Univerzita Karlova v Praze

Fakulta sociálních věd

Institut ekonomických studií

Bakalářská práce

2011   **Petr Choutka**

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Determinants of FDI in Sub-Saharan Africa

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Prohlášení

Prohlašuji, že jsem bakalářskou práci vypracoval samostatně a použil pouze uvedené prameny a literaturu.

V Praze dne 12.5.2011   Petr Choutka

Poděkování

Na tomto místě bych rád poděkoval svému konzultantovi, Petrovi Janskému, M.Sc., za cenné připomínky a rady.

Abstrakt

Tato práce se zabývá determinanty přímých zahraničních investic v zemích Subsaharské Afriky. Tento region byl po dlouhou dobu považován investory za příliš rizikový a jediným důvodem pro investice se zdál být výskyt nerostných surovin, především ropy. Cílem této práce je především zjistit, jestli se v posledním desetiletí situace změnila a jestli se zemím, které zlepšily své institucionální prostředí, podařilo přilákat významnější množství zahraničních investic do jiných sektorů ekonomiky. K analýze determinant je využíváno standardních ekonometrických modelů pro analýzu panelových dat, pomocí kterých se postupně pokusím vysvětlit nejen roční úhrnný příliv zahraničních investic, nýbrž také jejich podíl na HDP a jejich akumulaci za posledních 10 let. Výsledky potvrzují skutečnost, že nerostné zdroje hrají dominantní roli pro investory zvažující investice v zemích Subsaharské Afriky.

Klíčová slova: přímé zahraniční investice, nerostné suroviny, Subsaharská Afrika

Abstract

This paper deals with determinants of foreign direct investments in Sub-Saharan Africa. This region has been considered very risky for foreign investors and the only incentive for FDI was seen in natural resources, especially oil. The objective of this paper is to find out whether this trend has prevailed in the past decade or if countries that managed to improve their institutional environment attracted significant amount of FDI into other sectors of economy. Standard econometric models are employed to explain FDI flows to individual countries. Not only FDI flows but also the share of FDI to GDP and accumulated FDI are used as dependent variable. The results confirm the fact, that natural resources still play the most important role for inward FDI.

Key words: foreign direct investment, natural resources, Sub-Saharan Africa

Contents

1. Introduction

In the 1990s we witnessed a large boom of foreign direct investment (FDI) as a result of world globalization. Many countries relied on inflow of FDI as a source of their economic growth. Growth of every country is limited but by attracting FDI you can somehow break this limit. FDI serves not only as a source of profit for foreign investors but also brings new technology and management skills. The empirical evidence showed that increase in FDI does not crowd out domestic investments and thus brings benefits to all individuals.

No wonder that governments all over the world are trying to pursue policies which are likely to attract foreign investors. In the 1980s and 1990s, many African countries started pursuing policies which dramatically improved their investment environment. But as we can see from the table 1, in spite of the increase in FDI flowing to Sub-Saharan Africa (SSA), African countries still lag behind. Share of countries in the region of SSA on total FDI inflow reached only 3,4 per cent in 2009. On the other hand, a certain progress can be observed and is very encouraging.

What is the major cause of this progress? Are natural resources to be ´blamed´ or is there another factor making Africa attractive? Was the FDI inflow equally distributed among individual countries or just few of them accounted for a large part of FDI? If the latter is correct, then are the leaders poor or rich in natural resources? What else is important for foreign investors? Those questions are to be answered in this paper.

Table 1. Share of world regions on total FDI inflow (%)

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Developing economies	21	18,3	26	28	32,5	39,9	33,5	29,8	26,9	35,6	42,9
Asia - developing countries	10,3	10,6	13,8	16,1	20,7	23,8	21,9	19,4	16	21	27
America - developing countries	9,6	7	9,7	9,3	8,1	13	7,7	6,5	7,8	10,3	10,5
Africa	1,1	0,7	2,4	2,6	3,6	3	3,9	3,8	3	4,1	5,3
SSA - excluding South Africa	**0,7**	**0,4**	**1**	**1,8**	**2,8**	**2,2**	**2,2**	**2,5**	**1,7**	**2,4**	**3,4**

Source: UNCTAD and author´s calculations

2. Empirical studies covering this topic

Asiedu (2000) examined the impact of natural resources, market size, government policy, institutions and political stability on FDI flows into African countries. Her analysis covered 22 countries in SSA over the period 1984-2000. Employing fixed-effects panel estimation she came to the conclusion that all above mentioned variables are significant and have the expected sign. Her results imply that not only uncontrollable factors such us market size or natural resource endowments matter. Suitable government policy is a very powerful instrument leading to an improvement in institutional environment which will be attractive for FDI.

Morisset (2000) confirmed that countries offering large markets and natural resources succeeded in attracting significant amount of FDI. He also suggests that following appropriate policies can make even resource-poor countries very attractive. Ensuring macroeconomic and political stability, opening up to trade, modernizing investment codes and starting a liberalization programme belong to very promising strategic actions. His empirical results supporting this statement are not that strong but in my point of view, it takes more time to convince foreign investors that business environment in Africa has made certain progress.

After they take it into account, every marginal improvement could be followed by positive response of FDI inflow.

Ezeoha, Cattaneo (2011) used panel data from 30 SSA countries covering the period from 1995 to 2008. They complain about being limited by lack of data which is very similar to what I had to face in my paper. Their paper shows the importance of natural resources and points out that larger economies are more likely to attract non-resource seeking FDI. Moreover, investment inflow can be promoted be opening up to international trade. This result confirms previous findings about impact of openness on FDI and is widely accepted by other papers.

Asiedu (2002) discovered that indicators that are usually important for inward FDI, do not matter in the region of SSA. Her results proved infrastructure and higher return on capital to have no effect on FDI to SSA, while they have been perceived as very significant in other regions. She finds a positive effect of trade openness on FDI but points out that this effect is weaker in SSA than in other regions. She also identified so called *adverse regional effect* causing that *SSA will receive less FDI by virtue of its geographical location*.

3. FDI theory

„According to the IMF and OECD definitions, direct investment reflects the aim of obtaining a lasting interest by a resident entity of one economy (direct investor) in an enterprise that is resident in another economy (the direct investment enterprise). The ´´lasting interest´´ implies the existence of a long-term relationship between the direct investor and the direct investment enterprise and a significant degree of influence on the management of the latter. Direct investment involves both the initial transaction establishing the

relationship between the investor and the enterprise and all subsequent capital transactions between them.´´

The investment theory distinguishes two types of investment. Portfolio investment (or indirect investment) occurs when stocks, bonds or other market instruments are purchased by foreign investors in order to make a profit. On the other hand, foreign direct investment involves also transferring technology, know-how and management skills. Statistically, foreign investment is considered as direct if more than 10 percent of the company equity is held by foreigners.

3.1.   Theories explaining FDI flows

There are a lot of theories standing behind the FDI flows. The existence of FDI is often explained by the concept of comparative advantage based on differences in labour productivities.

- **Theory of comparative advantage**

Adam Smith claimed that countries can gain by focusing on production of goods in which it has an absolute advantage. David Ricardo managed to prove that an absolute advantage is not necessary for specialization of production to be beneficial. Due to the comparative advantage it can be beneficial to trade even with the least developed countries. Heckscher and Ohlin also contributed significantly to the theory of international trade which is closely related to the FDI theory. Their model basically says that each country should produce goods whose production is intensive in factors the country is abundantly endowed with.

- **The neoclassical model**

The neoclassical model of international trade explained comparative advantage of countries by different capital endowments. Let us assume two countries with two factors of production – labour and capital and two products – labour intensive and capital intensive. We also assume that there is the same technology available in both countries, there is a perfect mobility of factors of production within a country, there are no transportation costs, preferences of people and products they consume are homogenous . Provided that all these assumptions hold, the difference in capital endowments causes the interest rate to be different. Higher interest rate is very attractive for foreign investors. The conclusion of this model is that the possibility of higher profit is the only incentive for foreigners to invest their money.

- **Other theories**

The modern theory of FDI goes back to Hymer (1960). He observed that domestic firms always have a certain advantage over foreign firms because they know better local environment. If foreign enterprises want to succeed in tough competition they must have some advantages over domestic firms. But this can happen only in conditions of imperfect market where not all the firms have access to the same advantages.

Production cycle theory (Vernon, 1966) claims that after a new product is launched on the market it experiences four stages of its production. At first, the product is produced only by domestic firms and is demanded by domestic customers on a large scale. After some time, the product becomes old-fashioned and is rather exported to lower-income countries. Domestic firms exporting this product will not enjoy large foreign demand for their products forever. Foreign firms will have access to this technology and will be able to imitate this product

and offer import-substitution for domestic customers. If the original producers want to maintain a certain market share, they have to reallocate their production to the countries where their products are still demanded.

The eclectic paradigm (Dunning, 1980) – According to this theory there are three types of advantages multinational corporations can enjoy when producing abroad. The ownership advantages consist in possessing specific technology, know-how or marketing. Location advantages include market size, transport costs or specific government policies. Finally, internalization advantages can be used if the transaction costs on the free market are higher than the internal costs.

