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Chinese influence on economic growth in Sub-Saharan Africa.

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Abstract

This thesis examines the difference between the influence of trade between Sub-Saharan Africa (SSA) and China and the influence of trade between SSA and the rest of the world on economic growth in SSA. The examination is done by estimating coefficients using an ARDL-Model. The main explanatory variables in this model are export and foreign direct investment (FDI), the dependent variable is economic growth, measured in GDP. Chinese imports from SSA are remarkably focussed on natural resources. The resource-seeking nature of Chinese involvement in SSA differentiates the export patterns of SSA towards China and towards the rest of the world. In this distinction between the two export patterns originates the difference between the influence of trade with China and trade with the rest of the world on economic growth in SSA. Trade with China turns out to be negatively impacting economic growth, whereas trade with the rest of the world has a positive impact.

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1. Introduction

Between 2001 and 2016, Sub-Saharan Africa (henceforth SSA) has had an economic growth rate of around 5% per year on average. With this economic growth came structural reforms, stronger public institutions, and a more responsible macroeconomic management, creating opportunities for SSA to engage more in global trade. During the same period, trade between SSA and China experienced rapid growth. In 2013 China became the most significant export partner for SSA, and China now accounts for 27% of SSA's export, from just 2.3% in 1985 (Pigato and Tang, 2015).

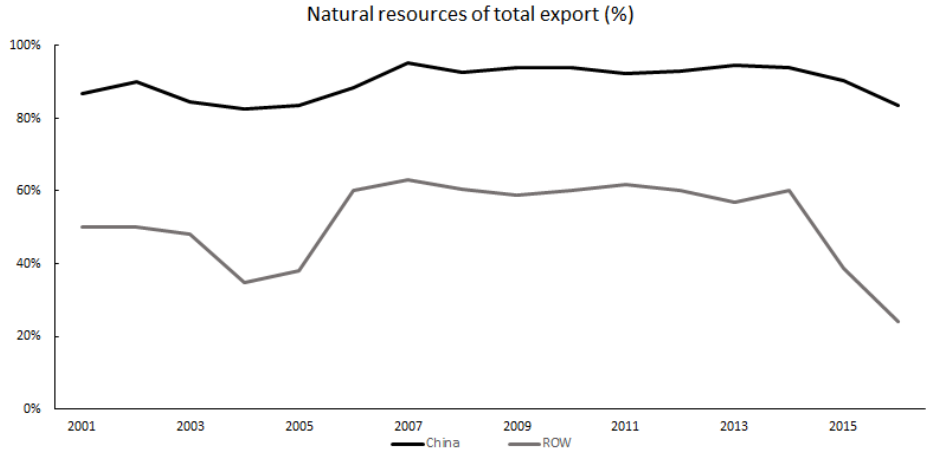
According to the basic principles of comparative advantage and trade, both SSA and China should profit from trade (Dornbusch, Fischer and Samuelson, 1997). SSA's export can roughly be divided into four groups: oil, non-oil natural resources (e.g., metals, minerals, and wood), agriculture goods and manufactured goods. As reported by the World Integrated Trade Solution, SSA has a revealed comparative advantage in the first three groups and a (growing) disadvantage in the last one. China on the other hand, has a revealed comparative disadvantage in the first three groups, and an advantage in the last one.

The bilateral trade pattern between SSA and China is in conformity with the principles of comparative advantage. The export products of SSA towards China consist primarily out of oil and non-oil natural resources and the share of natural resources out of total exports is only growing. SSA also has a comparative advantage in agriculture goods, yet Chinese import tariffs on these goods are obstructing SSA to exploit these fully. Whereas the export from SSA focusses on primary commodities, SSA's import from China consists primarily of manufactured goods. This is in line with the overall Chinese export pattern, which mainly includes consumer and intermediate goods. SSA and China overall participate in different export markets, making that exporters in SSA face limited competition from Chinese exporters in the world market. Moreover, the export products produced in respectively SSA and China are often complementary rather than competitive, as Chinese production of (export) products uses the imported natural resources from SSA (Pigato and Tang, 2015).

The trade pattern of SSA with the rest of the world (ROW) is far less concentrated on natural resources. In Figure 1 the export share of oil and non-oil natural resources out of total export from SSA towards China and towards the rest of the world is shown. Between 2001 and 2016, the difference between the share of oil and non-oil natural resources out of total export between China and the rest of the world was at least 28%, in 2005. Overall the difference increased from 37% in 2001 towards 59% in 2016.

The nature of China's imports from SSA is clearly resource-seeking. The urge of China for SSA's natural resources can be explained by the need of China to sustain its production capacity, thereby perpetuating its economic growth (Kolstad and Wiig, 2011).

Figure 1. The share of natural resources out of total export for China and ROW.



