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Kafayat Amusa, Nara Monkam and Nicola Viegi

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The political and economic dynamics of foreign aid: A case study of United States and Chinese aid to Sub-Sahara Africa.

Kafayat Amusa*, Nara Monkam†, Nicola Viegi‡

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Abstract

The foreign aid arena as it pertains to the African continent has traditionally been dominated by the Organization of Economic Co-operation and Development (OECD) countries, however over the last three decades non-traditional donors such as the China, South Africa and Brazil have emerged in the donor field. The increasing importance of non-traditional donors has meant that the economic and political stronghold of Western and OECD countries in sub-Sahara African (SSA) has gradually ebbed, due to increased competition amongst donors on the continent. Specifically, as the economic and political reach of the United States (USA), the second largest bilateral donor to SSA has diminished, amongst the group of emerging donors, China has become the largest contributor of aid to SSA countries. There appears to be a political - economic dynamic that points to the existence of two competing reasons underpinning the foreign aid trend in SSA. Using a comparative approach, this study examines the determinants of aid allocation by China and the United States to SSA countries. The study finds that both donor motives and recipient need are factors in US and Chinese aid allocation to SSA. Additionally, the study finds differences in US aid allocation determinants pre and post China's entry into SSA's aid field. Furthermore, evidence of income and population bias is observed for both donor countries.

Key words: foreign aid allocation, donor motives, recipient need, Sub-Saharan Africa

JEL classification: F35

1 INTRODUCTION

The foreign aid arena as it pertains to the African continent has traditionally been dominated by the Organization of Economic Co-operation and Develop-

*PhD candidate, Department of Economics, University of Pretoria and lecturer, University of South Africa. Email: amusako@unisa.ac.za

†Director, Research, African Tax Administration Forum (ATAF).

‡Professor, Department of Economics, University of Pretoria

ment (OECD) countries. Over the last three decades, however, non-traditional donors such as the China, South Africa, Brazil and a number of Middle Eastern countries have begun to emerge in the donor field, Chaponniere (2009). Contrary to OECD donor countries, emerging country donors provide non-concessionary aid with a focus on sectors in recipient countries that are in dire need of the aid (Brautigam, 2008; Chaponniere 2009). According to Meyer (2012) emerging donors have begun to establish a new status quo, one without attached policy strings and one which focuses on infrastructure, innovation, exports and health, rather than governance. Amongst the group of emerging donors, China has become the largest contributor of aid to sub-Saharan African countries (Woods, 2008). Between 2000 and 2012, China undertook over 1700 projects amounting to over seventy five billion dollars in over 50 African countries (Sun, 2014).

The increasing importance of non-traditional donors has meant that the economic and political stronghold of Western and OECD countries in SSA has ebbed over the decades. Between 2002 and 2009, the share of DAC donors in total disbursements of ODA increased from 57 percent to 59 percent while over the same period, foreign aid from non-Western or non-DAC countries increased from 0.11 percent of total aid disbursed to 0.41 percent (OECD- DAC CRS database, 2014). In addition, the economic and political reach of the United States (USA), arguably the most visible and vocal Western country on the African continent is gradually being diminished. USA, the second largest[1], bilateral source of ODA to Africa has in the last two decades shifted its aid focus in the region towards the social sector, specifically to the education and health sectors. Over the same period, foreign aid from non-Western donors in many sectors has increased sharply (Strange *et al.*, 2013).

The increased role of non-Western donor countries in SSA is in part due to the conditionalities imposed on recipient countries, partly to avoid issues of corruption and mismanagement of aid funds that arose in foreign aid utilization over previous years Brautigam (2009). The conditionalities attached to the provision of foreign aid have caused a "look fast" type approach on the part of recipient SSA countries, for whom China's less stringent conditionalities provides an alternative to Western aid.

As part of the conditions imposed on Western aid, focus has been on recipient country governance with a view to address governance issues in order to effect political or policy changes in recipient countries. A recent example of this is in Malawi and Tanzania where donors threatened to withhold aid if corruption within government was not addressed. This is contrary to the approach followed by non-Western donor countries who have pursued an aid policy driven less by governance issues and more in part by economic interests, interest aided by the need to fill the vacuum created by the diminished role of the US and the West. An example of this is Russia's incursion in Nigeria and South Africa as well as China's incursion into Nigeria, Zambia, Democratic republic of Congo and Zimbabwe.

[1]According to the author's calculations from OECD-CRS database, the USA is the second largest bilateral donor to SSA, second only to France since 1980.

There therefore appears to be a political-economic dynamic that points to the existence of two competing reasons underpinning the foreign aid trend in SSA. Firstly, the ability to use foreign aid to entrench donor values in recipient nations on one hand and secondly, the pursuit of economic objectives without interference from recipient nations. The vast literature on the aid – growth nexus has mainly focused on the growth impact of foreign aid (Papanek, 1972; Singh, 1985; Islam, 1992; Pederson, 1996; Asteriou, 2008; Burnside and Dollar[2], 1997; Dalgaard *et al.*, 2003; Radelet *et al.,* 2004; Singh, 1985; Ali and Issay ,2005; Duc, 2006; Ekanayake and Chatrna, 2009; Bauer, 1972; Svensson, 1999; Hajimicheal *et al.,*1995; Durbarry *et al.,* 1998; Knack, 2000; Hansen and Tarp, 2001). However, very few studies have addressed the increasing significance of traditional donors in the foreign aid field and especially in SSA countries.

