Economic benefits of Chinese foreign aid: An analysis of China's aid to Africa

A Research Paper Design presented by:

Quynh Anh Nguyen

In partial fulfilment of the requirements for obtaining the degree of

MASTER OF ARTS IN DEVELOPMENT STUDIES

Major:

Economics of Development

ECD

Members of the Examining Committee:

Dr. Howard Nicholas

Prof Dr. Nguyen Trong Hoai

Ho Chi Minh City, Vietnam

December 2017

CHATER 1: INTRODUCTION

The notion of "emerging donors" has been an important one in the recent literature on foreign aid. With the rise of China as an emerging donor and Sub-Saharan Africa (SSA) as the main recipient of its growing aid, much attention has been focused on the nature of China's aid relationship with developing countries, particularly in the SSA region. For its part Beijing has been stressing the reciprocal nature of its interactions with SSA and promising a new aid relationship; one of a partnership based on traditional friendship. However, academics express doubts about the latter and China's real motives behind its aid to the SSA region. The general agreement appears to be that although Chinese aid differs from that of traditional donors (OECD members), it still adheres to the basic principle of aid, which is to primarily serve the interests of the donor. In theory, the so called self-interest can extend from economic benefits to political interests of the donor. For China, it seems that economic interests are the main motives behind its aid program in Africa. Many African countries express gratitude for Beijing's generous offers of aid, cancellations of debt and promises of trade and investment in exchange for energy and minerals. The Chinese government also states its allocation of aid to Africa is for mutual benefit. However, China has been at the centre of criticism for its rapidly expanding role in the continent as an energy and resource extractor. Critics charge that China's extractive behaviour in Africa is no less than neo-colonialism, as it attempts to secure oil and other resources. It is no secret that China's interest in SSA is for the raw materials it requires to feed its industrial machine. Indeed, China's imports from the region are heavily concentrated in petroleum and mineral. Data also shows that China is one of the biggest importers of fuels in the world. Figure 1.1 below shows the share of fuels imported by China. There is a constant increase up to 2012, after which it falls reflecting a slowdown of the Chinese economy.

Figure 1.1: Shares of China's imports of oil to the world, 2010-2012
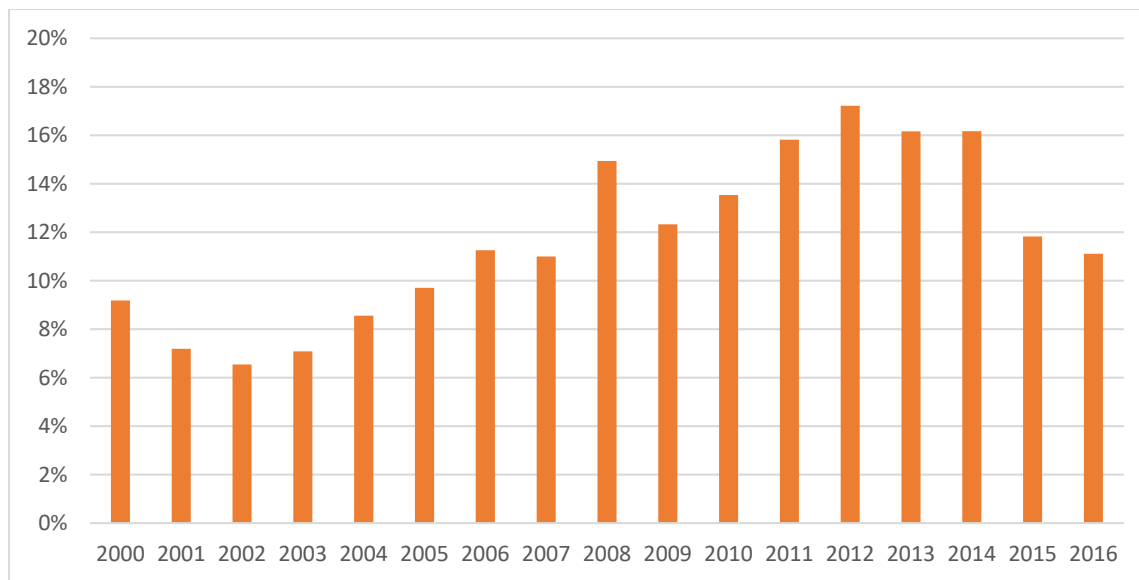
There is also a feeling that China's aid policy also serves its export strategy, by making aid receivers more prone to importing from China.

In the context of the above, the paper attempts to investigate the motivations of Chinese foreign aid to SSA, with the emphasis being on the economic motivations and in particular the trade-aid linkages. The trade benefits refer to the imports of strategic raw materials to serve the production needs of the economy and exports of Chinese goods to the region. The research objective is to see the nature and extent of the aid trade relationship and in particular a) aid facilitates flows of raw materials from Africa to China and b) aid allows greater Chinese exports to countries in this continent.

It needs stressing that the study does not look at the potential benefits of the recipients of Chinese aid, or compare Chinese aid to those of the OECD countries in this regard. Rather, the sole focus is on whether Chinese aid as served the interests of China, particularly its economic interests. Also of note is the relative dearth of official data on Chinese aid, since this is often to be found under the guise of foreign investment.

The study is organized as follows: Chapter 2 introduces some theories and empirical studies of motivation of aid with a focus on the trade gains from aid. Attention is also paid to China's aid

economic motives and the trade-aid link with Africa. Chapter 3 provides background information about China's economy and discussion the reasons behind China's aid activities. More specifically, it explains the importance of raw material and markets for China's growth dynamism. Background on China's aid is also included together with Chinese policy toward aid. Chapter 4 presents an analysis of the aid-trade link, distinguishing between exports and imports. The last chapter will then attempt to draw conclusions from the preceding study.

CHAPTER 2: LITERATURE REVIEW

2.1 Aid in general

    2.1.1 The purpose of aid

In this chapter, the paper considers arguments for and against economic motives of foreign aid. Based on a humanitarian concern about worldwide development, aid is claimed to contribute to the process of alleviating absolute poverty and global economic inequality and distress. The role of aid in promoting economic growth and human development in recipient countries has been the main focus in the literature recently. Recent articles covering the literature on aid and growth include McGillivray et al. (2006) and Arndt, Jones, and Tarp (2010). The effectiveness of aid in raising real GDP growth can be found in studies of Morrissey (2001), Hansen and Tarp (2001), Easterly (2003), Easterly et al. (2004), and Patella et al. (2007). The overall conclusion is that "recipient country growth would have been lower under the counterfactual of no aid".

Related literature discusses the possibility of short-term 'win-win' effects of bilateral aid for both donors and recipients, where economic development in recipient countries is also believed to benefit donor countries in the long run through enhanced trade opportunities and greater global economic and social stability. There are agreements that donor's self-interest is the main motivation behind giving aid. (Alesina and Dollar (2000); Maizels & Nissanke, 1984; McKinlay & Little, 1977). They argue that foreign aid flows are mostly followed by donor's advantageous strategies which are ranged from political and economic benefit.

McKinlay and Little (1977) Study the allocation of U.S. aid over the years 1960-1970. They note that humanitarian model which consider economic assistant is the main rationale behind aid allocation has received criticisms from the literature while there is considerable evidence has supported the view that aid is strongly linked to donor's foreign policy interest. They explicitly test the former model and question the validation of it in explaining U.S aid allocation. They later is motivated to build a systematic model so called "foreign policy model". Guided by the wide range of literature, the model then is developed in to five substantial models that capture various interests of the U.S: "development interests", "overseas economic interests", "security interests", "power political interests", and "interest in political stability and democracy". By doing so, the authors can isolate the effect of different types of interest of U.S's aid. The results of the study support the foreign policy model. There is also evidence indicates that "power political and

security concerns are the central interests supported by and controlled through the U.S aid program" (McKinlay & Little, 1977, p. 80). One important emphasis the authors made in their research is that "the best single indicators of relative need are population and per capita GDP" in the context of aid. They argue that as population grows and GDP per capita declines, the relative need for aid rises. If two countries receive identical amounts of aid (that is, identical absolute commitment), but one has a larger population and lower per capita GDP, then some preference is being shown toward the smaller, wealthier country in the sense that its relative needs for aid are lower.

Follow McKinley (1977), Maize's and Naissance (1984) examine the balance of motivations between "recipient need' and 'donor interest'. They use two alternative models reflecting the need for aid of recipient countries and the donors' gain from giving aid, respectively. The data covers bilateral and multilateral aid flows to 80 countries in 1969-1971 and 1978-1980. The first model is found to be inapplicable as an explanation of allocation of aid. The second model of donor interest provides a good explanation of bilateral aid but poor explanation of multilateral aid. More specifically, political and security interests is found dominantly affect the results and its coefficient increase sharply from 1969-1971 period to 1978-1980 period. Aid for investment shows positive effect, but not significant. Trade interests represented by a dummy variable, which equal 1 if the recipient country exports more than 1% of world exports of any strategic materials such as bauxite cobalt, copper, nickel, etc. shows positive coefficient in both periods, but again insignificant. And by comparing results from two periods, the analysis show that there is a shift from the domination of recipient need aid in the first period to the domination of donor interest aid in the second period. Maize's and Nissanke (1984, p. 891) concludes "bilateral aid allocations are made largely or solely in support of donors' perceived foreign economic, political and security interests". With regard to econometric technique, Maizels and Nissanke (1984) cross-country linear multiple regressions for analysis. The choice of cross-country regressions is not new in empirical literature of aid. Early analysis using this kind of regression includes Davenport (1970), Henderson (1971), Wittkopf (1972). Cross-country regression is often used to compare the differences amongst the subjects in a specific point in time, it is not meant to capture changes through time. Therefore, weakness of the model that it might not help explain cause and effect in this study of trade and aid. A problem often arises from the use of linear regressions is that the results may be affected by extreme values (or 'outliers') of the variables included. In attempt to mitigate these problems, Maizels and

Nissanke (1984) take average of variables used in regressions for each three year period 1969-1971 and 1978-1980. Outliers are also eliminated from regressions. There is report that estimate results change from significant to insignificant in one of the estimations in this study after the exclusion of outliers.

Alesina and Dollar (2000, p.55) suggests that donor's interest explains more of "distribution of aid than the political institutions or economic policy of recipients". They use the data on bilateral aid flows reported by the Development Assistance Committee of the OECD for every five-year period between 1970 and 1994 to study the behavior of bilateral donor aggregately and individually. Aid flows from U.S., Japan, France, and Germany account for the majority of the total aid. The authors consider variables such as trade openness (a zero-one index), colonial history, democracy (an index from on a scale of 1–70 and foreign direct investment (FDI relative to GNP), etc. A new variable using records on UN voting patterns is constructed based on the correlation of voting between each donor-recipients pair. This index is claimed to measure the friendship between a donor and a recipient. The study finds that aid tends to flow to recipients with colonial past and favor voting patterns in the United Nations. In particular, France has given overwhelmingly to its former colonies; and Japan's aid is highly correlated with UN voting patterns (countries that vote in tandem with Japan receive more assistance). They finds no evidence suggesting a link between FDI and bilateral aid flows.

The debate between aid for altruism and self-interest in the literature are likely come to a general agreement in favor of the latter. In other the word, general belief is that donors give aid to serve their own interests. Clearly, the measurement of interests varies from study to study. As a result, the literature is rather fragmented, with one study emphasizing this or that variable and with relatively little attempt at confronting the impact of different variables and their interactions. There is virtually no solid evidence on the relative importance of different variables. Furthermore, it should be noted that, most authors find that the determinants of bilateral and multilateral aid are quite different and one cannot explain the two together.

Some particular studies focus on trade targeting resource- rich recipients (Brautigam 2007, 2010; Jiang, 2009; Downs, 2007; Fuchs, 2011). They argue that donors giving aid to promote energy relation with developing countries with natural resources endowment. Aid is argued as a mean to secure exports of oil, raw material from recipient countries to donor countries. It is often given

under the form of investment in extraction projects or building infrastructure that support the exploitation process. However, there is no clear empirical evidence supporting these above points. Dreher and Fuchs (2015) empirically test if self-interest dominates China's aid allocation; they finds that China's aid allocation seems to be unaffected by characteristics of the institution and the endowment of natural resources in recipient countries.

2.1.2   The trade-aid link

Dominant aid theory suggests that trade, FDI, and political alliance represent donors' interest. The main focus of this part is to address the link between foreign aid and trade. It is important to acknowledge a correlation between aid and trade flows from a donor to a particular recipient in the literature. Researchers have analyzed the relationship between aid and trade flows from donors to recipients to address one of two questions: (a) Is aid given by donors to promote trade with recipients (aid leads to trade)? (b) Is trade a determinant of aid allocation decisions of donors (trade leads to aid)? The two questions reflect two opposite views on the link between trade and aid. On the one hand, trade (imports by the recipient from the donor) is an indicator representing the economic relationship between trading partners (donors-recipients) and is a determinant of aid allocation. That is trade leads aid. With this view, literature often makes emphasis on exports from donor countries and recipient countries. On the other hand, the link could be that aid comes first, then trade follows. This can happen directly, when the aid is tied (to imports from the donor), or indirectly, if the aid contributes to growth and an increase in the demand for imports from the donor. In either case, aid can be said to determine trade and either or both forces can be depending given pair of donor – recipient.