3.2.   FDI incentives

In this part, I will describe under which conditions it is desirable to attract FDI by providing incentives to foreign companies. This kind of economic policy can be very powerful and encouraging for new investors.

There is quite a strong agreement and we will explore this later that multinational corporations[1] (MNCs) are mostly attracted by fundamentals which cannot be changed quickly by suitable policies or cannot be changed at all. No government has the ability to increase market size, level of human capital or natural resources endowments immediately. But governments can influence investment decisions by various incentives. In case the main economic fundamentals are similar in more countries, incentives might play a very important role. The most typical incentives include tax reliefs, preferential loans or subsidies. Even though these incentives take more forms, all of them represent financial costs to the government, i.e. local taxpayers. Before providing advantages to foreign investors government should raise the question if the benefits of FDI exceed its costs.

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[1]According to the Investopedia definition, MNC is a corporation that has its facilities and other assets in at least

Although incentives are very powerful instrument for attracting FDI, we should be aware of its drawbacks. Firstly, it is very difficult to recognize which projects would occur without incentives and which would not. In case the host country is attractive enough due to its economic fundamentals there is no reason for the government to use other costly instruments. Secondly, there is uncertainty about future benefits of FDI and it is especially relevant in case of FDI which are driven mainly by incentives. Such investors instantly look for a location offering larger benefits and after discovering a better opportunity they quickly change their host country. Governments should avoid attracting this kind of FDI, since the benefits of FDI cannot be seen immediately but they need some time to make the difference visible. Thirdly, if there are no significant differences between foreign and domestic investors, incentives provided only to foreigners create a huge distortion of competition.

Public policy intervention can be justified in case the economy suffers from low level of growth, high unemployment and insufficient investment. In such a case there is no reason for policies to be discriminatory. The same rules should apply to both foreign and domestic companies. However, foreign enterprises usually differ from local firms in many aspects. We talk about market failure that is related to MNEs. The most common market failures which accompany FDI are externalities and spillovers[2]. It can happen that market fails to take benefits of FDI into account and the government should correct the failure by creating advantages for MNEs.

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[2] For spillovers see chapt 2.3

3.3. Spillovers

Spillovers should not be omitted in any serious paper on FDI. They are quite difficult to measure but have been already recognized and described. In addition to an increase in overall level of capital, spillovers belong to the FDI benefits. Governments should focus on attracting FDI that would bring new technology, know-how and management skills.

Many empirical studies confirmed that inward FDI also bring benefits to local firms[3]. Most of them tested the hypothesis that there is a positive correlation between FDI and productivity. They came to the conclusion that benefits arise from the fact that foreign firms bring new technologies and they train local workers who can be later employed by domestic producers. Furthermore, domestic companies face enhanced competition and are pushed to introduce new technologies which would not otherwise occur. Spillovers are considered the second channel through which FDI promote economic growth. The first – and also more obvious – is an increase in level of capital.

We distinguish horizontal and vertical spillovers. Horizontal spillovers have impact on local competitors, whereas vertical spillovers affect mainly the suppliers of MNEs. This implies that vertical spillovers are more likely to be positive but we miss more empirical studies to confirm this hypothesis. Majority of papers is focused on effects of horizontal spillovers and the results are mixed. Generally, we can conclude that developing countries do not receive positive spillovers from FDI. In case of more developed countries there is a positive impact to be found.

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[3] For more details see studies by Blomstrom, Persson (1983) or Blomstrom (1986)

3.4. Role of FDI in (not only) developing countries

The contribution of FDI to development is very similar to any other capital flow. FDI channels resources from countries where they are abundant to those where they are scarce. The inflow of FDI allows countries to exceed the limit of investments given by supply of domestic savings. Benefits of FDI are very similar to those of international trade. After opening up domestic producers face enhanced competition and your economy receives new technology and ideas.

Before trying to discover what factors are important for attracting foreign direct investments into a certain country we should answer the following question. Is it actually desirable for developing countries to support inflow of capital from abroad? One of the economic arguments for promoting such inflows is that it accelerates the GDP growth of FDI recipients. Many empirical studies have been made to prove that there is a positive correlation between FDI inflow and long-run economic growth. The results were sometimes heterogenous for the sample countries but generally there is an agreement among economists that FDI flowing into the country contributes to its economic growth in the long-run provided that the country reached a certain level of some factors such as level of education, infrastructure and good institutions.

- Positive consequences of inward FDI:

1) Following Krugman and Obstfeld (2009), let us assume two basic macroeconomic identities[4]:

$$Y = C + I + G + NX \text{ (expenditure approach)}$$

$$Y = C + S + T \text{ (the total income is used for paying taxes and the disposable income is consumed or saved)}$$

By putting these identities together and substituting $NX = -I_f$, we obtain

$$(S - I) + (T - G) = -I_f$$

This identity shows that insufficient domestic savings can be supplemented from abroad by acquiring foreign wealth. If we considered a closed economy with no possibility of receiving foreign capital the identity would look as follows:

$$(S - I) + (T - G) = 0, \text{ by rearranging we get}$$

$$S + T = I + G$$

This implies that domestic investments are limited by domestic savings.

Open economies can raise investment and foreign borrowing without changing savings. For example, if Nigeria decides to build new roads, it can import the materials from France and borrow French funds to pay from them. Such transactions are also accompanied by rising current account deficit by the same amount as the increase in investment.

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[4] C – consumption, I – investment, G – government expenditure, NX – net export, I_f – net capital inflow

2) Inward FDI do not only bring additional capital to the host economy but it is also accompanied by transfer of technology, know-how or management skills.

3) The MNE can be seen as a connection between the domestic and the world market. Without this connection it is very difficult for less developed countries to gain access to the world markets.

4) After MNE enter a foreign market it contributes to an enhanced competition which forces domestic producers to be more efficient.

5) Rising FDI serve as a signal to other countries that the local market offers a great potential for profits which promotes its competitiveness.
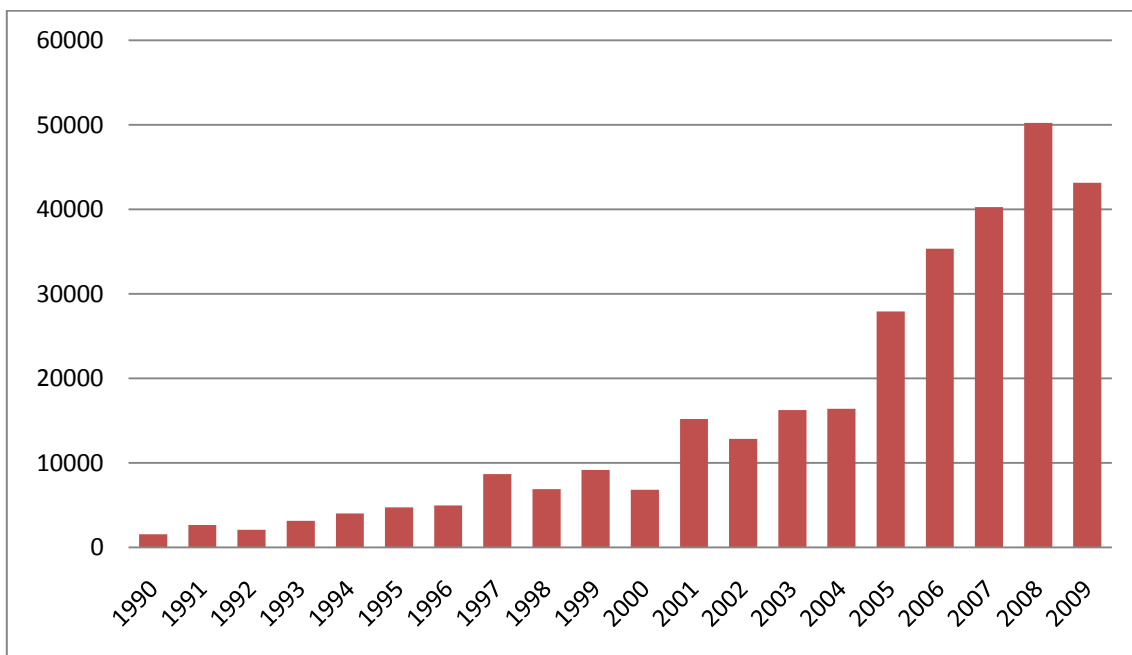

- Negative consequences of inward FDI:

1) The inflow of FDI can be seen as an additional supply of savings which crowds out the domestic savings.

2) FDI inflow causes the domestic currency to appreciate and the domestic exporters lose their competitiveness. This phenomenon is known as a Dutch disease and it explains the situation when a sudden increase in exploitation of natural resources results in a decline of the manufacturing sector.

3) MNE often import their inputs and increase deficit of the current account balance.

4) The widening gap between the development and efficiency of local and foreign producers can lead to the existence of so called dual economy.

