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FDI inflows to Sub-Saharan Africa

- An empirical study over SACU's impact on FDI

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Abstract

Some of the world's poorest countries are located in Sub-Saharan Africa. FDI inflows have the potential to over time accelerate economic growth. Since domestic investments are typically scarce in developing and emerging countries, FDI is necessary in order to pursue economic growth. Using panel data for 40 countries in Sub-Saharan Africa during the period 1996-2011, this study investigates the impact of the free trade agreement SACU on FDI inflows to member countries. By combining results from two different fixed effect models, it is concluded that SACU has a positive and indirect influence on FDI inflows to member countries through the channel openness. FDI can be seen as a positive external effect from a free trade agreement. This is important information for developing countries trying to grow and integrate into the global economy.

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List of abbreviations

COMESA Common Market for Eastern and Southern Africa

EAC East African Community

ECOWAS Economic Community of West African States

EU The European Union

FDI Foreign Direct Investments

FE Fixed effects

LSDV The Least Squares Dummy Variable method

SACU Southern African Customs Union

SADC Southern African Development Community

WTO World Trade Organization

UN United Nation

1. Introduction

Foreign direct investments (FDI¹) are generally presumed to be valuable both for the host country and for the investor. When investors seek to invest with low risk and the highest possible return, a primary benefit of FDI is that money is allowed to flow freely to businesses with good growth prospects in any part of the world (Amendo, 2013). Many countries have reduced or eliminated policies and restrictions in order to attract an increased level of FDI (Kok and Ersoy, 2009).

There are various empirical studies showing a positive relationship between FDI and economic growth, demonstrating the importance of FDI for local as well as global growth. Azam (2010) suggest that FDI inflows have the potential to accelerate economic growth over time. Whereas Adhikary (2011) argues that the volume of international capital and the magnitude of capital formation are essential factors for increasing a country's economic growth.

Capital streams to developing countries are usually seen as beneficial for all parties. The capital rich investor can diversify its own risk when investing in productive assets that will, if well chosen, grow in returns for future decades. For the host country the investments can promote economic growth, but also bring new technology, business skills, and experienced management into the country (Guillermo et al., 1996).

Some of the world's poorest countries are located in Sub-Saharan Africa (Bosker and Garretsen, 2012). In many of these countries development is argued to proceed in the right direction. During the last decade, six of the ten fastest-growing economies in the world were located in Sub-Saharan Africa. (The Economist, 2011). In 2011 FDI inflows to Sub-Saharan Africa increased from USD 29 billion in 2010 to USD 37 billion, which is comparable with the peak in 2008 (Unctad, 2012). *"The continuing rise in commodity prices and a relatively positive economic outlook for Sub-Saharan Africa are among the factors contributing to the turnaround"* (Unctad, 2012, p 16). Lund et al. (2010) argues that the collective long-term prospects for Africa are strong, but countries face different growth trajectories; *"...our analysis suggests that Africa has strong long-term growth prospects, propelled both by external trends in the global economy and internal changes in the continent's societies and economies"* (Lund et al., 2010, p 4).

A functional free trade area increases countries market size, making it an important factor for attracting FDI (Jenkins and Thomas, 2002). Free trade areas are likely to increase trade volumes because of policy changes aimed to liberalize trade, and larger trade volumes are associated with economic growth. Hence, a functional free trade area is likely to enhance growth both through larger trading volumes and through increasing levels of FDI. However, literature on developing

¹ The definition used in this paper is: *"An investment made by a company or entity based in one country, into a company or entity based in another country. Foreign direct investments differ substantially from indirect investments such as portfolio flows, wherein overseas institutions invest in equities listed on a nation's stock exchange"*. (OECD, 2008)

countries investigating whether members of free trade areas really are attracting more FDI than non-members is scarce. This is the research gap attempted to be filled with this paper. *The paper investigates developing countries, with the foremost aim to study the impact of a free trade agreement on FDI inflows to member countries.* The issue is essential since developing countries, having typically small levels of national investments, are in need of investments from foreign countries. Since FDI is associated with economic growth, one should try to distinguish its determinants and possible channels through which it is influenced. If free trade agreements actually increase FDI inflows to member countries, this is important information for developing countries when trying to grow and integrate into the global economy. With the intention to answer the paper's foremost aim, specified below as the third question, two other research questions are stated first. Those two questions in combination will be used to answer the third question.

- What factors are important for attracting FDI inflows to developing countries?
- Do members of a free trade agreement in developing countries become more open² after the agreement has come into force?
- Does a free trade agreement in developing countries affect FDI inflows to member countries?

On October 21, 2002, the Southern African Customs Union (SACU) signed a free trade agreement that came into force in 2004. Their member countries are Botswana, Lesotho, Namibia, South Africa and Swaziland (WTO, 2013-04-05). The free trade agreement SACU is suitable to utilize in order to answer the research questions above. To our knowledge there is no research which has been carried out studying the impact of the SACU free trade agreement on FDI. This study will hence address its aim by investigating important determinants for attracting FDI³ to Sub-Saharan Africa, and specifically by studying the free trade agreement SACU's impact. If a positive relationship is found between a free trade agreement and FDI; FDI might be a positive external effect from the free trade agreement.

In order to introduce the reader to the subject, background and literature review will be presented next, before the working hypotheses that relate to the research questions are presented. The hypotheses are followed by a description of the empirical models, presentation of the utilized variables as well as explanation of data. The paper ends with presentation of the results as well as a discussion regarding the results and their consequences for international trade and FDI inflows to developing countries. The importance for influencing possible policy changes in the future is also discussed.

² Definition of openness: $((\text{imports} + \text{exports}) / \text{GDP}) * 100$ for country i in year t

³ FDI in this paper is foreign direct investments from the entire world, including from other countries in Sub-Saharan Africa and in the SACU area, to countries in Sub-Saharan Africa

2. Background

2.1 The importance of FDI for development

Investments are essential for economic performance, especially for creating new job opportunities as unemployment is strongly linked to poverty. FDI is necessary in order to create development when domestic investments are limited. (Jenkins and Thomas, 2002). Africa is starting to become more attractive for multinational firms. In a survey from 2012 made by Invest AD, Africa was perceived as the most attractive region for investments. There is a fast growing middle class, which is one of the reasons to why there has sprawled an increased interest from foreign firms (Svd, 2012). Compared to other developing areas, investments are still quite small and domestic investments within the region are also poor. According to Jenkins and Thomas (2002) this is a response to the disappointment of the governments' failure to create an investor friendly environment. Other explanations are low production, corruption, transport insufficiencies, poor telecommunication networks, and a closed trade policy (Collier and Gunning, 1999). According to Jenkins and Thomas (2002), the primary disincentives for foreign firms to set up in Sub-Saharan Africa are the perception of poor governance, lack of access to foreign currencies, and volatile exchange rates. Kinda's (2013) policy suggestion for Sub-Saharan Africa is to focus on infrastructure, institutions, and trade regulations. Jenkins and Thomas (2002) and Kinda (2013) have found the following variables to be the ones most frequently correlated with increased FDI in Africa; economic openness (especially to international trade), economic growth and stability, the quality of institutions, and the physical infrastructure in a country.

FDI might generate positive externalities for the host country, but these externalities do not always come automatically. To ensure the expected benefits on poverty alleviation and social welfare, one has to maintain certain levels of institutional quality, access to infrastructure etc. Some possible positive externalities are; development of human capital, improved access to the world market, tax revenues and employment creation. (Jenkins and Thomas, 2002).

South Africa is the country in Sub-Saharan Africa receiving the highest levels of FDI inflows. One of the reasons for those high levels is the market size of South Africa. According to Jenkins and Thomas (2002) the size of the local market is the single most important factor for investing in the southern parts of Africa. Market size is especially important for multinational companies that are not only producing for exports but are also interested in expanding to new markets. A functional free trade area increases countries' market size and hence becomes an important part in attracting horizontal⁴ FDI.

If enlarged openness to trade increases a country's inflow of FDI cannot be determined with certainty. Different evidence shows either a negative or a positive influence on FDI from increased openness. Tariff jumping is the concept usually disused when this subject is discussed.

⁴ Horizontal FDI is when a foreign firm is producing in a country with the aim to access the local market.

Tariff jumping is when foreign firms locate their production in a host country with the intention to avoid a trade barrier with the country. (Bloningen et al., 2004). A consequence may be that foreign investments decrease when a country opens up for trade. The reason is that foreign firms can trade instead of making direct investments in that country in order to access the desired market.

2.2 Free trade agreements and Sub-Saharan Africa

There are a few different free trade areas⁵ located in Sub-Saharan Africa. The focus of this paper is on an agreement with a reasonably long history, making it possible to evaluate its effect on FDI inflows. The agreement in focus is SACU. With a history dating as far back as 1889 SACU was the oldest custom union in Africa, today they have a free trade agreement with common external tariffs. (SACU, 2013-04-06). SACU was not a fully functional custom union. It included tariffs, excise and sale duties on goods. But these trade barriers were changing from time to time before the new agreement in 2004. The free trade agreement was signed October 21, 2002, but did not come into force until July 15, 2004. The agreement includes goods and services but not investments. A free movement of domestic products within the area is allowed, which also includes goods that are imported from outside the area and sold to other member countries. Member countries have the right to impose restrictions on domestic products due to protection of humans' health, animals, plants, and the environment. (SACU, 2013-03-26).

There are two reasons for choosing SACU as the research object. Firstly, the agreement came into force in 2004, providing large enough time periods before and after the policy change in order to conduct the study. Secondly, it is a functioning free trade area, which is not the case with other agreements in Sub-Saharan Africa. The agreements that will be discussed further down in this section are not functioning free trade areas. However, they can still have some influence on trade within the Sub-Saharan region.

SACU's vision is;” *An economic community with equitable and sustainable development, dedicated to the welfare of its people for a common future*”. The area is trying to establish this vision by working with regional integration through politics, economy, and trade. SACU's goal is to reach a sustainable economic growth within the area, development for employment creation, poverty reduction, and a higher global competitiveness. (SACU, 2013-03-25).