Aid causes trade

There is a general agreement in the standard aid-trade literature that aid protects and supports the givers' trade policy. Kemp and Kojima (1985) indicate that donors usually transfer financial resources and condition recipient governments to spend more on donor's trade goods. Wagner (2003) also agrees with this view. He goes one arguing that exports increase because of direct and indirect gain from aid. According to him, "the most obvious direct aid-trade link occurs with explicitly-tied aid, where a recipient that receives tied aid is obligated to use those funds to buy goods or services from the donor". Indirectly, effect of aid can persist and lead to exports of goods that is not directly attached to aid. For those reasons, the export stimulation of aid may have

exceeded the amount that is directly tied (Wagner, 2003). Morrissey (1993) discusses that tied aid does not necessarily increase exports to donors, it is export competition between donors is the dominant trade objective. He makes a reference to Jepma (1989) who finds that some 30 to 50 percent of tied aid from major donors is not trade creating and goes on arguing that aid is used as an export subsidy or in more general support for exports. The study suggests that donor nations are looking for a chance to enter frontier markets or at least maintain market share to other competitors by giving more aid. Lahiri and Raimondos (1995) look at aid as a mean to reduce trade restriction. They introduce a two-country model of tied aid under the pre-existence of quantitative restrictions on trade. The researchers argue that foreign aid is used as a trade-promotion strategy to increase export and "donor countries may wish to mitigate the trade barriers by linking aid to the relaxation of barriers" such as tariffs and quotas. (Lahiri & Raimondos, 1995, p. 313).

From a development perspective, aid contributes to economic growth in recipient country; and through the development channel exports of recipient countries will subsequently increase in general and in particular to donor countries (McGillivray and Morrissey, 1998). Pettersson (2013, p. 867) notes "aid has the possibility of speeding up the learning-by-doing process when practicing trade, thus facilitating future exports in its creation of customer relations, reputation, distribution channels and in adapting to the formal and informal market environment". Aid is also claimed to enhance the export potential of the recipient countries. Regardless of bilateral trade, exports from recipients might also increase. Hence, aid creates links between the donor and the recipient that might result in long-run positive effects on trade.

There are numerous empirical studies attempting to test the trade-creating effect. Wagner (2003) uses gravity model of trade to statistically test the link between aid and export expansion. The theoretical basis of the model used to address the effect of aid on trade is similar to that of Nilsson (1997), who employs a version of the gravity model to analyze the effects of bilateral and multilateral aid on EU exports to recipient countries. The basic idea of the gravity model is that bilateral trade flows are explained by three sets of variables:

(a) variables indicating total potential supply of the exporting country;

(b) variables indicating total potential demand of the importing country; and

(c) variables that hinder or engender trade between importing and exporting countries.

Some simplifying assumptions allow us to reduce the three sets of variables to two. Since most donors are consider large economies and recipients are small economies, it makes sense to assume that the export capacity of the donor exceeds the import capacity of recipients. Therefore, we can simplify the model to use (b) and (c) by assuming that demand of import from recipient determines volume of trade between pairs of partner. The physical distance is often used as a hinder of trade between donor– recipient pairs. However, it can be omitted as in cases relative distance is unlikely to influence trade volumes between specific donors to specific countries. And also of note is that that sometime a major hindrance will be accessibility rather than physical distance from a given donor to a given recipient (Osei, 2004). Wagner (2003) claims that this method can not only measure exports directly linked to aid-financed projects but it can also capture possible indirect effects of aid on exports. His study finds that 35 cent out of every dollar of aid spent comes directly back to buy goods that are tied to aid and another 98 cents are generated indirectly by selling other goods.

Tajoli (1999) looks from recipient's perspective, examining the effect of tied aid on total imports of recipient countries. The study focuses on Italian with its 34 aid's recipients from 1982 to 1991 using GLS with countries' fixed effects. Share of imports of manufactured goods to recipient country is the dependent variable. The right hand side of the equation includes share of tied aid over total aid flows to one country, share of export to GDP of recipient country and total aid flows as share of GDP. All variables are presented in shares, as the author claims that it would be safer in terms of exogeneity of the independent variables. The study finds unexpected results that the effect of tied aid on recipient's imports is insignificant and negative. It suggests that a higher degree of tying does not necessarily increase imports of aid's recipients. However, a positively significant relationship between total aid flows and import propensity is observed. This finding is relevant to the existing literature that aid relaxes recipient's budget constraints, more money available will increase import demand. However, it can worsen recipient's term of trade. Tied aid is often considered to raise costs of imported goods, then it might cause reverse effect on import volume. The study provides a very interesting approach to tied aid as but one might criticize the reliability of the estimation since a very important factor that is price of imports is not included in the model. Additionally, recent evidence suggests that the variable on bilateral exports loses its significance once recipient-country fixed effects. (Claessens et al., 2009; Dreher, Nunnenkamp, & Schmaljohann, 2013; Hoeffler & Outram, 2011). In the same paper, Tajoli (1999) also test whether

the tied aid granted by the Italian government is used as strategic trade policy. According to the author, Italy ties a very large percentage of its bilateral aid flows; "if the main reason behind its aid policy were commercial interests then it must influence Italian market shares in the recipient countries" (Tajoli, 1999, p.384). Ratio of exports from Italia over total imports of manufactured goods of the recipient country defines Italian market shares and is treated as dependent variable. This variable is expected being explained by degree of tying, measured as the ratio of Italian tied aid over total Italian aid. The test gives non-significant correlation between degree of tied aid and market shares. The author concludes that for Italia, tying aid apparently has no role in maintaining is foreign market in recipient countries and tying does not seem to work as a commercial policy.

McGillivray, Morrissey, and Cnossen (1999) review a few studies of aid and-trade reationship between European countries and Africa. The evidence suggests that France use aid to maintain and increase its exports to Africa, the UK uses aid to offset the decline in its exports, while Germany does not need to use aid to increase its export performance.

Trade causes aid

There exists an opposite position in the literature saying that exports leads to aid. The rationale for this view is that donors choose to support the development process for their trading partners rather than for other countries. Or more selfishly, donors just give aid to their trading partners so they can import more of their goods. Either way, donors are well aware that aid spent enhances benefits from existed trading relationship (Alesina & Dollar, 2000; J. C. Berthélemy, 2006; Morrissey, 1993; Younas, 2008). Empirical studies on "aid lead to trade" or widely known as aid allocation typically suggest three broad sets of variables which are believed to determine the allocation of aid. These are classified as follows:

(a) variables which capture the developmental requirements of the recipient;

(b) variables which represent the recipient's political and strategic importance to the donor; and

(c) variables which represent the commercial and economic importance of the recipient to the donor

According to Barthel at al. (2014), earlier contributions to the aid allocation literature often reported a positive effect of donor exports on aid. Berthélemy (2006) using a three-dimensional

panel dataset, combining the donor, recipient and time dimensions finds that most donors only concern of their own interests that significant trading partners are those who receives more aid. The results are in line with those found previously by J.-C. Berthélemy and Tichit (2004). Berthélemy (2006) uses shares of bilateral exports to donor GDP to explain aid commitment flows. The author argues that aid commitment flows usually precede aid disbursements; therefore will better reduce simultaneity bias. According to him, commitments provide a more accurate measure of donor supply than disbursements because it does depend on the administrative capacity and it rather represent the will of donors rather than promotes exports. He also lags this variable to limit the risk.

Barthel, Neumayer, Nunnenkamp, and Selaya (2014) study if competition for export markets is the reason behind aid allocated to recipient countries. The researchers follow the previous literature lagging explanatory variables and using aid commitments (as in Berthélemy, 2006) to reduce endogeneity concerns. They perform additional estimations where they use the level of exports predicted by a simple gravity model instead of actual levels of exports. They justify predicted level of exports rather than actual level of exports can help eliminate possible causality. This estimated level of exports then is divided by GDP and treated as the main explanatory variable. Controls variables includes GDP per capita as a measure of recipient's need; population to account for recipient' size of the economy. The study find no clear evidence for export competition driving aid allocation.

Younas (2008) empirically estimates the determinants of aid allocation by 22-Development Assistance Committee (DAC) member countries of OECD to 87 aid recipient countries over the period 1991–2003. Explanatory variables includes income per capita (GDP per capita), ratio of imports to GDP. He also divide total imports into manufacturing goods and agricultural products, both as a ratio to total import. He explains that using imports as share of GDP and individual imports category as share of total imports reduces any potential endogeneity bias. The author also want to take into account recipient-specific and time-invariant characteristic such as political rights and civil liberties. Therefore he choose to use pooled ordinary least squares (POLS) as the regression model since it provides a relatively precise measure of those fixed country factors. Because most explanatory variables vary across a wide range, he takes natural log of these variables. Log-log model also helps minimize the effects of extreme values on estimations and

coefficients estimated by the model can be interpreted as elasticities. The study finds that OECD members tend to allocate more aid to their importers, especially importers of manufacturing goods. One important note from Younas (2008) is that aid and GDP per capita are expressed in real terms. Aid data is converted into constant US$2000 using the unit value of the world import price index, and then divided by the recipient nations' population. The author uses this real aid per capita as dependence variable since he wants aid to reflect purchasing power in a recipient country. He also explains that it can represent donors' decision making. Since aid budget for allocation is fixed, donors need to decide how much to give and to which countries.

With regard to studies of a specific country, McGillivray and Morrissey (1998) examine data on trade and aid from Japan to developing countries in Asia and finds that Japan tends to concentrate its aid on the more dynamic Asian economies, which are also the more likely to trade with Japan. There is also evidence that aid may be given to countries, such as ex-colonies, which have strong trading ties with the donor. Exports and aid to former colonies may be high; and concessions for certain strategic products may require a positive amount of aid. (Alesina & Dollar, 2000; Lloyd, McGillivray, Morrissey, & Osei, 2000). As discussed in the previous chapter, Alesina & Dollar (2000) provides evidence that aid tends to flow to recipients with colonial history. Gounder (2007) think the colonial relation between Australia and Papua New Guinea is the sole reason why Papua New Guinea is the only recipients of Australian government support.

Correlation between trade and aid

As reviewed above, theories and empirical evidence suggest a bidirectional causality. That is the effect of aid on trade and the effect of trade on aid can happen at the same time. Nowak-Lehmann, Martínez-Zarzoso, Herzer, Klasen, and Cardozo (2013) discuss that bilateral aid is endogenous and that "in the long run, aid (from members of the OECD) stands in a bi-directional relationship with donors' exports". Lloyd (2000, p.111) also notes that there is possibility that aid-trade linkage does not straightforwardly follows neither of the two directions; "aid and trade could form parts of a mutually reinforcing cycle that the presence of one increases the likelihood of the other". For different pairs of donor and recipient countries, the link can be in either direction. Therefore, one should first examine the data to determine which potential effects is most likely to prevail in a particular donor-recipient relationship. (Lloyd et al., 2000; McGillivray & Morrissey, 1998; Osei, Morrissey, & Lloyd, 2004). Lloyd et al. (2000) try to establish causation between trade and aid

flows of various European donors and African recipient by running Granger tests. Their results were mixed. Aid Granger-causes trade in 14% of the trading partners, trade Granger-causes aid accounts for 17% of the trading partners and 20% of the remaining trading partners, changes in aid and trade happens simultaneously, Wagner (2003) also agree that possible forms of aid-trade linkages are various and interrelated. However, he argues that Granger tests do not really measure causation. The author notes that "donors often make aid commitments before the aid is actually disbursed, so a recipient government may import from a donor knowing that the aid is coming. Consequently, the timing of events does not establish causation". According to him "the intuition behind the aid-trade link contends that there is an explicit or implicit contract between the donor and recipient. Causation in a contract context differs from causation in other contexts, because neither event would occur without the other event. The extra trade would not occur without the aid and the aid would not occur without the extra trade. Each of these two events is conditional upon the other and can be regarded as dependent on the other. Causation in one direction does not negate causation in the other direction." (Wagner, 2003, p. 159). He consider it is the interlinked nature of aid-trade relationship so it is hard to empirical test or provide clear evidence.

Osei et al. (2004) use a set of observations on bilateral aid and trade flows between four donors and 26 African recipients over 1969 –95. Osei et al. (2004) believe that the stronger effect of the two: trade creates aid and aid created trade will decide the observed aggregate relationship between aid and trade. They continue to argue that pairs of countries exhibiting different underlying causal relations should not be pooled in a single panel otherwise it can lead to bias results. On the basis of results from bivariate Granger-causality tests of aid and trade for all pairs of donor-recipient over time, the researchers classify five cases of the natural causal relationship between aid and trade. Case I is where "trade Granger-causes aid", and this would be the implicit assumption for aid allocation studies. Case II is where "aid Granger-causes trade, as in the assumption that aid 'creates' exports. Combined scenarios are Case III where there is "bi-directional causation". He also believe that it can be no relationship exists at all, or alternatively that other common factor(s) is responsible for the observed temporal correlation between aid and trade such as historical and cultural links, common language. These two possible cases are classified as Cave IV "contemporaneous causation and Case V "no statistical relationship". To examine the effect of aid to trade, he uses sample of donor – recipient pairs for which aid is found to Granger-cause trade. Change in imports volume of recipient from donor is the dependent variable. Independent variable

includes output growth (GNP). Output growth should have a positive effect in any import demand function. However, the author notes that a negative relationship could happen and imports and output growth of a particular recipient country could not proportionally move together. The study also controls for variables of aid, one is change in aid volume and the other captures change in the share of a recipient's aid from a donor. The author note that the latter represents other forms of tie to politic or. Change in import shares is thought to count for the impact of past imports on current imports. One might question the use of imports and aid in shares to measure changes. An increase/decrease in aid share or imports does not necessarily mean that aid volumes and imports volume between any donor-recipient pair have increased/ decreased. When it comes to econometric technique, Osei (2004) uses Wu-Hausmann and Breusch-Pagan tests to choose between two methods of estimate: Within Group (WG) and GLS. The choice of method is based on the efficiency and consistency properties of the resulting estimators. The study also recognizes the non-stationarity problem addressing in Lloyd et al. (2000) and takes first difference of the series to deal with it. Introducing first different means over-differencing the data since not all the series for the donor –recipient pairs were found to be non-stationary. The author also acknowledges potential methodological problems as well as considerable complexity in interpretation by doing so. Estimate from the aid-to trade panel and pooled panel yields inconsistent results. While the former gives unexpected negative effect of aid on trade, the latter shows that aid volumes does create more trade.