5) Resource-seeking FDI are not accompanied by any spillovers effects and its major result is that the currency appreciation. Moreover, economic growth based on export of natural resources is not sustainable and does not bring benefits to a large share of population. The government should

use the revenues for promoting other sectors of the economy which are essential for sustainable growth and development.

4. History and trends of FDI in Sub-Saharan Africa

In the figure 1 we can see an aggregated FDI inflow into countries in SSA. The relatively sharp increase in the investment amount may suggest that Africa changed from very exotic investment region to a place which is considered as a huge investment opportunity. Between 1999 and 2009 the FDI flowing into SSA more than quadrupled. Such a trend is not a coincidence and we should be able to explain this trend.

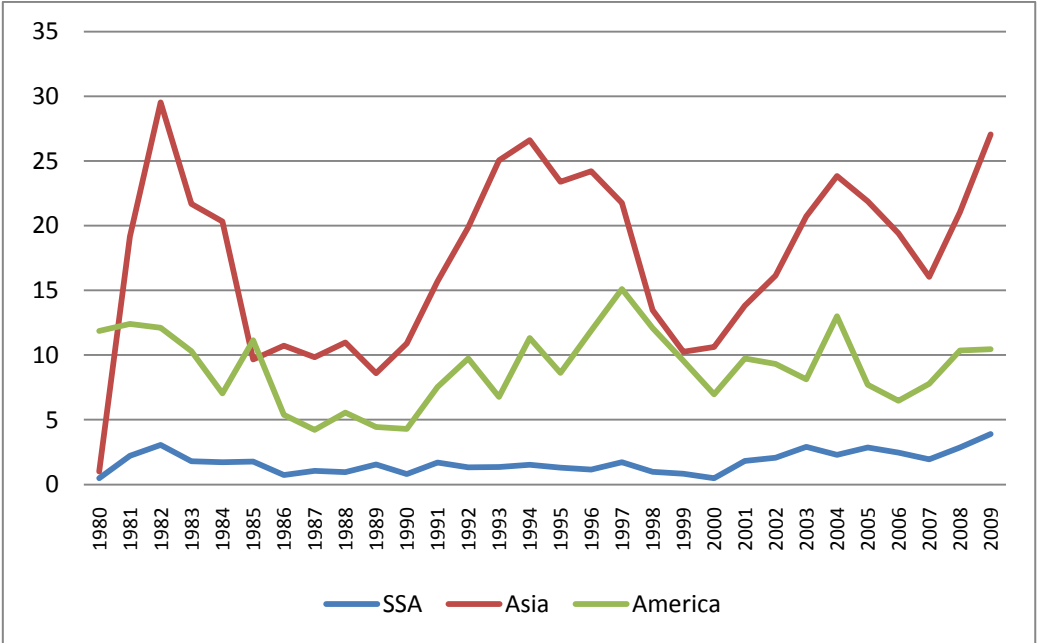**Figure 1. FDI inflow to SSA countries (mil. U.S. dol.), 1990 – 2009**

Source: UNCTAD and author´s calculations

At first let us try to find out if the FDI inflow into SSA improved also in relative terms. After looking at the figure 2 we can conclude that in the past

decade SSA countries increased their share in world FDI inflows. In 2009 almost 4% of global FDI were realized in SSA. It does not sound like a brilliant achievement but this trend starting from 2000 seems to be very supportive.

Many papers focused on FDI in Africa which date back to the period from 1995 to 2004 point out that Africa attracts more FDI only in absolute terms, whereas it relatively declines[5]. This trend is confirmed by our data because the curve representing share of SSA on FDI inflows stagnates or even declines in the 1990s. In other regions depicted in the picture we can see large fluctuations in FDI as a result of oil shocks or crisis in Asia. Africa does not seem to suffer from these fluctuations very much. It is constantly bad in attracting FDI. However, in the past decade Africa was not only doing better in absolute terms but it also increased its share on global FDI inflows. If this trend continues the continent of Africa is likely to be considered a standard location for FDI and foreign companies will not hesitate to use this potential.

Figure 2. Share on world FDI inflows by regions (developing countries only), 1980- 2009

Source: UNCTAD and author´s calculations

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[5] One of these papers is by Asiedu, 2004, Policy reform and FDI in Africa: Absolute Progress but Relative Decline

After looking at the 2008 data on FDI flows in SSA countries we can easily identify which factors are the main drivers of FDI. In the table 5 we can see five countries being the most successful in attracting FDI in 2008. In the next columns there are two determinants which are considered to be the most important for inward FDI in SSA Africa – market size measured by GDP and natural resource endowments measured by share of fuel on total merchandise exports.

However, data on FDI flows in recent years does not provide the full information about the attractiveness. Some countries experienced massive inflows in the past and their markets are more saturated than markets of countries which became a significant FDI recipient not long ago. The concentration of FDI in SSA countries is captured by inward FDI stock.
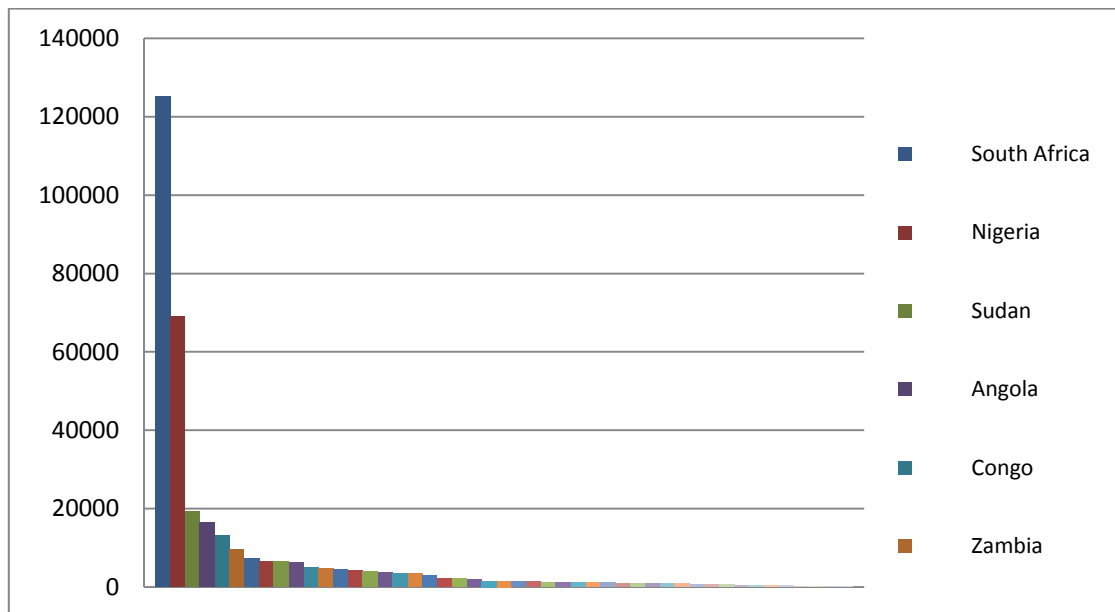
Distribution of FDI in SSA countries is illustrated in the figure 3 which shows inward FDI stock in individual SSA countries. This graph shows that FDI in SSA are heavily concentrated in only few countries. 73 % of total FDI went to only six countries depicted in the figure. The largest recipient of FDI, South Africa, became a destination for 36 % of foreign investments, followed by Nigeria which absorbed more than 20 %. We can argue what is the main cause of such a trend but the role of the market size and natural resources is undisputable.

Table 2. The main recipients of FDI in SSA (2008)

Country	Inward FDI (mil. U.S. dol.)	GDP (mil. U.S. dol.)	Share of fuels on export (%)
Angola	16 581	106 295	98,9
South Africa	9 006	492 155	35,4
Nigeria	6 814	315 030	92,1
Sudan	2 600	89 033	77,1
Ghana	1 220	33 907	15,9

Source: UNCTAD, World Bank

Figure 3. Inward FDI stock, 2006 (Mil. U.S. dollars)

Source: UNCTAD and author´s calculations

4.1. Is Africa different?

From the current trends of FDI we can conclude that there used to be a relative decline of FDI in Africa in the past decades. What is the main cause of such a trend?

Africa as a continent is associated with instability, non-credible governments, extremely high poverty and it is not seen as a potential location for FDI. Nowadays such a picture is not relevant for many African countries any more. In spite of the stagnation or even decline of GDP in 1990s many countries in SSA experienced pretty high growth in the last decade. Governments realized their countries can benefit from inflow of FDI and started following policies which help create attractive investment environment.

Governments managed to ensure political and economic stability which are crucial for investors considering investments in a certain country. They also removed administrative barriers and created quite a friendly business

environment, they opened up to foreign trade and they allowed free market to work without necessary government interventions. The progress in the field of business environment can be seen in the table 2.

However, Africa is still considered to be too risky to become a favourable location for FDI. This continent is seen as a place of civil wars, political instability, hyperinflation and extremely poor people who suffer from hunger and deadly diseases. Unfortunately this is the exact description of reality in some countries. According to the newest report published by United Nations Development Programme, people in 36 out 50 SSA countries experience very low level of development. However, if the investors are able to differentiate between the individual countries they can discover perfect investment opportunities offering high profits.