Although the role of donor interest and recipient need in aid allocation has been well examined using a recipient need model (McKinley and Little, 1979; Maizels and Nissanke, 1984; Mosley *et al.,* 1995; Gang and Lehman, 1990), a donor interest model (Frank, 1969; Jalee 1968; Hensman, 1971; Hayter, 1981) and the more popular hybrid model that acknowledges the significance of both recipient need and donor motives (Wittkopf, 1972; Cingranelli and Pasquarello, 1985; Bowels 1987; Poe and Sirirangsi, 1993; McGillivray, 2003; McGillivray and Fenny, 2008; Neumayer, 2010; Lundsgaarde *et al.*, 2010; Harrigan and Wang, 2011; Dreher and Fuchs, 2011) there remains some paucity in studies that provide comparative empirical evidence that specifically addresses the growing importance of non-Western donors to SSA. In addition, it is also important to determine whether or not the two political–economic views stated above stand up to empirical scrutiny and whether the determinants of foreign aid allocation in SSA follows the trends observed in other developing regions.

Recent developments in the database on Chinese aid by Strange *et al.*, (2013) provides the opportunity to empirically ascertain to some degree and to compare the determinants of Chinese aid allocation to SSA countries with that of well-established traditional donors. Taking the USA, the second largest bilateral donor to SSA and China the biggest non-Western donor to SSA respectively, the objective of this paper is to examine the determinants of aid allocation by both USA and China to SSA. Using multi-level analysis for the US and Heckman sample selection analysis for China the study seeks to answer the following specific questions: (1) how does recipient's governance influence USA and China's aid allocation to SSA countries? (2) Do oil resource considerations influence USA and China's aid allocation to SSA? (3) How has the emergence of China in the aid field[3] altered the determinants of USA aid allocation to SSA?

The rest of the paper is structured as follows: section 2 discusses Chinese and American foreign aid to SSA. Section 3, provides a review of the aid allocation

[2]Easterly, Levine and Roodman (2004) Knack (2001), McGillivray and Morissey (2001) and Doornbus (2001) Hansen and Tarp (2001), Guillaumont and Chavet (2001) have all critisised the B-D results.

[3]This study takes the "emergence" of China in the aid field to mean the period from 2000 which is the period from which aid data is available. It should be mentioned that China has provided assistance to SSA since 1956.

literature. The methodology and data employed in the study is explained in section 4, section 5 provides a discussion of the estimation results and section 6 concludes.

2 Stylised facts on Chinese and American Aid to Sub-Sahara Africa

2.1 Chinese aid to Sub-Sahara Africa

In the 1960's Africa provided China with an opportunity to increase the country's political and diplomatic reach. The interest in Africa arose as a direct result of disconnect between the Chinese and the Soviet Union over the legitimacy of China's ideological positions (Chaponniere 2009) as well as the increased competition between the Americans and the Japanese in Asia which made Africa a potential new area of opportunity (Copper 1976). China's aid policy in the 1960's was premised on equality between partners, mutual benefit, respect for sovereignty, respect for obligations and enhancing self-reliance of Chinese aid recipients.

In addition to the political motives, Africa presented China with economic opportunities. Therefore while the initial motive for Chinese aid to SSA was to strengthen diplomatic ties, the resource motive became an important factor in Chinese aid allocation. By 1976, the resource motive was apparent in numerous SSA countries from infrastructure (the construction of the Tan Zam railroad in Zambia was in part to facilitate China's access to copper) to the construction of roads in countries like Ethiopia (to assist the movement of cotton exports to China). China's view of the resource possibilities in SSA continues even today. According to Sun (2014) since 2001, the need to boost Chinese domestic economic growth has further driven China's interest in SSA's natural resource.

China's aid policy on Africa underwent major reforms between 1994 and 1995. The policy reforms were necessary for three main reasons. First, increased population experienced by china put untold pressures on the country's resource base and therefore Africa became an attractive prospect as a source of much needed resource. Second, China's increasing foray into Africa and gains in political foothold posed a potential threat to Western countries and there was a need to pacify the Western countries. Lastly, the aid policy reform factored in China's economic strategy. The provision of aid was motivated by the need to expand into new markets.