In the same study, Osei (2004) later uses sub-sample of donor – recipient pairs for which trade is found to Granger-cause aid to test the effect of trade on aid. For this test, change in volume of aid is the dependent variable. Output growth is included to capture the development needs of a recipient; higher growth implies less need for aid. The expected effect of growth will be negative. Imports shares represent the commercial interests of donors so it is expected to have a positive effect on aid if they capture the extent of trading ties between the pair. Donors are expected to give more aid to their trading partners. In this test, the author choose to use trade shares rather than absolute levels arguing that donors would expect change in shares to represent the potential. Again, it is not clear if changes in shares can reflects actual changes in absolute value of aid flows. The lagged aid terms are included suggesting that the preceding year's aid is used as a benchmark for current allocation. The estimated results show similarity between sub-samples and pooled sample that share of imports is an important factor to the allocation of aid. However, for those pairs where

trade causes aid, there is no evidence that the level of imports determines the level of aid, nor that GNP growth affects changes in aid. For the full sample other factors show little effect; the magnitude of the coefficients are weak. One of the important implication of this finding is to point out the weakness of testing average effect for aggregate relationships over a wide range. It criticizes the norm of using the available sample of donor –recipient pairs to test either the significance of trade in an aid allocation regression or the significance of aid as a determinant of trade. It particularly emphasizes different directions of causal aid-trade link depending different pairs of donor-recipient.

2.2 Chinese aid

According to McCormick (2008, p. 82), China appears to be motivated by a combination of altruism, mutual benefit, and strategic interests. As in the case of western donors, "China emphasizes motives like altruism and mutual benefit in public statements, but these can be difficult to disentangle from the more pragmatic strategic and economic interests".

With respect to poverty and development, China's Ministry of Commerce (1985) emphasizes that its aid projects play "a positive role in expanding the national economies of the recipient countries and improving the material and cultural life of the people in these countries." Highlighting the idea of mutual benefit, the ministry claims "to help the recipient countries develop their national economies and bring about economic progress for both China and these countries" (Ministry of Commerce 1985). The State Council (2011) emphasizes the need orientation in China's aid allocation by claiming that the country "sets great store by people's living conditions and economic development of recipient countries, making great efforts to ensure its aid benefits as many needy people as possible." Of course, such views, particularly when stated by Chinese officials, must not be confused with observable facts. China's focus on infrastructure projects might meet development needs largely neglected by DAC donors (Brautigam, 2009). These views largely contradict Naım (2007) who claims that rogue donors like China "couldn't care less about the long-term well-being of the population of the countries they 'aid'." China is often described as the chief villain among the new donors. Naım (2007) characterizes its development aid as "rogue aid," that it is independent from the needs in developing countries, but rather dominated by China's

national interests alone. The objectives of Chinese development assistance are, according to Naım, to "gain greater access to resources and boost international alliances"

Speaking of benefits, facilitating the export of natural resources to China is seen as a central aim of Chinese aid. As a recent World Bank study put it: "Most Chinese government funded projects in sub-Saharan Africa are ultimately aimed at securing a flow of sub Saharan Africa's natural resources for export to China" (Foster et al. 2008, p. 44). China's need for resources (oil, minerals and timber in particular) is mentioned most frequently as commercial motives of its aid (Tull 2006; Davies 2007; Naım 2007; Halper 2010). There is widespread belief that much Chinese aid is linked to resource acquisition. As China grows, it faces increasing pressure to meet internal demands for natural resources (Vines et al. 2009; Taylor 2009). China's quest for oil is well documented (Economy, 2004; Pan, 2005; Lyman, 2005; Jiang, 2009; Zhao 2013 a; Brant, 2013; Tseng, 2015). Bräutigam (2010) explains the so-called "natural resource-backed loans and lines of credit" as a form of development assistance utilised directly for access to resources: "A country uses its natural resources to attract and guarantee an infrastructure loan from China on better commercial terms than it is likely to get from commercial banks. The loan is used to build infrastructure… In some cases … existing natural resource exports are used as security to guarantee repayment. In other cases, the loan will be contingent on a Chinese company gaining preferential access to a block of natural resources that will be developed, and the proceeds used to repay the loan". (Brautigam, 2010, p.21). Zafar (2007) also notes a form of tied aid calling 'China's aid for oil strategy' which involves offering financial assistance and funding of construction projects in exchange for access to oil supplies. In what seems to be an attempt to answer this accusation, the White Paper contains the following passage: "Of China's concessional loans, 61% are used to help developing countries to construct transportation, communications and electricity infrastructure, and 8.9% are used to support the development of energy and resources such as oil and minerals" (People's Republic of China, 2011). Aid project for natural resources from China is also believed to wildly spread in all Africa. The World Bank's own database of Chinese projects in Africa, supplemented by more recent research, reveals that only seven African countries have actually used large, natural resource-backed lines of credit from China Eximbank for infrastructure projects not directly connected to the exploitation of the resource. (World Bank, 2008)

There are also much debates around these assertions. The Chinese government flatly rejects the claim that its aid program is designed to secure access to other countries' natural resources (PRC 2011; Provost 2011). Brautigram (2010) offers a counter argument that China's aid projects are commonly misunderstood. First, there is no evidence that most China-funded projects are somehow connected to getting resources. Although significant in size, only a tiny minority of these have involved the complications of the loan-infrastructure-resource packages. Most of them have been simple turnkey projects: A building, a bridge, or a health clinic. The large, complicated infrastructure-resource loans, though relatively rare, indicate what the Chinese mean when they talk about "win-win" cooperation. A country uses its natural resources to attract and guarantee an infrastructure loan from China on better commercial terms than it is likely to get from commercial banks. Dreher and Fuchs (2015) empirically test if self-interests are motives behind China's aid allocation; they finds that China's aid allocation cannot be explained by recipients' endowment with natural resources and institutional factors. Their model includes China's (logged) total exports to a particular recipient country in constant US dollars to present commercial interests that China might use its aid to promote exports to recipients. (Barbieri et al. 2009; Barbieri and Keshk, 2012). Variable of a recipient country's (logged) oil production in millions of barrels per day also being used for the same purpose of capture China commercial interest but in the form of raw materials. (Humphreys, 2005). Data on Chinese project aid, food aid, medical staff and total aid money to developing countries from 1956–2006 are made used to do the analysis. In contrast to widespread perceptions, the study finds no evidence that China's aid is distorted towards countries with large natural resource endowments. Overall, it seems unjustified to accuse Chinese aid as "rogue aid"

Another motive of China'aid is that it is used to target future access to export markets and to improve business opportunities (Davies, 2007; Pehnelt, 2007). The Ministry of Commerce (1999) openly concluded that, through its aid activities, China's "enterprises entered the markets of the developing countries very quickly and were welcomed by the governments and enterprises of these countries." China's exports of relatively cheaper manufactured products reach virtually all African countries. People from these countries also benefit greatly because they have more access to affordable goods. However, Lammers (2007) argues that by purchasing raw materials from the continent and selling value added products back, China will create an unfavorable trade balance for many African countries. One other form of aid, used only by China, is the tariff exemption.

Preliminary evidence from China's use of such exemptions suggests that the effects on output and the trade balance are positive, but much of the positive balance appears to be the result of natural resource from Africa to China. To conclude, Chinese aid is intertwined with trade in ways that make it difficult to separate the two.

CHAPTER 3: BACKGROUND

3.1 China's economy

Before the 1970s ended, China had been a planned market economy and trapped in poverty. Its per capita income was US$154 in 1978, less than one-third of the average in Sub-Saharan African countries. China was a closed and inward-looking economy as well. Its trade dependence (trade-to-gross domestic product (GDP) ratio was only 9.7 per cent. Since the transformation into a open economy, China has been growing miraculous and becomes the most intriguing economic phenomenon of our time. Annual GDP growth averaged 9.7 per cent over the 36-year period and annual growth in international trade averaged 16.6 per cent. China is now an upper middle-income country, with a per capita GDP of US$8,070 in 2015; more than 600 million people have escaped poverty. It is one of the most robust and stables economies at a global level.

Figure 3.1: China's GDP per capita (current US$), 1978-2016

Trillion
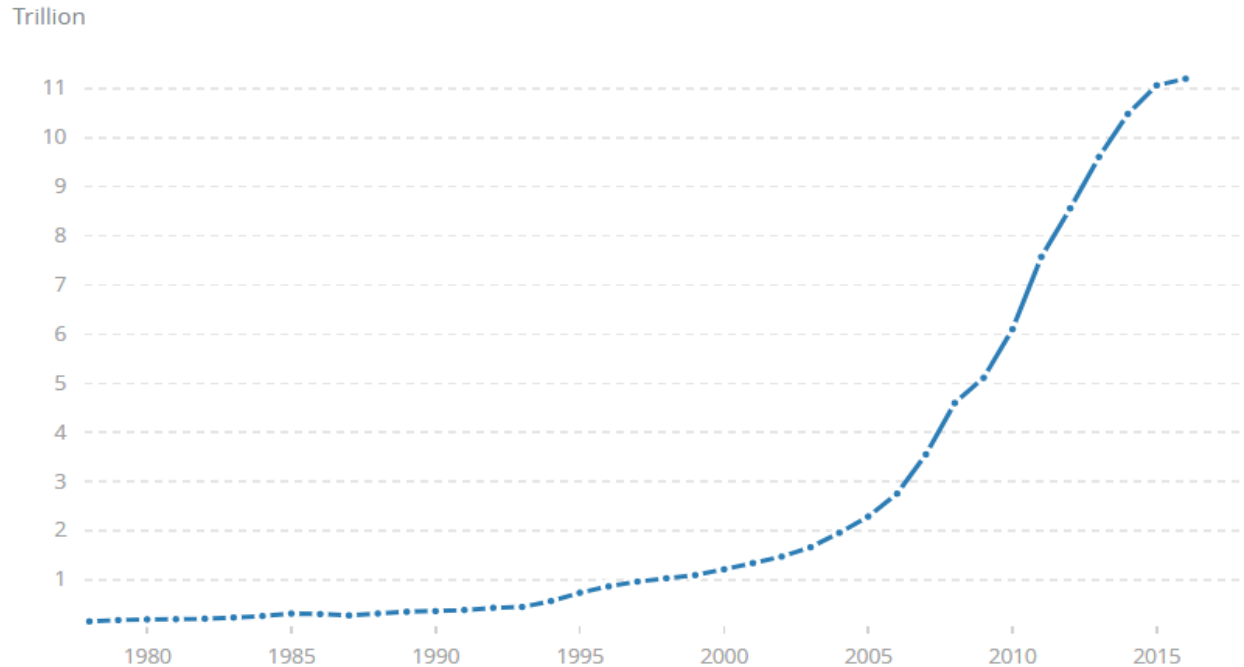
 Source: World Bank

China has become not only a driver of world development but also a stabilising force of the world economy thanks to its spectacular growth over the past three decades. This extraordinary performance far exceeded the expectations of anyone. China now is a key engine of global growth as demonstrated in Figure 3.2

China has become a strong protector of the international trade architecture since its incorporation to the World Trade Organization (WTO). Its trade dependence ratio has reached around 50 per cent, the highest among the world's large economies. In 2009, China overtook Japan as the world's second-largest economy and replaced Germany as the world's largest exporter of merchandise. (World Bank 2017). China is a strict promoter of free trade, having sharply supported the culmination of the Round of Doha in order to liberalize the global trade. Furthermore, it has been stimulating the aggregated demand at the international level with its massive purchasing power.

Figure 3.2: Country contributors to real global growth, 1995 – 2015
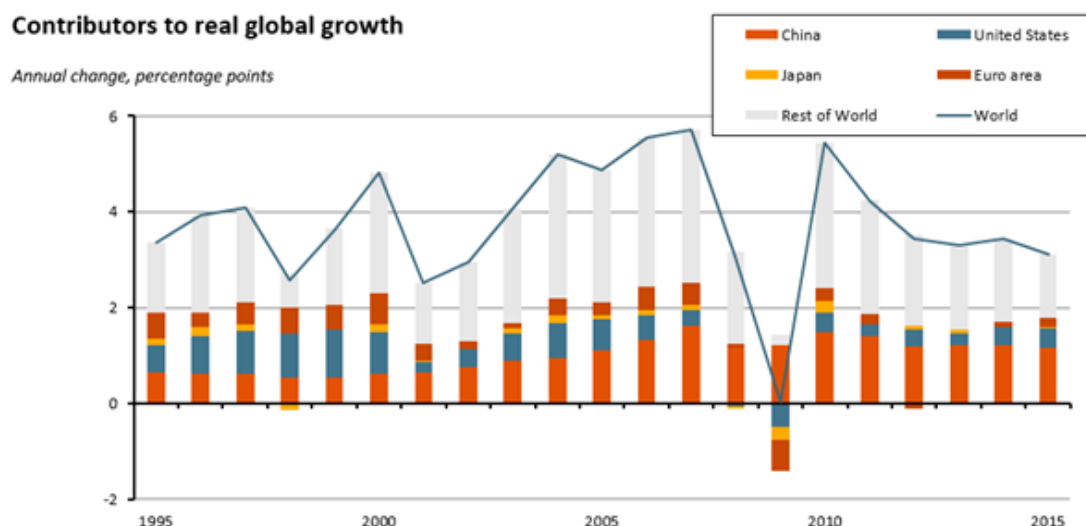
Source: Figure 2.1 in IMF Regional Economic Outlook: Asia and Pacific April 2016

China's dependency on raw material

The first impact of the Chinese development model is China's growing hunger for more and more energy and natural resources, leading to massive extractive activities both inside China and around the world. A fast growing economy typically requires more energy. China has produced a manufacturing structure that requires huge increases in energy consumption, creating an inefficient energy consumption system. China is now the "factory of the world." The major portion of its economic output is oriented towards industries that are primarily energy-driven.