In recent times it is common for these kinds of free trade agreements to also include investments, that is, that there are no regulations on investments. SACU has not included investments yet, so for SACU, both member countries and all other countries face the same investment conditions. It is therefore possible to test free trade areas' influence on FDI inflows. If investments had been included, the possible increase in FDI could originate from member countries because of the free flow of investments, which might have nothing to do with the free trade agreement.

⁵ The World Trade Organization's (WTO) definition of a free trade area is: “Trade within the group is duty free but members set their own tariffs on imports from non-members” (WTO, 2013-04-03).

All SACU members are also members of the Southern African Development Community (SADC⁶). SADC's main goal is to increase development through cooperation between its members. One aspect of fulfilling their goal is to enhance cooperation in trade and investments between member countries. (SADC, 2013-03-25). SADC signed an agreement in 1996 with the aim to remove all trade barriers, but this has taken a long time and it is still not a functioning free trade area. Since SADC came into force in the beginning of our investigation period, it will not influence effects measured in this study. If SADC had any influence on trade or FDI inflows its effects will happen already the first year of analysis, and will hence not be measured as a change in the econometric models.

There are other free trade agreements between countries in Sub-Sahara Africa as well as with other countries outside of the region. One is an agreement between SACU and EFTA. They signed a free trade agreement including goods, which came in effect on May 1, 2008. Because it happened so recently it should not have any influence on the analysis of this paper. Furthermore, South Africa has a free trade agreement with the EU, which came into force January 1, 2000. (WTO, 2013-03-25). There is also cooperation between SADC, Common Market for Eastern and Southern Africa (COMESA) and East African Community (EAC). They announced the African Free Trade Zone (AFTZ) on October 22, 2008. AFTZ is not yet a functioning free trade area. Agreements not yet functioning as well as the ones which came into effect recently will most likely not influence this analysis.

⁶ Member countries of SADC are; Angola, Botswana, Lesotho, Malawi, Mauritius, Mozambique, Namibia, South Africa, Swaziland, Tanzania, Zambia, Zimbabwe, DR Congo, Madagascar and the Seychelles (WTO, 2013-03-25)

3. Literature review

3.1 Theoretical Background

FDI has been discussed and analyzed for a long time. There are several different theoretical explanations behind motives and determinants of FDI. For instance, Hymer (1976) was looking at FDI from an industrial organization theory point of view. FDI comes from the fact that foreign firms receive firm-specific advantages outweighing disadvantages that may exist in the host country. This theory mainly answers the question; why firms invest in other countries than the mother country, not where firms will invest (Forsgren, 2008). This paper investigates determinates for where companies will invest and especially if free trade agreements are important for the decision on where to invest.

Borsos-Tostila (1999) distinguishes between three levels of analysis on which studies in the theoretical field are based. The first level is microeconomic analysis, which is derived from the theory of the firm; it investigates FDI from the perspective of an individual firm. The second level is macroeconomic analysis based on theories of trade, location, and the balance of payment and exchange rate effects. The macroeconomic level examines broad national and international trends. The third level is mesoeconomic⁷ analysis, which applies theories based on game theory, industrial economics, and theory of innovation. This level considers the interaction between firms at an industry level.

Different types of FDI require different explanations. The theory used should reflect the question asked. For example, both the form of FDI and the motives of the investors have implications for deciding the location. There are different levels of commitment for the investor, e.g. joint venture, acquisition or greenfield⁸. Moreover, there are four main motives for firms to invest in other countries; market-seeking FDI, resource- or asset- seeking FDI, efficiency seeking FDI, and knowledge seeking FDI (Markusen et al., 1995). These motives are strongly connected to another way of dividing FDI into two different types, namely horizontal and vertical FDI.

Horizontal FDI is when foreign firms produce in a country with the intention to access the local market (market seeking). This kind of FDI often involves duplication of the entire production process (with the exception of headquarter services) across multiple countries. (Blonigen et al., 2005). Vertical FDI is when foreign firms produce in a country with the intention to export the goods (cost seeking). Different determinants are important for the host country in order to attract either of these two types. To attract horizontal FDI, high trade regulation, good infrastructure and institutional quality are important factors. Gains in strategic advantages (intangible assets) and trade costs are important to those investors, since they can offset costs of setting up a new plant.

⁷ Mesoeconomic is the study of economic agreements that are not based on either macroeconomics (the reasoning of aggregate totals of demand) or microeconomics (that is based on supply and demand), but instead on the importance of what structures these forces play out.

⁸ Greenfield is when a company starts a new venture in a foreign country by constructing new operational facilities from the ground up.

Financial factors, human capital, and factor costs are crucial for attracting vertical FDI; those factors are mainly deciding the location of investments. (Kinda 2013).

Attracting FDI is a key concern both in the developing and developed world. The investment climate is of high importance for developing countries in order to attract FDI. Foreign firms investing to reach the local market are to a high extent affected by financing constraints, such as financial infrastructure. Foreign firms investing in a host country to export its goods are on the other hand more affected by physical infrastructure problems. Improvement of physical and financial infrastructure in developing countries hence improves the probability of receiving FDI. (Kinda, 2010).

3.2 Empirical Literature

When investigating inward FDI to developing countries one can choose between two different approaches; either to use national data and a macroeconomic approach, or to adopt the microeconomic approach using company data (Barros et al., 2013).

Most of the literature that are analyzing FDI from developed countries to emerging or developing countries, typically examines and finds the following variables fundamental; domestic capital stock, economic growth, employment protection, export, knowledge capital, location choice, multinational characteristics, production spillover, and technology transfer (Barros et al., 2013).

Groh and Wich (2012) conclude four different groups of factors playing an important role when absorbing FDI; economic activity, the legal and political system, the business environment, and infrastructure. Another factor that can be added is history. Wei (1995) argues that transaction costs of businesses are important and that ethnical background and history helps to reduce this cost. Another set of factors often mentioned in this context is gravity factors including e.g. distance. Demekas et al. (2007) argue that the gravity factors are important, but that factors such as decline in trade barriers and labor costs can also increase inward FDI. During the last decades the type of FDI flowing to developing countries has changed its pattern. Today foreign investments to developing countries are largely vertical. (Buthe and Millner, 2008)

More about results from earlier empirical studies on FDI in developing countries are discussed in the section about variables.

Baltagi et al. (2008) investigate the impact of regional trade agreements on bilateral FDI. They study trade liberalization between Western Europe versus Central and Eastern Europe. They showed a strong reallocation of bilateral outward FDI from Western Europe into Central and Eastern Europe. There are also other studies looking at the impact of trade agreements on FDI in developed countries. Blomström and Kokko (1997) found a negative impact of the US-Canada Free Trade Agreement on the bilateral FDI but an increment in inward FDI flows from outside the region. Papers Levy et al. (2003a and 2003b), analyze the impact of region integration and find that it has to have a harmless effect on FDI. Their explanation is that the utilized models do

not take in to account the different types of FDI (horizontal or vertical). However, they still argue that members of a trade agreement are more attractive towards foreign investors than other countries are.

Rose (2004) concludes that there is little reason to believe that agreements like the General Agreement on Tariffs and Trade (GATT) and institutions like the World Trade Organization (WTO) have had a remarkable effect on trade. Taking standard gravity effects in to account, there is no link between bilateral trade and membership. But if countries are located in a free trade area or parts of a similar type of agreement, there is an increasing impact on trade. Baier et al. (2007) find a free trade agreement to, on average, double members' bilateral trade over a ten year period. They also conclude that the most effective way to estimate the average effect of a free trade area on bilateral trade flows is to use panel data utilizing country- and time- fixed effects with or without a differenced panel. The theoretical motivation for this is obtained from the gravity equation.

Blonigen (2000) looked at tariff-jumping response of all firm and product combinations subject to U.S. antidumping investigations from 1980-1990. He found that tariff-jumping is only a realistic option for multinational firms from industrialized countries. Nunnenkam (2002) shows that tariff-jumping motives in developing countries lost much of its relevance well before globalization became an intensely debated issue.

This paper seeks to answer whether a free trade agreement has an impact on FDI inflows for members in areas with developing countries. The studies discussed above are all on developed countries. Additionally, a large part of earlier research is more focused on bilateral FDI. This paper's contribution to literature is to answer how a free trade agreement affects inflows of FDI to developing countries by investigating the effect of SACU on FDI. The research questions from the introduction are now stated once again to simplify reading, followed by working hypotheses.

- What factors are important for attracting FDI inflows to developing countries?
- Do members of a free trade agreement in developing countries become more open after the agreement has come into force?
- Does a free trade agreement in developing countries affect FDI inflows to member countries?

3.3 Working Hypotheses

Based on critical analysis of previous research, the following hypotheses are formulated that relate to our research questions. The hypotheses are specified in order to suit our research subjects; Sub-Saharan Africa and the free trade agreement SACU.

H₁: Important determinants of FDI to countries in Sub-Saharan Africa are GDP growth, openness, infrastructure, natural resources, inflation, international reserves, political rights, real interest rate, and SACU.

H₂: The SACU free trade agreement has increased openness for its member countries.

H₃: The free trade agreement SACU has had a positive influence on FDI inflows to member countries.

In order to address the stated research questions and attempt to find evidence for its related hypotheses, empirical models designed to answer these questions are now to be presented.

4. Empirical models

The third question cannot be approached immediately, but requires estimation of two different empirical models. Model I relates to the first hypothesis, with the aim to identify important factors for attracting FDI inflows to member countries. Model II relates to the second hypothesis, aiming to explore how SACU influenced openness of member countries. These two models together seek to answer to the main question by searching evidence for the third hypothesis; whether the free trade agreement SACU has affected FDI flows to member countries.

Panel data is used for 40 countries in Sub-Saharan Africa over a period of 16 years (1996-2011). The two models are presented below, and followed in next section by a review of the variables. The review contains earlier findings as well as discussions about how these variables are important for this particular study.

