0024
_SWE--N_FH_SWE	13.37328	4.277469	3.126448	0.0020
_SWT--N_FH_SWT	1.663792	2.141672	0.776866	0.4379
_UNK--N_FH_UNK	16.04136	3.262028	4.917605	0.0000
_USA--N_FH_USA	-1.413633	0.402589	-3.511359	0.0005
_NZL--N_FH_NZL	55.06795	7.095654	7.760800	0.0000

Weighted Statistics

R-squared	0.935983	Mean dependent var	0.826580
Adjusted R-squared	0.931164	S.D. dependent var	3.738797
S.E. of regression	0.980931	Sum squared resid	268.4612
F-statistic	194.2479	Durbin-Watson stat	1.967737
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.505554	Mean dependent var	1.117922
Sum squared resid	254.0304	Durbin-Watson stat	1.062250

Table A8.4   N_G as a fixed country specific variable in a SUR model

Dependent Variable: FDI2?

Method: Pooled EGLS (Cross-section SUR)

Sample (adjusted): 1980 1998

Included observations: 19 after adjustments

Cross-sections included: 16

Total pool (unbalanced) observations: 301

Linear estimation after one-step weighting matrix

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(N_CC2?/N_MS?)	-0.735372	0.022956	-32.03410	0.0000
LOG(N_ET2?/N_EP2?)	1.599829	0.078367	20.41461	0.0000
N_OPN1?	1.076602	0.140257	7.675920	0.0000
N_FH?	0.757441	0.204335	3.706860	0.0003
N_T?	-3.087064	0.237058	-13.02241	0.0000
C	7.070192	0.756063	9.351331	0.0000
_AUS--N_G_AUS	0.003766	0.002842	1.325028	0.1862
_AUT--N_G_AUT	-0.196123	0.026049	-7.528986	0.0000
_CAN--N_G_CAN	0.054671	0.030447	1.795599	0.0736
_DNK--N_G_DNK	-0.021586	0.036581	-0.590106	0.5556
_FIN--N_G_FIN	0.095625	0.019088	5.009800	0.0000
_FRA--N_G_FRA	-0.085765	0.016680	-5.141657	0.0000
_GER--N_G_GER	-0.369647	0.036647	-10.08675	0.0000
_ITA--N_G_ITA	-0.251758	0.022364	-11.25724	0.0000
_JPN--N_G_JPN	-0.004424	0.003026	-1.462243	0.1448
_NLD--N_G_NLD	-0.046907	0.003876	-12.10191	0.0000
_NOR--N_G_NOR	-0.055418	0.041901	-1.322580	0.1871
_SWE--N_G_SWE	0.162198	0.113156	1.433403	0.1529
_SWT--N_G_SWT	-0.001431	0.052194	-0.027408	0.9782
_UNK--N_G_UNK	0.289883	0.039078	7.418093	0.0000
_USA--N_G_USA	-0.162261	0.026240	-6.183796	0.0000
_NZL--N_G_NZL	0.418472	0.051623	8.106340	0.0000

Weighted Statistics

R-squared	0.979133	Mean dependent var	-0.299804
Adjusted R-squared	0.977562	S.D. dependent var	6.603737
S.E. of regression	0.989195	Sum squared resid	273.0034
F-statistic	623.3891	Durbin-Watson stat	1.885013
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.368305	Mean dependent var	1.117922
Sum squared resid	324.5442	Durbin-Watson stat	0.938058

A8.2   EMERGING COUNTRY

Table A8.5   N_CC/N_MS as a country specific variable in a SUR model

Dependent Variable: FDI2?

Method: Pooled EGLS (Cross-section SUR)