Jiang (2009) mentions some of the figures that characterize the China's energy-driven economy. "With about 6 per cent of global GDP, China consumes per cent of the world's coal, 30 per cent of iron, 27 per cent of steel, 40 per cent of cement, 20 per cent of copper, 19 per cent of aluminium and 10 per cent of electricity. Accompanying this heavy industrial structure is the tremendous waste of energy". As acknowledged by Zhang Guobao, deputy commissioner of China's National Development and Reform Commission, to generate every 10,000 yuan of GDP, China uses as much as three times the energy as the global average. The ratio is even higher than major advanced industrialized countries. In producing US$1.00 GDP, China consumes tenfold the level of energy

that Japan does. In producing the same industrial goods, China uses 11.5 times the energy that Japan requires.

Such a heavy demand for energy and raw materials have led to two major structural requirements for China. One is to find more energy and resources within Chinese borders and to develop them as fast as possible. Another, the China government calls for Chinese enterprises to "go out," around the world to search and extract additional energy and resources. Given Africa's rich endowment of energy, minerals and other key resources, it is natural that Chinese enterprises would see the continent as a new frontier.

To feed its booming economy China needs resources, fuels, minerals, metals and, above all, oil. As shown in Figure 3.3 and 3.4 China has been experiencing an energy production-consumption gap since 1980s. The gap has been widening over time. From 1998 onward, it shows in the imported shares of fuel and minerals from less than 10 percent in 1999 to over 30 percent in 2012.

Figure 3.3: China energy consumption and production gap, 1980-2012
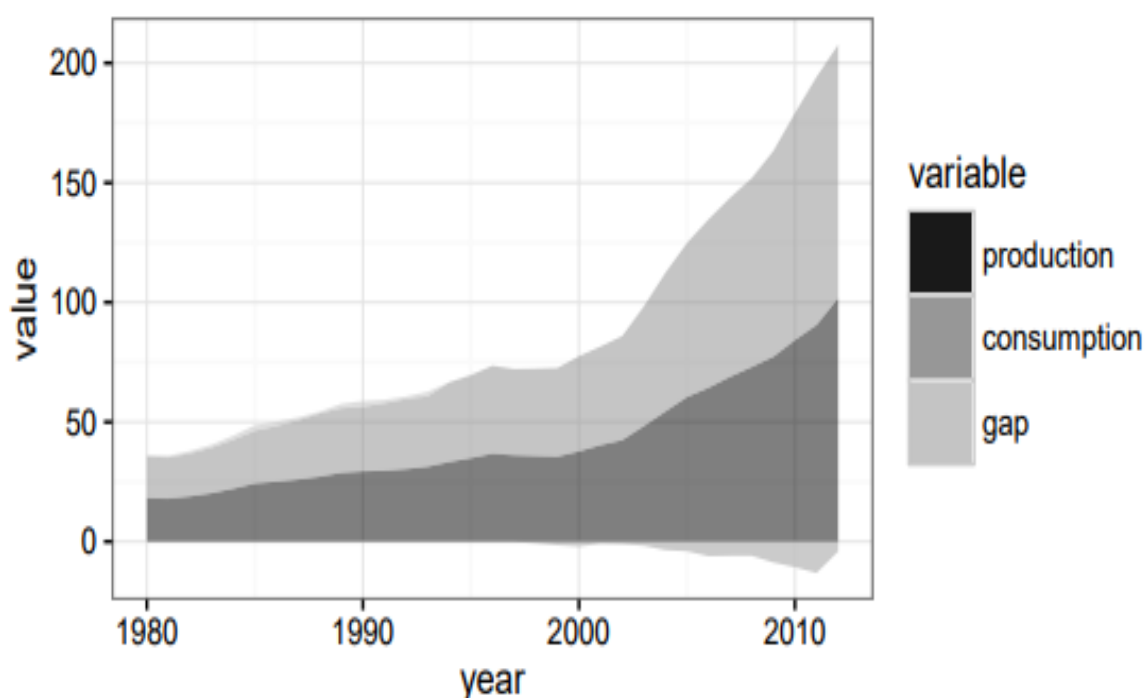
Source: US Energy Information Administration. Figure 3 Tseng (2015)

Figure 3.4: Changing composition of China's import, 1999-2012
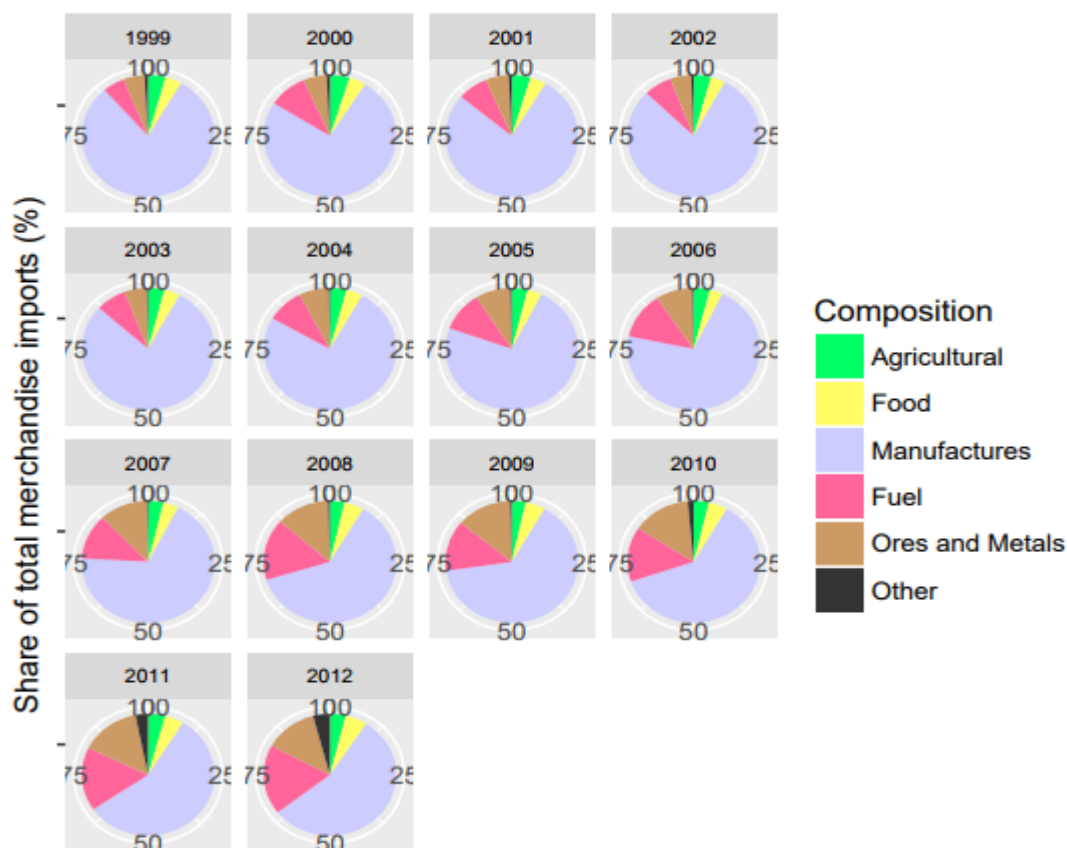
Source: US Energy Information Administration. Figure 3 Tseng (2015)

A growing percentage of imported oil is from Africa. China's oil-driven loan-exemption agreement with South Sudan (2012), its involvement in the highly controversial $5 billion oil-for-aid loan in Angola (2007) and the $9 billion mining and infrastructure aid partnership with the Democratic Republic of Congo (2008) are just a few notorious examples.

The importance of market for China's growth dynamism

Another objective of China's foreign aid, which is closely linked to its commercial benefit, is opening up new export markets for Chinese products and helping Chinese companies to invest and set up manufacturing plants in foreign markets (NYU Wagner School, 2008). Hence, foreign aid can be considered as a means of conducting business. Furthermore, giving aid is a way of improving trade with recipient countries. According to McMillan and Naughton (1992), the efficiency of China's industry, in particularly manufacturing, "is indicated by its success in

selling in competitive world markets". As China's economy evolves, production is moving from agriculture and raw materials to more sophisticated goods as showed in Figure 3.5. China's export structure has transformed remarkably as manufacturing products account for a vast increase in volume and value exported. Expanding markets is needed to relieve the enormous supply that China produces. Considering the cheap price with reasonable quality of Chinese products, it is expected that developing world are more likely the importers. This is reflected in the volume of trade between China and developing countries, especially Africa.

Figure 3.5: Composition of Exports and Imports from China, 1992-2012
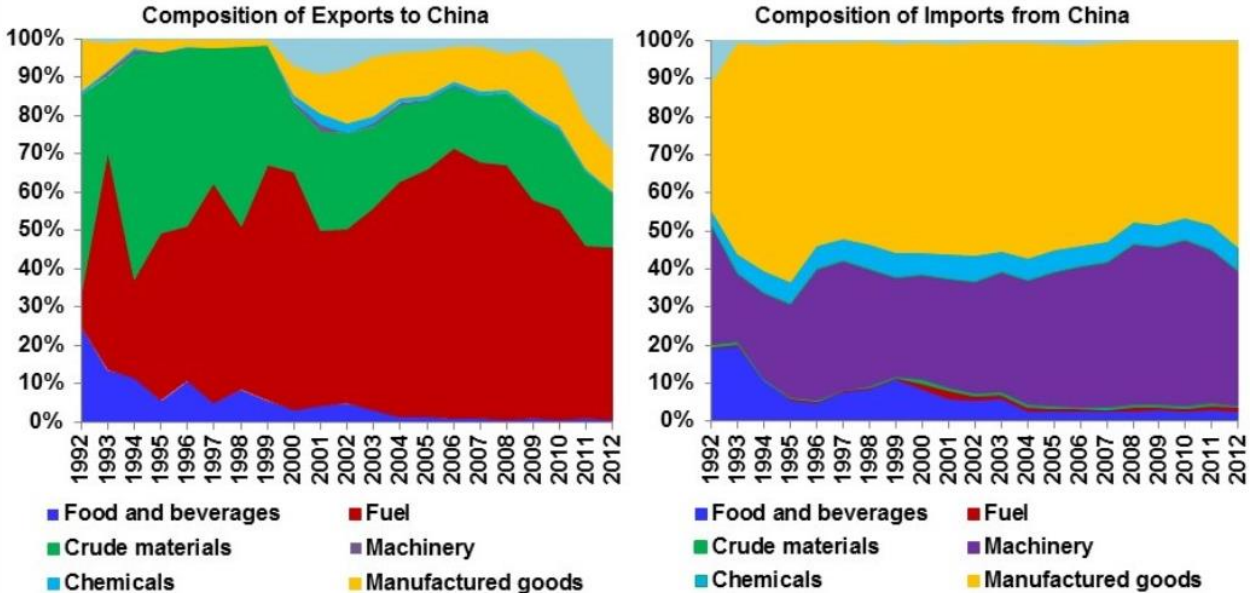
Source United Nation, Comtrade.

Trade between China and Africa

Africa's fast-growing population offers a welcomed market for China's manufactured goods. The endowment of natural resources in this continent in return can fulfill the China's search for energy. This fact is observed in trade volume between China and Africa. Table 3.1 shows an upward trend of China-Africa exports and imports from 1992 to 2012. Trade deficit for China became more clearly toward the recent data. Normally a trade deficit is perceived as a loss but in case of China, in addition to the gain from selling exports to Africa, China also receives a greater benefit from imported oil from the continent. Figure 3.6 decomposes China- Africa imports and exports by sector. While 81% of exports from China are industrial products, over 90% of imports to China

are natural resource-based. It confirms the belief that trade relation between China and Africa mainly involving China import of oil and export of manufacturing goods.