4.1 Model I

Estimation of model I is as follows:

$$FDI_{it} = \beta_0 + \beta_1 GDP_gr_{it} + \beta_2 Infl_{it} + \beta_3 Real_in_{it} + \beta_4 Open_{it} + \beta_5 Reserve_{it} + \beta_6 Pol_r_{it} + \beta_7 Infr_{it} + \beta_8 Nat_re_{it} + \delta_9 SACU_{it} + \mu_i + \gamma_t + \varepsilon_{it}$$

Where,

FDI_{it+1} = Net FDI inflows as percentage of GDP in country i year t

GDP_gr_{it} = GDP growth (annual %) in country i year t

$Infl_{it}$ = Inflation as consumer prices (annual %) in country i year t

$Real_in_{it}$ = Real interest rate (%) in country i year t

$Open_{it}$ = Openness of a country. Measured as ((imports + exports)/GDP)*100 in country i year t

$Reserve_{it}$ = International reserves. Measured as percentage of GDP in country i year t

Pol_r_{it} = Political rights. Measured on an index from 1 to 7 in country i year t

$Infr_{it}$ = Infrastructure. Measured as telephone lines per 100 people in country i year t

Nat_re_{it} = Total natural resources rents (% of GDP) in country i year t

$SACU_{it}$ = Dummy variable for SACU members (1 for post-SACU member and 0 otherwise) in country i year t

μ_i = The within country fixed effect

γ_t = The within period fixed effect

ε_{it} = The time-varying error term

The model is estimated using a two-way fixed effects approach; controlling for time-constant country effects for each land, and time trends in form of four different time-periods (1996-1999, 2000-2003, 2004-2007, 2008-2011). The time invariant error term μ_i is specified with only a country subscript, indicating only a change with each country i but not across time ($i=1,2,\dots,n$).

The country invariant error term γ_t is specified with only a time subscript, indicating that it only changes with time t but not across countries ($t=1,2,\dots,T$).

One reason behind implementing a fixed effects model is the need to control for unobserved heterogeneity⁹. Wooldridge (2008) refers to the time constant error term, in our case μ_i , as the unobserved effect or as unobserved heterogeneity. OLS will be biased and inconsistent if μ_i or γ_t are correlated with the explanatory variables in the model. When some part of the error term is correlated with x_{it} pooled OLS will suffer from heterogeneity bias.

There are reasons to assume that country- and time-specific factors affect FDI inflows to countries in Sub-Saharan Africa, and that these factors are fixed. Existing unobserved country effects are factors like geographical location, history and other unmeasured country specific factors constant over a long period of time. Also, sixteen years is a long time for an area in transformation. Hence one must also assume presence of unobserved time-trends within countries during the investigation period. Each period is assumed to possess effects specific for that particular time-period. The division of data into four-year periods in form of period-dummies is an attempt to capture these time-trends. These country- and time fixed effects must be included in the model; hence a good approach is to estimate a two-way fixed effects model controlling for unit fixed effects (country) and time fixed effects (time-period). An advantage of this approach is that a fixed effects model reduces concerns over omitted variable bias. All time-invariant and country-level factors as a source of omitted variable bias are ruled out by the model, even though many of them are not measurable (Angrist and Pischke, 2009)

Another reason for choosing to control for time-periods is the fluctuation in data. A majority of the Sub-Saharan African countries are developing or emerging countries, causing variables like inflation and GDP to fluctuate heavily between years during the investigated period. Controlling for time-trends through different time-periods will benefit in fitting fluctuating data into a linear model. Further, some negative values for the dependent variable do not allow the use of logs. The period of 16 years allow investigation of important factors on a long term basis, while having the year 2004 in the middle allows investigating changes in FDI flows caused by the SACU agreement coming into force. Simultaneously, the time-period division of data is a way to deal with the problem of missing values, which is more or less impossible to avoid when working with Sub-Saharan countries.

⁹ Differences across units being studied.

4.2 Model II

The second question requires adaptation of the empirical model. The main variable of interest here is the SACU-dummy, investigating the influence on a country's openness of signing the free trade agreement in 2004.

Estimation of model II is as follows:

$$\text{Open}_{it} = \beta_0 + \beta_1 \text{Pol_r}_{it} + \beta_2 \text{Infr}_{it} + \beta_3 \text{Nat_re}_{it} + \delta_4 \text{SACU}_{it} + \gamma_t + \varepsilon_{it}$$

Where,

Open_{it} = Openness of a country. Measured as ((imports + exports)/GDP)*100) in country i year t

\ln_Open_{it} = The natural logarithm of the variable Open

Pol_r_{it} = Political rights. Measured on an index from 1 to 7 in country i year t

Infr_{it} = Infrastructure. Measured as telephone lines per 100 people in country i year t

Nat_re_{it} = Total natural resources rents (% of GDP) in country i year t

SACU = Dummy variable for SACU members (1 for post-SACU member and 0 otherwise), in country i year t

γ_t = The within period fixed effect

ε_{it} = The time-varying error term

Model II is estimated using a one-way fixed effects model; controlling for time trends in form of the four different period dummies. A reason for just controlling for time trends in model II is that SACU is assumed to control for unit differences, when the major difference attempted to distinguish in this step is the difference between SACU countries and other countries in Sub-Saharan Africa.

To build further on the first part addressing SACU's impact on FDI, the main purpose here is to put emphasis on SACU's impact on openness. Openness is not believed to be influenced by the financial controls used in model I, but by factors explaining a country's current condition, such as the level of infrastructure or its political stability. Hence, the financial variables are excluded from model II.

In order to reach the best fit possible for data in model II, both the variable openness and its log are used as dependent variables. Contrary to model I, data for the dependent variable openness is always positive, allowing the use of logs in order to handle fluctuating data. There are several reasons for using logs. Heteroskedastic or skewed distributions of strictly positive variables can be mitigated or even eliminated by logs. Likewise, logs typically narrow the range of the variable, making estimates less sensitive towards outliers. (Wooldridge, 2008).

4.3 Approaches

The fixed effects estimator can be obtained either through the within transformation where data is unit- and time-demeaned, or through the dummy variable regression. When using the dummy method, an intercept for each i and each t are estimated by using dummy variables for all cross-sectional observations and all time periods. The dummy variable method gives exactly the same estimates of β_j as with demeaned data, also standard errors and other major statistics are identical. (Wooldridge, 2008). The dummy variable method, here referred to as the least squares dummy variable method (LSDV), is the one used for all estimations in this paper.

Further, there are reasons to assume presence of heteroskedasticity. Homoscedasticity fails whenever the variance of the error term, given the explanatory variables, is not constant. Heteroskedasticity will not cause bias or inconsistency in the β_j , but it will invalidate t statistics, F statistics and the usual standard errors. (Wooldridge, 2008).

The Breusch-Pagan / Cook-Weisberg test for heteroskedasticity assumes constant variance in error terms. If the test rejects the null that there is homoscedasticity, one possibility to allow for presence of heteroskedasticity is to use heteroskedasticity-robust standard errors. The Breusch-Pagan test will be implemented in association with estimations, in order to decide whether it is required to allow for the presence of heteroskedasticity.

For similar studies it is common to assume that all or some of the explanatory variables have a delayed effect on explaining FDI. One approach is to lag the dependent variable, net inflows of FDI, by one period to allow a time lag from explanatory variables. In this study we find it logical not to follow that type of setup. Since our data is annual it is not rational to assume e.g. inflation for one particular year to influence outcomes for the dependent variable the year after that. It would have been more rational if analyzing monthly data. Another approach could have been to delay the effect of SACU in our models by one year, and assume SACU to have a delayed effect on FDI inflows. However, we find it more believable to assume affects already the same year as the agreement came into force. Since the SACU agreement was signed two years before it came into force it is reasonable to assume possible investors to be aware of this fact, and hence increase investments already in 2004 or even earlier.

5. Variables

5.1 Explanatory variables

The following macroeconomic and institutional factors are equivalent to the explanatory variables presented in model I and model II above. A brief discussion about each variable will be presented, where the variables' importance for this particular study is supported by findings from earlier empirical studies.

GDP growth

GDP growth is a common variable in empirical research, where its influence on FDI is positive in most cases. According to Prasad (2007), countries with high economic growth tend to be stable economies, an important condition for attracting FDI. Kinda (2013) claims that financial development is an engine of economic growth since it provides better business opportunities.

High economic growth is in most cases correlated with developed financial markets. Jenkins and Thomas (2002) show that South Africa attracts more FDI than other countries in the region because of its relatively better developed financial market. Based on earlier findings, we find GDP growth to be of high importance when investigating determinants of FDI inflows to Sub-Saharan Africa. The variable should capture the fact that investors are searching for markets with growth prospects, where investments are supposed to give profitable returns.

The market size has, as discussed earlier, been shown to have an impact on FDI inflows. However, GDP growth is believed to be correlated with the size of the market. Furthermore, no suitable variable representing market size could be found for the entire Sub-Saharan Africa. Level of GDP is commonly used to explain market size, but not suitable for our model due to the following reasons; 1) GDP is present in the denominator for the dependent variable FDI, hence it cannot be used as an explanatory variable, 2) level of GDP is correlated with GDP growth, which would bring multicollinearity into the model. When the countries to be analyzed are developing countries, we believe that GDP growth is a better choice than level of GDP. Developing countries are still growing, and our data set contains countries under different levels of progress. GDP growth is hence important in order to control for markets with different growth prospects.

Inflation

Inflation is linked to FDI in two separate ways; firstly, high inflation is a result of badly managed monetary and fiscal policies, which is negatively related to FDI. Secondly, high inflation levels can reflect poor economic conditions, which also discourage FDI (Calvo et al., 1996). FDI also affects inflation, because high inflation rates increases capital cost and affects the inflow of FDI negatively (de Mello, 1997). Wang and Swain (1995) investigated the determinants of FDI on the manufacturing industry in China and found inflation and exchange rate to have a similar and negative influence on FDI. Inflation is important for this study since countries' political and economic environments in Sub-Saharan Africa differ substantially.

Real interest rate

Developing countries tend to experience more severe problems with high interest rates than developed countries do. The capital cost also affects FDI negatively in the same way as with inflation. Interest rates are linked to a country's financial risk. (Asiedu et al., 2004). Obsfeld (1986) finds evidence for high real interest rates having a negative influence on FDI inflows. This variable is important for this study since it captures that investors might be risk-averse. It might be perceived as more risky to invest in a country with high real interest rates. Likewise, a high interest rate expands the spread between the domestic rate and the world rate, which seems to be negative when investing.