China's aid policy reforms were effected in three main ways. First, new instruments that linked aid, trade and investment between China and Africa were introduced and implemented. Second, programmes that combined foreign aid with economic cooperation were developed and financed and lastly, China refined its portfolio of tools to aid domestic restructuring. The restructuring also saw the creation of three policy banks, China's development Bank (which along with China Eximbank, was responsible for overseeing oversees aid), China export–import bank and China agricultural development bank which were

all state-owned and controlled and provided a way in which the government could provide targeted finance that combined both planning and market means (Brautigam 2009). In addition, the policy reform produced the economic and trade strategy that sought to allow the combination of mutual cooperation and trade between China and Africa. This permitted Chinese investments in manufacturing and agriculture, growth in Chinese assembly factories which created increased demand for Chinese exports and also allowed China's incursion into the exploration and investment in minerals and forest resources on the continent.

From 2000, China further cemented itself as a major aid role player in Africa. In October 2000, the forum on China–Africa cooperation (FOCAC) which included 44 African countries was established. China undertook to provide financing for debt relief, training programmes as well as investments (Brautigam 2009). In the same year, the China-Africa Business Council was established and saw China announce the cancellation of 1.2 billion US dollars in debt. In 2006 China published the white paper on China's African policy which highlighted a focus on 'win-win' relationship between China and Africa. In the same year China announced a 1.4 billion US dollar debt cancellation; creation of a 5 billion US dollar fund comprised of soft loans and commercial loans and undertook a doubling of its aid between 2006 and 2009. China also agreed to the construction of 30 hospitals and training of 15000 Africans (Chaponniere 2009).

A significant portion of Chinese foreign aid is targeted to low income developing countries, a large proportion of which is provided to Africa. According to China's white paper on foreign aid issued by the Chinese government in 2011, "the main areas of support for China has been in projects in agriculture, industry, economic infrastructure, public facilities, education and medical and health care, with the intent on improving recipient countries industrial and agricultural productivity, laying a solid foundation for their economic and social development, and improving basic education and health care".

Between 2000 and 2012, China has undertaken over 1700 projects in Africa in over 50 African countries and amounting to over 75 billion US dollars. While this amount is less than the ninety billion dollars committed by the US in the same period, it still represents a significant alternative source of aid financing for the continent. China's aid in SSA is varied and can be found in almost all the sectors from telecommunication to health. The largest amount of aid funding goes towards the transport, storage, energy and communications sectors.

A significant share of Chinese aid is geared towards infrastructure development as over 70 percent of Chinese aid is directed at construction of infrastructure. Chinese aid in this infrastructure in SSA outweighs that of other donors, accounting for over 30 percent of total value of infrastructure projects in Africa (Gharib, 2013). SSA's education and health sectors have also benefitted significantly from Chinese aid, however the amount of aid committed to these two sectors lag behind others sectors like transport and energy possibly due to the fact that a significant amount of western aid is focused on these two sectors (see table 1).

In terms of the largest SSA recipients of Chinese aid, Nigeria, Ghana and Sudan have been the top recipients in the last decade (see table 2). The three

countries combined received around 250 million US dollars in aid, the majority going to energy infrastructure such as oil pipelines, Strange *et al.,* (2013).

2.2 American Aid to Sub-Sahara Africa

It is estimated that USA provides approximately 80 million US dollars in aid to SSA annually (USAID).US foreign aid has generally been motivated by political, economic and altruistic factors with the objective of promoting economic growth in the recipient nation, poverty reduction, improving governance and increasing access to basic education and health care (Turnoff and Lawson 2011). Between 1960 and 2006, US aid to SSA increased by 2,661 percent from 211 million US dollars to 5.6 billion US dollars and accounted for a 17 fold increase in the proportion of aid in its budget. Within the same period, USA foreign aid budget increased from 1.4 percent to 23.8 percent. Simultaneously, USA also contributes to multilateral aid agencies including the World Bank, the African Development Bank (ADB) and the international Monetary Fund (IMF), Cato handbook for policy makers, (2006 and 2007).

US aid allocation has come under attack in recent years for the misalignment between it and recipient country needs. Predominantly, US aid is concentrated in the health and education sectors of many recipients, making Chinese aid the more preferred option of funding as the Chinese provide aid in the energy, transport and storage and communication sectors.

Regional allocation of US foreign assistance commitments shows that developing Asia, Europe and SSA are the top three focus regions for the USA. Since 1980, a significant portion of total US foreign assistance is provided to developing Asia, 205 billion US dollars, followed by developing Europe with 200 billion US dollars and 120 billion US dollars to SSA in the same period (see figure 1).

Between 1995 and 2012, a total of 8.1 billion US dollars was committed to SSA. 5.1 billion US dollars of foreign aid was committed to the health sector (6.3 percent of total aid commitments in the same period), 4.1 billion US dollars was earmarked for the agriculture sector (5.1 percent of total aid commitments) and 3.3 billion was committed to the education sector (4.1 percent of total aid committed). Transport and storage, energy and communication sectors received 3.1 percent, 0.6 percent and 0.07 percent of total aid committed between 1995 and 2012 respectively.