Table 3.1: China-Africa exports and imports, 1992 - 2012

Indicator/Year	1992	2002	2012
Export (US$ Thousand)	341783.859	5091604.507	100945516.5
Export (US$ Thousand)	828331.147	4956977.089	61507680.35
Total trade (US$ Thousand)	1170115.006	10048581.6	162453196.8
Trade deficit (US$ Thousand)	486547.288	-134627.418	-39437836.1

Source: World Integrated Trade Solution (WITS)

Figure 3.6: China- Africa trade by sector, 2010
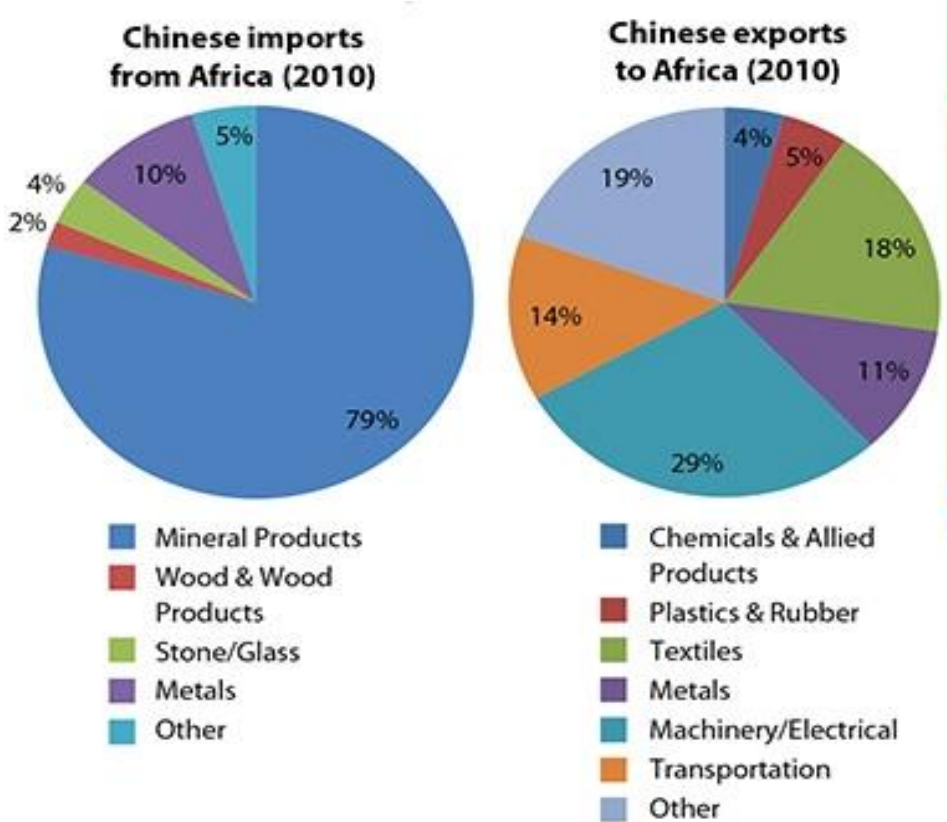
Souce: African Research Institute

3.2 Chinese aid

3.2.1 Estimate China's aid

Chinese foreign aid is provided in three forms: grants and interest-free loans (through state finances) and concessional loans administered through China Eximbank. According to the White Paper (2011), to the end of 2009 China had provided a total of 256.29 billion RMB (US$39.3 billion) in aid, made up of approximately 41 per cent in the form of grants, 30 per cent as interest-free loans and 29 per cent as concessional loans. A key characteristic of Chinese aid that somehow sets it apart from traditional donors is that it tends to lump all of the different types of economic engagement together under the label "aid". Aid from China can be classified into eight categories: complete projects; goods and materials; technical cooperation; human resource development cooperation; medical teams sent abroad; emergency humanitarian aid; volunteer programs in foreign countries; and debt relief; 40 per cent of China's foreign aid expenditure is in the form of "complete projects".

Aid provided by China mainly falls into three types: grants (aid gratis), interest-free loans and concessional loans. The first two are under the supervision of China's state finances, while concessional loans are provided by the Export-Import Bank of China as designated by the Chinese government. By the end of 2009, total aid from China to foreign countries is estimated of 256.29 billion yuan countries, as divided by types: 106.2 billion yuan in grants, 76.54 billion yuan in interest-free loans and 73.55 billion yuan in concessional loans. From 2010 to 2012, China appropriated in total 89.34 billion yuan (14.41 billion U.S. dollars) for foreign assistance in three types: grant (aid gratis), interest-free loan and concessional loan. Foreign aid expenditure is part of the state expenditure, under the unified management of the Ministry of Finance in its budgets together with The Ministry of Commerce and other departments under the State Council.

Grant is mainly offered to help recipient countries build small or medium-sized social welfare projects, and to fund human resources development cooperation, technical cooperation, material assistance and emergency humanitarian aid. In the three years 2010-2012, China provided 32.32 billion yuan of grants, accounting for 36.2 percent of the total assistance volume.

Interest-free loan is mainly used to help recipient countries construct public facilities and launch projects to improve people's livelihood. In the three years, China offered 7.26 billion yuan of interest-free loans, taking up 8.1 percent of its foreign assistance volume.

Concessional loan is mainly used to help recipient countries undertake manufacturing projects and large and medium-sized infrastructure projects with economic and social benefits, or for the supply of complete plants, machinery and electronic products. In the three years, the concessional loans China provided to other countries amounted to 49.76 billion yuan, or 55.7 percent of its total assistance volume in the same period.

There are characteristics of China that makes its different from that of traditional donors. The following passage is extract from Tseng and Krog (2015, p15) will give insights to explain the differences: "Although recipients do receive the facilities and services pledged by China, during the contracting process, the pledged money seldom leaves the Chinese hands because China's aid programs generally requires at least 50 percent of the goods and services used toward the programs to be sourced from China and contracted firms tend to import Chinese workers to work on local construction projects…The Eximbank offers a broad array of instruments to finance aid operations, ranging from more ODA-like grants and debt relief, to export promotion items such as export credits and commercial loans and lines of credit. However, even the Eximbank's aid credits are not considered "concessional" for they are generally fixed at London Interbank Offered Rate (LIBOR, which is the market rate) plus some margins; instead, it is the Ministry of Finance that subsidizes the actual cost of the funds resulting from interest rate difference (Brautigam, 2011b).

Even though China's "aid" contribution (per OECD standard) is relatively small compared to traditional DAC donors, when other state-sponsored or subsidized overseas investments are included, China appears to be a major source of OOF. The bulk of the Eximbank's lending operations is tended toward supporting Chinese firms "going global." Estimates by Moss and Rose (2006) and Davies (2010) suggest that China's Eximbank has surpassed its Japanese and UK counterparts in becoming one of the largest export credit agencies in the world with an asset base totaling US$445.1 billion (using 2014 annual average exchange rate) compared to US$23.5 billion for the Export-Import Bank of the United States (as of 2014, EXIM Bank of the United States 2014)"

Figure 3.7: Sectoral distribution of China's aid: 1949-2009 vs. 2010-2012
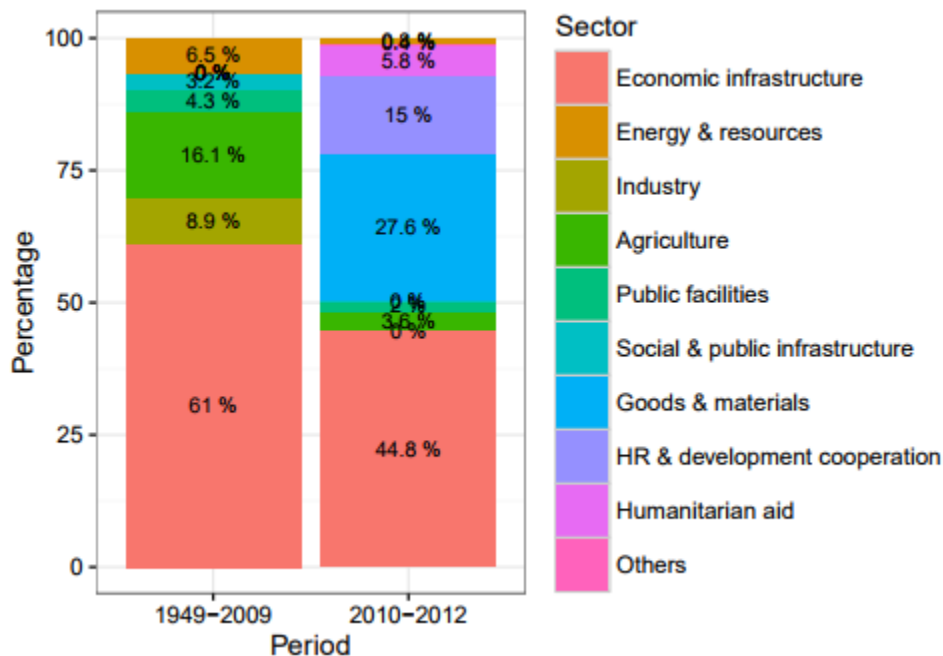
Source: Figure 8, Tseng (2015)

Figure 3.7 compares the sectoral distribution of China's aid in the period 1949-2009 and 2010-2012 reported in the 2011 and 2014 edition of Foreign Aid White Paper. Although the largest component, "Economic infrastructure," has downed from 61 percent to 44.8 percent, two new sectors in 2014 listing, "Social & public infrastructure" and "Goods & materials," constitute respectively 27.8 and 15 percent of disbursed loans during 2010-2012, and both were financed through preferential import/export credits and natural resource-backed loans (Information Office of the State Council, 2014) - a key stimulant to recent boom in Africa's crude materials export to China.

On 10 July 2014, China's Information Office of the State Council released its second White Paper on Foreign Aid. China's first white paper, released in April 2011, offers an overview of Chinese foreign aid from 1950 to 2009. The new white paper provides an update of Chinese aid for the period 2010–2012. Impressively Rapid Growth Chinese cumulative foreign aid from 1950 to 2009 reached 256.29 billion yuan1 (US$41.7 billion), while Chinese aid from 2010 to 2012 was 89.34 billion yuan (US$14.53 billion), more than one-third of its cumulative aid for the six decades prior to 2010. By the end of 2012, China had provided 345.63 billion yuan (US$56.22 billion) in aid, of

which the period 2010–2012 accounted for 25.8 per cent. There is also a drastic change in China's aid components. From 2010 to 2012, there was a big increase in concessional loans, which accounted for over half of Chinese aid, and a big fall in interest-free loans, which accounted for less than 10 per cent. Africa and Asia remain the main recipients. From 2010 to 2012, China provided aid to 121 countries: 51 in Africa, 30 in Asia, 19 in Latin America and the Caribbean, 12 in Europe and 9 in Oceania. Africa and Asia continued to be the two largest recipients of Chinese foreign aid.

Some of researchers believe China's aid have become a source of concern to Western aid agencies. Lancaster (2007) pointed out that "the Chinese provide their aid largely without the conditions that typically accompany Western aid-a good human rights performance, strong economic management, environmentally responsible policies and political openness on the part of recipient governments". Chinese aid emphasizes infrastructure, something many poor countries need and want but often find traditional Western aid donors reluctant to fund. For example highways and railways, is the main area of business for the Chinese in Africa.

Figure 3.8 Net ODA from leading donors and Estimated Foreign aid from China, 2001-2013
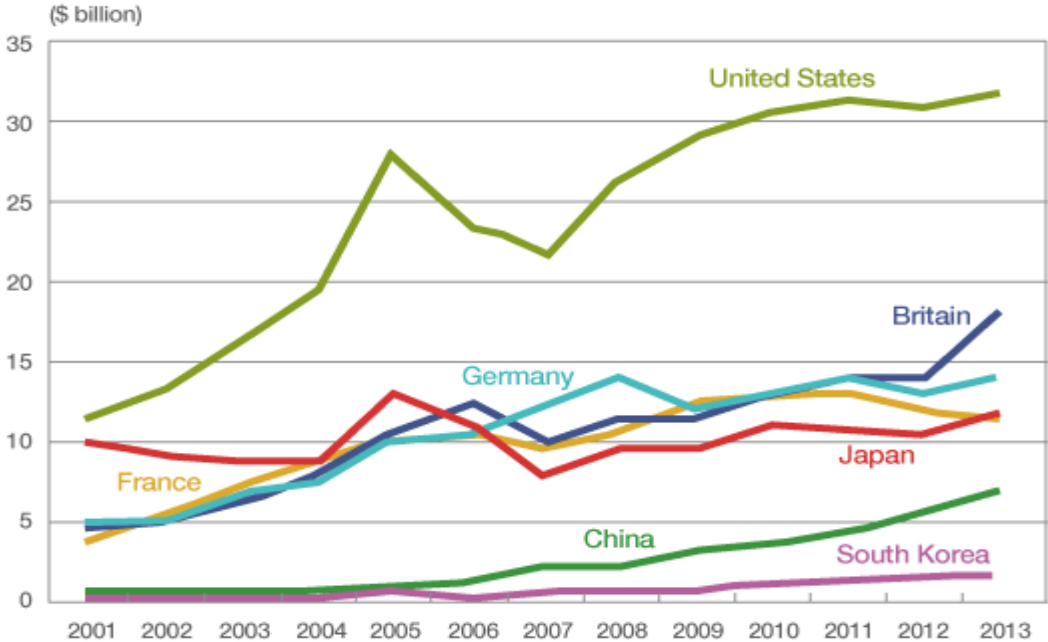
Source: OECD International statistics; Kitano Naoshiro and Harada Yukinori, "Estimate China's foreign aid 2001-2013" (JICA Research Institute Working paper No.78, 2014)

Figure 3.8 compares the volume of China's aid with other leading traditional donors. It is clear that aid from China is rising constantly surpassing South Korea' aid and expected to meet the level of that from other developed countries such as Japan, France or Germany. China has become a main source of financial assistance in the world.

3.3 Chinese policy toward aid

China is not a "new" donor, since its history of aid giving goes back 60 years (Varrall, 2012). The history of Chinese aid provision can be refers to three stages: 1950–78, 1978–mid 1990s, and 1990s onwards, with the changes reflecting shifts in China's own development situation and strategies (Ministry of Commerce, 2007). Between 1979 and 1982, "China began to build their economic strategy toward a more market-oriented", "open-door," international economic policy. The "open door" to the West; the growing demand for foreign exchange and decentralization within China; and a new concern with economic results, efficiency, and profits led to a major reshaping of China's foreign aid program, "blurring the lines between foreign aid and other forms of economic relations." (Brautigam, 2007). China started to become an emerging donor in the late 1990s, a development that was related to its own domestic development policy of "going out", and to its greater involvement in multilateral and international organizations. In 2004. China enters another "new stage" in its aid program, marked by a massive and sustained increase in levels of aid. Between 2004 and 2009 China's foreign aid budget increased by an average of 29.4 per cent per year (People's Republic of China, 2011. In 2011, total amount is approximately US$4.5 billion (Interview CN064, 6 May 2011).

The Chinese Government, in its first ever White Paper on Foreign Aid (referred to hereafter as the White Paper), released in April 2011, frames China's provision of aid as "operating within the context of China's position as a developing country but also as part of the fulfilment of its international responsibilities". China states it overall objectives is to providing foreign aid to "help recipient countries to strengthen their self-development capacity, enrich and improve their peoples' livelihood, and promote their economic growth and social progress" (People's Republic of China, 2011). There is a clear declaration that Chinese aid is a "model with its own characteristics" and as a developing country, the operation of China's aid "falling into the category of South–South Cooperation" (People's Republic of China, 2011). Chinese officials claims that as a developing country itself, its foreign aid possesses different characteristics from that of

"traditional donors". Unlike the West's, Chinese foreign aid does not focus on political issues. (Naím, 2007). Instead, Chinese stresses the importance of stimulating economic growth and implementing a development model based on each country's specific requirements and circumstances (Interview SP011, 17 September 2009).