Openness

The openness variable is created according to a common formula in related studies; the sum of imports and exports divided by GDP. Controlling for openness captures a country's competitiveness in international trade (Stoian and Filippaios, 2008). Campos and Kinoshita (2003) show that the openness level of a country is an important factor for attracting FDI. Jenkins and Thomas (2002) indicate in their empirical research on Africa that there is a positive relationship between economic openness and FDI. This is especially the case when the openness variable is related to international trade. Lipsey (2000) finds openness to be the single-most important determinant for attracting FDI. Habib and Zurawicki (2001) state that countries with high exports receive a higher level of FDI inflows relative to countries with lower levels of exports. Openness is believed to be central in our study since it is an indication of a country's feasibility to trade. Even if the investor's intention is to access the local market, the simplicity for reaching the market from abroad is considered. How easily investors can move capital in and out of a country matters when choosing a country for the investments. Hence, the openness variable is expected to capture investors' precaution for closed markets.

International reserves

Large international reserves reflect a vital local economy. Foreign investors are more confident investing in countries with high international reserves (Onyeiwu and Shrestha, 2004). This variable is important since it signals the state of a country towards potential foreign investors. High levels of international reserves are believed to attract investors, whereas lower levels are believed to have the opposite effect.

Political rights

The political rights variable is an index stretching from 1-7, where 7 represents the worst conditions of political rights and 1 represents the best. Democratic countries are more likely to respect laws, intellectual property rights, and are less corrupt. Democratic countries are therefore associated with lower risks in comparison with countries having poor political rights and low stability of institutions (Asiedu et al., 2011). The reason for poor distribution of FDI to African countries is, according to Ngowi (2001), the high risks associated with low political rights.

Countries having poor levels of political rights usually have unstable political environments. As Sethi et al. (2003) discuss, political instability interfere with economic processes, which in turn can result in fewer investments. Accordingly, a stable political environment reduces uncertainty for potential investors (Loree and Guisinger, 1995). Dunning and Narula (2004) argues that investments and trade only run efficiently in a stable and peaceful country, and that political stability is an underlying assumption for all other determinates of FDI. Political instability might interfere with economic processes and result in less direct investments (Sethi et al., 2003). Since Sub-Saharan Africa consists of many countries where stability and human rights varies, the variable political rights is an important complement to macroeconomic variables. The variable should capture the importance of a stable environment for attracting FDI.

Infrastructure

According to Groh and Wich (2012), infrastructure is the fourth most important factor for absorbing inward FDI. Well-developed infrastructure implies lower communication costs and a reduction of difficulties when managing business activities (Chidlow et al., 2009). Infrastructure is a key factor when exporting goods as well as when selling them locally. Empirical results from studies investigating the importance of infrastructure for FDI inflows to Sub-Saharan Africa differ; Asiedu (2002) finds a positive influence of infrastructure on FDI in North Africa, but no significant results concerning Sub-Saharan Africa. Whereas Luiz and Charalambous' (2009) research on Sub-Saharan Africa concludes infrastructure to be highly relevant and important.

It is possible to measure infrastructure in two different ways; transportation infrastructure and communication infrastructure (Erdal and Tatogly, 2002; Loree and Guisinger, 1995).

Nowadays it is common to use the number of Internet users as a proxy for communication infrastructure. However, in this study telephone lines is considered to be a better proxy for several reasons. Our investigation period starts in 1996, which, in general, is considered an early date for the Internet. A majority of the developing countries had limited access to Internet by that time; their access might even be limited today depending on the level of development.

Additionally, access to data is better for telephone lines. However, some problems might be of concern with this proxy. In recent years the number of cellular phone users has been increasing rapidly. In 2009 there were approximately 15 times more cellular phone subscriptions than telephone landlines in Africa. (The World Bank, 2011).

Since costs associated with business (e.g. production costs, delivery cost) is a well prioritized factor for potential investors, infrastructure is considered to be an important factor for this study. Countries with a well-developed infrastructure should typically be expected to attract more FDI.

Natural resources

Natural resources are measured as total natural resource rents as percentage of GDP. Natural resource rent is the difference between selling-price of an output (including normal return) and its costs of production and extraction. Asiedu and Lien (2004) stress the importance of including

availability of natural resources when analyzing determinants of FDI. In a later paper from 2011 they find that the availability of natural resources is correlated with democracy, which in return can have a negative influence on inward FDI. Natural resources, especially oil, are often a leading factor to increased volatility in the exchange rate, because trade with natural resources, oil in particular, is generally characterized by booms and bursts. Exchange rate volatility implies macroeconomic uncertainty and therefore affects FDI negatively. On the contrary, Jadhav (2012) argues that resource seeking is a strategy for multinational companies, implying that natural resources play an important role in the attraction of FDI.

Based on previous research on natural resources' influence on FDI, as well as a disseminated distribution of natural resources in Sub-Saharan Africa, we find it important to include natural resources as an explanatory variable for FDI. It is an interesting variable since it is hard to predict the results; it has showed both negative and positive effects on FDI.

Internal openness

Internal openness is a variable not used in the empirical study, but analyzed by graphs. It is defined as; $(\text{internal imports} + \text{internal exports})/\text{GDP}$ for country i in year t , where internal means within the SACU area.

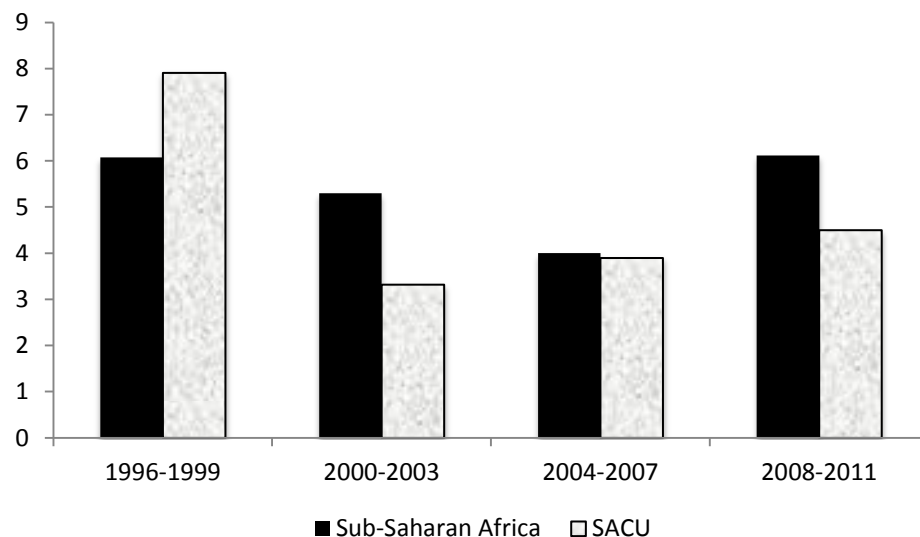
External openness

External openness is a variable not used in the empirical study, but analyzed by graphs. It is defined as; $(\text{external imports} + \text{external exports})/\text{GDP}$ for country i in year t , where external means SACU countries' trade with the rest of the world.

5.2 The dependent variable FDI

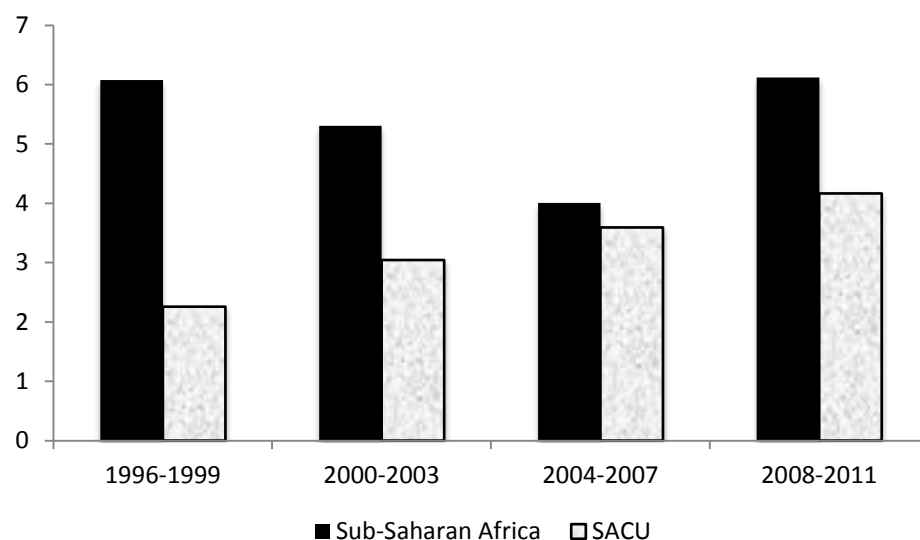
Net inflow of FDI as percentage of GDP is the dependent variable used for analysis. The FDI variable and its pattern of evolvement during the investigation period will be discussed below.

Graph 1 shows the average inward FDI for Sub-Sahara Africa (including SACU) and for SACU countries. There has been an increase in FDI for member countries of the SACU agreement from year 2000. The highest level of FDI for the period was between 1996 and 1999. For the Sub-Saharan countries an increase in FDI inflows can be seen during the period 2004-2011.



Graph 1. Source: Average FDI to SACU and Sub-Saharan Africa (including SACU members) World Bank DataBank, Foreign direct investment, net inflows (% of GDP)

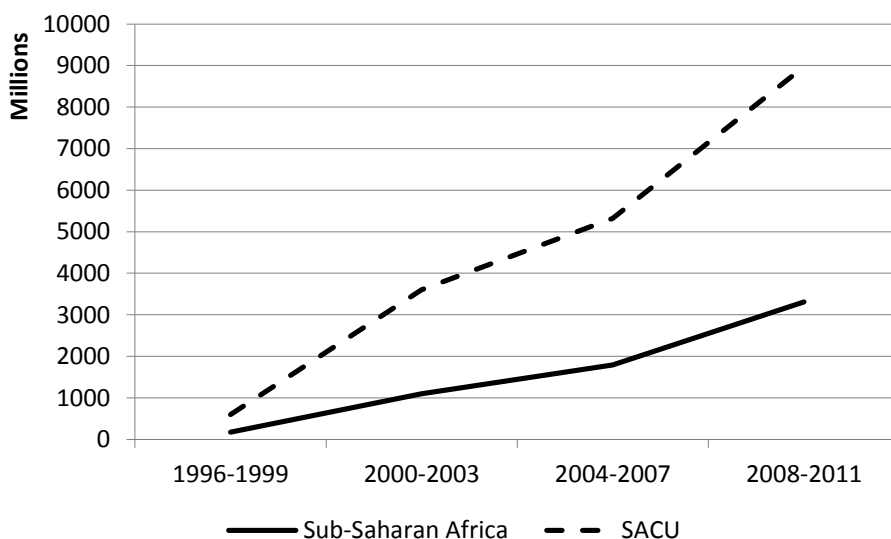
The extreme FDI level for SACU countries 1996-1999 is caused by Lesotho. To demonstrate Lesotho's impact, the country is excluded from graph 2. The picture one gets from graph 2 is that FDI levels for SACU countries have experienced an increasing trend from 1996 to 2011. However, Sub-Saharan Africa experienced a negative trend during the period 1996-2007. But this trend turned after 2007 as can be seen in the graph below.