USA is the second largest bilateral donor to SSA, second only to France between 1980 and 2012. In the same period US provided as high as 10 billion US dollars on a bilateral basis to individual SSA countries. Table 3 provides a list of the top 10 recipients of US aid between 1980 and 2012. Sudan, Ethiopia, Kenya and the democratic republic of Congo have been the highest recipients of US aid over the period 1980-2012. There is a slight change in the recipients of US aid between the period before China emerged in SSA aid field (1980-1999) and the period after the Chinese entry (2000-2012). Post china, Nigeria, Uganda, Tanzania and South Africa became part of the destination for a significant amount of the US aid committed to SSA. Of the four countries, two (South Africa and Nigeria) have arguably the largest economies on the continent, driven

by natural resource exports as well as growth and innovation in other sectors like the banking and service sectors. The other two countries (Tanzania and Uganda) are two of the fastest growing economies in East Africa.

3 Literature Review

3.1 Aid Allocation Models and Estimation Techniques

The extant literature on the determinants of foreign aid allocation has been undertaken in the form of a recipient need model, a donor interest model and the more popular hybrid model which emerged later. The recipient need models focused on aid allocation as a result of the perceived needs of the recipient. The determination of aid allocation from this perspective date as far back as McKinley and Little (1979), Maizels and Nissanke (1984), Mosley (1985), Gang and Lehman (1990) amongst many others that attempt to estimate and explain the aid allocation process. This model is based on the idea that inherent in recipient countries is poverty and poor economies that necessitate the provision of funds from the more developed world. This sprung the idea that the poorer a nation is the more aid it receives or should receive.

The donor interest model proposes that the allocation of aid is driven singularly by the interest of donors (see Frank, 1969; Jalee 1968; Hensman, 1971; Hayter, 1981). These interests have been classified into economic strategy, political strategy, and cultural similarities. According to Harrigan and Wang (2011), "donor aid policy is driven by the need to take advantage of strategic and commercial gains that can be derived from aid and hence allocate aid to pursue their self-interest". Common variables in the donor motive literature include trade as an economic motive, military stronghold in recipient nation as political strategy and oil as a resource motive.

Over time however, the aid allocation literature has acknowledged that the allocation of aid is a function of both recipient needs and donor motives, and therefore the model specifications and estimation techniques of early aid allocation studies have in recent years been called into question. McGillivray (2003) criticises early studies for failing to consider in the estimation process, both recipient need and donor motives in one equation. Similarly, Wittkopf (1972); McKinley and Little (1979) all level the same criticism against early studies and suggest that the problem with estimating separate equations for donor interest or recipient needs as prevalent in previous studies is that they incorrectly assume that the decision to allocate aid and how much to allocate is driven by either the donor interest or the recipient needs. This assumption raises the problem of omitted variables bias.

The above criticism of early studies paved the way for the emergence of later studies that take a hybrid approach (Wittkopf, 1972; Cingranelli and Pasquarello, 1985; Bowels 1987; Poe and Sirirangsi 1993; Fenny and McGillivray 2008; Neumayer 2010; Harrigan and Wang 2011; Dreher *et al.*, 2011). This approach combines both recipient need and donor interest and allows for the

estimation of a single equation encompassing both factors.

Many argued that US foreign aid allocation was motivated by self - interest. However, others point to the fact that US aid policy was geared towards rewarding poor nations, nations that exhibited a good human rights record or nations that maintained good governance and good governance practices countries (Cingranelli and Pasquarello, 1985; Carleton and Stohl, 1987; Demirel-Pegg and Moskowitz, 2009). Cingranelli and Pasquarello (1985) examined the role of human rights practices of Latin American countries in US foreign aid allocation and concluded that the US favoured poorer Latin America nations and nations that suffered from huge trade deficits. At the eligibility stage, Neumayer (2010) found that poorer countries and countries with a low regulatory burden, democratic countries and countries that respected the rule of law were deemed eligible for US aid.

Harrigan and Wang (2011) sought to determine whether the US was different from other select Western donors in terms of its aid allocation. Findings indicate that recipient need plays a rather minor role in US aid policy while US interests are more significant when compared to Canada, France, Italy, japan and the United Kingdom. In addition poorer, less populous countries benefitted from higher Canadian, French, Italian, Japanese and UK aid. However since the collapse of the Soviet Union, all above countries but Canada focused more on recipient needs in their aid allocation decisions.

Within the hybrid model, many authors explain the income and population biases. The idea that the poorer and less populous a nation is the more aid it receives. Many reasons have been put forward to explain why donors prefer smaller countries than larger ones including that bigger nations are less able to absorb foreign aid and as such are less preferred to smaller nations (Dowling and Hiemenz, 1985). Harrigan and Wang (2011) explain the population bias from a geo-political interest. Due to the decline in political benefits to a donor as a result of increasing recipient population, donors would rather spread aid amongst countries to ensure support at councils such as the UN. Also with smaller recipients, there a lower cost to exerting political leverage when compared to larger recipient countries.