Source: World Integrated Trade Solution data, World Bank

Alongside the growth in export from SSA towards China came a significant growth of foreign direct investments (FDI) flowing the opposite direction, from China towards SSA. The total amount of Chinese FDI in SSA was over twenty times more in 2013 than it was in 2003 (Alon, Chen and Zhang, 2014). Despite the substantial increase, the presence of Chinese capital in relative terms is still modest. In 2013, Chinese FDI represented 7% of total foreign capital. The direction of these FDI is predominantly concentrated in recourse-rich countries. Out of the top ten FDI receiving countries in SSA, six are rich in oil (Alon et al., 2014). At a sector level, around 30% of total FDI has been in the extraction industry, and the construction sector accounts for 16%. These two sectors are interrelated, as most projects in the construction sector funded by Chinese investments consist of building infrastructure to support the transport of products from the extraction industry (Pigato and Tang, 2015). The nature of Chinese FDI also suggests an interrelationship between export and FDI. FDI is directed to support the productivity (capacity) in the extraction sector, which could lead to a higher domestic production, which in turn could lead to an increase in exports of natural resources.

On the import side of SSA, China also gained influence. The share of imports from China out of total imports increased from 4% in 2001 towards 14% in 2013. Contradictive to the little diversification in export products, imports from China are extremely miscellaneous.

Machinery and electronics represent the largest share with 27%, followed by textiles and clothing, which account for 19%.

In this thesis, I aim to investigate the influence of trade with China and with the rest of the world on economic growth in SSA. The growing difference in the share of oil and non-oil natural resources out of total export, caused by the recourse seeking nature of trade with China, brings me to the following research question:

'' *To what extent differs the influence of trade between SSA and China on economic growth in SSA with the trade between SSA and the rest of the world?''*

In this thesis, I will focus my research on export. The export pattern towards China is remarkably concentrated on primary goods and exposes a notable difference with the pattern towards the rest of the world, whereas imports are diversified both from China and the rest of the world. Moreover, the share of imports out of total imports from China is twice as small as the share of exports towards China out of total export.

Numerous researches have been conducted to prove the relationship between export and economic growth, for example by Taylor (1981). In an intercountry comparison of 55 developing countries between 1960 and 1977, he found significant results for the positive relationship between (manufacturing) exports and economic growth. Balassa (1978) also found empirical evidence of the positive influence of export on economic growth. According to Balassa, the main reason growing export contributes to economic growth is that it tends to attract foreign capital. This relationship is in line with the findings earlier in the introduction, stating that Chinese FDI is aimed to support SSA's export towards China. Because of the complementary nature of the interrelationship between export and FDI, the influence of (Chinese) FDI on economic growth in SSA will also be discussed in this thesis. There are various studies concerning this subject, many of them find empirical result of FDI positively contributing to economic growth. Warnock and Warnock (2006), for example, describe the positive impact of foreign capital on the domestic economy, promoting economic growth.

This thesis will follow the methodology of a paper by Acaravci and Ozturk (2012). In their paper, they examine the (causal) relationship of the (independent) variables trade (measured in total exports) and FDI on the (dependent) variable economic growth (measured in GDP) in ten East-European countries by using an autoregressive distributed lag (ARDL) model.

The difference between the model used in this thesis and the model described above, next to the obvious difference in examined countries, is that the variables trade and FDI will be divided into two components: export to/FDI from China and export to/FDI from ROW. This thesis contributes to the existing literature because it directly compares the influence of trade with China on economic growth in SSA with the influence of trade with the rest of the world on economic growth in SSA, which has not been examined before.

2. Theoretical Framework

In the theoretical framework, first the (general) effects of export and FDI on economic growth will be discussed. The impact of Chinese involvement in particular will be analysed in the last section.

2.1 Export and Growth

There are multiple arguments within the trade theory stating that (increasing) export has a positive impact on economic growth. First of all, export development may lead to an increase in productivity. The growth of export could allow domestic producers to achieve more significant advantages of economies of scale, especially by the expansion of the export of products in which a country enjoys a comparative advantage. As discussed in the introduction, for SSA this includes oil and non-oil natural resources primarily. If domestic demand for certain products is too small for producers to obtain optimal scale, export to foreign markets could offer them the opportunity to nevertheless fully exploit these advantages (Giles and Williams, 2010). China's increasing demand for oil and non-oil natural resources provides such opportunities. In addition to that, export could help to allocate a countries production factors and resources in line with its comparative advantage, leading to an increase in the productivity of the country overall (Balassa, 1978). Secondly, an increase in export may loosen a binding foreign exchange constraint, allowing the import of foreign goods and investments (Xu, 1996). Furthermore, the capital earned by a country, arising from an increase in export, typically provide the means for a country to raise its import level of goods and services (Emery, 1967). This could allow domestic consumers to benefit from cheaper consumer goods and domestic producers to benefit from importing new technologies, thereby increasing their productivity (Wong, 2007). Finally, an increase in export could contribute to an increase in employment (Balassa, 1978).