China's foreign aid policy has distinct characteristics of the times. It is suited both to China's actual conditions and the needs of the recipient countries. China has been constantly enriching, improving and developing the Eight Principles for Economic Aid and Technical Assistance to Other Countries — the guiding principles of China's foreign aid put forward in the 1960s. According to China White paper 2011, basic features of China's foreign aid policy are as follows:

— Unremittingly helping recipient countries build up their self-development capacity. Practice has proved that a country's development depends mainly on its own strength. In providing foreign aid, China does its best to help recipient countries to foster local personnel and technical forces, build infrastructure, and develop and use domestic resources, so as to lay a foundation for future development and embarkation on the road of self-reliance and independent development.

— Imposing no political conditions. China upholds the Five Principles of Peaceful Coexistence, respects recipient countries' right to independently select their own path and model of development, and believes that every country should explore a development path suitable to its actual conditions. China never uses foreign aid as a means to interfere in recipient countries' internal affairs or seek political privileges for itself.

— Adhering to equality, mutual benefit and common development. China maintains that foreign aid is mutual help between developing countries, focuses on practical effects, accommodates recipient countries' interests, and strives to promote friendly bilateral relations and mutual benefit through economic and technical cooperation with other developing countries.

— Remaining realistic while striving for the best. China provides foreign aid within the reach of its abilities in accordance with its national conditions. Giving full play to its comparative advantages, China does its utmost to tailor its aid to the actual needs of recipient countries.

— Keeping pace with the times and paying attention to reform and innovation. China adapts its foreign aid to the development of both domestic and international situations, pays attention to

summarizing experiences, makes innovations in the field of foreign aid, and promptly adjusts and reforms the management mechanism, so as to constantly improve its foreign aid work

What China announces in public might differ from the actions it took. In fact, China's announcements and conditions on aid lead observers to believe that China's aid policy is benefiting itself. Chinese aid is almost entirely tied to the purchase of Chinese goods and services. In 1987 Beijing announced that 69 percent of China's aid funds were spent on (Chinese) equipment, the rest presumably was spent on local costs (local labor, energy, and materials) and some equipment and machinery imported from advanced industrial countries. From 1995 to the present, China has accelerated the "win-win" cooperation of the 1980s in a drive for strategic partnerships, where aid has become a tool of economic instruments. China's aid projects to a large extent serve its own development needs, facilitating the export of raw materials to China, and requiring that 50% of project materials and services are to be sourced in China.

CHAPTER 4. ANALSIS

4.1 Data analysis

This paper uses China's project aid in Africa for 2000-2012 period to do analysis. The data is collected from AidData database. Data set is media-based conducted using a "data collection methodology, called Tracking Underreported Financial Flows (TUFF), to collect project-level data from suppliers of official finance who do not participation in global reporting systems." (AidData's Methodology for Tracking Underreported Financial Flows codebook, 2015). Since Chinese government does not publish details about its aid program, this database is a valuable source for studies of China's aid. It covers a large number of project aid but I will only use official aid for this analysis. Data on China's imports and exports are collected from The World Integrated Trade Solution (WITS) database for the same period 2000-2012.

In the first part of this chapter, I will examine the data then provide analysis with regard to what are discussed in the above chapters.

Figure 4.1: China aid, imports from and exports to Africa ($bn), 2000-2012
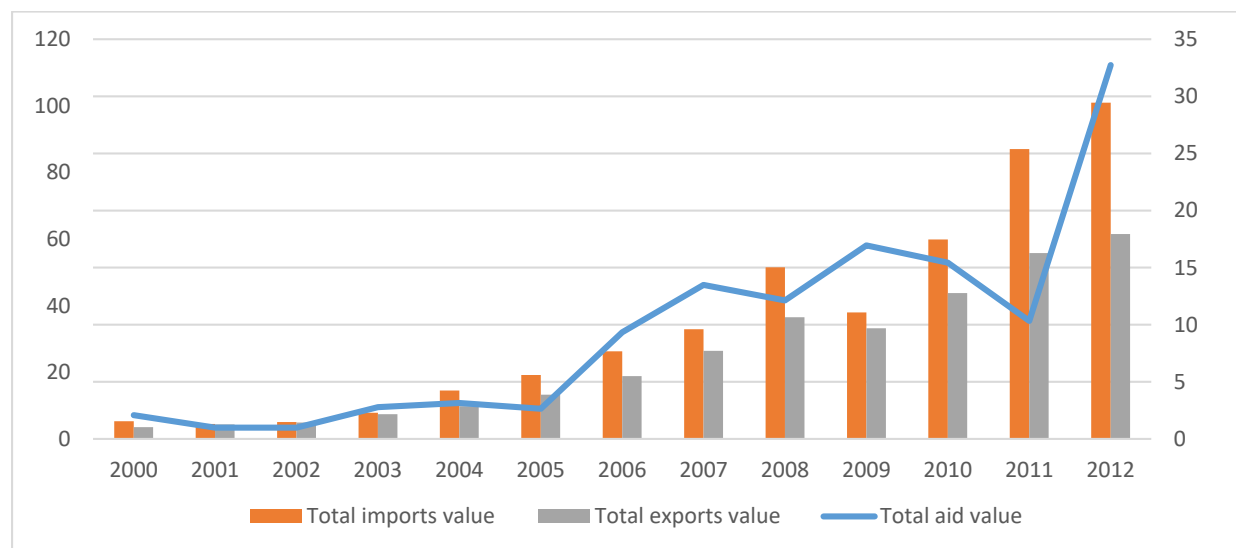
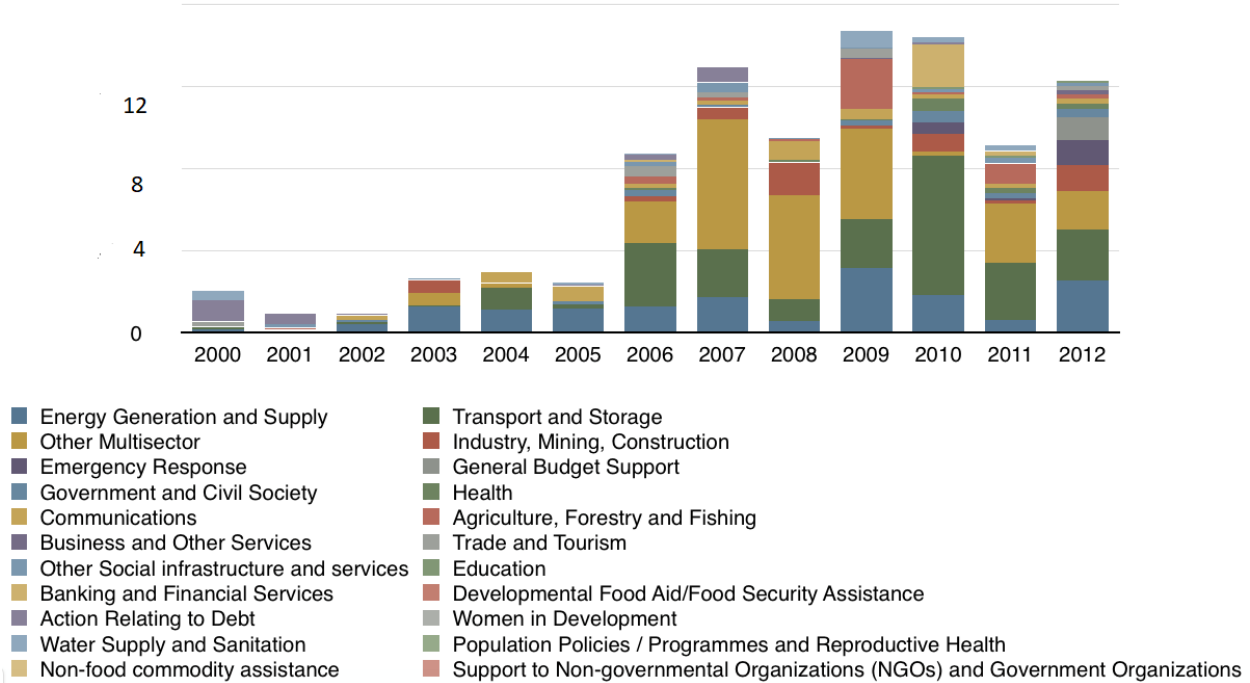
Source: World Integrated Trade Solution (WITS)

Figure 4.1 shows trends in China's aid, its imports from and its exports to Africa. It is clear that three indicators all experienced an upward trend from 2000 to 2012. There are falls in total aid value in 2008 and 2011 but the volume resumed its upward trend a year after that. Especially, it is reported that there was a sharply rise China's aid to Africa in 2012 right after the fall in 2011. For the entire period, total aid value increased from just over 2 billion dollars in 2000 to nearly 33 billion dollars in 2012. It reflects the concern that China is rising as a world donor.

The rise in aid volume is accompanied by rises in both China's imports volume from Africa and its export volume to Africa. China began the period with bilateral imports of over 5 billion dollars and ended the period with that of 100 billion dollars, which is twenty times higher. Exports to Africa increased nearly as much as imports over twelve years. The data does not tell what factor causes the others but clearly there was a correlation between China's trade and its aid to Africa. Aid could strengthen economic relations with African countries, open new market in Africa, and create good environment for investment. Nevertheless, it could be the other way around that China and Africa countries became important trading partners that China wanted to give financial assistance to Africa to reinforce the relationship. Considering the fact that China is still a developing country, it would want to give aid in exchange of something else. It is principle that a growing economy like China would after its concern for a sustainable economic growth and push

for more economic benefits. It could be understood that China found benefits in trading with Africa. In particularly, China needs energy for growth and it found abundant sources of oil in Africa. China needs markets for its booming manufacturing production, it found demand from Africa too. The upward trends in all three indicators indicates a win-win situation. Not only China is happy trading with Africa, Africa also welcome aid flows from China.

Figure 4.1 also shows a fact that China experienced a trade deficit with Africa throughout the period. Considering China's demand for energy, it makes sense not to see this deficit as a loss to China. Reversely, it implies that the benefit China got from imports has been greater than its benefit from exporting to Africa. China is such an unusual case to study. In general, trading with Africa resulting in no cost to China.

Figure 4.2: China's aid to Africa by sector ($bn), 2000-2012

Legend:
- Energy Generation and Supply
- Transport and Storage
- Other Multisector
- Industry, Mining, Construction
- Emergency Response
- General Budget Support
- Government and Civil Society
- Health
- Communications
- Agriculture, Forestry and Fishing
- Business and Other Services
- Trade and Tourism
- Other Social infrastructure and services
- Education
- Banking and Financial Services
- Developmental Food Aid/Food Security Assistance
- Action Relating to Debt
- Women in Development
- Water Supply and Sanitation
- Population Policies / Programmes and Reproductive Health
- Non-food commodity assistance
- Support to Non-governmental Organizations (NGOs) and Government Organizations
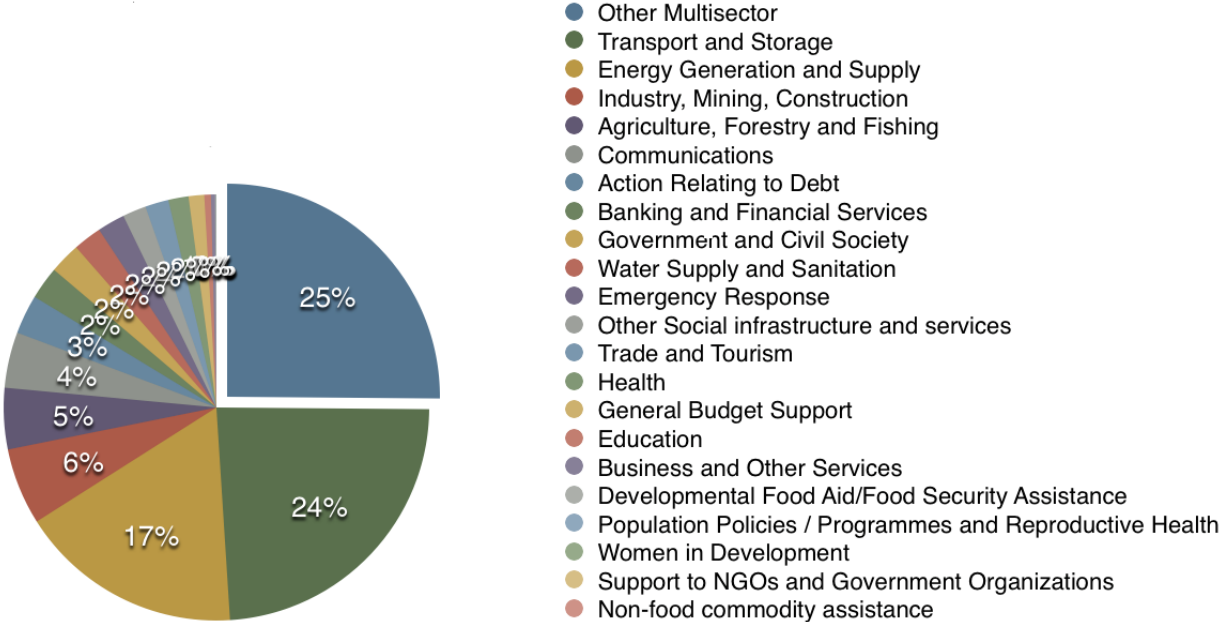
Source: World Integrated Trade Solution (WITS)

Figure 4.2 decomposes China's aid by sector. It is clear that aid was distributed unequally amongst sectors. It focused mostly on four following sectors: Energy generation and supply, Transport and Storage, Industry, Mining, Construction, and Other Multisector. It is not too risky to say aid was transferred sectors where supports energy generation and supply; and this amount was increasing

overtime. The only downfalls happened in 2008 and 2011 reflecting the downward trend in total aid but it was only temporarily after aid to these sectors rose again. There might be a change in amount of aid distributed to each sector over the year but in general, the total amount aid flowed to these four most-receiving sectors was still huge.