International organisations do a lot to encourage foreign investors to take Africa into consideration. In 1999 UNCTAD published a booklet intended to send a clear message to investors[6]: „Treat Africa like any other continent or region: do not simply write it off, but have a differentiated look. Look at it closely, country by country, industry by industry, and opportunity by opportunity. Your competitor may well be there already. ´´

Nowadays investments in many African countries can be made without a complicated approval process, investors are not obliged to ensure participation of local people or inputs in the production process. During the privatization process many government enterprises were offered to not only domestic but also foreign private firms. Moreover, it si much easier for foreigners to repatriate their profits. There is also a danger that foreign companies will be unexpectedly limited in their behavior by the government. In this case foreign company can ask international court to settle these disputes and thus it can avoid a confrontation with local courts which may be not independent. African countries have abolished or at least are gradually abolishing foreign exchange controls.

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[6] For more details see UNCTAD (1999): FDI in Africa: Performance and Potential

We could also see a creation of monetary unions which makes the situation much easier for investors doing business in those countries. Some countries attract foreign investors by providing FDI incentives. These include exemption from import tariffs for inputs related to the realization of investment or tax incentives. Lack of transparency was a common feature of African governments for a long time. Many of them changed the regulatory framework and made it more transparent, created market conditions fostering competition, removed administrative barriers and made it easier for employers to hire and fire employees. Some countries even started disclosing its revenues it gained from natural resources activities of foreign companies.

Table 2. Starting a business – change between 2004 and 2011

	Time (days)		Cost(% of income per capita)	
	2004	**2011**	**2004**	**2011**
Angola	119	68	1 316	163
Botswana	108	61	11	2
Burkina Faso	40	14	147	49
Cameroon	45	19	176	51
Congo, Dem. Rep.	166	84	1486	735
Ethiopia	44	9	483	18
Lesotho	93	40	64	27
Madagascar	67	7	59	6
Mali	41	8	204	86
Mauritania	82	19	141	34
Mozambique	153	13	112	19
Niger	35	17	450	118
Rwanda	18	3	235	10
Senegal	58	8	122	63
Sierra Leone	26	12	1 540	118
Zambia	38	18	33	28

Source: www.doingbusiness.org

Goverments also changed its legislature framework which ensures protection of property rights. Morover, many bilateral international agreements have been signed by host countries and countries serving as a source of investment. This means that no investor has to make his or her decision under uncertainty, which always causes the allocation of capital not to be as efficient as possible. The governments started to follow responsible monetary and fiscal policies aimed at maintaing low inflation and public debt. They also realised that their producers cannot become competitive with overvalued currencies and thus they conducted such an exchange rate policy causing their currency to depreciate.

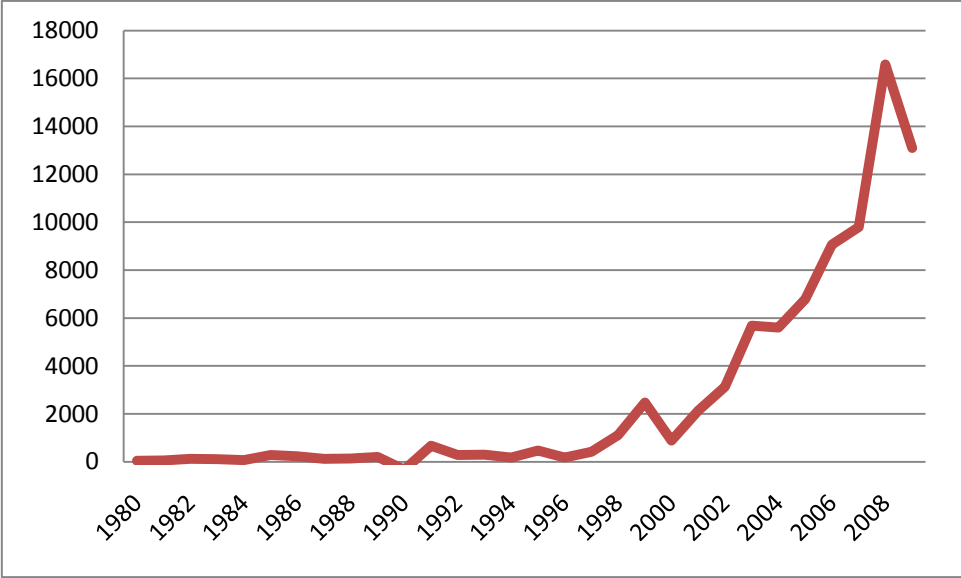## 4.2.   Closer look at the most successful

We have already identified SSA countries which appear to have succeeded in attracting FDI in comparison to the rest which have been lagging behind so far. Let us take a look at the historical evolution of basic indicators having impact on FDI.

Angola

Since I observe the SSA countries from 1980, I will not be interested in the period before 1975 when Angola gained its independence. After 1975 Angola suffered huge devastation caused by civil war lasting almost three decades. After the peace accord in 2002 government of Angola was facing a major challenge to reconstruct the damaged country and make the economy develop. Without knowing much about the steps taken by the government and using only data on evolution of GDP per capita (PPP adjusted) we can conclude that Angola is going in the right direction. Between 2002 and 2008 the GDP per capita (PPP) telling a lot about the standard of living more than doubled. The

average GDP growth in the past decade reached 11,1% which makes Angola to be on average growing faster than China. Due to this rapid change Angola ranks among the ´´richest´´ countries in SSA. However the UN Human Development Index (HDI) for 2010 taking into account GDP per capita, life expectancy and expected years of schooling ranks Angola 146th out of 169 countries.

Figure 4. Inward FDI flows in Angola, 1980-2009

Source: UNCTAD and author´s calculations

In 2002 Angolan economy experienced a growth rate of 14% and with the exception of 2003 the economy continued to grow very quickly reaching a record of 21% growth in 2005. Apart from the peace accord this growth reflects mainly the growth in oil production. The dependency of Angola on the oil sectors is enormous and this situation will remain for many years. While the oil production was increasing dramatically the rest of the economy did not experience an equivalent growth. This trend changed in 2006 and non-oil sectors stopped playing a negligible role. The oil sector currently accounts for 43,5% of the GDP, which is a low number in comparison with some years in the past. The

share of oil sector on the GDP decreased due to policies aimed at diversification of the economy.

Fuels and mining products account for 97% of Angolan exports to the EU and Angola´s main trade partners are USA and China, both of which satisfy the majority of its oil demand by imports. This suggests that Angola do not have to worry that there will not be customers longing for its oil and other natural resources. The foreign investors are aware of this fact and despite of some restraints of Angolan business environment the oil sector received huge amount of FDI.
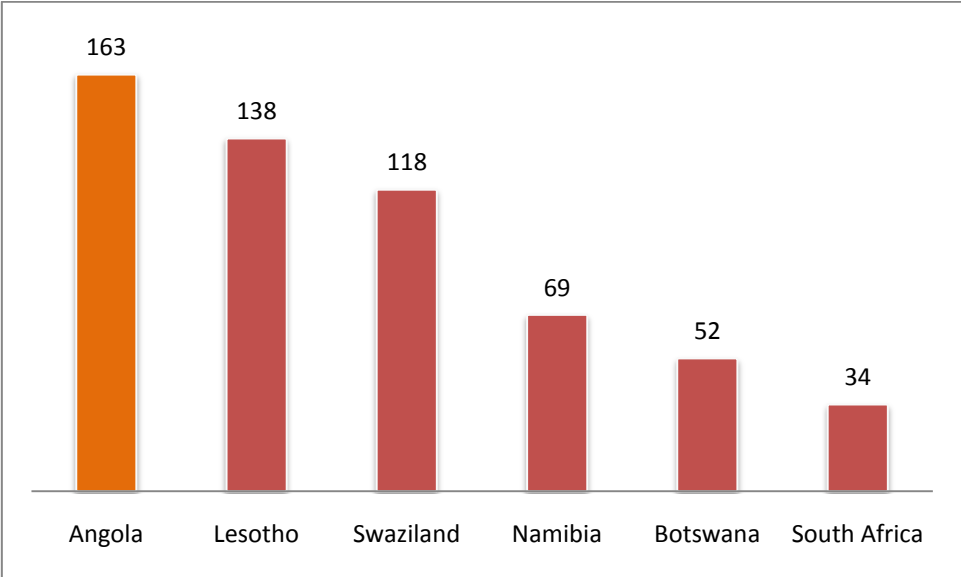
Furthermore, there are many investment possibilities related to the infrastructure rebuilding started in 2002 as a result of damaging civil war. Many experts predict that Angola will continue to grow at a double-digit rate.