Sample (adjusted): 1980 1999

Included observations: 20 after adjustments

Cross-sections included: 13

Total pool (unbalanced) observations: 248

Linear estimation after one-step weighting matrix

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(N_ET?/N_EP?)	-2.785368	0.372155	-7.484421	0.0000
N_OPN1?	6.891902	0.368672	18.69388	0.0000
N_FH?	2.456267	0.232204	10.57804	0.0000
N_T?	2.776524	0.194462	14.27798	0.0000
N_G?	0.032391	0.006435	5.033754	0.0000
C	-2.951099	0.810065	-3.643038	0.0003
_ARG--LOG(N_CC_ARG/N_MS_ARG)	-0.417411	0.036879	-11.31836	0.0000
_BRA--LOG(N_CC_BRA/N_MS_BRA)	-0.197048	0.055727	-3.535923	0.0005
_CHL--LOG(N_CC_CHL/N_MS_CHL)	-0.736144	0.054400	-13.53212	0.0000
_CHN--LOG(N_CC_CHN/N_MS_CHN)	-1.160437	0.150443	-7.713482	0.0000
_COL--LOG(N_CC_COL/N_MS_COL)	-0.439823	0.051789	-8.492638	0.0000
_HKG--LOG(N_CC_HKG/N_MS_HKG)	-0.553337	0.106772	-5.182415	0.0000
_IDN--LOG(N_CC_IDN/N_MS_IDN)	0.293948	0.084307	3.486633	0.0006
_IND--LOG(N_CC_IND/N_MS_IND)	1.630758	0.122249	13.33961	0.0000
_MEX--LOG(N_CC_MEX/N_MS_MEX)	-0.380988	0.055756	-6.833162	0.0000
_MYS--LOG(N_CC_MYS/N_MS_MYS)	-0.888201	0.190722	-4.657057	0.0000
_PHL--LOG(N_CC_PHL/N_MS_PHL)	1.242555	0.069937	17.76687	0.0000
_THA--LOG(N_CC_THA/N_MS_THA)	1.376080	0.100191	13.73464	0.0000
_VEN--LOG(N_CC_VEN/N_MS_VEN)	-0.497628	0.064457	-7.720304	0.0000

Weighted Statistics

R-squared	0.972010	Mean dependent var	1.985683
Adjusted R-squared	0.969809	S.D. dependent var	5.728076
S.E. of regression	0.995278	Sum squared resid	226.8425
F-statistic	441.7977	Durbin-Watson stat	1.702823
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.649160	Mean dependent var	1.929015
Sum squared resid	358.7670	Durbin-Watson stat	0.911283

Table A8.6   N_OPN1 as a country specific variable in a SUR model

Dependent Variable: FDI2?
Method: Pooled EGLS (Cross-section SUR)
Sample (adjusted): 1980 1999
Included observations: 20 after adjustments
Cross-sections included: 13
Total pool (unbalanced) observations: 248
Linear estimation after one-step weighting matrix

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(N_CC?/N_MS?)	-0.360177	0.162317	-2.218976	0.0275
LOG(N_ET?/N_EP?)	2.641985	0.596610	4.428328	0.0000
N_FH?	3.631722	0.268154	13.54344	0.0000
N_T?	2.700546	0.523939	5.154313	0.0000
N_G?	0.017049	0.009197	1.853716	0.0651
C	-4.632431	1.224531	-3.783024	0.0002
_ARG--N_OPN1_ARG	1.218522	0.376644	3.235206	0.0014
_BRA--N_OPN1_BRA	3.146482	0.676692	4.649802	0.0000
_CHL--N_OPN1_CHL	1.090507	0.649583	1.678780	0.0946
_CHN--N_OPN1_CHN	-5.277890	1.124165	-4.694944	0.0000
_COL--N_OPN1_COL	0.691770	0.498849	1.386731	0.1669
_HKG--N_OPN1_HKG	-8.397983	1.911702	-4.392934	0.0000
_IDN--N_OPN1_IDN	7.874661	1.383231	5.692947	0.0000
_IND--N_OPN1_IND	7.087289	0.982767	7.211566	0.0000
_MEX--N_OPN1_MEX	3.727244	0.462065	8.066493	0.0000
_MYS--N_OPN1_MYS	-14.68410	2.784360	-5.273779	0.0000
_PHL--N_OPN1_PHL	9.542371	0.816576	11.68583	0.0000
_THA--N_OPN1_THA	-9.992643	1.227277	-8.142125	0.0000
_VEN--N_OPN1_VEN	0.833998	0.454754	1.833954	0.0680

Weighted Statistics

R-squared	0.937662	Mean dependent var		1.606958
Adjusted R-squared	0.932762	S.D. dependent var		3.828280
S.E. of regression	0.992684	Sum squared resid		225.6615
F-statistic	191.3621	Durbin-Watson stat		1.565115
Prob(F-statistic)	0.000000			

Unweighted Statistics

R-squared	0.470639	Mean dependent var		1.929015
Sum squared resid	541.3220	Durbin-Watson stat		0.625253

Table A8.7   N_FH as a country specific variable in a SUR model

Dependent Variable: FDI2?
Method: Pooled EGLS (Cross-section SUR)
Sample (adjusted): 1980 1999
Included observations: 20 after adjustments
Cross-sections included: 13
Total pool (unbalanced) observations: 248
Linear estimation after one-step weighting matrix