2.2 FDI and Growth

In the literature concerning the impact of FDI on economic growth, several reasons arguing a positive effect come to light. Bosworth and Collins (1999) show that inflowing foreign capital stimulates domestic investment in the host country. FDI adds to the capital stock of the receiving country, which encourages domestic investments and thereby contributes to economic growth of the country by increasing its production capacity and helping domestic producers achieve full advantages of economies of scale (Alon, Chen, and Zhang, 2014). Borensztein, Gregorio, and Lee (1997), using a regression of cross-country data of 69 developing economies, reveal that FDI is even more productive than domestic investments. This suggests that foreign firms investing in a domestic market have more advanced technology and management skills to compensate for the competitive advantage of domestic firms, supposing domestic firms have more knowledge in, and easier access to, the local market. Following this reasoning, hosting FDI can be an important channel to import advanced foreign technology and human capital.

2.3 Chinese Involvement

As discussed in the introduction, SSA's export towards China and Chinese FDI towards SSA are interrelated. Export to China consists mainly out of natural resources and FDI are focussed around industries aiming to increase the capacity of extraction and facilitate the transport of the retrieved products, thereby increasing the export capacity. This seems to be in line with the argument made in the previous section, stating that FDI has a positive effect on economic growth by increasing a countries production capacity. Moreover, China is directly involved in promoting domestic producers to obtain advantages from economies of scale. According to Pigato and Tang (2015), bottlenecks in infrastructure could prevent producers to achieve this, yet the Chinese FDI directed to SSA infrastructure reduce this obstruction. Above that, Chinese demand for natural resources creates a big enough market to accommodate the supply of domestic producers when producing at optimal scale. This suggests a mutual benefit for both SSA and China, yet there is a difference between traditional (Western and Japanese) FDI and FDI from China in particular. The traditional FDI arises from privately-owned companies seeking short-term profits. On the contrary, Chinese FDI comes primarily from either (partly) state-owned companies or companies that are subsidised by the Chinese government for establishing themselves abroad. The capital costs of these firms tend to be lower than the costs for privately owned companies, hence they can operate with a longer time horizon (Alon et al., 2014) and can offer projects at a lower price. Using these price discounts, Chinese firms

are crowding out (Western) competition, thereby diminishing the increase in productivity arising from competition. Furthermore, these investments are linked to the strategic objective of China as a whole to obtain long-term access to natural resources, in order to sustain its level of manufacturing to perpetuate its level of economic growth (Kaplinsky, McCormick and Morris, 2014). Investment from, and even development aid provided by, China is often tied to the access to natural resources (Kolstad and Wiig, 2011) and the use of Chinese inputs (Kaplinsky et al., 2014). Chinese firms are using their own machinery and even employ a low-paid Chinese workforce, discouraging the transfer of human capital and technology. Additionally, this also reduces the effect on the employment rate and the improvement of allocation of resources and production factors in the host country, which could potentially arise from an increase in export. To facilitate import from SSA even more, most export products from SSA are free of tariffs when entering the Chinese market.

On top of this, it appears that Chinese investors are attracted to countries with bad institutions (Buckly et al., 2007), whereas in general investors are attracted towards countries with good institutions (Asiedu, 2006). Bad institutions, and especially corruption, tend to be of negative influence on economic growth in a country (Mauro, 1995).

Another argument suggesting a less mutual benefit of trade between SSA and China is that the one-sided aim of resource-seeking trade can cause 'Dutch Disease': '*'the coexistence within the traded goods sector of progressing and declining, or booming and lagging, sub-sectors*'' (Corden and Neary, 1982). In many cases, the 'booming' industry is the extraction industry, and the 'lagging' industry is the manufacturing industry. The theory is that the boom in the extraction industry causes an allocation of resources around this industry, including employment, causing a decline in manufacturing industry output and employment. Moreover, the boom causes the real exchange rate to appreciate, which decreases the competitiveness of a country towards the rest of the world, causing both the export of the booming industry and the manufacturing industry to fall.

In SSA something similar to the Dutch Disease theory occurs. The real exchange rate of 70% of the countries in SSA has appreciated during 2000 and 2011. This is partially caused by the fact that these countries pegged their currencies to the euro and partially by the demand for oil and non-oil natural resources, especially from China (Pigato and Tang, 2015).

During the same period, China facto pegged the renminbi to the dollar, while the dollar has been undervalued relative to the euro. This resulted in an appreciation of African currencies relative to the renminbi of 43% on average, while the currencies of other main trade partners of China depreciated by 11% (Jeanneney and Hua, 2015). This appreciation of SSA

currencies is stimulating the import of manufactured goods by SSA from China, which negatively effects domestic producers and eventually may lead to de-industrialisation (Kolstad and Wiig, 2011). On the other hand, the appreciation of SSA currencies relative to the renminbi is barely influencing export of SSA towards China.

According to the theory of Dutch Disease, the appreciation of the currency of the exporting currency should harm the competitiveness in such a manner that the level of export should decrease as well. However, the export consists primarily out of natural resources with fixed prices on the world market. Therefore the changes in real exchange rates do not impact the level of export (Jeanneny and Hua, 2015). This suggests that a detrimental sequence takes place. China is importing natural resources from SSA to perpetuate its own level of manufacturing and economic growth and is effectively keeping its currency undervalued. These exports from SSA are causing African currencies to appreciate, and because of the undervaluation of the renminbi, this appreciation is relatively even more significant between SSA and China. The appreciation itself puts Chinese manufactured imports in a comparative advantage relative to domestically produced goods. This stimulates SSA import of manufactured goods from China, contributing to Chinese economic growth, yet negatively influencing SSA domestic producers and withholding SSA from industrial diversification. On the other hand, the appreciation does not affect the import of natural resources by China from SSA, because these prices are fixed on the international market. This puts the focus and allocation of resources even more on the extraction industry.