On the other hand, the business environment is not considered to be favourable. Angola´s Investment Climate Assessment (ICA) identified the major constraints for the investment of the private sector. Over half of surveyed firms reported access to credit as a major or very sever constraint. The process of application for a loan is very complex and takes a lot of time. The firms located in Angola have to rely on their internal funds to a large extent. Another sever constraint is the availability of electricity. According to the report 84% of the firms experienced power outages which bring indirect costs to the firms. In spite of the intensive infrastructure rebuilding many firms in Angola mentioned the bad infrastructure as a significant bottleneck. The level of corruption perceived by foreign firms is huge and bribery is part of their everyday´s life. These results find support in the Corruption Perception Index ranking Angola among the most corrupted countries. Moreover, the local court system is seen as corrupted as well.

The World Bank publishes an annual report on the business environment in individual countries. In 2011 Angola ranked 163 out of 183 economies. As we can see in Figure 8, there are countries in the SSA region which provide

better environment for foreign enterprises but in recent years, none of them is as successful in attracting FDI as Angola. In order to attract higher amount of FDI into other areas apart from the oil sector, Angola needs to improve its regulatory framework.

Figure 5. Global Ranking – Ease of Doing Business (2011)

Source: World Bank

On the other hand, Angolan government realizes its potential as a location for FDI and from 2003 it has been pursuing policies aimed at attracting FDI. It has created the National Private Investment Agency which helps the investors with the application process, offers tax incentives and provide useful information.

Even though the non-oil sectors are catching up the greatest potential for growth is in the oil production. This potential is strengthened by oil prices which are expected to be high for a longer period due to continuing social tensions in oil-rich countries. Angola is expected to outpace Nigeria in the oil production by 2012 and become the largest oil producer in SSA. The dependency of Angola on

the oil sector can be also demonstrated by the negative growth rate in 2009 as a result of a drop in oil prices and reduced OPEC production quota.

Nigeria

Nigeria belongs to the three main recipients in the SSA. Along with Angola and South Africa it accounted for 82% of inward FDI flowing into SSA in 2009. Let us take a look at the FDI determinants examined in this study. Nigeria is the most populated African country and represents the second largest market in the SSA with its GDP of 315 bil. in 2009. According to the market size hypothesis such a large market should be attractive for FDI and this hypothesis is confirmed by data on FDI inflow.

From the historical point of view we will see that regulatory framework really matters and that favourable FDI policies are really efficient. From 1973 to 1988 Nigeria economy experienced and average flow of only 0.79% of GDP. This was mainly the result of regulations which were restrictive enough to discourage foreigners from making an investment. In 1986, Nigeria adopted structural adjustment programme and started a process aimed at eliminating hostile policies towards FDI. In 1988 The Industrial Development Coordinating Committee was established as an agency for attracting FDI and was followed by Nigerian Investment Promotion Commission. System of export processing zones (EPZ) allowed foreign investors to set up their enterprise in a special area where trade barriers such as tariffs and quotas do not apply. These zones are usually set up in less developed countries and its main objective is to attract new employers. More jobs created due to this system contribute significantly to alleviation of poverty. Data on FDI inflow suggests that all these steps taken had a significant impact and put Nigeria on the top of FDI destinations in SSA.

Mauritius

After gaining independence in 1968, economy of Mauritius experienced regular annual growth of 5 or 6 % for most of the period. Mauritius has developed from a low income, agriculturally based economy to a middle income diversified economy. The driving force of its development was growing export sector, which was promoted by export processing zones. All key sectors benefited from both domestic and foreign investments. However, the proportion of FDI to domestic investments was very small and did not exceed 6 % in the 1980s and 1990s. The main contribution of FDI in Mauritius was transfer of technology and know-how. Domestic companies managed to acquire technologies brought by foreigners and started to play the major role in development of Mauritius.

What is even more positive is the fact, that this economic growth was reflected in human development of local people. The life expectancy increased, infant mortality was lowered significantly and Mauritius has the fifth-highest GDP per capita in SSA. Experience of Mauritius shows that quality of FDI rather than quantity matters. Mauritius succeeded in taking the best from FDI.

4.3.   Southeast Asia – an example to follow?

Sub-Saharan Africa attracted 1,2% of annual global FDI flows in the 1980s and only 0,8% in the 1990s. This contracts significantly with South East Asia, which attracted 7% and 15% in the same periods. Why is there such an assymetry of FDI distribution and why are some regions far more successful in attracting FDI than the others? The nations of Southeast Asia succeeded in competing for FDI and their experience provides lessons for other developing countries. FDI is considered the major cause of export-led growth in Southeast Asia. These investments were accompanied by transfer of technology which

contributed to the transformation from agriculture and raw materials extraction to production of manufactured goods. These countries recognised the potential of foreign investments and they took steps which created friendly environment for foreigners. As a result of FDI inflows these countries belonged to the fastest-growing economies. Foreign investors from developed countries were the most active in the late 1980s as they were looking for new locations for their production base. As I already mentioned, government policy is crucial for business and investment activity and policy makers in Southeast Asia were aware of that. Majority of investment projects were oriented on export promotion but investments focused on import substitution were also welcomed. However, investors intending to provide goods to local markets had to face more restrictions. On the other hand, export-oriented investment projects were treated in a very favourable way. Due to enhanced export we could see a shift to manufacturing-based economy.

In earlier decades ASEAN countries pursued policies which supported import substitution and they were convinced that government intervention was necessary for industry sector to develop. Most sectors were protected from foreing competition by trade barriers, especially high tarrifs. Despite these and other restrictions many MNEs took part in investment projects because they could share profits resulting from protectionism practices. After some time policies were oriented to export promotion. MNEs interested in locating their affiliates in export processing zones were given incentives. They were allowed to own unlimited amount of land, imports of inputs were duty free and they were given tax reliefs. Such a sharp increase in export resulted in very high growth rates and countries were rewarded for pursuing friendly FDI policies.

4.4.   Natural resource trap

It may seem that oil-rich countries such as Nigeria or Angola do not have to do much in order to attract FDI. The only thing is to remove barriers on entry of

foreign companies and wait until enough of them come and start exploiting their natural resources. On the other hand, empirical evidence shows that countries possessing large amounts of natural resources tend to have worse institutions and manufacturing sector in such countries is less likely to develop. There are more reasons for that. Due to revenues gained from fuels and minerals, governments are not financially dependent on its citizens and are not interested in creating quality institutional environment which is necessary for taxes to be collected. Financial sources from outside the country undermine the link between people and government and are considered an impediment to development of other sectors.

Another phenomenon hurting African countries that receive large revenues from natural resources is so called Dutch disease. This concept is based on what happened in 1960s in the Netherlands. In 1959 a large natural gas field was discovered and the country experienced huge inflow of revenues from abroad. To everyone´s surprise this led to a decline in manufacturing sector which suddenly lost competitiveness. The experts who examined this situation came to the conclusion that sudden large inflow of foreign money leads to real currency appreciation. And strong currency harms your exporters. The current situation in many African countries is very similar.

5. Determinants of FDI

Let us take a closer look at individual determinants of FDI which will be tested in my regression model.

Market size

The most traditional determinant of FDI is market size which was accepted as very significant in almost all empirical studies. This is compatible with the so called market size hypothesis saying that the host market has to be large enough in order to utilize the resources efficiently. This implies that from a certain level of market size, growing market will attract more and more FDI. All empirical papers include market size as one of the variables explaining FDI. Let us look at the data on the market size measured by GDP and let us focus on the largest markets in SSA. South Africa, Nigeria and Angola as the largest producers in SSA also received the highest amount of FDI in the period from 2005 to 2008.

Table 3. – The largest and smallest markets in SSA (Mil. U.S. dollars)

Country	GDP	Inward FDI	FDI/GDP
South Africa	492 155	9 006	1,83
Nigeria	315 030	6 814	2,16
Angola	106 295	16 581	15,6
Sudan	89 033	2 600	2,92
Ethiopia	70 068	108	0,15
Central African Republic	3 254	117	3,6
Lesotho	3 202	55	1,72
Burundi	3 090	13	0,42
Gambia, The	2 262	70	3,09
Seychelles	1 858	251	13,5

Source: UNCTAD and author´s calculations

We should also take into account that there can be positive corellation between inflow of FDI and growth of the host economy. This topic was covered by many papers and the empirical evidence shows that the impact of FDI on long-term growth depends on other factors and positive effect promoted by many papers is not unconditional. Bhagwati (1978) is the author of a hypothesis claiming that the effect of FDI on growth is stronger in countries which pursue export promoting policy than in countries whose objective is to substitute imports by domestic production. Balasubramanyam (1996) gathered data on 46 developing countries in order to test this hypothesis and provided certain support for what Bhagwati claimed. The results of Borensztein, Gregorio, Lee (1998) indicate that only countries that have achieved a certain level of human capital benefit from FDI inflow and are awarded by higher economic growth. My paper focuses only on SSA being the place where the least developed countries are concentrated and due to general lack of human capital it may be the case that inflow of FDI does not promote long-run growth or can be even harmful.