Graph 2. Average FDI to SACU and Sub-Saharan Africa (including SACU members) excluding Lesotho in both cases. Source: World Bank DataBank, Foreign direct investment, net inflows (% of GDP)

Compared to other countries in Sub-Saharan African, Lesotho has a larger inflow of FDI relative to its size. Lesotho is also one of few countries receiving a large part of FDI to sectors besides mining based industries. They received a large part of FDI in the textile industry, mainly from Asian countries. The reason for the extreme level of FDI inflows to Lesotho in the end of the 1990s was mainly a highland water project in the end of the decade. In 1996 the inflow was USD 287 million, which compared to year 2000 is almost 90 percent of the total investments in export-oriented manufacturing that originates from FDI. Generally, the reasons for high FDI inflow to Lesotho are low corporate tax, free repatriation of profit, as well as no secondary or withholding tax on dividends distributed by manufacturing companies to local or foreign shareholders (World Bank Group, 2007).

In order to show the trend of FDI inflows without the impact of GDP, graph 3 pictures the inflow of FDI in nominal amounts. It can be seen that there has been an increase in FDI from 1996 and forward. For SACU levels of FDI increase relatively faster.



Graph 3. The FDI inflow in nominal amounts to SACU and Sub-Saharan Africa. Source: World Bank DataBank, Foreign direct investment, net inflows (BoP, current US\$)

6. Data

Working with data from developing countries brings on some disadvantages. The major data issue is missing values, which has forced us to dismiss a number of countries from the analysis. The excluded countries mainly lacked values for the dependent variable FDI. Also, real interest rate is a variable with many missing values. There are a few countries having large problems with explanatory variables, e.g. lacking real interest rate for the entire 16 year period. Some countries, for which gaps of explanatory variables were considered too big, are excluded from the data set. The following Sub-Saharan African countries were excluded from analysis: Eritrea, Guinea, Sierra Leone, Somalia, South Sudan, Mauritania, Sao Tome and Principe, and Gambia. After exclusion of those countries the analysis includes a total of 40 countries.

6.1 Data Sources

Data is collected from three different databases. For the econometric analysis all data except political rights is collected from The World Bank DataBank, World Development Indicators, a collection of development indicators compiled from officially recognized international sources. The political rights variable is collected from Freedom House. Freedom House is an independent watchdog organization analyzing the challenges of freedom and advocating for greater political and civil liberties. They also support activists that defend human rights and promote democratic changes. The organization has an index measuring political rights. This index is scaled between 1 and 7. Countries considered holding good political rights score a low number, whereas countries with bad conditions in form of low levels of political rights score a high number on the scale. Data for bilateral trade of SACU members is collected from United Nations Commodity Trade Statistics Database.

One main concern is to find sufficient data. Access to suitable and reliable data for countries in Sub-Saharan Africa is limited. A large part of the data to be found is reported by the countries themselves, and it is of importance to understand that those values are not always completely reliable. However, the data is collected for 40 countries over a time period of 16 years. We thus still believe, as will be discussed through the paper, that a meaningful analysis is feasible.

6.2 Dealing with missing values

Dealing with missing values has different solutions. As previously mentioned, countries with too severe problems with missing values are excluded from the analysis. Because of data problems the dataset was decreased from 48 countries to the currently used 40 countries. However, in order to avoid losing an unnecessarily large number of observations when running regressions interpolation and extrapolation are implemented wherever possible. When a variable was spotted with a value gap of maximum three data points, linear interpolation or cubic spline interpolation was used to fill in the gap. However, when the gap exceeded three missing data points, no effort was done in order to replace the values. Since a majority of data fluctuated heavily and behaved in an unpredictable way, we concluded that neither of the data approximation methods was good enough to fill in those large gaps.

The political rights variable is only available during the period 1998-2011. In addition, every country in the data set had a missing value at year 2000. However, the variable is stable over time. The largest change for a country's political rights value is one step on the index scale during the period 1996-2011. Some countries even have a fixed value during the entire period. In the case of political rights; linear interpolation with integers is assumed to be reliable for filling in gaps of missing data points. However, lacking data before the investigation period 1996-2011 makes it doubtful trying to replace the values for 1996-1997. A more detailed explanation about the method of interpolation and extrapolation is to be found in appendix 2.

The bilateral trade is reported by the importing and the exporting country. Analyzing data we found that those numbers are not always the same even though they should be. Because of different numbers import values are used whenever possible, and for export the recipient country's import values is used. Import values are used since those numbers are reported by the recipient country, and not by the country that is producing the goods. The producing country has namely more incentives to exaggerate. Even here there are some problems with missing values. In cases where it was either the export- or the import value that was missing, the available value was multiplied by two. This assumption seems to work well. In cases where both import- and export- values were missing, but values were available for the rest of the years, interpolation was used (the same method as discussed earlier). This is not a perfect solution, but the only one available making it possible to witness the trend even if the numbers are not completely accurate.

7. Results

7.1 Part I

The first part of the result seeks to answer the first question by empirically demonstrating important determinants for attracting FDI to Sub-Saharan Africa. The following factors were thought to be of importance to attract foreign investors; GDP growth, openness, infrastructure, natural resources, inflation, international reserves, political rights, real interest rate, and membership of SACU. Since OLS was found to have a poorer fit with data than the two-way fixed effects model, a two-way fixed effects model controlling for units (country) and time (time-periods) is the one that is reported and analyzed.

Since heteroskedasticity might be a concern, the Breusch-Pagan / Cook-Weisberg test for heteroskedasticity was implemented to test for its presence. The null hypothesis that the error variances are all equal was rejected in favor of the alternative that there are some difference ($\chi^2=1177.04$ and $p<.0000$). Hence we must assume to have some heteroskedasticity present in the model. To allow for its presence, standard errors are adjusted to heteroskedasticity-robust standard errors. In table 1 below a two-way fixed effects estimation of model I is presented.

Table 1. Two-way FE model

	(1)	
	FDI	
GDP_gr	0.209	(0.140)
Open	0.242***	(0.0415)
Infr	-0.0473	(0.368)
Nat_re	-0.286**	(0.0942)
Infl	0.0423	(0.0832)
Reserve	0.0874	(0.0752)
Pol_r	0.527	(0.455)
Real_int	0.0311	(0.0871)
SACU	2.903	(1.989)
Two-way FE	Yes	
<i>N</i>	335	
<i>R</i> ²	0.789	
<i>F</i>	9.294	
df_m	41	
df_r	293	

Robust Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 1 displays results from estimation of model I. The model fits data well at the .01 percent level ($F=9.294$ and $p<.0000$). Studying the value of R^2 ; this model accounts for 78.9 percent of the total variance in net inflows of FDI. Openness and natural resources are shown to be significant explanatory variables of FDI inflows to Sub-Saharan Africa. Openness is significant at the .001 level, while natural resources are significant at the .01 level. Of the significant variables,

however, the sign of natural resources can be discussed. It is not obvious that its sign should be either positive or negative. The estimation shows that an increase in a country's natural resources reduces net inflows of FDI. Expected signs will be discussed further in the discussion and conclusion section. The magnitudes of the significant variables are in line with what one would expect. The magnitude of the openness variable is our main interest; if openness increases by 1 percentage point net inflows of FDI will increase by .242 percentage points.

Further, an F-test was implemented to ensure that significant fixed group and time effects are present. The null hypothesis of the F-test that all dummy parameters equals zero is rejected in favor of the fixed effects ($F=6.51$ and $p<.0000$). Hence, fixed group and time effects exist.

Because of the unbalanced panel, many observations are lost during estimation. Since real interest rate is a variable spotted with many missing values, one suspicion is that it does not only cause a large drop-out of observations, but also influence results. Therefore, estimation was performed excluding real interest rate as an explanatory variable. As expected much fewer observations were lost during estimation, observations increased from 335 to 488. However, the lost observations did not influence the results. The only notable change between the two estimations was that natural resources changed from a .01 significance level to a .05 significance level.

Worth mentioning is also the difference between estimation with usual standard errors and estimation with heteroskedasticity-robust standard errors. With usual standard errors also GDP growth was significant at the .01 level with a positive sign. GDP growth was expected to have a positive influence on FDI inflows, since this has been proved by several researcher performing similar studies.

Evidence could not be found to prove the entire H_1 to be true. Estimation of model I show that openness and natural resources are important determinants for attracting net inflows of FDI to Sub-Saharan Africa. Determinants which could not be proved to have an impact are; GDP growth, infrastructure, inflation, international reserves, real interest rate, and political rights.

Striking about the results from the two-way fixed effects estimation of model I is that the SACU dummy is not significant in either of the cases. However, the result does not necessarily have to mean that SACU has no positive impact on net inflows of FDI. A free trade agreement is likely to influence openness of member countries, since it involves policies intended to relax barriers to trade. If SACU increases openness of its member countries, SACU may have an indirect effect on FDI inflows caused by the increased openness. Whether the free trade agreement SACU increased openness of its member countries or not is now to be studied in part II of the result-section.

7.2 Part II

This section seeks to answer the second question by investigating whether member countries of SACU have become more open after the free trade agreement came into force. The one-way fixed effects model is applied, controlling for time in form of period-dummies. As discussed in the section describing model II, a one-way fixed effects model is a better approach in this step of analysis than a two-way fixed effects model.