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(N_CC?/N_MS?)	-0.019528	0.075166	-0.259792	0.7953
LOG(N_ET?/N_EP?)	-1.444679	0.392876	-3.677184	0.0003
N_OPN1?	4.012579	0.331997	12.08620	0.0000
N_T?	3.656637	0.246574	14.82978	0.0000
N_G?	0.021672	0.007806	2.776247	0.0060
C	-4.014083	0.752139	-5.336892	0.0000
_ARG--N_FH_ARG	1.895261	0.371713	5.098717	0.0000
_BRA--N_FH_BRA	0.006639	0.425358	0.015609	0.9876
_CHL--N_FH_CHL	4.864006	0.600728	8.096859	0.0000
_CHN--N_FH_CHN	7.436413	0.660557	11.25779	0.0000
_COL--N_FH_COL	2.606746	0.543584	4.795479	0.0000
_HKG--N_FH_HKG	6.515712	0.708620	9.194934	0.0000
_IDN--N_FH_IDN	-10.10101	1.424403	-7.091400	0.0000
_IND--N_FH_IND	-13.82699	1.045688	-13.22287	0.0000
_MEX--N_FH_MEX	-28.06062	7.019046	-3.997783	0.0001
_MYS--N_FH_MYS	7.957238	0.879786	9.044520	0.0000
_PHL--N_FH_PHL	-4.049027	0.311409	-13.00228	0.0000
_THA--N_FH_THA	-4.736803	0.605381	-7.824499	0.0000
_VEN--N_FH_VEN	2.635107	0.679975	3.875299	0.0001

Weighted Statistics

R-squared	0.898062	Mean dependent var		1.256292
Adjusted R-squared	0.890050	S.D. dependent var		3.026645
S.E. of regression	1.003597	Sum squared resid		230.6505
F-statistic	112.0818	Durbin-Watson stat		1.679632
Prob(F-statistic)	0.000000			

Unweighted Statistics

R-squared	0.624760	Mean dependent var		1.929015
Sum squared resid	383.7186	Durbin-Watson stat		0.896035

Table A8.8   N_G as a country specific variable in a SUR model
Dependent Variable: FDI2?
Method: Pooled EGLS (Cross-section SUR)
Sample (adjusted): 1980 1999
Included observations: 20 after adjustments
Cross-sections included: 13
Total pool (unbalanced) observations: 248
Linear estimation after one-step weighting matrix

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(N_CC?/N_MS?)	-0.371139	0.069870	-5.311845	0.0000
LOG(N_ET?/N_EP?)	2.037757	0.449274	4.535667	0.0000
N_OPN1?	2.058533	0.327208	6.291213	0.0000
N_FH?	2.821804	0.452053	6.242196	0.0000
N_T?	0.438628	0.298325	1.470301	0.1429
C	-0.039909	0.926112	-0.043093	0.9657
_ARG--N_G_ARG	0.002974	0.022987	0.129370	0.8972
_BRA--N_G_BRA	-0.169365	0.060676	-2.791276	0.0057
_CHL--N_G_CHL	0.026165	0.036517	0.716524	0.4744
_CHN--N_G_CHN	0.255180	0.069990	3.645971	0.0003
_COL--N_G_COL	0.045544	0.037898	1.201772	0.2307
_HKG--N_G_HKG	0.258947	0.056293	4.599987	0.0000
_IDN--N_G_IDN	-0.282703	0.101075	-2.796970	0.0056
_IND--N_G_IND	-0.182795	0.059646	-3.064670	0.0024
_MEX--N_G_MEX	0.027406	0.052442	0.522591	0.6018
_MYS--N_G_MYS	0.231161	0.049032	4.714458	0.0000
_PHL--N_G_PHL	-0.139534	0.027688	-5.039544	0.0000
_THA--N_G_THA	-0.084672	0.035582	-2.379620	0.0182
_VEN--N_G_VEN	-0.026054	0.051925	-0.501775	0.6163

Weighted Statistics

R-squared	0.650137	Mean dependent var	0.963003
Adjusted R-squared	0.622637	S.D. dependent var	1.564894
S.E. of regression	0.961313	Sum squared resid	211.6242
F-statistic	23.64119	Durbin-Watson stat	1.408699
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.406931	Mean dependent var	1.929015
Sum squared resid	606.4691	Durbin-Watson stat	0.586091

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Table A8.9   N_CC/N_MS as a fixed country specific variable in a SUR model