4 Aid Allocation Model

The empirical analysis examining the determinants of donor aid allocation is based on a linear model that takes the following form:

$$total\ aid_{it} = \phi_0 + \phi_1 X_{it} + \phi_2 G_{it} + \mu_{it} + \varepsilon_{it} \tag{1}$$

Where the dependent variable $total\ aid_{it}$ is the total foreign aid that a country, i receives from donor j in year t. Following Neumayer (2003) the dependent variable is defined as total foreign aid as opposed to per capita aid. From the donor's perspective, it is more rational and easier to allocate aid to recipients from a given or fixed amount of total aid rather than to allocate aid based on per capita terms as this is more cumbersome and can lead to

overshooting or undershooting the fixed overall amount of aid available to the donor (McGillivray and Oczkowski, 1992). Additionally, total commitment aid from the donor is utilised, noting the argument made by Neumayer (2003) that commitment aid is a better proxy as it is the decision variable of the donor, which the donor has control over. Aid disbursements depend to some extent on whether the recipient requested the aid commitment.

X_{it} represents a vector of control variables that account for both recipient need and donor interests: G_{it} is a vector of governance variables included to ascertain the significance of recipient country governance in the amount of aid allocated, μ_{it} represents effects specific to country i and the error term is denoted by ε_{it}.

4.1 Control Variables

When considering such analysis, the econometric model should therefore be undertaken within a donor interest–recipient need framework, which includes not only variables that account for recipient country needs, but also donor interest variables. The control vectors are discussed below.

The most common control variable used in the aid allocation literature to capture recipient country need is the level of income measured predominantly as the per capita GDP. The lower the per capita GDP the poorer the country and therefore the more in need of aid it is. The use of GDPC as a proxy for recipient country need should not be interpreted lightly. According to Gang and Lehman (1990), GDPC is limited in its ability to fully explain the distributional issues that underline basic need. At best GDPC is a measure of absorptive capacity and simply captures growth criteria for aid distribution. Following Gang and Lehman (1990), Maizels and Nissanke (1984), McKinlay and Little (1977, 1979) GDPC is included in this study. As an extension of the recipient need hypothesis, the possibility of an income bias is examine by separating SSA countries according to their income groups. Following the OECD's classification of countries according to income groupings, three dummy variables are created one for upper middle income SSA countries, another for lower middle income SSA countries and one for low middle income SSA countries.

To overcome the limitation of GDPC as a need proxy, and considering that both the US and China provide aid to the health and education sectors of SSA countries, infant mortality rate and secondary school enrolment rate are included as further need variables. Infant mortality and school enrolment are general indicators of real standard of living and provide insight into the quality of the health care and education systems of recipients (Gang and Lehman, 1990). Health and education are considered to be basic needs and factors that encourage increased aid inflows from donors.

To control for the recipient country size, population is included. Population size can affect aid allocation decisions in a number of ways. First, according to Neumayer (2010) the larger the population, the more aid eligible the country is deemed to be compared with less populous countries. Second, the relationship can be negative if donors equate large populations with lower per capita aid and

thus a lower effectiveness of aid amounts allocated.

In the consideration of donor interest, following the aid allocation literature, economic, political and cultural motives of the donor are included. Total exports of donor j to recipient i is included with the idea that the larger the share of a donors exports is to the recipient country, the more willing the donor might be to giving aid to the recipient. The aid allocation literature alludes to the fact that foreign aid is not only motivated by altruistic motives, but behind the need to assist developing countries lays the need to pursue donor economic motives. The hypothesis is that donors with resource motives are more inclined to provide aid to resource rich recipients. The resource motive hypothesis is thus examined with the inclusion of a resource dummy (oil dummy where 1 = oil producing recipient and 0 = non-oil producing recipient country).

In addition a colony dummy (1 = countries colonised by the donor or other Western powers, 0 = recipient countries not colonised by the donor country or a western power) is included as proxy for donor cultural motives and is used to capture whether or not a recipient country that is a former colony of the donor receives more aid than recipients that are not former colonies of the donor.

Following Dreher, Nunnenkamp and Thiele (2011), a distance variable is included in the Chinese regression to test the hypothesis that new donors like China will be more likely to provide aid to recipients that are geographically closer.

A number of different measures of governance has been utilised in the aid – governance literature. The inclusion of governance variables allows the determination of whether or not the quality of governance is a considerable factor in both donor allocation decisions and aid effectiveness. The political rights and civil liberty index constructed by Freedom house is utilised in this study.

Many of the aid allocation studies consider the level of governance of the recipient. However proxies such as political rights, rule of law etc. reflect the institutional aspects of governance. Many SSA countries experience periods of conflict which is usually followed by increased aid inflows. However, conflict is largely ignored in the aid allocation literature and therefore in addition to the governance variable, a conflict dummy is included in the regressions to capture the significance of conflict periods in donors' aid allocation decisions.

4.2 Data

The data on total US foreign aid commitments is obtained from OECD's CRS online database. Data on Chinese foreign aid is obtained from the database developed by Strange *et al.,* (2014) on Aiddata.org on http://china-aiddata.org/ projects who track Chinese aid for development. Data on US and Chinese exports to SSA countries is obtained from the IMF's direction of trade (DOT) online database. Population size, per capita GDP, infant mortality rate and secondary school enrolment rates are obtained from the World Bank, World development indicators (WDI). Data on political rights and civil liberties are obtained from the freedom house index database.