3. Hypotheses

This paper is based on finding the difference between the influence of trade with China and trade with the rest of the world on economic growth in SSA. FDI is examined as well, because it is often complementary to export. As discussed in the theoretical framework, various arguments are explaining why an increase in export and FDI causes economic growth. It leads to an increase in productivity and production capacity, as it facilitates production factors to allocate conform the comparative advantages of the host country, allows domestic producers to achieve full advantages of scale, increases the employment rate and promotes the import of new technology, human capital, and cheap consumer goods. Chinese investments are mainly concerned with the construction industry and infrastructure projects, increasing the production capacity of SSA. Moreover, China's need for oil and non-oil natural resources creates a sufficient demand for the extraction industry in SSA to obtain optimal scale. However, the

little diversification in export products towards, and FDI from China may lead to Dutch Disease. Export caused SSA's currencies to appreciate, deteriorating SSA's competitiveness. This is hardly influencing the extraction industry itself, as the natural resources have a fixed price on the world markets, yet does harm industries outside the extraction industry, by promoting import of manufactured goods (from China). This allows consumers to profit from cheap products, yet is simultaneously crowding out domestic producers, refraining SSA from industry diversification. Furthermore, Chinese investments projects are often bound to the use of their own machinery and workforce, discouraging the transfer of new technology and human capital, and not contributing to the increase of SSA's employment rate. Besides this, China seems to work towards its strategic objective of long-term access to natural resources to perpetuate its level of production and to conserve its level of economic growth. FDI comes primarily from (partly) state-owned companies, and other firms receive subsidies for establishing themselves in SSA.

In order to reveal the expectation of the outcome of this study, two hypotheses have been formed to answer the research question. Based on the literature described above and especially the strategic and self-enriching nature of the trade between China and SSA, I developed the following hypotheses:

H1: Trade with China is less contributing to economic growth in SSA than trade with the rest of the world.

H2: FDI from China is less contributing to economic growth in SSA than FDI from the rest of the world.

Important to notice is that the second hypothesis comprehends the direct effect of FDI on economic growth. The positive effect FDI could have by supporting export, thereby indirectly influencing economic growth, is not measured here.

4. Data and Methodology

To analyse the hypotheses, I will use an ARDL-model, in line with the empirical research of Acaravci and Ozturk (Acaravki and Ozturk, 2012). In the next section, an overview of the research will be given. The sections after that provide a detailed explanation of (the source of) the data and methodology.

4.1 Research Overview

The ARDL model estimates coefficients which reveal how the independent variables influence the dependent variable. The autoregressive model is used here to allow for autocorrelation of the responsive variable (Stock and Watson, 2015). The responsive, or independent, variable in this model is economic growth, which is measured in GDP.

The auto correlated (one year) lagged value of GDP is a variable that contains all factors influencing economic growth in SSA, except for FDI and export. This thesis aims to examine the difference of influence between SSA's trade with China and trade with the rest of the world. Therefore, the main explanatory variable is trade, measured in export. This variable consists of two components, which are export to China and export to the rest of the world. As explained before, FDI is closely related to export. Besides an increasing effect on export, FDI itself also influences economic growth directly. To avoid an omitted variable bias in the coefficient of trade, I include FDI as one of the explanatory variables in the model. Since trade appears in two ways, this variable is split into two distinctive components: FDI from China and FDI from the rest of the world.

According to Stock and Watson (2015), large outliers in the data become unlikely after taking the natural logarithms of the variables. Moreover, the natural logarithm converts changes in variables into percentage changes. This makes it easier to interpret the coefficients. For these reasons, I take the log-values of each variable. Finally, to overcome the problem of unobserved heterogeneity, I implement fixed effects to control for any country or time invariant components in the model. In the model, these fixed effects are represented as γ_i and δ_t respectively. The ARDL-model used for the regression will therefore take the form as presented below:

$$Ln(GDP_{it}) = \beta_0 + \beta_1 * Ln(GDP_{it-1}) + \beta_2 * Ln(EX_{it}^{CH}) + \beta_3 * Ln(EX_{it}^{ROW}) + \beta_4 * Ln(FDI_{it}^{CH}) + \beta_5 * Ln(FDI_{it}^{ROW}) + \gamma_i + \delta_t + \varepsilon_t$$

The final dataset is panel-data which consists of 49 countries in SSA between the period of 2001 and 2016. This period has been chosen because China started to expand its trade relation with SSA countries excessively during this period (Pigato and Tang, 2015). Furthermore, this

time sample will give the most relevant information about the current situation and, therefore, is the most useful to provide implications for the future.