In table 2.1 below two different estimations of model II is presented; the first column shows estimation where the dependent variable appears in its original form, the second column shows estimation where the dependent variable is the natural logarithm (log) of open. Also here the Breusch-Pagan / Cook-Weisberg test for heteroskedasticity was implemented to test for differences in error variances. The null hypothesis that the error variances are all constant was rejected in favor of the alternative that there are variability in the variances; for the level model the outcome was ($\chi^2=225.29$ and $p<.0000$), whereas the outcome for the log model was ($\chi^2=4.09$ and $p=.0431$). Notable is that the presence of heteroskedasticity seems to decrease when taking log of the dependent variable. This was also expected, when logs can mitigate the problem of heteroskedasticity. However, the test is still significant at the .05 level, indicating that error variances cannot be assumed to be constant.

Table 2.1 One-way FE model controlling for time periods

	(1) Open		(2) ln_Open	
Pol_r	0.170	(0.959)	-0.0355**	(0.0134)
Infr	1.660***	(0.231)	0.0242***	(0.00266)
Nat_re	1.040***	(0.129)	0.0153***	(0.00102)
SACU	45.37***	(7.335)	0.566***	(0.0860)
Time effect	Yes		Yes	
N	520		520	
R ²	0.218		0.338	
F	24.01		53.57	
df_m	7		7	
df_r	512		512	

Robust Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 2.1 displays results from estimating model II. Utilizing the one-way fixed effects model is one approach taken in order to fit data into a linear model. Another approach taken to fit data is by taking log of the dependent variable openness. However, both models are reported and analyzed.

The first column in table 2 displays the level model. The F test indicates a good fit of data ($F=24.01$ and $p<.0000$). R^2 is a bit low (.218), but still reasonably good. Infrastructure, natural resources and SACU are significant at the .001 level.

The second column in table 2 displays the log model. The F test shows a good fit of data ($F=53.57$ and $p<.0000$). Observing R^2 the goodness-of-fit of this model is also reasonable good with a value of .338. The main object is to explain SACUs impact on openness using a suitable model. Infrastructure, natural resources and SACU are significant at the .001 level, while the political rights variable is significant at the .01 level. Political rights changed from being insignificant in the level model, to significant with the correctly expected sign in the log model. Better infrastructure and a larger endowment of natural resources both have a positive influence on a country's openness. The coefficient for political rights has to be interpreted with caution. Its index is graded from 1 to 7, where 1 is associated with a high level of political rights and 7 is associated with a very low level of political rights. Hence, improved political rights (in our case a decrease on the index-scale) have a positive influence on a country's openness. The most interesting coefficient to interpret here is the SACU dummy, which is shown to have a positive influence on openness. The log estimation tells us that SACU increases openness by 55.6 percent, while the level estimation indicates an increased openness by 45.37 percent. Magnitudes of the SACU dummies are very large compared to other explanatory variables in the model. One concern is that outliers in data might make coefficients of SACU unrealistically high.

One source for high magnitudes of the SACU dummy might be Lesotho's high values of the openness variable, caused by large trading volumes compared to GDP. Lesotho is a very small country, implying that e.g. a project like the highland water project in the end of the 1990s might have an unreasonable high influence on the openness variable, and hence on our analysis. In order to look into whether this is the case, Lesotho is now excluded from analysis. Model II is hence estimated again; with the only difference from table 2.1 being that Lesotho is excluded. Results from estimations can be seen in table 2.2; where column one displays a level-model and column two displays a log-model. The null hypothesis that the error variances are all equal is rejected also here; ($\chi^2=284.19$ and $p<.0000$), and ($\chi^2=7.07$ and $p=.0078$).

Table 2.2 One-way FE model controlling for time periods

	(1)		(2)	
	Open		ln_Open	
Pol_r	1.170	(0.947)	-0.0254	(0.0134)
Infr	1.982***	(0.206)	0.0275***	(0.00247)
Nat_re	1.056***	(0.129)	0.0155***	(0.00103)
SACU	28.53***	(5.856)	0.405***	(0.0824)
Time effect	Yes		Yes	
N	506		506	
R^2	0.235		0.364	
F	28.81		63.30	
df_m	7		7	
df_r	498		498	

Robust Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

As expected the magnitude of the SACU dummies decreased. In the level-model from .4537 to .2853, and in the log-model from .566 to .405. Except for changes in the SACU-dummies, significance levels and magnitudes are very similar as when Lesotho was included in estimations. R^2 values are .235 and .334 respectively. Interpretations from these estimations are that SACU countries increases openness by 40.5 percent according to the log-model, and by 28.53 percent according to the level model. These numbers sound more reasonable compared to estimates from table 2.1.

Lesotho is a very small country compared to both other SACU countries and to other Sub-Saharan African countries. When comparing estimates between table 2.1 and table 2.2, the magnitudes of the SACU dummies differ unreasonably much given Lesotho being the only difference between them. Lesotho was excluded from the model because of the following reasons; 1) containing extreme data in comparison with other SACU countries (especially imports and exports in relation to GDP), 2) having a very large impact on the regression estimates, 3) being a relatively small part of the SACU area. Because of those reasons we find it reasonable to trust estimations from table 2.2 where Lesotho is excluded.

Even though the magnitude of SACU decreased when excluding Lesotho, SACU is still shown to have a large impact on openness. Interesting about infrastructure and political rights are that these factors could not be proved to have a direct impact on FDI in model I. However, they have a positive impact on a country's openness, and openness in turn was shown in the previous step to have a positive influence on FDI inflows. Hence, infrastructure and political rights have an indirect effect on attracting FDI. But SACU has in comparison the largest indirect impact on FDI through its influence on openness.

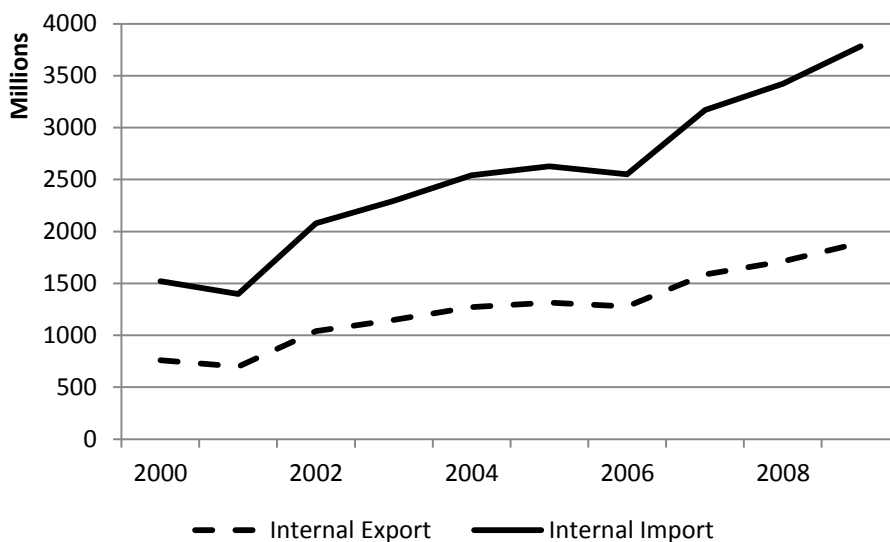
Equivalent with hypothesis H_2 , the SACU free trade agreement is shown to have a positive influence on openness of its member countries. However, result-part II cannot distinguish between internal and external openness. Whether the SACU countries opened up more for trade towards other member countries, towards countries outside the SACU area, or in both directions is discussed below. In part III of the result SACU's effect on FDI inflows will be analyzed. Also there will be a discussion about internal, external, and total openness.

7.3 Part III

The last question is answered by studying whether the free trade agreement SACU has affected FDI inflows to member countries. The section seeks to find evidence for hypothesis H_3 ; that the free trade agreement SACU has had a positive influence on FDI inflows to member countries. This last sub-part of the result is of importance in order to string together the foremost aim of this paper; to investigate the impact of a free trade agreement on FDI inflows to member countries. Whether SACU has affected FDI inflows is answered by combining the empirical results from estimations of model I and model II, combined with studying graphs describing trends over time.

Those graphs describe trading volumes and openness for countries within SACU versus Sub-Saharan Africa. Because of limited access to bilateral trade data, the period investigated in this section is mostly 2000-2009. This is, however, enough to cover the period which is of most importance to investigate in order to study the impact of SACU on FDI. Regressions could unfortunately not be implemented in this last step of analysis, since the division of openness into internal versus external openness generated too few observations of SACU countries for a statistically secure result.

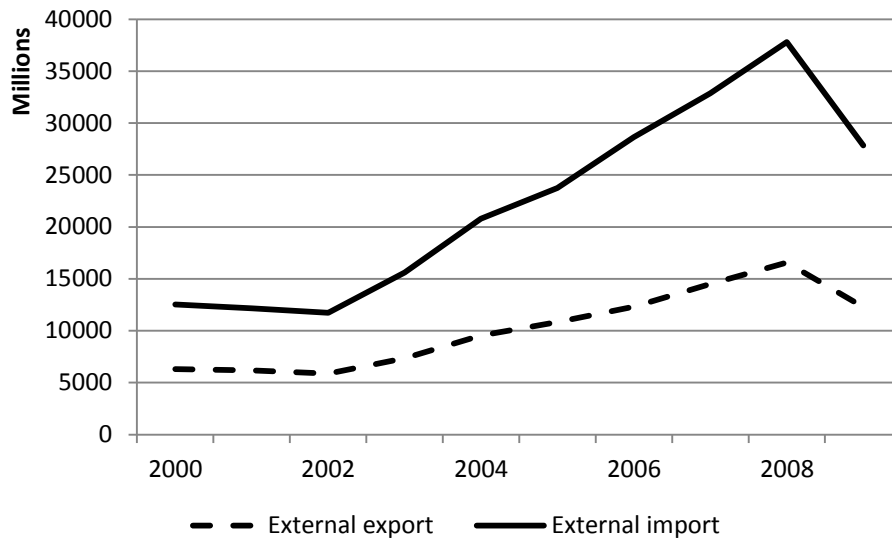
Graph 4 below shows evolvement of total volume of exports and imports between the five member countries of SACU during the period 2000-2009.