Dependent Variable: FDI2?
Method: Pooled EGLS (Cross-section SUR)
Sample (adjusted): 1980 1998
Included observations: 19 after adjustments
Cross-sections included: 10
Total pool (unbalanced) observations: 176
Linear estimation after one-step weighting matrix

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(N_FH?)	-0.734006	0.578895	-1.267944	0.2067
LOG(N_ET?/N_EP?)	5.992976	0.522114	11.47830	0.0000
LOG(N_T?)	-0.436587	0.324394	-1.345853	0.1803
LOG(N_OPN1?)	3.586757	0.556375	6.446653	0.0000
N_G?	0.017418	0.020400	0.853826	0.3945
C	35.70461	2.897131	12.32412	0.0000
_AGO--LOG(N_CCB_AGO/N_MS_AGO)	2.312816	0.392867	5.887014	0.0000
_DZA--LOG(N_CCB_DZA/N_MS_DZA)	4.217710	0.458163	9.205698	0.0000
_EGY--LOG(N_CCB_EGY/N_MS_EGY)	2.742259	0.561930	4.880070	0.0000
_LSO--LOG(N_CCB_LSO/N_MS_LSO)	0.108419	0.570996	0.189877	0.8496
_NER--LOG(N_CCB_NER/N_MS_NER)	4.237300	0.445760	9.505797	0.0000
_NGA--LOG(N_CCB_NGA/N_MS_NGA)	2.077615	0.522776	3.974194	0.0001
_SWZ--LOG(N_CCB_SWZ/N_MS_SWZ)	1.914390	0.479490	3.992557	0.0001
_TUN--LOG(N_CCB_TUN/N_MS_TUN)	4.072368	0.443396	9.184505	0.0000
_TZA--LOG(N_CCB_TZA/N_MS_TZA)	2.873280	0.456471	6.294547	0.0000
_UGA--LOG(N_CCB_UGA/N_MS_UGA)	3.257810	0.464803	7.009010	0.0000

Weighted Statistics

R-squared	0.876823	Mean dependent var	1.846598
Adjusted R-squared	0.865275	S.D. dependent var	2.575224
S.E. of regression	0.945235	Sum squared resid	142.9550
F-statistic	75.92929	Durbin-Watson stat	1.559804
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.569825	Mean dependent var	3.517808
Sum squared resid	2668.918	Durbin-Watson stat	0.699305

Table A8.10   N_FH as a fixed country specific variable in a SUR model

Dependent Variable: FDI2?

Method: Pooled EGLS (Cross-section SUR)

Sample (adjusted): 1980 1998

Included observations: 19 after adjustments

Cross-sections included: 10

Total pool (unbalanced) observations: 176

Linear estimation after one-step weighting matrix

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(N_CCB?/N_MS?)	2.932701	0.553258	5.300788	0.0000
LOG(N_ET?/N_EP?)	6.521786	0.564483	11.55357	0.0000
LOG(N_T?)	-0.107488	0.362827	-0.296251	0.7674
LOG(N_OPN1?)	3.703428	0.621881	5.955200	0.0000
N_G?	0.017574	0.021658	0.811445	0.4183
C	42.70244	3.760862	11.35443	0.0000
_AGO--LOG(N_FH_AGO)	-2.739533	0.767422	-3.569788	0.0005
_DZA--LOG(N_FH_DZA)	-7.404078	0.640892	-11.55277	0.0000
_EGY--LOG(N_FH_EGY)	-3.327509	0.797512	-4.172362	0.0000
_LSO--LOG(N_FH_LSO)	2.410974	1.448820	1.664096	0.0981
_NER--LOG(N_FH_NER)	-6.974049	0.576935	-12.08811	0.0000
_NGA--LOG(N_FH_NGA)	-2.117147	0.741956	-2.853466	0.0049
_SWZ--LOG(N_FH_SWZ)	-1.634434	1.072316	-1.524209	0.1294
_TUN--LOG(N_FH_TUN)	-6.664620	0.573380	-11.62340	0.0000
_TZA--LOG(N_FH_TZA)	-3.688569	0.603502	-6.111945	0.0000
_UGA--LOG(N_FH_UGA)	-4.353964	0.591286	-7.363554	0.0000

Weighted Statistics

R-squared	0.872816	Mean dependent var	1.279397
Adjusted R-squared	0.860892	S.D. dependent var	2.542749
S.E. of regression	0.948374	Sum squared resid	143.9060
F-statistic	73.20104	Durbin-Watson stat	1.571779
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.475320	Mean dependent var	3.517808
Sum squared resid	3255.258	Durbin-Watson stat	0.604144