The ARDL-model generates estimations of the coefficients β_0 to β_5. The coefficients, for example β_2, can be interpreted as follows: if the export from SSA to China increases with 1%, GDP will increase with β_2 %. The difference between the coefficients will therefore reveal the difference between the influence of export to China and export to the rest of the world on economic growth in SSA.

As discussed in the theoretical framework, China is attracted to countries with bad institutions relatively more than the rest of the world. Bad institutions itself have a negative impact on economic growth. So, countries with a low economic growth rate attract more Chinese investments. This suggests reverse causality: economic growth in a country (the dependent variable) affects the amount of Chinese FDI it is receiving, which in turn affects the export level from that particular country towards China (the independent variables). This could lead to a simultaneous equation bias. A second ARDL-model has been regressed in order to avoid this bias. The model executed the same regression, yet with a different sample: exclusively countries with (relative) good institutions.

4.2 Data

Panel data on export, FDI and GDP has been collected for 49 countries between 2001 and 2016. Export data per country has been retrieved from the World Integrated Trade Solution (WITS) database, provided by the World Bank. Both data on total export and export directly to China could be found here, in US$. However, the export data is not complete for all countries. Not all countries share their trade information, and not all information has been judged as reliable by the WITS. Other reasons for missing data are that a country suffered from (civil) war or that the country simply did not exist for the entire time span. For six countries (Chad, Democratic Republic Congo, Equatorial Guinea, Liberia, Somalia and South Sudan) the data on export, both to China and to the rest of the world, is missing entirely between 2001 and 2016. For four countries (Djibouti, Eritrea, Guinea Bissau and Sudan) only one or two years of export data is available, and for seven countries (Comoros, Gabon, Lesotho, Mali, Sao Tome, Sierra Leone and Swaziland) between four and nine years of export data is missing. To fill the gaps of missing data, I collected mirror data. Instead of for example searching for export figures from Chad to China, I looked for data on Chinese imports from Chad. The data on import could also be retrieved from the World Bank. After

adding the mirror data to the dataset, data of only a few years for a few countries were still missing: three years of Cabo Verde and Comoros, four years of Guinea Bissau, five years of Sao Tome and eleven years of both Sudan and South Sudan.

The GDP per year per country could also be found via the World Bank. It is not available for Eritrea between 2012 and 2016 and for Somalia between 2001 and 2012.

For the countries mentioned above, the years containing missing data on either GDP or export have been excluded from the estimation of the ARDL model.

Data on FDI has been harder to find. Total inflowing investments per country are retrieved via the World Bank, yet inflowing investments from China specifically are not retrievable from there. In fact, there is a lot of discussion about the reliability of data on Chinese FDI. Official reports provided by the Ministry of Commerce of the People's Republic of China (MOFCOM) about outgoing investment flows are not in line with the definition of FDI by the Organization for Economic Co-operation and Development (OECD). Furthermore, they do not include investment flows channeled indirectly through Hong Kong and other offshore finance centers and there is (anecdotal) evidence that a lot of Chinese firms choose to not participate in the registration process obliged by the Chinese government, to avoid time-consuming processes (Shen, 2013). For that reason data on FDI provided by MOFCOM tends to be lower than the actual amounts. Therefore, in this paper, data retrieved from The China Global Investment Tracker (CGIT) has been used. CGIT is an initiative of the American Enterprise Institute and The Heritage Foundation. They track Chinese FDI directly from corporate websites and news reports and put this together in a publicly accessible database. The value of Chinese contracts is used as a proxy for the investment flows. They only report investments worth $95 million or more, yet they do include those investments channeled indirectly. Despite missing many investments that do not reach $95 million, the total value of FDI published is still exceeding the value provided by MOFCOM. That is why in this thesis the choice has been made to use data from CGIT. The direction of Chinese FDI and the sectors in which the investments are being made are, however, corresponding in the data sets of MOFCOM and CGIT. Summary statistics can be found in Tables 5 and 6 in the appendix.

Data on governance has also been retrieved from the World Bank. The World Bank described six different governance indicators: Voice and Accountability, Political Stability and Absence of Violence/Terrorism, Government Effectiveness, Regulatory Quality, Rule of Law and

Control of Corruption. They have examined and scored each country on all of these dimensions every five year, starting from 2006.

4.3 Methodology

To investigate the difference between the influence of trade with China and the influence of trade with the rest of the world on economic growth in SSA, I used an ARDL model. The estimations of the coefficients belonging to the (natural logarithms of) variables Export to China (EX_t^{CH}), Export to rest of the world (EX_t^{ROW}), FDI from China (FDI_t^{CH}), and FDI from the rest of the world (FDI_t^{ROW}), will reveal this difference. The ARDL-model and the corresponding coefficients have been estimated by making use of the data analysis and statistical software STATA. First, I manually transferred the data described above to Excel, in order for STATA to be able to read and use it. The data on export from SSA towards the rest of the world had to be manually computed for each country, by subtracting export to China from total exports. FDI from rest of the world has been calculated in the same way. According to the database of CGIT, not every country in SSA received Chinese FDI each year. As taking the natural logarithm of zero is undefined, I added one to all values of $\mathrm{FDI}_t^{\mathrm{CH}}$. After that, I took the natural logarithms of all variables. Finally, I estimated the model.