4.3 Estimation Technique: Determinants of US Aid Allocation

Traditional single level models allow for the examination of relationships at one analytical level, which is usually at an individual level, an aggregate construct such as a country. Single level models however limit the degree of inference that can be made about the individual (country) level relationships. Given that most variables and relationships in economics are multi-level in structure, the use of single level analysis ignores this and therefore results based on such analysis will be flawed (Luke, 2004). Multilevel models allow for the analysis at all levels to be carried out simultaneously and allows the use of dependent variables that are categorical (0/1). Another advantage of multilevel models is that it enables the extent of the differences in aid amounts allocated at the country level and region level when the explanatory variables are included and when they are excluded. Empirically, the advantage of multilevel models lies in the fact that they are statistically more efficient; provide more efficient use of data than fixed effects approaches in which dummy variables and their interactions have to be added to the regression models.

According to Rabe-Hesketh and Skrondal (2012), multilevel models have the ability to examine the influence of cluster level covariates and also control for lower level predictors simultaneously. In this case, population, per capita GDP, exports, infant mortality rate, secondary school enrolment rate, political rights and civil liberties are classified as level 1 variables and the country's income and regional classification are taken to be level 2 variables.

The aim of this study is to empirically test the hypothesis that differences in aid allocation is influenced by the level of the stated socio-economic variables of a recipient country. The study utilises country data on dependent and independent variables comprising of foreign aid data nested within countries that are nested within regions. The model is specified in the general form as follows:

$$In(aid)_{it} = \varphi^* X_{it} + \beta^* G_{it} + \in_{it} \tag{2}$$

Where *ln* (aid) is the natural log of total donor aid to country i in time t. X_{it} is a vector of regressors, G_{it} is a vector of governance, $_{it}$ is the error term.

The multilevel model is therefore written in the form of a 2 level hierarchical linear regression:

Level1:

$$\begin{gathered} In(aid)_{it} = \varphi_{0i} + \varphi_{1t}(\exp ort)_{it} + \varphi_{2t}(GDPC)_{it} \\ +\varphi_{3t}(pop)_{it} + \varphi_{4t}(mortality)_{it} + \varphi_{5t}(enrolment)_{it} \\ +\varphi_{6t}(polrights)_{it} + \varphi_{7t}(civilrights)_{it} + \varepsilon_{it} \end{gathered} \tag{3}$$

Level 2:

$$\varphi_{0i} = \varphi_{00} + \varphi_{01}(resource)_i + \varphi_{02}(Colony) + \varphi_{03}(lanuage)_i + U_{01} \tag{4}$$

Each country in the study can have a different average amount of aid (φ_{0i}), therefore the slope and intercept are allowed to vary across level 2. In addition,

the level 2 equation shows each of the level 1parameters as a function of the level 2 predictors. Therefore φ_{0i} (the level 1 intercept) is the level 1 intercept in level 2 unit I, α_{00} is the mean value of level 1 dependent variable $(In(aid)_{it})$, controlling for level 2 predictors; resource, language and colony, $\alpha_{01,}\alpha_{02,}\alpha_{03,}$ is the slope of the level 2 predictors and U_{01} is the error (un- modelled variability) for unit i..

Level1:

$$\begin{gathered} In(aid)_{it} = \varphi_{0i} + \varphi_{1t}(\exp ort)_{it} + \varphi_{2t}(GDPC)_{it} \\ +\varphi_{3t}(population)_{it} + \varphi_{4t}(Mortality)_{it} + \varphi_{5t}(enrolment)_{it} \\ +\varphi_{6t}(Polrights)_{it} + \varphi_{7t}(\mathrm{Ci}\, vilrights)_{it} + \varepsilon_{it} \end{gathered} \tag{5}$$

Level 2:

$$\begin{aligned} \varphi_{0i} &= \varphi_{00} + \varphi_{0i} resource_i + \varphi_{02} \mathrm{col}\, ony_i + \varphi_{03} language_i + U_{oi} \\ \varphi_{1t} &= \varphi_{10} + \varphi_{11} resource_i + \varphi_{12} \mathrm{col}\, ony_i + \varphi_{23} language_i + U_{1i} \\ \varphi_{2t} &= \varphi_{20} + \varphi_{21} resource_i + \varphi_{22} \mathrm{col}\, ony_i + \varphi_{23} language_i + U_{2i} \\ \varphi_{3t} &= \varphi_{30} + \varphi_{31} resource_i + \varphi_{32} \mathrm{col}\, ony_i + \varphi_{33} language_i + U_{3i} \\ \varphi_{4t} &= \varphi_{40} + \varphi_{41} resource_i + \varphi_{42} \mathrm{col}\, ony_i + \varphi_{43} language_i + U_{4i} \\ \varphi_{5t} &= \varphi_{51} + \varphi_{51} resource_i + \varphi_{52} \mathrm{col}\, ony_i + \varphi_{53} language_i + U_{5i} \\ \varphi_{6t} &= \varphi_{61} + \varphi_{61} resource_i + \varphi_{62} \mathrm{col}\, ony_i + \varphi_{63} language_i + U_{6i} \\ \varphi_{7t} &= \varphi_{71} + \varphi_{71} resource_i + \varphi_{72} \mathrm{col}\, ony_i + \varphi_{73} language_i + U_{7i} \end{aligned} \tag{6}$$