Graph 4: Internal export versus internal import for SACU countries. Source: World Bank DataBank, Export and Import (current US\$)

As was predicted, trade volumes between member countries increased during our investigated period. A conclusion based on the trend displayed in graph 4 is that the internal volume of traded goods has increased, except for a couple of small dips. Since graph 4 displays bilateral trade the graphs over exports and imports should be identical. But because of issues with data they are not. For a more thorough explanation about how this is handled, read the section describing data. Our judgment is that data problems will not have a substantial effect on analysis, since trends are still easily detected despite a few missing values. The trend of trade over the entire period is increasing, but shortly after 2004 the increasing curve gets steeper. The steeper curve may be referred to policy changes that came into force because of the SACU agreement in 2004, and will be discussed further in what follows.

Graph 5 below show member countries' evolvement of exports and imports towards rest of the world (excluding trade between SACU countries) during the period 2000-2009.

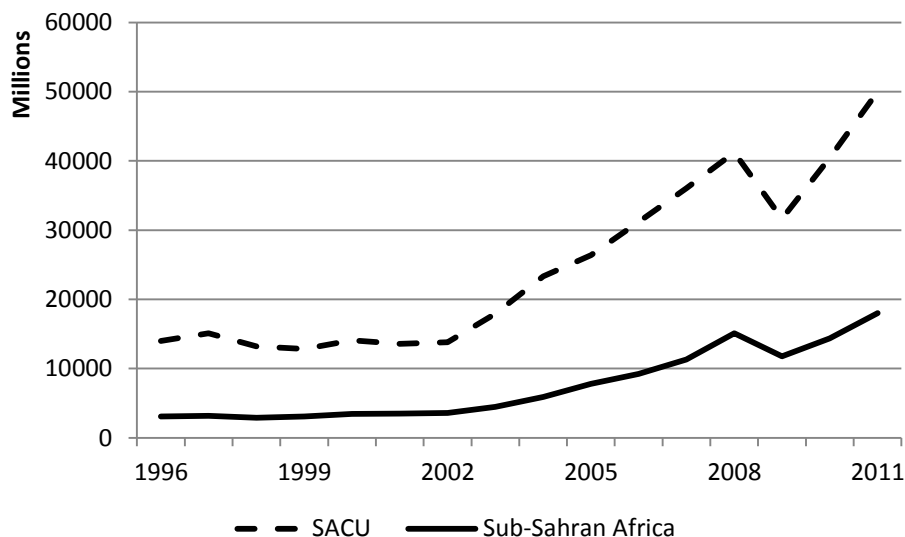


Graph 5: external imports versus external exports for SACU countries. Source: World Bank DataBank, Export and Import (current US\$)

A conclusion from graph 5 is that the total volume of externally traded goods has increased for SACU. However, the trend is in comparison with internal trade smoother, with a distinct dip around year 2008. SACU's internal trade has not experienced the same dip (see graph 4). An explanation can be that internal trade within the free trade area was less affected by the financial crisis than external trade towards the rest of the world.

Comparing internal and external trade from graph 4 and graph 5, we believe the patterns can be referred to the SACU agreement in 2004, and to effects in the global economy caused by the 2008 financial crisis. A free trade agreement relaxes trading policies between member countries such as tariffs and other barriers to trade. Hence, increasing internal trading volumes is a natural consequence following such an agreement. And indeed, the increasing trend of trade gets steeper for internal trade after 2004. On the other hand, external trade does not necessarily need to show a distinct increase that can be referred to the free trade agreement.

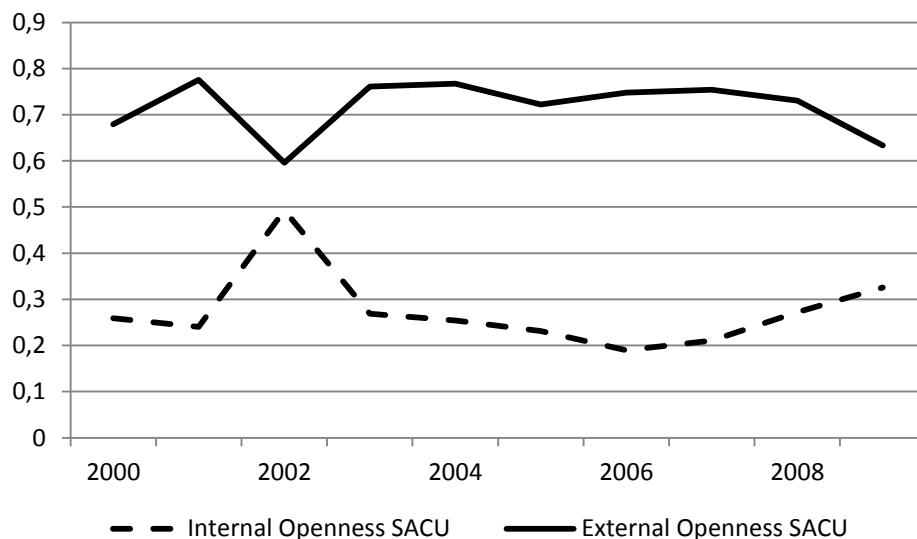
Total trade volumes (imports + exports) for SACU countries versus for the rest of Sub-Saharan Africa are shown in graph 6 below. Data is in this case not divided into internal versus external trade, allowing the graph to stretch over our entire investigation period 1996-2011.



Graph 6: total trade volumes SACU versus total trade volumes Sub-Saharan Africa. Source: World Bank DataBank, Export and Import (current US\$)

Similar trends can be seen in graph 6 as shown in graph 4 and 5. In addition this graph shows that trade starts to recover a year after the distinct dip in 2008. This is an indication of the fact that this dip might be caused by the 2008 financial crisis. Interesting about total trade volumes is also the long-term increasing trend for the entire Sub-Saharan Africa, as well as the fact that this trend has a steeper increase for SACU members. Graph 6 is interesting since it depicts trading patterns very clearly. The trends for the two groups are similar during approximately the first seven years. After that the trend for SACU countries changes direction and increases faster than the trend for non-member countries does.

In the following, the variable openness will be analyzed. Openness $((\text{imports} + \text{exports})/\text{GDP})$ is the variable utilized in the econometric parts of this paper. Important differences from merely studying the trading volumes in form of imports and exports, is that the variable openness fluctuates more because of changes in GDP. GDP has in general increased more than trading volumes, making the trend of openness less distinct in comparison with trading volumes. In order to make interesting comparisons the openness variable is now divided into internal openness (between SACU countries) versus external openness (between SACU countries and rest of the world). Again bilateral trade data limits the analysis to cover the period 2000-2009. Graph 7 below shows evolvement of internal versus external openness.



Graph 7: Internal Openness SACU versus external Openness SACU. Source: United Nations Commodity Trade Statistics Database, comtrade

When studying internal openness in graph 7, a reversed trend compared to external openness can be spotted from shortly after year 2005. We refer this increase to adoption of the SACU agreement. The reason for this claim is the empirical results presented earlier. SACU is from estimation of model II (table 2.1 and 2.2) shown to have a positive and significant impact on openness. However, model II cannot distinguish between internal versus external openness. The plots in graph 7 give indications of direction to which openness have changed; this indication is that the SACU agreement has increased internal openness of member countries. Empirical results are further strengthened by graph 6 where a plot over total trading volumes in SACU shows a positive and clearly increasing trend. External openness is in general more flat compared to internal openness. As mentioned earlier SACU's dip for external trade is believed to be caused by the 2008 financial crisis.

The distinct changes in graph 7 for the year 2002 require an explanation. GDP levels for SACU countries are high in general around year 2002. GDP levels increases relatively faster than external trading volumes, causing the external openness to drop. Internal trading volumes on the other hand increases relatively faster than GDP, causing a peak for internal openness in 2002. The drastic increase in internal trading volumes is to some extent caused by outliers such as Lesotho. As discussed earlier, Lesotho carried out a large project in 2002, increasing their trading volumes. But by studying graphs, one cannot say exactly why internal openness has a peak and external openness has instead a decline in 2002. In order to determine the causes, one would have to make a thorough study around what happened in the area that particular year. However, the above discussion contains likely reasons.

Openness is from part I empirically shown to have a positive influence on FDI. Part II shows that SACU has a positive influence on openness. From part III, trade volumes for both SACU members and the rest of Sub-Saharan Africa are shown to have a positive trend, where trading volumes for SACU members have had a relatively faster increase during the period after the agreement came into force. Further, it seems like a relatively large part of the increased openness can be referred to increased openness towards other member countries of the SACU agreement (see graph 7). Even though the changes in openness cannot be exactly referred to internal or external openness, we can conclude that SACU has had an indirect positive influence on FDI inflows through its positive impact on openness. This is in line with hypothesis H₃, with the addition that SACU influences FDI through the discovered channel openness.

7.4 Summarized results

From the first hypothesis H₁, it is concluded that openness has a large positive and significant impact on net inflows of FDI. Natural resources are also shown to be a determinant of FDI inflows to Sub-Saharan Africa. However, we failed to prove GDP growth, infrastructure, inflation, international reserves, political rights, and real interest rate to influence FDI.

In a second step, evidence is found supporting hypothesis H₂, when it is concluded that the SACU free trade agreement has had a positive influence on openness for member countries. However, model II cannot determine whether the increased openness should be referred to an increase in internal trade (bilateral trade between member countries), to an increase in external trade (trade towards rest of the world), or to both. An interesting addition to part two is that infrastructure, natural resources, and political rights (in estimations including Lesotho) were found to have an indirect effect on attracting FDI inflows through their positive influence on openness.

Hypothesis H₃ is supported by results from model I and model II in combination with descriptive graphs from the investigated period. SACU is concluded to have a positive and indirect influence on FDI inflows to member countries through the channel openness.

The foremost aim of this study, *to investigate the impact of a free trade agreement on FDI inflows to member countries*, finds support from H₃; SACU has a positive influence on FDI through its effect on openness. The increased openness is indicated to depend mostly on larger internal openness. But the origin of the increased openness cannot be determined with certainty.