As aforementioned, there is a discussion about the reliability of data about Chinese FDI. Moreover, CGIT only reports investments worth $95 million or more, thereby excluding a lot of Chinese investments that do not reach this amount. Therefore, if the CGIT database does not show any Chinese FDI flowing into a specific country in a specific year, it is unclear if the amount indeed is zero, another amount under $95 million, or even an actual missing value. The latter could apply if information about Chinese FDI is not even available to CGIT itself. However, after adding one to all values of $\mathrm{FDI}_t^{\mathrm{CH}}$, all cases in which the GCIT did show any FDI flowing in are now counted as one, and not as a missing value. Consequently, they all have been taken into account in the regression. This reduces the reliability of the data even more.

For this reason, a second ARDL regression model has been estimated. I created a new variable for this model: FDI world (FDI_t^{World}). The data of total inflowing FDI per country per year, which is available through the World Bank, has been used for this. When using this variable there is no distinction between Chinese FDI and FDI from the rest of the world, yet

the effect of FDI on export, which can cause an omitted variable bias, is still captured in the variable FDI_t^{World}.

The use of fixed effects in the regression model controls for the effect of bad institution on economic growth itself, yet it does not control for the fact that Chinese investors are relatively more attracted to countries with bad governance than investors from the rest of the world.

To avoid that a simultaneous equation bias arises from countries with bad institutions, I created a second sample. To do this, I divided all countries in SSA into two groups: Good Governance and Bad Governance. To make the selection, first the average score of each different dimension of governance, for the period 2006 until 2016, of each country has been computed. The average score of these six outcomes together provides an overall score on governance per country. Then the average score of the governance indicators for SSA as a whole has been computed.

Countries with a total score under the average score of SSA have been assigned to the Bad Governance group, countries with a total score above the average of SSA have been assigned to the Good Governance Group. The groups, including the average government index scores per country, can be found in Table 7 and 8 in the appendix.

5. Results

Table 2 provides the outcomes of the ARDL regression model including all variables. The regression has been executed conform the following formula:

$$Ln(GDP_{it}) = \beta_0 + \beta_1 * Ln(GDP_{it-1}) + \beta_2 * Ln(EX_{it}^{CH}) + \beta_3 * Ln(EX_{it}^{ROW}) + \beta_4 * Ln(FDI_{it}^{CH}) + \beta_5 * Ln(FDI_{it}^{ROW}) + \gamma_i + \delta_t + \varepsilon_t$$

Table 2. ARDL-Model output including all variables

Ln(GDP)	Coef.	Std. Err.	z	P>|z|
$\mathrm{Ln(GDP_{t-1})}$	.7600036	.0228133	33.31	0.000
$\mathrm{Ln(EX^{CH})}$	-.0027415	.0029791	-0.92	0.357
$\mathrm{Ln(EX^{ROW})}$	.0360035	.0106548	3.38	0.001
$\mathrm{Ln(FDI^{CH})}$	.0014944	.0006773	2.21	0.027
$\mathrm{Ln(FDI^{ROW})}$	.0070804	.0046364	1.53	0.127
_Cons	4.607411	.5342125	8.62	3.560373

Number of obs: 648

R-sq: 0.9944

The coefficient for trade with China is -0.0027, so negative, whereas the coefficient for trade with the rest of the world is positive, namely 0.0360. This implicates that if a country in SSA increases its exports towards China with 1%, their GDP will decrease by 0.0027%. On the other hand, a 1% increase in export to the rest of the world would increase their GDP by 0.036%. However, with a p-value of 0.3570, the coefficient for trade with China is not significant. The coefficient for trade with the rest of the world is significant at a 1% level.

The influence of FDI on economic growth shows different results: FDI from both China and the rest of the world have a positive impact on GDP. However, the coefficient for FDI from China is significant at a 5% level, whereas the coefficient for FDI from the rest of the world, having a p-value of 0.1270, is not. The coefficient for the effect of FDI from the rest of the world is 0.0071, which is bigger than the coefficient for the effect of FDI from China, which is 0.0015.

These coefficients represent the direct impact of FDI on the GDP of the host country, not the indirect effect via export. The R-squared of the sample is 0.9944, meaning is the independent variables GDP_{t-1}, EX_t^{CH}, FDI_t^{CH} , and FDI_t^{ROW}explain over 99% of the variance in the model

As discussed before, there is a discussion about the reliability of data about Chinese FDI. Therefore a second ARDL regression has been executed, using the variable FDI_{it}^{World}. The regression resembles the next formula:

$$Ln(GDP_{it}) = \beta_0 + \beta_1 * Ln(GDP_{it-1}) + \beta_2 * Ln(EX_{it}^{CH}) + \beta_3 * Ln(EX_{it}^{ROW}) + \beta_4 * Ln(FDI_{it}^{World}) + \gamma_i + \delta_t + \varepsilon_t$$

Table 3 displays the outcomes the ARDL model above. It shows similar results to those in Table 2, both on FDI and export. First, the signs of the coefficients are equal to those in the first regression. The coefficient for export to China is -0.0028, slightly more negative than in the first regression. Export to the rest of the world is 0.0341, a little less positive than in the first regression. The coefficient of export towards China is again not significant, and the coefficient for export to the rest of the world is again significant at a 1% level. The effect of incoming FDI remains positive, with a coefficient of 0.0077, significant on a 10% level. The R-squared of the sample is 0.9953.