Substituting level 2 into level 1 equation and writing out provides the mixed level model with both the fixed effects (top part of the equation) and random effects terms (bottom part of equation 5):

$$\begin{gathered} In(aid)_{it} = \varphi_{00} + \varphi_{0i} \mathrm{Re}\, source_i \\ +\varphi_{11} resource(\exp orts) + \varphi_{21} resource(gdpc) + \varphi_{31} resource(pop) \\ +\varphi_{41} resource(mortality) + \varphi_{51} resource(enrolment) \ldots\ldots \end{gathered} \tag{7}$$

$$+U_{oj} + U_{ij} \exp orts + U_{2j} gdpc + U_{3j} pop + U_{4j} mortality + U_{5j} enrolment + U_{6j} \tag{8}$$

4.4 Estimation technique: Determinants of Chinese Aid allocation

The estimation of the determinants of Chinese aid allocation to SSA countries poses some challenges. Chinese foreign aid data begins in 2000 and is not complete for all years for all countries and as such does not permit the use of a multilevel analysis. Instead, the Heckman sample selection (Heckman 1979)

prominent in the literature is adopted. This estimation technique is one of the three together with the type 1 Tobit model (Tobin, 1958) and the two–part model used to analyse data in which a variable has a large amount of zero values. Underlying the techniques is the design that donors can choose to provide a positive amount of aid to certain recipients and provide no aid to others. In some cases smaller donors prefer to give large amounts of aid to specific countries. This implies therefore that some countries receive aid from a donor while other countries do not and thus aid which is the dependent variable is only partly continuous with positive probability mass at zero (Neumayer, 2003). OLS estimates will be biased in this regard. Formally the two equations can be presented as follows:

$$Y_1^* = \alpha + X_{1i}B_1 + u_{1i} i = 1, 2 \ldots\ldots\ldots N \tag{9}$$

$$\begin{aligned} Z_i^* &= \alpha + X_2 B_2 + u_{2i} i = 1, 2 \ldots\ldots\ldots N \\ Y_i &= Y_i^* \text{ if } Z_1 = 1 \text{ if } Z_i^* > 0 \\ Y_i &= 0 \text{ if } Z_1 = 0 \text{ otherwise} \end{aligned} \tag{10}$$

Z^*_I is a binary decision variable on whether or not the country is seen to be eligible for aid, while Zi is its observed counterpart. Yi are the levels of aid allocated to the eligible country and Y^*_i are the potential aid allocations.

The aid equation is specified as:

$$\begin{gathered} aid_{it} = \beta_0 + \beta_{it} GDPC_{it} + \beta_2 population_{it} \\ + \beta_3 \exp ort_{it} + \beta_4 mortalitrate_{it} + \beta_5 enrolmentrate_{it} \\ + \beta_6 politicalrights_{it} + \beta_7 resource_{it} + u_1 \end{gathered} \tag{11}$$

Aid is assumed to be observed if

$$\begin{gathered} \gamma_0 + \gamma_1 GDPC_{it} + \gamma_2 population_{it} + \gamma_3 \exp ort_{it} \\ + \gamma_4 moralityrate_{it} + \gamma_5 enrolmentrate_{it} + + \gamma_5 enrolmentrate_{it} \\ + \gamma_6 politicalrights_{it} + \gamma_7 resource_{it} + \gamma_8 dis \tan ce_{it} + u_2 > 0 \end{gathered} \tag{12}$$

5 Analysis and discussion of results

This section provides the estimation results together with a discussion of the results. The results of the initial OLS estimation for both US and China are provided followed by the findings from the multilevel framework for the US and Heckman selection model results for China. With the exception of the governance and the dummy variables, all variables are transformed to natural log.

5.1 Baseline OLS estimation results

To begin the analysis, a simple OLS regression for both the USA and China is performed in order to provide an elementary glimpse at the data using a comparable technique for both countries. The results are presented in table 4. The estimation result indicates that exports, per capita GDP and population are significant determinants of Chinese aid to SSA countries. The governance variable, Political rights which captures institutional characteristics of the recipient as well as the conflict variable are not significant in the determination of Chinese aid allocation. It appears that both donor interest and recipient needs determine Chinese aid allocation to the region.