Reichert, Weinhold (2001) conducted a causality test between FDI and growth and came to very heterogenous results which rather supported the hypothesis of human capital threshold. De Mello (1997) conducted a survey whose results made him to point out two main reasons why FDI should be growth enhancing. Firstly, every investment is accompanied by technology transfer which contributes significantly to the efficiency of the production process. Secondly, FDI also bring some knowledge transfer such as labour training, management skills etc. Alfaro, Chanda, , Kalemli − Ozcan and Sayek (2004) examined the role of financial markets and its impact on relationship between FDI and economic growth. Their analysis showed that improvements on the financial market increases the marginal product of FDI. On the other hand, Carkovic and Levine (2002) did not find any impact of FDI on long-term growth in their study. But generally there is an agreement that FDI enhances

economic growth. This may not be true in case of the least developed countries which are represented by many countries in my sample. Examining the causality between FDI and growth is not a primary issue of this paper but the problem of this causality has to be taken into consideration when analysing market size as one of the determinants of FDI.

Let us forget about mutual causality of FDI and growth and let us look at market size as one of possible determinants of FDI. As mentioned above market size belongs to the most traditional determinants and is included as explanatory variable in all serious papers on FDI determinants.

Asiedu (2000) tested FDI determinants in African countries and included also some non-traditional variables. She came to the conclusion that market size measured by GDP is significant for inflow of FDI. She also points out that market size is rather an uncontrollable factor which cannot be quickly changed as opposed to other factors such as investment-friendly policies.

Market growth

Not only absolute value of GDP is important for potential investors but also growth rate of GDP in recent years is taken into account when making a decision on the location of investment. Growing economy offers higher profits in future which can be grabbed by foreign investors. Again there might be a problem with causalities because increase in FDI amount may enhance growth of GDP. This issue is discussed above and I will look at GDP growth as one of FDI determinants. But before making some conclusions in the end we should have in mind this problem. Taking the possibility of causality into account may help us describe our results more precisely.

There are many papers focusing on the relationship between FDI and economic growth. The results mainly depend on the features of examined countries. Some studies discovered negative effect of FDI on growth for a

sample of developing countries (Griffin 1970). It may be caused by the fact that the majority of FDI are export-oriented and flow mainly into the primary sector. On the other hand there are many studies confirming the positive influence of FDI on economic development.

Natural resources

As we can see from the table below, countries rich in natural resources are more likely to attract foreign direct investments. In 2009 more than half of total investments in SSA countries went to only 4 countries which can be found on the top of the largest oil producers in Subsaharan Africa. Angola as the main FDI recipient received more than one quarter of the total amount of FDI going to SSA in 2009. I should also mention a few facts about Angola. This country suffered from the long lasting civil war which ended in 2002. According to Human Development Index[7] this country belongs to the least developed countries on Earth. Risk of political instability in Angola is still considered not to be negligible. And during the Civil war a large part of local infrastructure was damaged. All above mentioned facts indicate that this country should not be attractive for foreign investors. But as I pointed out earlier Angola can offer huge oil reserves which can explain this „mystery´´. In addition African governments give incentives for investors to come and exploit their natural resources since they receive significant export tax revenue.

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[7] HDI is a composite statistic used to rank countries according to their level of human development. It takes into account GNI per capita, life expectancy and education. (For more information see Human development reports on www.undp.org)

Table 4. Do the oil-richest countries attract more FDI than the others? (2008)

	Oil production (BBL/day)	Ranking (SSA)	Inward FDI (Mil. U.S. Dol.)	Ranking (SSA)
Nigeria	2 211 000	1	6 814	2
Angola	1 948 000	2	16 581	1
Sudan	486 700	3	2 600	4
Congo	274 400	4	1 727	5

Sources: UNCTAD, www.cia.gov

The benefits of resource-seeking FDI for developing countries are disputable. Many studies focusing on relationship between FDI and development suggest that resource-seeking FDI do not bring positive spillovers such as creation of new jobs, technology transfers etc. But exploring this puzzle is not an issue of this paper. In the case of Subsaharan Africa countries natural resources seem to be a crucial determinant of fdi. Unfortunately, natural resources are an uncontrollable factor that cannot be changed or improved by a certain economic policy. But the evidence shows that even natural resource-poor countries managed to attract foreign investors by improving other factors such as investment environment or infrastructure.

Unfortunately many studies did not add natural resources into their analysis of FDI determinants. I think inclusion of this variable is not necessary in case of regions that are generally poor in natural resources, especially oil. But a serious paper focused on African countries most of which belong to the largest producers of oil, copper, gold and other mineral resources cannot omit such variable. Asiedu (2000) pays much of her attention to this variable and she finds a very strong relationship between natural resource endowments and inflow of FDI. This observation implies that resource-rich countries can increase the amount of inward FDI by improving their investment environment.

And how to actually measure natural resource endowments of a host country? I inspired from Asiedu (2000) who used share of fuels on export as a proxy.

Infrastructure

One of the most important determinants of fdi is also quality of local infrastructure. IMF (2002) gathered data which indicated that availability of good quality infrastructure enhances FDI. Firstly, countries with better infrastructure definitely provide better investment conditions. Secondly, developed infrastructure is considered an assumption for long-term economic growth. This also implies that there is a correlation between quality of infrastructure and economic growth which needs to be taken into account. There are more indicators which capture current state of infrastructure. The most common indicator is a number of telephones per 1000 people.

Human capital

It was already mentioned in this study that human capital of host country has impact on benefits from inflow of fdi. Borensztein, Gregorio, Lee (1998) found out that only countries that have reached a certain human capital threshold can benefit from FDI in the long run. I will not deal with this finding in this part and I will rather focus on the role of human capital in location of investments. Nowadays it is not longer true that natural resource-poor country with a small market cannot attract higher amounts of FDI. Foreign investors look not only for cheap labour but also labour with certain skills and knowledge. Pfeffermann and Madarassy (1992) point out that the relative importance of skills and knowledge compared to labour costs has increased significantly. Zhang, Markusen (1999)

guess that when a country becomes sufficiently scarce in human capital, MNE will not be interested in investment even if the unskilled employees worked for free. Lucas (1990) examines why capital does not flow from rich to poor countries. According to diminishing returns to scale marginal product of capital should be higher in countries with lower stock of capital. He claims that this simple economic law does not take into consideration other aspects and one of the most important is the difference in human capital endowment.

But what about empirical evidence? Root and Ahmed (1979) did not find any relationship between human capital endowment and amount of FDI even though they used more indicators as proxies for human capital and skilled labour. Schneider and Frey (1985) find that human capital variable is not significant in explaining FDI inflows. Narula (1985) claims that human capital variable is able to explain extent of FDI in developed countries. On the other hand he does not find any relationship between human capital endowment and FDI inflow in developing countries. Only when the country is developed enough, human skills and knowledge play an important role in attracting FDI. Noorbakhsh and Paloni (2001) came to the conclusion that developing countries should pursuit policies enhancing level of human capital. Countries relying on cheap labour or natural resources will not succeed in attracting FDI into industries with higher added value.

There are many indicators of the human capital that can be used as a proxy of this variable which can seem to be difficult to quantify. Root and Ahmed (1979) used school enrollment ratio. The problem is that this captures rather the current flow than the current stock of human capital.

Macroeconomic stability

Macroeconomic stability is considered to be an important assumption for economic prosperity and is also taken into consideration by foreign investors. If

governments fail to maintain macroeconomic stability they will be seen as non-credible and doing business in such countries will not be attractive. The most common indicator of macroeconomic stability is inflation. High inflation is perceived as a symptom of monetary control loss. Since investors prefer doing business in more stable economies I would expect a negative effect of inflation on FDI. Moreover, it is much more difficult to make investment decisions in countries with totally unpredictable future.

According to World bank study (1993) countries in South-East Asia managed to accumulate large amount of capital due to macroeconomic stability and rapid export growth. Bleaney (1996) finds a negative influence of poor macroeconomic policy and growth associated with low investment inflows. Onyeiwu and Shrestha (2009) claim that inflation can be a disincentive to foreign investors because of its effects on the real effective exchange rate.[8] Rising inflation reduces the REER and foreign investors gain less money after repatriating profits and dividends. Jenkins, Thomas (2002) mention that investors take into account the profitability in the long-run which is undermined by local currency depreciation. We should be aware of the fact that inflation might comprise more information in addition to reflecting stability. Rising domestic prices causes domestic currency to appreciate in real terms and affects negatively exports competitiveness.

Openness to trade

Relationship between openness to trade and inflow of FDI is very difficult to predict. It may seem that the more open the country is the more attractive it is. It is true but only in case of export-seeking FDI. Foreign firms which are not looking for new markets allocate their production facilities abroad because of availibility of natural resources or higher production efficiency. Apart from that

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[8] REER is used to determine currency value relative to other major currencies

the investor will be definitely interested in problems he or she might face when exporting the products. On the other hand, market seeking FDI can be easily attracted by well protected markets, which offer higher market share and also higher profits. Since majority of FDI in SSA occur in countries offering oil, diamonds or gold it is rational to expect positive effect of openness on investments inflow.

FDI stock

As inward FDI are accumulated the total stock of FDI rises and it gives a signal to foreign investors about market attractivity. If many MNEs locate their investments in a certain country, such country is perceived as attractive and other companies follow this trend.