8. Discussion and conclusion

The results from model I are in line with what one could expect, except that we believed more variables would be proved to have an impact on FDI. The outcome that opens up for discussion is the variable natural resources. Its influence on FDI is from model I shown to be negative. One explanation for the negative sign could be the so-called resource curse; countries with an abundance of natural resources tend to experience less economic growth and less beneficial development outcomes compared to countries with fewer natural resources. Countries suffering from this phenomenon might have problems such as corruption, low quality institutions etc. Countries with these characteristics are not attractive for investors. Another explanation for the negative sign might be that FDI inflows to those areas consist of horizontal FDI. Investors focusing on horizontal FDI have no interest in natural resources; hence they avoid these types of markets for reasons such as e.g. institutional problems.

Determinants from estimation of the first model that could not be proved to have an impact on FDI are; GDP growth, infrastructure, inflation, international reserves, political rights, and real interest rate. But from estimations of the second model testing determinants of openness it is found that, except for SACU, also political rights and infrastructure has significant and positive effects on openness. This indicates that political rights and infrastructure also are affecting FDI through openness. Political rights are typically low for isolated countries. Autocracies are for example characterized by closed borders (low trading volumes) and low level of human rights because of method of governing. Hence one should expect increasing political rights to also increase the openness for a country. Well-developed infrastructure is likely to be essential for a well-functioning international trade. So it is also logical that better infrastructure makes a country more open, when it simplifies factors such as transport and communication. The proxy for infrastructure used in this study is telephone lines. But expanding telephone networks should be correlated with expansion of other parts of infrastructure as well. There could also be some reversed effect here, when openness (larger volumes of traded goods) could affect the need to expand infrastructure. However, it seems more credible to be the other way around. Assuming expansion of infrastructure to be a sign of economic development, from which trading internationally comes as a natural consequence. It seems like SACU is not the only factor attracting FDI through the channel openness. Political rights and infrastructure are also affecting FDI through its influence on openness, but relatively less than SACU. The conclusion about political rights, however, is discussable since its coefficient only was shown to be significant in the estimation of model II including Lesotho.

Noticeable is that natural resources has a positive influence on openness. That natural resource has a positive impact on openness is expected since natural resources often are exported. In this study natural resources have a negative direct effect on FDI, and also a positive indirect effect through openness.

There are other trade agreements within Sub-Saharan Africa. However, SACU is the only well-functioning free trade area. If parts of the positive trend considering international trade for Sub-

Saharan Africa are caused by any one of the not yet functioning free trade areas cannot be determined by this study. South Africa is the SACU country with largest trade volumes, both considering internal and external trade. Some reasons behind South Africa's successful trade are; the size of the country, the fact that it is more developed compared to other SACU countries, and that South Africa has a trade agreement with EU. Even though South Africa has a trade agreement with EU it is still possible to analyze and answer the question whether the SACU agreement has increased inflows of FDI to the region. Result part III indicates namely that a large part of SACU's increased openness can be referred to trade within the SACU area, which cannot be caused by South Africa's trade with EU.

In result part III it was concluded that trading volumes had increased more for SACU members in comparison with the rest of Sub-Saharan Africa. Our definition of openness is; total trading volumes as a percentage of GDP. Including GDP in this ratio is necessary in order to take the different country sizes into consideration. However, when just studying trading volumes (see graph 6) the trend is steadily increasing and is smoother in comparison with the openness variable. From this it can be seen that SACU countries are in general trading more than before. SACU has had a positive effect on total trading volumes. This trend actually changed course already around year 2002 (see graph 6). An explanation can be that the SACU agreement was signed already in 2002. Possible investors could have been aware of the possible market expansion. Early investments in one SACU country laid up an easier access to all five countries after year 2004.

Why SACU has increased inflows of FDI may be due to several reasons. It can be assumed that the main reason behind investments is market-seeking aims; investors want to access a new larger market (horizontal FDI). A free trade area increases an area's market size and hence creates a more attractive environment for investments. Cost seeking aims (vertical FDI) can also be a reason for investments within a free trade area. Even if the goal is to produce a good and then export it, some positive factors might be received from a free trade area, e.g. cheaper import of parts that are needed for manufacturing. Businesses with many diverse production channels may affect FDI. Member countries of free trade areas are typically more positive towards trade and more open towards the rest of the world, making them good choices for cost seeking investments.

Since SACU as a free trade area affects FDI inflows, FDI can be seen as a positive externality from a free trade agreement. This is one good argument in the process of attempting to convince developing countries to open up for trade. Increased trade does not only benefit economic growth, it also accelerates growth through inflows of FDI. An inflow of investments from foreign countries is especially important for developing countries, when domestic investments are typically scarce. A key to economic growth is namely investments. This paper finds SACU to increase FDI through openness. But it might also be the case that SACU affects the inflow of FDI through other channels than openness.

Important factors for attracting FDI to developing countries are openness and natural resources. Further this study indicates that developing countries turn out to be more open as a consequence of becoming a member of a free trade agreement. Openness is the channel through which FDI is affected when developing countries are becoming members of a well-functioning free trade area. It is important to take into consideration that this study is made merely on countries in Sub-Saharan Africa. Depending on culture, history, geographic conditions etc., empirical results may differ between different parts of the world. In order to make a certain conclusion regarding developing countries and FDI in general, similar studies are needed using data for developing countries in other parts of the world.

Furthermore, studies about the impact of free trade areas on FDI inflows for developing countries are needed. Similar studies covering more than just one free trade area are especially desirable. Other suggestions for further research are to investigate whether free trade agreements influence horizontal FDI, vertical FDI, or both. It would also be of interest with a more thorough study looking into other possible channels through which FDI is attracted.

9. References

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Appendix 1: Countries covered by analysis

Angola	Liberia
Benin	Madagascar
Botswana	Malawi
Burkina Faso	Mali
Burundi	Mauritius
Cameroon	Mozambique
Cape Verde	Namibia
Central African Republic	Niger
Chad	Nigeria
Comoros	Rwanda
Congo, Dem. Rep.	Senegal
Congo, Rep.	Seychelles
Cote d'Ivoire	South Africa
Equatorial Guinea	Sudan
Ethiopia	Swaziland
Gabon	Tanzania
Ghana	Togo
Guinea-Bissau	Uganda
Kenya	Zambia
Lesotho	Zimbabwe

Appendix 2: Dealing with missing values

Linear interpolation and extrapolation

When linear interpolation or extrapolation is applied to fill in missing values, the following formula is utilized;

$$y = \frac{y_0 * (t_1 - t) + y_1 * (t - t_0)}{(t_1 - t_0)}$$

Where; y is the interpolated/extrapolated value, y_0 and y_1 are the two points closest to the interpolation/extrapolation point, t_0 and t_1 are points in time relating to y_0 and y_1 , t is the point in time relating to t

Cubic spline interpolation

The cubic spline method is implied using the Excel add in; NumXL¹⁰.

Cubic splines are popular for interpolation. A spline is a tool helping draw smooth curves connecting widely spaced points. A cubic spline curve has the same function for an interpolation problem.

As discussed in the paper, missing values are replaced wherever it is possible to fill in gaps of one to three values. All missing values that are replaced are taken care of in Excel, before importing data into STATA.

Before using any kind of interpolation, data is plotted in order to study its patterns of fluctuation. Linear interpolation and cubic spline interpolation is then compared in graphs before deciding which data approximation is most suitable on a case by case basis. Wherever necessary, earlier available annual data (prior to 1996) is used in order to backfill missing values that appear between the years 1996-1998.

In total 52 values for the econometric analysis are replaced using interpolations, extrapolations, or cubic spline interpolations. (39 values for natural resources are replaced by extrapolating the year 2011, 6 values for real interest rate are replaced by cubic spline interpolation, 7 values for inflation are replaced by cubic spline interpolation.) In the bilateral trade analysis covering SACU countries, 4 values are replaced using cubic spline interpolation.

¹⁰ <http://www.spiderfinacial.com/products/numxl>

Appendix 3: Summary statistics

<i>Variables</i>		<i>Mean</i>	<i>Std.dev</i>	<i>Min</i>	<i>Max</i>	<i>Observations</i>	
Year	<i>overall</i>	2003.5	4.613	1996	2011	N =	640
	<i>between</i>		0	2003.5	2003.5	n =	40
	<i>within</i>		4.613	1996	2011	T =	16
FDI	<i>overall</i>	5.344	13.311	-82.892	145.202	N =	640
	<i>between</i>		6.571	.137	26.799	n =	40
	<i>within</i>		11.619	-104.347	126.056	T =	16
GDP growth	<i>overall</i>	5.181	7.783	-32.832	106.280	N =	640
	<i>between</i>		4.246	-1.483	22.872	n =	40
	<i>within</i>		6.556	-45.925	93.187	T =	16
Inflation	<i>overall</i>	23.476	178.769	-9.616	4145.108	N =	613
	<i>between</i>		66.773	1.669	346.915	n =	40
	<i>within</i>		166.867	-311.191	3281.668	T-bar =	15.325
Real Interest rate	<i>overall</i>	11.822	32.156	-96.870	508.741	N =	433
	<i>between</i>		22.107	-11.456	127.085	n =	31
	<i>within</i>		25.465	-92.094	393.478	T-bar =	13.968
Openness	<i>overall</i>	66.184	53.834	15.159	743.413	N =	640
	<i>between</i>		39.117	22.578	182.186	n =	40
	<i>within</i>		37.468	-39.601	643.228	T =	16
International reserves	<i>overall</i>	14.701	14.942	.051	114.448	N =	622
	<i>between</i>		13.831	2.391	81.969	n =	40
	<i>within</i>		6.812	-20.626	47.181	T =	15.55
Political rights	<i>overall</i>	4.237	1.833	1	7	N =	528
	<i>between</i>		1.747	1	7	n =	40
	<i>within</i>		.653	2.165	6.951	T-bar =	13.2
Infrastructure	<i>overall</i>	3.068	5.989	.006	32.127	N =	633
	<i>between</i>		5.950	.033	25.976	n =	40
	<i>within</i>		.993	-6.583	9.218	T-bar =	15.825
Natural resources	<i>overall</i>	12.127	17.898	0	80.692	N =	639
	<i>between</i>		17.194	0	65.825	n =	40
	<i>within</i>		5.602	-11.815	45.780	T-bar =	15.975
SACU	<i>overall</i>	.063	.242	0	1	N =	640
	<i>between</i>		.167	0	.5	n =	40
	<i>within</i>		.177	-.438	.563	T =	16