Figure 4.3: China's aid to Africa by sector (%), 2012

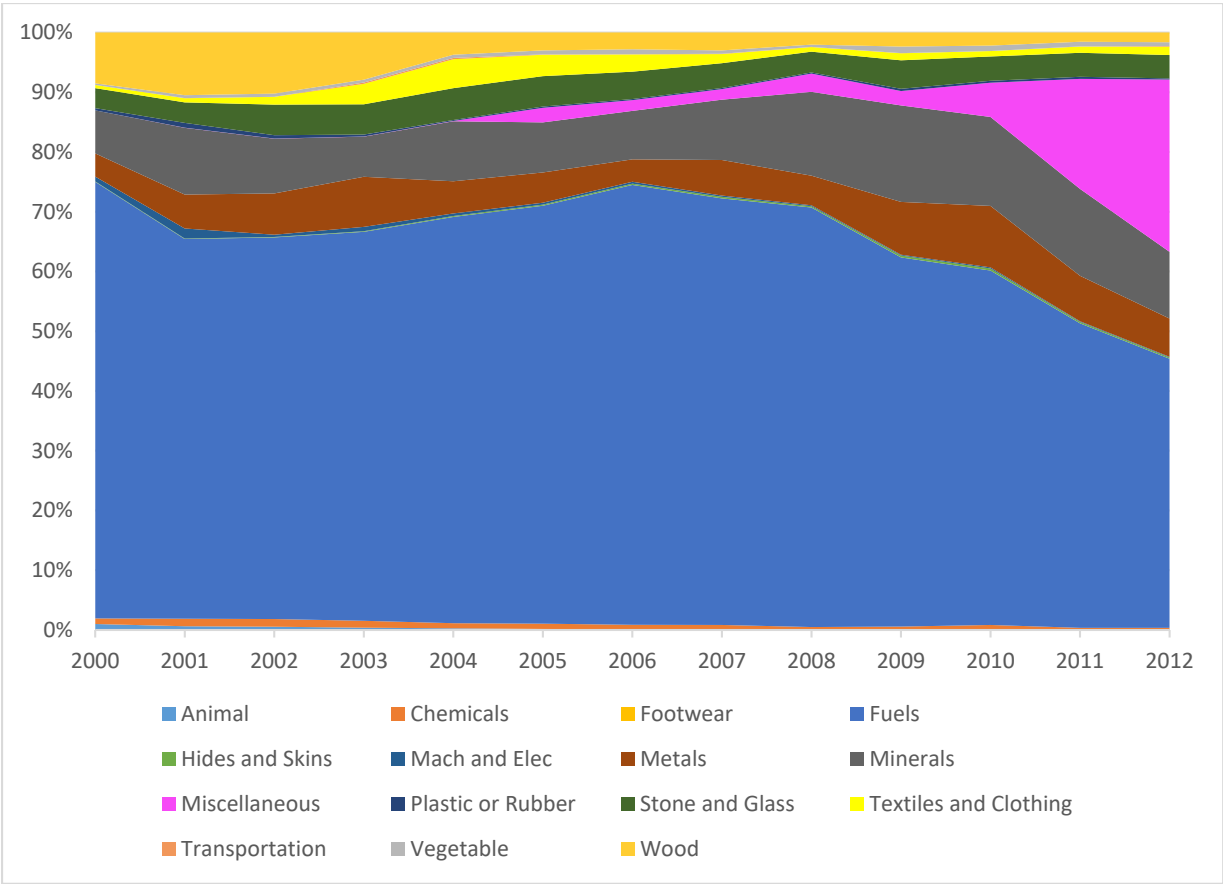Source: World integrated trade solution (WIST)

Figure 4.3 looks at China's aid as in percentage terms. It can be seen that infrastructure including roads, dams, pipelines, electricity & water supply lines, communication lines, port facilities, public buildings has been the main focus of Chinese aid projects together with aid to energy generation and supply sectors. Altogether, about more than 80 percent of aid flows to these sectors. China itself also officially made announcement that infrastructure was and would always be the focus of its development assistance in Africa.

It is not new that infrastructure is poor and insufficient for economic activities in Africa. Lacking of necessary infrastructure can be a big obstacle for Africa's development but not only that, it can also hinder China from extracting more fuel, minerals, etc. Therefore, aid as a source of finance to

infrastructure firstly enhances the capacity of producing more extractive materials. It directly serves China's benefit of getting more imports of these products. Obviously, economic interest explained more of China's aid to Africa from 2000-2012 in comparison with other strategic interests discussed in the literature.

Humanitarian aid such as health, education, developmental food, women development, only accounted for a minor share of about ten percent of total aid. Again, the data confirms what is documented in the literature that donors do not give aid because of recipients' development. However, it is believed that infrastructure aid will support development in long term. It justifies the classification of infrastructure aid as aid for development. And as a matter of fact, China has been willing to give more of this kind of aid and African countries has been happily taking it.

Figure 4.4: China's imports from Africa by sector (% of total), 2000-2012

Source: World integrated trade solution (WIST)

Figure 4.4 presents China's imports from Africa by sector. It is obvious that the largest share was taken by Fuels. This is not surprise. It is correspondent with the large share of aid flows to help the extractive process. It was shown here that the share of fuels in total China's import was decreasing together with other natural-based products which belong to Minerals, Metals, Stone and Glass. However, the absolute amount spent on raw materials has been increasing over the period with only an exception of 2009. It is noteworthy that the 2009 fall in raw materials imported by China was happening at the same time with the slowdown of Chinese economy due to global crisis. One possible explanation for this fall in China's imports of raw materials is that its production was heavily affected by the crisis, thus it required less energy and materials imported from Africa. Moreover, it should be noted that the data showed here constraints from 2000 to 2012. There are signs that percentage of imported raw materials in total China's imports has been rising again since 2015. To conclude, raw materials has been accounted for the most significant proportion of China's imports from Africa and it has been the main motive behind China's import relation with Africa.

Chart 4.5 China's exports to Africa by sector (% of total), 2000-2012
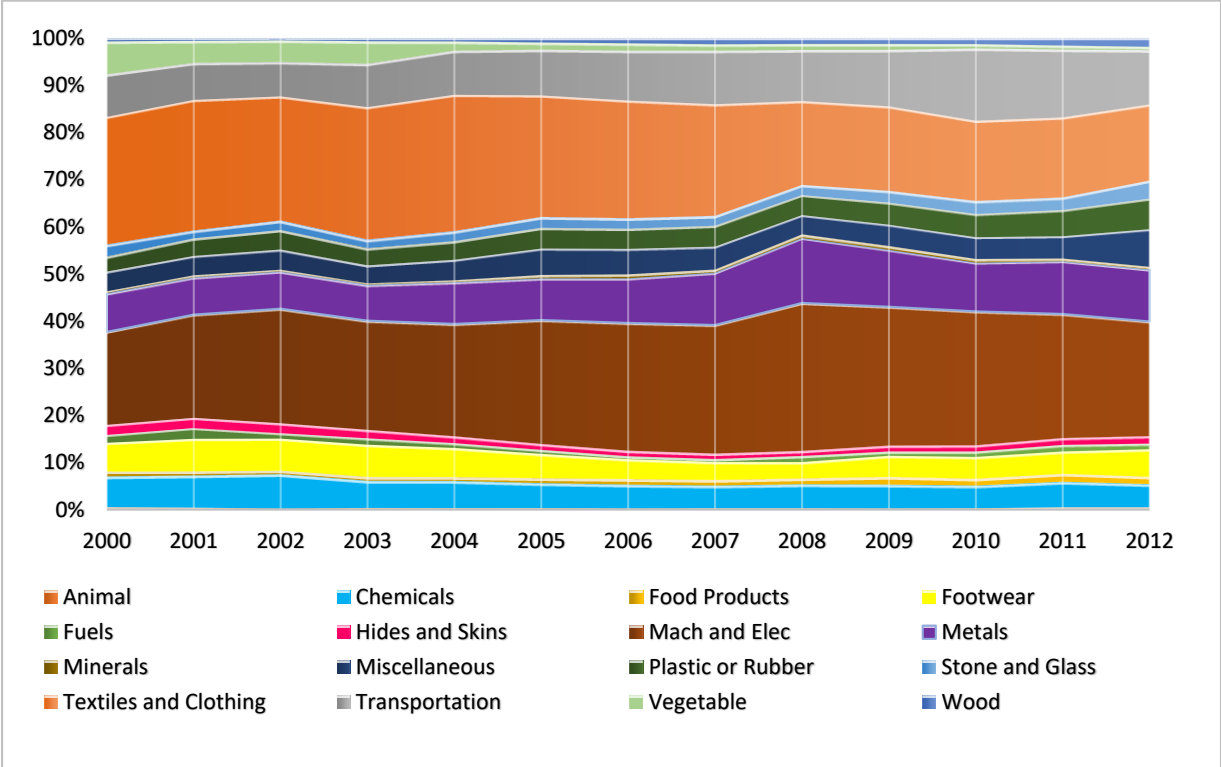
Source: World integrated trade solution (WIST

The first point can be taken from Figure 4.5 is that exports from China to Africa was not too concentrated as its imports from Africa. It ranged from resource-based products to high-skilled products. Accounting for a major share was Machine and Electricity, Textiles and Clothing, Metal, Transportation and Footwear. Clearly, China has offered African countries with products of its manufacturing production which are more affordable with reasonable quantity. Therefore it is agreeable to say that exports from China makes African people better off. But more importantly, by importing goods from China, Africa is supporting China's already impressive industrialization and contributing to a greater growth of its production.

4.2 Aid-trade Correlation

As review above, China's interest of giving aid to Africa mainly involves securing imports of strategic resources and expanding market for exports. This chapter will investigate the aid-trade interlink by breaking trade into imports and exports. By this I mean, the analysis will focus on the correlation between aid and China's imports from Africa and between aid and China's exports to Africa. I will test the relationship between aggregate aid and aggregate exports/imports. The ideal behind this can be track back to the literature that donors are often see Africa as a developing continent where the needs for aid are most urgent. Most of the countries in Africa share similar in colonial past, culture, level of development, etc.

With regard to imports in case of China, the literature suggests that aid has a positive relationship with imports of raw materials. In order to explain this, aid is claimed to flow into construction sectors to support extractive process. In other words, aid is tied to imports of raw materials to China. It is a bi-direction effect and it is difficult to identify which factor explains the other. Measuring the degree of correlation will be the most sensible way to show the nature of this relationship. For the purpose of this statistical technique, it does not matter which factor of the two factors is explanatory variable and which is dependent variable. One might simply expect that more aid flows in terms of absolute value links to an increase in imports also in value terms. It is important noting that variable used to account for China's imports should reflect the need of China for raw materials. Those reasons justify the choice of imports value in extractive sectors and aid value flows to construction sectors as two variables in the correlated relationship. It should be taken to account the time effect of Chinese aid on its imports from Africa. Since aid is poured mainly into construction of infrastructure to support the extraction of resource-based materials, it

takes time to show impact on imports volume. For this reason, the variable of aid volume will be lagged one to three years.

With regard to the relationship between China's exports and aid, I follow the literature suggest the allocation effect of trade. If China wants to expand the existed exports to Africa then it should encourage this continent to purchase more by giving them financial resources. Besides, China's aid to Africa is accused of being tied to buy China's goods. Therefore, it is impossible to separate the impact of two factors on each other. Since aid is given in money value so exports should also be measured in value. For that I will use two variables: total aid value and total imports value to study the correlation between China's exports and China's aid to Africa. Lagged variable of one to three year of exports value are also included when analyzing correlation using aggregate data to capture the possible time effect of exports on aid.

It should be noted that percentage changes in aid and imports/exports also tell something. If growth in aid value increases, growth in imports/exports value should be increased too. However, since correlation test is believed to give unreliable results if apply for percentage figures, I will not examine the above factor in growth terms

4.3 Aggregate correlation

In this substantial part, I will investigate the aggregate correlation between imports and aid using total value aid flows from China to Africa each year from 2000 to 2012. Plotting the data gives an overall impression of the nature of the relationship. I take turn to plot 4 alternatives representing six possible relationship:

- Alternative 1: Imports of raw materials and infrastructure aid
- Alternative 2: Imports of raw materials and 1-year lagged infrastructure aid
- Alternative 3: Imports of raw materials and 2-year lagged infrastructure aid
- Alternative 4: Imports of raw materials and 3-year lagged infrastructure aid

Scatter plot for 4 alternatives are combined in one graph as below.