Other determinants

There are many other indicators that are considered by potential investors most of which are difficut to quantify. Political stability is very important because only stable economies can offer quality investment environment and eliminate uncertainty which is crucial for investment decisions. In my analysis, this determinant will be represented by political stability index published by World Bank as on of development indicators.

One of the main restraints for FDI reported by investors was bad regulatory framework. Since it is not easy to quantify this variable I will again use an index pulished by World Bank. Last but not least, foreign enterprises doing business in less developed countries complain that rule of law does not work very well. That is why I will test if this variable matters or not. World Bank database provides me with index on this determinant as well.

6. Econometric model

I gathered data on some of above mentioned variables. My sample includes following Sub-Saharan Africa countries: Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Central African Republic, Cote d´Ivore, Ethiopia, Gambia, Ghana, Guinea, Kenya, Lesotho, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, Seychelles, South Africa, Sudan, Swaziland, Tanzania, Togo, Uganda, Zambia, Zimbabwe. I was limited by availibility of data for indicators and some periods of time. I tested following indicators in period from 1998 to 2008:

	Proxy	Determinant
GDP	Annual GDP (U.S. dollars)	Market size
GROW	GDP growth (%)	Market growth
INF	Inflation rate (%)	Macroeconomic stability
OPEN	Share of X and M on GDP	Openness to trade
INFR	Mainlines (per 100 people)	Quality of infrastructure
FUEL	Share of fuels on exports	Natural resources endowment
STAB	Index published by WB	Political stability
REG	Index published by WB	Regulatory framework
LAW	Index published by WB	Rule of law
STOCK	FDI stock	Market attractivity

- Multicollinearity

Firstly we have to deal with the statistical phenomenon of multicollinearity. This refers to a situation in which two or more explanatory variables are highly correlated. Correlation coefficients showing mutual dependency of two variables can be seen below in the form of correlation matrix.

Table 5. Correlation matrix

	GDP	GROW	INF	OPEN	INFR	STAB	REG	LAW	STOCK	FUEL
GDP	1									
GROW	0,089	1								
INF	0,007	-0,242	1							
OPEN	-0,117	-0,009	0,107	1						
INFR	0,074	-0,066	-0,006	0,541	1					
STAB	-0,177	-0,078	-0,078	0,476	0,53	1				
REG	0,166	0,06	-0,125	0,103	0,386	0,623	1			
LAW	0,003	0,044	-0,102	0,355	0,593	0,832	0,805	1		
STOCK	0,9544	0,095	-0,016	-0,052	0,082	-0,111	0,145	0,018	1	
FUEL	0,3038	0,271	0,009	0,018	-0,125	-0,259	-0,354	-0,433	0,336	1

Source: Author´s calculations

We can see that there is a high correlation between three pairs of variables. The variable called Rule of Law is highly correlated with Political Stability and Regulatory Framework. This seems to be intuitive since in politically stable countries with quality regulatory framework the rights are better protected and can be easier enforced. For this reason, the variable on Rule of Law will be omitted in my regression.

Another pair of highly correlated variables includes GDP and Stock of Inward FDI. The mutual dependency of these explanatory variables was expected and provides support to some above mentioned ideas. Firstly, large markets provide more opportunities for FDI and are less likely to become saturated. Secondly, inward FDI promote economic growth and have positive long-run impact on GDP. Due to high correlation FDI stock will not be included in the model.

- **Simple pooled OLS model**

Let us consider the following model:

$$y_{it} = X_{it}\beta + u_{it}$$

Where y_{it} is the observation on the dependent variable for cross-sectional unit i in period t, X_{it} is a 1 x k vector of explanatory variables for unit i in period t, β is a k x 1 vector of parameters and u_{it} is a disturbance term specific to unit i in period t.

Using Gretl software I obtained following estimations for vector of parameters β:

Table 6. OLS model - results

	Coefficient	St. Error	t-value	p-value
const	-951,561	343,162	-2,773	0,0060 ***
GDP	9,80E-09	1,52E-09	6,467	6,17e-010 ***
GROW	118,421	24,9712	4,742	3,76e-06 ***
INF	-5,55747	4,2399	-1,311	0,1913
OPEN	11,3133	3,17134	3,567	0,0004 ***
INFR	-3,05148	1,95193	-1,563	0,1194
FUEL	20,0868	3,98518	5,04	9,57e-07 ***
STAB	-5,17396	6,59787	-0,7842	0,4338
REG	-8,97099	8,14515	-1,101	0,2719
$R^2 = 0,496260$				
Adjusted $R^2 = 0,478269$				

Source: Author´s calculations

When using OLS model we should check if certain assumptions hold. By excluding two variables which caused multicollinearity, we ensured that there are no variables in our model that are highly correlated. Another assumption of

OLS model is normality of residuals. After looking at the Q-Q plot we can conclude that residuals are not normally distributed. And the assumption of homoskedastiticy does not hold as well.

P-values in the last column show which variables are statistically significant. Since the p-values are either very small or quite high it will be very easy to make conclusions concerning their significance. The group of strong variables is composed of GDP, GDP growth, Openness to trade and Share of fuels on total merchandise exports. These finding support trends which can be observed in SSA countries in the past decade. Countries with large and quickly growing markets, resource-rich countries and countries open to trade are the most likely to attract large amounts of FDI. Variables describing both economic and political stability proved as non-significant which may be a bit surprising.

On the other hand, we have to keep in mind that proxies for those stabilities may not be the most suitable. According to the results infrastructure is also not important for foreign investors. Morover, the parameter does not have the expected sign. I assumed that countries offering quality roads, railways and ports were more successful in attracting FDI. The negative relationship can be explained in such a way that countries lacking basic infrastructure fill this gap by investments from abroad. We have seen this trend in recent years when China has invested a lot in Africa, especially in infrastucture.

- **OLS model using only significant variables**

In the previous model, I identified the most important determinants of FDI. Now, I will build up a model using only those variables which showed certain power in explaining inward FDI. Only proxies for market size, market growth, natural resources endowment and openness to trade will be considered. In this

case, I take natural logarithms of both dependent and explanatory variables. The model looks as follows:

$$log\ FDI_{it} = \beta^0 + \beta^1.log\ GDP_{it} + \beta^2.log\ GROW_{it} + \beta^3.log\ OPEN_{it} + \beta^4.log\ FUEL_{it}$$

Using OLS I obtained estimations of parameters $\beta^0, \dots, \beta^4$. Those parameters are actually elasticities expressing what percentage change in dependent variable is caused by a change of one per cent in a certain explanatory variable all other things being equal. Their values and significance is depicted in the table.

Table 7. OLS model - results

	Coefficient	St. Error	t-value	p-value
const	-30,2769	2,40022	-12,61	7,76e-028 ***
log GDP	1,11485	0,0878472	12,69	4,41e-028 ***
log GROW	0,410246	0,16776	2,445	0,0152 **
log OPEN	1,92159	0,216266	8,885	2,27e-016 ***
log FUEL	0,157603	0,0521536	3,022	0,0028 ***
$R^2 = 0,571521$				
Adjusted $R^2 = 0,563766$				

Source: Author´s calculations

Statistical significance was confirmed for Market Size, Natural Resources, Trade Openness and also economic growth. The value of coefficient of determination is 0,572 which is higher than in the previous model.

Now we should check if the model used was appropriate. The pooled OLS model is adequate in case the intercepts do not vary across the units. Let us conduct an F-test testing the null hypothesis, that the difference between intercepts related to each unit is not statistically significant. The very small p-

value counts against the null hypothesis and in favor of the fixed effects model which allows the intercepts of each unit to differ.

We will also check the suitability of random effects model. We can use Breusch Pagan test with the null hypothesis that the pooled OLS model is adequate. Its very small p-value tells us that we should reject the null hypothesis in favor of the random effects model.

We rejected the pooled OLS model against both of the alternatives. The question which models is more adequate can be addressed by Hausman test. If the unit- or group-specific error is uncorrelated with the independent variables, the random effects estimator is more efficient. If there is not such a correlation the random effects estimator is inconsistent and we should prefer the fixed effects model. The null hypothesis to be tested is that the random effects estimator is consistent. The low p-value indicates that the null hypothesis is rejected in favor of fixed effects model.

- **Fixed effects model with robust standard errors**

Now let us consider a more sophisticated fixed effects model with robust standard errors. As opposed to the simple pooled OLS model, fixed effects model decompose the error term u_{it}. We write $u_{it} = \alpha_i + \varepsilon_{it}$ which yields

$$y_{it} = X_{it}\beta + \alpha_i + \varepsilon_{it}$$

We decomposed the error terms into time-invariant components α_i and error terms ε_{it} which are specific to each observation. We treat α_is as fixed parameters which are to be estimated. In this model we avoid the problem of heteroskedasticity by using robust standard errors. The results are summarized below:

Table 8. Fixed effects model - results

	Coefficient	St. Error	t-value	p-value
const	-13568,2	3394,9	-3,997	9,17e-05***
GROW	107,707	45,695	2,357	0,0194**
INF	-10,5728	4,34841	-2,431	0,0160**
OPEN	14,1921	4,09519	3,466	0,0007***
FUEL	15,2927	4,89795	3,122	0,0021***
STAB	-8,14467	4,64088	-1,755	0,0809*
REG	-16,3419	5,67157	-2,881	0,0044***
INFR	0,229838	0,9482	0,2424	0,8087
log GDP	565,971	141,904	3,988	9,47e-05***
$R^2 = 0,532665$				
Adjusted $R^2 = 0,432347$				

Source: Author´s calculations

When using OLS model we should check if certain assumptions hold. We eliminated the problem of heteroskedasticity by using robust standard errors. By excluding two variables which caused multicollinearity, we ensured that there are no variables in our model that are highly correlated. Another assumption of OLS model is normality of residuals. After looking at the Q-Q plot we can conclude that residuals are not normally distributed.