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Table A8.11   N_OPN1 as a fixed country specific variable in a SUR model

Dependent Variable: FDI2?
Method: Pooled EGLS (Cross-section SUR)
Sample (adjusted): 1980 1998
Included observations: 19 after adjustments
Cross-sections included: 10
Total pool (unbalanced) observations: 176
Linear estimation after one-step weighting matrix

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(N_CCB?/N_MS?)	-0.022473	0.560768	-0.040076	0.9681
LOG(N_ET?/N_EP?)	5.275332	0.577938	9.127846	0.0000
LOG(N_T?)	-0.781373	0.442359	-1.766378	0.0792
LOG(N_FH?)	-2.263555	0.642861	-3.521063	0.0006
N_G?	0.007593	0.025258	0.300642	0.7641
C	25.00682	3.265452	7.657995	0.0000
_AGO--LOG(N_OPN1_AGO)	7.800364	6.463784	1.206780	0.2293
_DZA--LOG(N_OPN1_DZA)	6.923556	0.581524	11.90588	0.0000
_EGY--LOG(N_OPN1_EGY)	1.910971	0.610235	3.131532	0.0021
_LSO--LOG(N_OPN1_LSO)	-6.425625	1.892306	-3.395659	0.0009
_NER--LOG(N_OPN1_NER)	8.102313	1.388498	5.835309	0.0000
_NGA--LOG(N_OPN1_NGA)	-3.220917	1.233545	-2.611107	0.0099
_SWZ--LOG(N_OPN1_SWZ)	0.439592	1.613219	0.272494	0.7856
_TUN--LOG(N_OPN1_TUN)	9.871806	1.181679	8.354051	0.0000
_TZA--LOG(N_OPN1_TZA)	-0.760174	1.215253	-0.625527	0.5325
_UGA--LOG(N_OPN1_UGA)	1.885707	0.847517	2.224979	0.0275

Weighted Statistics

R-squared	0.776535	Mean dependent var	1.380456
Adjusted R-squared	0.755585	S.D. dependent var	1.881866
S.E. of regression	0.930363	Sum squared resid	138.4922
F-statistic	37.06635	Durbin-Watson stat	1.455913
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.485900	Mean dependent var	3.517808
Sum squared resid	3189.614	Durbin-Watson stat	0.613345

Table A8.12   N_G as a fixed country specific variable in a SUR model
Dependent Variable: FDI2?
Method: Pooled EGLS (Cross-section SUR)
Sample (adjusted): 1980 1998
Included observations: 19 after adjustments
Cross-sections included: 10
Total pool (unbalanced) observations: 176
Linear estimation after one-step weighting matrix

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(N_CCB?/N_MS?)	-2.055511	0.764899	-2.687296	0.0080
LOG(N_ET?/N_EP?)	1.431077	0.611040	2.342036	0.0204
LOG(N_T?)	-0.468897	0.444508	-1.054868	0.2931
LOG(N_FH?)	-3.567645	0.840643	-4.243948	0.0000
LOG(N_OPN1?)	0.107752	0.632175	0.170446	0.8649
C	6.785814	3.426521	1.980380	0.0494
_AGO--N_G_AGO	0.035926	0.150546	0.238638	0.8117
_DZA--N_G_DZA	-0.302462	0.130526	-2.317252	0.0218
_EGY--N_G_EGY	-0.050895	0.056265	-0.904560	0.3671
_LSO--N_G_LSO	0.537560	0.525775	1.022415	0.3081
_NER--N_G_NER	-0.102912	0.142634	-0.721509	0.4716
_NGA--N_G_NGA	0.222099	0.115054	1.930384	0.0553
_SWZ--N_G_SWZ	0.186275	0.329392	0.565512	0.5725
_TUN--N_G_TUN	0.086461	0.173327	0.498832	0.6186
_TZA--N_G_TZA	0.134476	0.108613	1.238123	0.2175
_UGA--N_G_UGA	-0.088979	0.081081	-1.097411	0.2741

Weighted Statistics

R-squared	0.441976	Mean dependent var	1.189984
Adjusted R-squared	0.389661	S.D. dependent var	1.168822
S.E. of regression	0.913133	Sum squared resid	133.4099
F-statistic	8.448393	Durbin-Watson stat	1.376330
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.284583	Mean dependent var	3.517808
Sum squared resid	4438.636	Durbin-Watson stat	0.479825