Table 3. ARDL-Model output including FDI World

Ln(GDP)	Coef.	Std. Err.	Z	P>|z|

Ln(GDP L1.)	.7713034	.0222897	34.60	0.000
$\mathrm{Ln(EX^{CH})}$	-.0028484	.0029811	-0.96	0.339
$\mathrm{Ln(EX^{ROW})}$	.0340949	.0105521	3.23	0.001
$\mathrm{Ln(FDI^{WOLRD})}$	.0076804	.0045829	1.68	0.094
_Cons	4.607411	.5342125	8.62	0.000

Number of obs: 649
R-sq: 0.9953

The results of the sample containing only countries with good governance are presented in Table 4. This regression followed the same formula as the one used for the results in Table 2. The outcomes for this sample show the same signs as the outcomes for SSA as a whole. Export to China is again negatively influencing GDP, whereas export to the rest of the world influences GDP positively. Different in this sample is that both the coefficient for export to China and the coefficient for export to the rest of the world are significant on a 10% level.

The coefficient for Chinese FDI is again positive and significant, and the coefficient for FDI from the rest of the world again positive and bigger than that of FDI from China, yet not significant.

Table 4. ARDL-Model for Good Governance sample

Ln(GDP)	Coef.	Std. Err.	z	P>|z|
Ln(GDP L1.)	.7447542	.0353036	21.10	0.000
$\mathrm{Ln(EX^{CH})}$	-.0062146	.0035599	-1.75	0.081
$\mathrm{Ln(EX^{ROW})}$	.0398726	.0141386	2.82	0.005
$\mathrm{Ln(FDI^{CH})}$	.0019009	.0007904	2.41	0.016
$\mathrm{Ln(FDI^{ROW})}$	.0059627	.0064891	0.92	0.358
_Cons	4.817291	.7243196	6.65	0.000

Number of obs: 367
R-sq: 0.9960

6. Conclusion

In this paper, the difference between the influence of trade with China and trade with the rest of the world on economic growth in Sub-Saharan Africa has been investigated. The influence of trade, measured in export, on the economic growth, measured in GDP, has been analysed

by estimating coefficients that indicate the effect, using an ARDL-model. FDI appears to be complementary to, and even supporting an increase in, export. Above that, FDI on itself also influences economic growth. Therefore the effect of FDI on economic growth has been estimated as well. The research question of the paper is:

'' *To what extent differs the influence of trade between SSA and China on economic growth in SSA with the trade between SSA and the rest of the world?''.*

To answer the research question, two hypotheses have been formulated:
H1: Trade with China is less contributing to economic growth in SSA than trade with the rest of the world.

H2: FDI from China is less contributing to economic growth in SSA than FDI from the rest of the world.
The first hypothesis appears to be correct. All three models estimate the coefficient of trade with China to be negative, suggesting that export to China is negatively impacting economic growth in SSA. On the other hand, the coefficients for trade with the rest of the world are positive in all three models, suggesting that trade with the rest of the world is positively contributing to economic growth in SSA.

However, the coefficients for trade with China estimated in the first two models, both concerning the sample of SSA as a whole, are not significant. Therefore bounded conclusions cannot be drawn from these outcomes, and the hypothesis cannot be accepted. The results in Table 4, regarding the sample of countries with good governance within SSA, do show significant results for both export to China and export to the rest of the world. The results are significant on a 10% level. Therefore the hypothesis can be accepted for this sample, and the following can be concluded: trade with China is less, even negatively, contributing to economic growth than trade with the rest of the world, in countries in SSA with relatively good governance.

To evaluate if the second hypothesis can be accepted, the results in Table 2 and Table 4 have been used. In both models the coefficient FDI^{ROW} exceeds the coefficient FDI^{CH}. This implies that for both SSA as a whole and the sample of countries in SSA with good governance, FDI flowing in from the rest of the world has a higher contribution to economic growth than

Chinese FDI. Yet the coefficient FDI^{ROW} is not significant in both models, and FDI^{CH} is only in the first model. Consequently, the hypothesis cannot be accepted.

Various reasons can explain the positive effect of export towards the rest of the world on economic growth in SSA. First of all, an increase in export can lead to an increase in employment. Secondly, an increase in export could lead to an increase in production capacity and productivity, by allowing domestic producers to exploit full advantages of scale. Finally, export could help by providing the means to increase the import of technology, which in turn helps to increase productivity, and cheap consumer goods.

As stated before, FDI and export go hand in hand, as FDI is often complementary to export. FDI supporting the export industry in host countries, tend to increase the productivity and production capacity, as it enlarges the host country's capital stock and thereby encourages domestic investments. Furthermore, it increases the transfer of new technology and human capital.