The table 8 reports fixed effects regression results. We can see that 6 out of 8 explanatory variables are highly significant at a conventional level. The market size measured by GDP was confirmed as very important for FDI inflow. This is not surprising because large markets offer more opportunities for investments. In the literature it is sometimes standard to use the ratio of FDI and GDP as dependent variable. I did not choose this way and thus the significance of the market size is very high because it includes two types of information. Firstly, it reflects the simple fact that bigger markets provide more possibilities for foreign investors. The second piece of information is known as economies of scale. In other words, your resources can be used more efficiently in countries with bigger production. This implies that including GDP as explanatory variable is rational even though we try to explain the ratio of FDI and GDP.

Openness to trade proved to be very significant and the positive coefficient reflects the fact that majority of FDI flowing to SSA are resource-seeking. The purpose of exploiting natural resources is to export them to more developed countries and this is more difficult in economies with significant trade restrictions. Economies offering natural resources are often dependent on their mining sector and without being open to trade they would give up their major economic potential.

As I expected share of fuels on export plays an immense role in attractivity for foreign investors. This fact is very clear after observing FDI trends in oil-rich countries such as Angola or Nigeria. On the other hand, long-term benefits of resource-seeking FDI are disputable and as discussed above some economists even talk about *natural resources curse* or *natural resources trap.*[9]

Regulatory framework is statistically very significant but negative sign of the parameter was not expected. The only explanation I can think of is that governments of countries possessing natural resources create generally worse institutions than countries poor in fuels and minerals. If a government cannot rely on revenues from natural resources it is forced to build up quality institutions in order to collect money by taxing its citizens. To some extent, this interesting phenomenon is confirmed by negative correlation between proxies for regulatory framework and natural resources endowments.

Economic growth also proved to be important for FDI and positive sign of the coefficient suggests that growing markets attract more attention of investors than stagnating economies.

Inflation, an indicator of macroeconomic stability, also seems to play an immense role. The uncertainty is crucial for investment decisions and governments following unpredictable monetary and fiscal policies discourage companies from locating their FDI in such countries.

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[9] For more information see chapter 3.4

- **Fixed effects model with Share of FDI on GDP as dependent variable**

It is sometimes standard in the litarature to use share of FDI on GDP as dependent variable. This approach better reflects the attractivity of a country for foreign investors and based on this statistic we can say which countries are more successful and which of them failed. As we will see the statistical significance of some variables changes dramatically.

Table 9. Fixed effects model explaining FDI/GDP - results

	Coefficient	St. Error	t-value	p-value
const	7,84882	4,27924	1,834	0,0682*
log GDP	-0,374246	0,20056	-1,866	0,0636*
GROW	0,113109	0,05165	2,19	0,0298**
INF	-0,0085505	0,00788	-1,084	0,2795
OPEN	0,0284496	0,00787	3,613	0,0004***
INFR	0,00123198	0,00264	0,4667	0,6412
FUEL	0,0344135	0,01101	3,126	0,0020***
STAB	-0,0035604	0,01154	-0,3084	0,7581
REG	-0,0122963	0,01875	-0,6558	0,5127
$R^2 = 0,539256$				
Adjusted $R^2 = 0,440353$				

Source: Author´s calculations

Applying model with robust standard errors the problem of heteroskedasticity was eliminated. The problem of mulitcollinearity is not relevant because pairs of highly correlated variables were excluded from the model. However, it can be seen from the Q-Q plot that residuals are not normally distributed.

Natural resources, openness to trade and GDP growth proved to be significant at a conventional level. More detailed description of results can be found at the end of this chapter.

- **OLS model explaining cummulated FDI**

We can observe large fluctuations in inward FDI for individual years. It might be more appropriate to accumulate FDI inflow during a longer period of time and build up a model explaining this variable. I will do it with the aim to capture the FDI trend. Averages of FDI determinants will be used as explanatory variables. After getting results, I excluded the least significant variables and conducted the regression again. Table 10 reports the results.

Table 10. OLS model explaining cummulated FDI - results

	Coefficient	St. Error	t-value	p-value
const	-27417,3	7410,5	-3,7	0,0011***
log GDP	1144,94	328,343	3,487	0,0018***
GROW	269,444	137,514	1,959	0,0613*
INF	-99,5848	62,4682	-1,594	0,1235
OPEN	17,7126	6,24851	2,835	0,0089***
FUEL	15,3229	10,6737	1,436	0,1635
REG	-29,261	18,9134	-1,547	0,1344
$R^2 = 0,725980$				
Adjusted $R^2 = 0,660215$				

Source: Author´s calculations

For reasons mentioned above, problems of multicollinearity and heteroskedasticity are not relevant. Conducted tests suggest that residuals have normal distribution.

Market size and openness are the only significant variables. On the other hand natural resources did not prove statistical significance.

- **Summary of econometric models**

Several models were employed to discover which variables are important for FDI. As a dependent variable, FDI inflow or ratio of FDI and GDP can be used. In the first two models explaining FDI inflow, statistical significance of the market size is expected and was confirmed. The third model explains the ratio of FDI and GDP. In this case, FDI inflow is adjusted to size of the economy and better reflects attractivity of individual countries.

The simple pooled OLS model confirmed statistical significance of market size, market growth, natural resources and trade openness. After finding out that the fixed effects model is more appropriate, we applied this model on the same data. The results supported the importance of all variables identified in the polled OLS model and added inflation as another significant indicator. The

Fixed effects model explaining the ratio of FDI to GDP led to the conclusion that market growth, natural resources and trade openness have the major impact on FDI. The last model explains cummulated FDI in observed period. Market size and trade openness were significant again but natural resources did not prove any significance.

The statistical significance of market size, trade openness and natural resources allows us to make some conclusions. The importance of market size is very intuitive and was expected. This finding is supported by many previous papers on FDI determinants regardless of examined region. On the other hand, significance of natural resources is specific to the region of Sub-Saharan Africa. Together with the result on trade openness this fact allows us to claim that SSA countries succeeded in attracting resource-seeking FDI. Growth of GDP also seems to play a certain role. In this case, we should be aware that inward FDI can stimulate GDP and to some extent, market growth can be rather a result than a cause of FDI flows. Other variables either proved to be insignificant or they did not have the expected sign and thus their role cannot be easily explained.

- **Policy recommendations**

After receiving results and identifying significant variables, implications for economic policy can be derived. It should be taken into account that majority of FDI flowing to SSA are resource-seeking. By changing market size or natural resource endowments, countries would definitely attract more FDI. Unfortunately, these factors cannot be changed by government actions. On the other hand, governments can attract more FDI by creating favourable environment for resource seeking investors. Modernizing mining codes can make business much easier and will be followed by new investors coming to the economy. Trade liberalization could be another step towards an increase in FDI. Investors are interested in resources most of which will be exported and too many trade barriers and other restrictions discourage them.

- **Areas of future research**

Trends in FDI flows around the world are changing and developing markets seem to play more important role than they used to. For that reason, we can expect foreign companies to be more interested in less common regions such as Africa. This behavioral change is likely to influence the importance of individual determinants. Exploring the statistical significance by more sophisticated methods and including better proxies on some indicators would definitely bring more accurate implications.

7. Conclusion

The objective of this paper was to identify the main determinants of FDI in Sub-Saharan Africa countries in the past decade. I was limited by data availibility for some indicators which could also play a certain role. More econometric models were employed and they generally led to the conclusion that market size, openness to trade and natural resources endowment are very significant determinants of FDI. To some extent, this result confirmed the hypothesis that majority of FDI flowing to SSA countries are resource-seeking. Without opening up to the world market and promoting trade SSA countries are not likely to attract foreign investors. Natural resources endowment is given to each country and cannot be changed. Countries which cannot attract investors by natural resources have to focus on other areas such as business environment, corruption and FDI incentives. The most important question is whether it is actually desirable to attract as much FDI as possible. The experience of some countries shows that rather quality of FDI than its quantity matters. Countries with natural resources as the only incentive for FDI have not experienced any improvement in other areas of FDI and are likely to remain an oil, gas or diamonds field of developed countries. On the other hand, FDI accompanied by spillovers can boost productivity of domestic producers and contribute to economic development. Policy recommendations include trade liberalization and modernizing mining and other investment codes.

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