Figure 4.6 Two-way scatter plot of Infrastructure Aid and imports of raw materials
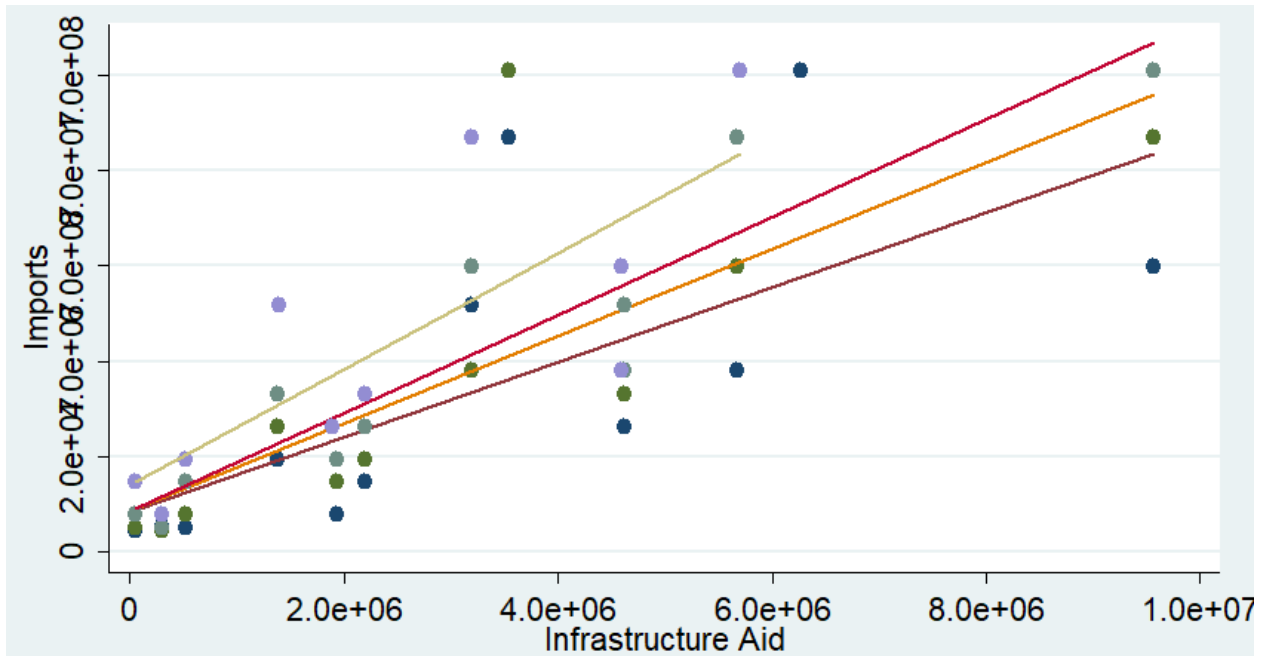
It can be seen that all 4 alternatives give results of positive linear correlation. It means that an increase (decrease) in imports is related to an increase (decrease) in aid. Table 4.1 will show more details of correlation degree.

Table 4.1 Correlation coefficients for infrastructure aid and imports of raw materials from aid recipients

	Infrastructure aid	1-year lagged infrastructure aid	2-year lagged infrastructure aid	3-year lagged infrastructure aid
Imports of raw materials	0.6814	0.7827	0.9283	0.7874

Table 4.1 reports details for alternative 1-4. It shows that the correlation coefficients are high and they increase when using infrastructure aid, 1-year lagged infrastructure aid, 2-year lagged infrastructure aid, respectively. The coefficients using 3-year lagged infrastructure aid decreases in comparison with the previous one but still high. The results suggest that the two factors are highly correlated to each other and the degrees of correlation grow stronger when aid precedes imports two years.

I take the same steps as in the previous part to examine the correlation between China's exports and its aid to Africa. Graph 2 combines scatter plots of three following alternative relationship:

- Alternative 1: Exports and aid
- Alternative 2: 1-year lagged exports and aid
- Alternative 3: 2-year lagged exports and aid
- Alternative 4: 3-year lagged exports and aid

Figure 4.7 Two-way scatter plot of aid and Chinese exports to aid recipients
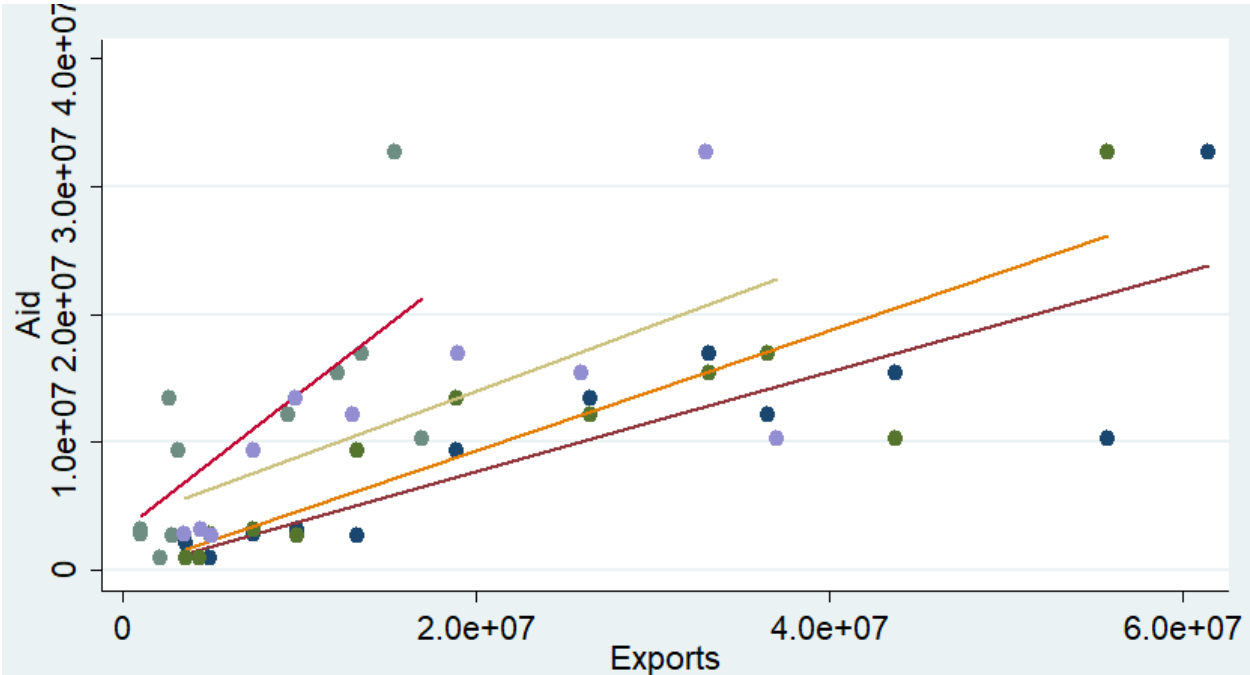
All four alternatives give results of positive linear correlation. It means that an increase (decrease) in exports is related to an increase (decrease) in aid. Table 4.2 will show more details of correlation degrees

Table 4.2 Correlation coefficients for Chinese aid and exports to aid recipients

	Exports	1-year lagged exports	2-year lagged exports	3-year lagged exports
Aid	0.8625	0.8951	0.8599	0.7006

Table 4.2 reports details for three alternatives. It shows that the correlation coefficients are very high. The highest coefficient belong to the relationship between aid and 1-year lagged exports, which is 0.8951. These results indicate that exports are mostly correlated to aid when exports precede 1 years.

Correlation tests provide statistical evidence that China's trade and its aid volume to Africa as a whole strongly move together. This finding is suggestive in the sense that China treats Africa as a unit. Aid projects from China are likely spread out the entire continent across many countries. This is well recorded by the data. Therefore, aggregate aid flows are better in explaining the link between aid and trade in this case. It is also worth noting that the correlation between exports of China goods and aid are higher than the correlation between imports and aid in both specifications. So it could be that export explains more of the reason for China's aid allocated in Africa. Another point to make here is that although the result from correlation test do not show which direction of the causal effect prevails, the degree of correlation increases/ decreases when taking lag of a variable to other variable may tell something. In this case, it is more likely that aid is given by China to Africa first in exchange for imports of raw materials later. And aid seems to flow to Africa only shortly after the flows of exports, indicating the allocation effect of trade on aid. However, it should be clear that trade and aid are interlinked, the effect that can be seen is not solely from one direction to another. Therefore, in studying the trade-aid link, one should take caution in concluding the effect of one factor on the other. It should also be noted that in order to investigate the relationship between trade and aid, characteristics of each factor should be taken into account. By analyzing things such as composition of aid/trade flows and specific characteristic of a donor/ recipient, one may find it easier in defining dominant effect.

CHAPTER 5: CONCLUSION

The preceding study sought to consider the contention that Chinese aid, like OECD aid in general, has served the interests of the donor, especially its economic interests. The analysis undertaken in this study concluded that this aid, like OECD aid in general, serves the interests of the donor, China, particularly its economic interests. It was shown that Chinese aid in the form of support for

infrastructure facilitating raw material extraction is strongly correlated with imports of raw materials from the aid recipient countries by China, with the former leading the latter, and Chinese aid in general was strongly correlated with Chinese exports to the aid recipient countries, with the relationship being largely a contemporaneous one.

These findings support similar findings in the literature arguing that trade and aid have a bi-directional influence on one another. Specifically, the findings in chapter 4 can be seen as similar to those of McGillivray and Morrisey (1998) who conducted their research with respect to the case of Japan as the donor and other Asian countries as the aid recipients (see chapter 2). The main difference between the present study and those such as McGillivray and Morrissey is that the present study disaggregates trade into imports and exports and look at the links between aid and each of these. The findings of the paper contradict those of a number of other studies cited in chapter 2 such as Tajoli (1999) and Dreher and Fuchs (2015) that found no strong relationship between aid and trade. Such differences in findings may of course be caused by the use of different data, variables and empirical methods.

There are also a number of limitations with the study which need noting. Firstly and most obviously, the paper uses correlation analysis to examine the nature of trade-aid linkage and only make a conclusion regarding the correlation of these two factors. This means that causality is only implied and not tested. Secondly, because the purpose of the analysis is to ascertain the existence of a contemporaneous relationship, the interpretation of results is difficult. McGillivray and Morrisey (1998) discuss this point in their research, noting that the derived high degree of correlation may not be due to donors' aid allocation decisions so much as the effects of aid on trade, which is referred to discussion of bi-directional effects in the literature. Finally, there are also data limitations which are inevitable for any study of Chinese aid. The Chinese government does not publish official records of its aid program, so available data may not fully capture what is actually happening with respect to Chinese aid.

REFFERECES

Alesina, A., & Dollar, D. (2000). Who gives foreign aid to whom and why? *Journal of economic growth, 5*(1), 33-63.

Barthel, F., Neumayer, E., Nunnenkamp, P., & Selaya, P. (2014). Competition for export markets and the allocation of foreign aid: The role of spatial dependence among donor countries. *World Development, 64*, 350-365.

Berthélemy, J.-C., & Tichit, A. (2004). Bilateral donors' aid allocation decisions—a three-dimensional panel analysis. *International Review of Economics & Finance, 13*(3), 253-274.

Berthélemy, J. C. (2006). Bilateral donors' interest vs. recipients' development motives in aid allocation: do all donors behave the same? *Review of Development Economics, 10*(2), 179-194.

Bräutigam, D. (2010). *China, Africa and the international aid architecture* (Vol. 107): African development bank.

Davies, P. (2007). *China and the end of poverty in Africa: towards mutual benefit?* : Diakonia Sundbyberg.

Dreher, A., & Fuchs, A. (2015). Rogue aid? An empirical analysis of China's aid allocation. *Canadian Journal of Economics/Revue canadienne d'économique, 48*(3), 988-1023.

Kemp, M. C., & Kojima, S. (1985). Tied aid and the paradoxes of donor-enrichment and recipient-impoverishment. *International Economic Review*, 721-729.

Lahiri, S., & Raimondos, P. (1995). Welfare effects of aid under quantitative trade restrictions. *Journal of International Economics, 39*(3), 297-315.

Lammers, E. (2007). How will the Beijing consensus benefit Africa. *The Broker, 1*, 16-18.

Lloyd, T., McGillivray, M., Morrissey, O., & Osei, R. (2000). Does aid create trade? An investigation for European donors and African recipients. *The European Journal of Development Research, 12*(1), 107-123. doi: 10.1080/09578810008426754

Maizels, A., & Nissanke, M. K. (1984). Motivations for aid to developing countries. *World Development, 12*(9), 879-900.

McCormick, D. (2008). China & India as Africa's new donors: The impact of aid on development. *Review of African political economy, 35*(115), 73-92.

McGillivray, M., & Morrissey, O. (1998). Aid and trade relationships in East Asia. *The World Economy, 21*(7), 981-995.

McGillivray, M., Morrissey, O., & Cnossen, T. (1999). IS THERE A LINK BETWEEN AID AND TRADE FLOWS? *Foreign Aid: New Perspectives, 68*, 85.

McKinlay, R. D., & Little, R. (1977). A foreign policy model of US bilateral aid allocation. *World Politics, 30*(1), 58-86.

McMillan, J., & Naughton, B. (1992). How to reform a planned economy: lessons from China. *Oxford Review of Economic Policy, 8*(1), 130-143.

Morrissey, O. (1993). The mixing of aid and trade policies. *The World Economy, 16*(1), 69-84.

Nowak-Lehmann, F., Martínez-Zarzoso, I., Herzer, D., Klasen, S., & Cardozo, A. (2013). Does foreign aid promote recipient exports to donor countries? *Review of World Economics, 149*(3), 505-535.

Osei, R., Morrissey, O., & Lloyd, T. (2004). The Nature of Aid and Trade Relationships. *The European Journal of Development Research, 16*(2), 354-374. doi: 10.1080/0957881042000220859

Pehnelt, G. (2007). The political economy of China's aid policy in Africa.

Tajoli, L. (1999). The impact of tied aid on trade flows between donor and recipient countries. *The Journal of International Trade & Economic Development, 8*(4), 373-388. doi: 10.1080/09638199900000023

Wagner, D. (2003). Aid and trade—an empirical study. *Journal of the Japanese and international economies, 17*(2), 153-173. doi: https://doi.org/10.1016/S0889-1583(03)00010-8

Younas, J. (2008). Motivation for bilateral aid allocation: Altruism or trade benefits. *European Journal of political economy, 24*(3), 661-674.