Trade with China, on the other hand, appeared to be of negative influence on economic growth in SSA. Moreover, Chinese FDI, although positively, seemed to be less contributing to economic growth than FDI from the rest of the world. Chinese FDI originates from state-owned companies, incentivized by the strategic objective of China to obtain long-term access to natural resources in order to sustain its production level. The resource-seeking nature of Chinese FDI and imports could cause an effect in SSA similar to the effects of Dutch Disease. The focus on, and increase in, exporting natural resources causes developments in other industries, outside the extraction industry, to remain marginal, and the relative exchange rates of SSA's currencies to rise. The latter decreases the development of other sectors even more, as they become less competitive on the world marked and cheap import products crowd them out on the domestic markets. Furthermore, Chinese companies investing in SSA tend to use their own employees and machinery, discouraging the transfer of new technology and human capital in host countries.

Nevertheless, the results remain suggestive, as the coefficients for trade with China are not significant. To examine the accurate effect of trade with China on economic growth in SSA, further research is necessary. This will be discussed in the next chapter.

7. Limitations and Suggestions

In this paper, the difference between the influence of trade with China and trade with the rest of the world on economic growth in SSA has been examined. Data on GDP, export, and FDI has been retrieved in order to execute this. However, the dataset is not complete. The data on Chinese FDI only represents investments above 95 million US$. Moreover, for eight countries data on either export or GDP is missing for at least three years of the time span of the analysis. The incompleteness of the data set causes the ARDL-model to estimate the coefficient less precise.

Another limitation of the research is that it examines the effect on a general level. The results present the impact on SSA as a whole, and fail to specialize the effects on specific countries. Further research could include an examination of the impact of export to China on specific countries. This thesis suggests that trade with China is negatively impacting economic growth in countries in SSA, yet the results for countries individually might be different.

Furthermore, the model only estimates the effect on GDP growth directly. All other factors that could potentially influence economic growth have been captured in the lagged value of GDP. Other factors related to economic growth are for example: (initial) human capital, the initial level of real per capita GDP, the share of government consumption in GDP, political stability and market distortions (Barro, 1991), yet the effect of export (to China) on these factors individually has not been looked into. Further research concerning this subject could provide necessary information for policy implications.

Finally, it could be interesting to study the effect of (Chinese) imports on economic growth in SSA. This thesis has discussed that imports could refrain SSA from industry diversification. On the other hand, imports allow domestic consumers to take advantage of cheap goods. Further research could determine which effects outweighs the other.

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Appendix

Table 5. Summary Statistics for Sample SSA

Variable	Obs	Mean	Std. Dev.	Min	Max
Ln(GDP)	758	22.55642	1.541412	18.09537	27.06627
$\mathrm{Ln(EX^{CH})}$	745	16.55496	3.705991	4.094345	24.24106
$\mathrm{Ln(EX^{ROW})}$	762	20.64096	2.022272	14.611	25.62937
$\mathrm{Ln(FDI^{CH})}$	786	4.943044	8.750286	0	22.88659
$\mathrm{Ln(FDI^{ROW})}$	731	25.83453	2.053724	17.26847	29.92204
$\mathrm{Ln(FDI^{World})}$	731	25.82561	2.068391	17.26847	29.92204

Table 6. Summary Statistics for Sample Good Governance

Variable	Obs	Mean	Std. Dev.	Min	Max
Ln(GDP)	416	22.63947	1.453823	18.09537	26.75606
$\mathrm{Ln(EX^{CH})}$	402	16.24195	3.526865	5.187386	23.24858
$\mathrm{Ln(EX^{ROW})}$	414	20.78174	1.880661	14.611	25.28189
$\mathrm{Ln(FDI^{CH})}$	416	4.368525	8.341865	0	22.64019
$\mathrm{Ln(FDI^{ROW})}$	402	26.03792	1.639817	20.8723	29.92204
$\mathrm{Ln(FDI^{World})}$	402	26.03834	1.639872	20.8723	29.92204

Table 7. Government Indices per Country for sample Good Government

Countries	Avg. Score
SSA	31
Mauritius	75
Botswana	72
Cabo Verde	67
Namibia	62
South Africa	62
Seychelles	58
Ghana	54
Lesotho	45
Senegal	44
Rwanda	43
Benin	42
Sao Tome and Principe	41
Burkina Faso	39
Zambia	39
Tanzania	38
Malawi	37
Mali	34
Mozambique	33
Uganda	32
Madagascar	32
Gabon	31
Gambia	31
Niger	31
Swaziland	31
Cameroon	31
Kenya	31

Table 8. Government Indices per Country for sample Bad Government

Countries	Avg. Score
Djibouti	25
Mauritania	25
Sierra Leone	24
Togo	22
Ethiopia	22
Liberia	22
Comoros	21
Cote d'ivoir	18
Nigeria	16
Guinea-Bissau	16
Congo rep	14
Angola	14
Guinea	14
Burundi	13
Equatorial Guinea	12
Eritrea	10
Central African Republic	9
Zimbabwe	9
Chad	8
Sudan	6
Congo Dem. Rep	5
South Sudan	5
Somalia	1