In the case of the USA, from the full sample estimation, all variables are significant determinants of US aid allocation decisions. This suggests that economic motives as well as recipient need are factored in US aid allocation decisions. Together with the full sample, the distinction between the pre and post China period is made for the USA. In the period preceding China's entry into SSA, per capita GDP, exports, infant mortality rate and secondary school enrolment rate are significant determinants of US aid allocation. Post China, population, infant mortality, enrolment rate, political rights, resource and conflict variables are significant in US aid allocation decisions.

The OLS estimation technique above is too simplistic. While it allows a first glimpse at the data, the results are not reliable especially given the above explanation of the appropriate estimation techniques laid out in the previous section.

5.2 Multilevel analysis and regression results: USA

The model is estimated by first determining the proportion of the variation in aid committed to the different countries that is attributed to differences between countries. This provides the variance partition coefficient (VPC), the first (statistical) reason for the appropriateness of using multilevel modeling to estimate equation 1. A simple multilevel model that allows for country effects on aid allocated or committed to be examined, while excluding the other explanatory variables is estimated. The VPC in multilevel models is equal to the intra class coefficient (ICC), and provides the measure of the share of the variance in the explanatory variable that is accounted for by the level 2 variables. The equation of which is written as follows:

$$VPC = \frac{\sigma^2_{u0}}{\sigma^2_{u0} + \sigma^2_r} \tag{13}$$

Where $\sigma^2_{u0}, \sigma^2_r$ are estimates of level 2 and level 1 variances respectively, derived from fitting the null model, which is, a simple multilevel model without explanatory variables. The null model is stated as follows:

Level 1:

$$In(Aid)_{it} = \alpha_{0t} + \varepsilon_{it} \tag{14}$$

Level 2:

$$\alpha_{0t} = \phi_{00} + u_i \tag{15}$$

The mixed effects form of equation 4 is then written as follows:

$$\begin{aligned} In(Aid)_{it} &= \underbrace{\phi_{00}}_{Fixed\ Effect} + \underbrace{u_i + \varepsilon_{it}}_{Random\ Effect} \end{aligned} \tag{16}$$

Fixed Effect Random Effect

ln(Aid) is the total aid committed to country i in time t. The fixed effect is thus given by the intercept term $\varnothing_{00}$ and it captures the overall mean aid committed across countries. The error is then split into two components: u_i which is specific to each country (the between country variance in aid committed) and ε_{it} which is specific to each time period for each country i (the within country variance in aid allocated).

The null model (see table 5) excludes all explanatory variables and therefore in this case only has one fixed effects estimate. The intercept term is given as 4.73 US dollars (exp (1.55)) and is interpreted as the average aid amount that each country is expected to receive. The between country standard deviation $\sqrt{\psi}$ of the random intercepts of the countries is calculated as 1.508 (exp ((0.441)) while the within country standard deviation $\sqrt{\phi}$ is 1.738 (exp (0.553)).

The ICC is thus calculated as follows:

$$\begin{aligned} ICC &= \frac{\psi^2}{\psi^2 + \phi^2} \\ &= \frac{1.5083^2}{15083^2 + 1.7385^2} \\ &= 0.43 \end{aligned} \tag{17}$$

The ICC value is given as 0.43, indicating that 43 percent of the variation in US aid allocated to SSA countries is attributed to differences between countries and thus provides the empirical support to the appropriateness of using a multilevel model (with country characteristics) to estimate equation (1).

5.3 Determinants of US aid allocation to SSA

In examining the determinants of aid allocation, a two–level mixed model with random intercepts at both region and country-within region levels is fitted to equation (1). The use of contemporaneous values of regressors in the model might pose some endogeneity problems. Endogeneity can arise if both countries provide aid to recipient countries in order to strengthen the commercial ties; however it is also possible that the aid provided to recipients drives stronger commercial bonds between the recipient and the donor. To control for endogeneity, lagged values of the explanatory variables are used in the model. The estimation results for the determinants of US aid allocation are provided in table 6. Model 1 provides the results excluding all dummy variables. Models (2)

to (5) provide the results with the inclusion of each dummy variable. Model (6) provides the results from the full model regression and is the model discussed in detail.

The results from model 1 indicate a statistically significant impact of exports, per capita GDP, population, infant mortality rate and political rights on US aid allocation decisions to SSA countries. The coefficient of the export variable is positive and significant, indicating that trade is an important consideration in US decision to allocate aid to SSA countries. An increase in bilateral trade between the US and the recipient nation increases aid allocated by 15 percent. It appears that the US provides more aid to recipient countries in SSA with which they have strong trade relationships. Similar findings are reported by Dreher and Fuchs (2011).

The results point to the existence of a population bias in US foreign aid allocation. The negative and statistically significant coefficient of the population variable suggests that larger recipient populations are deemed to foster diminishing marginal aid impacts. The bigger the population, the weaker the influences of aid in the recipient country and as such, donors prefer to give aid to recipients with smaller populations. The result is confirmed by similar findings reported by Younas (2008), Neumayer (2003).

Contrary to expectations from the aid allocation literature that poorer countries would receive more aid, the coefficient of GDP per capita is positive and significant[4]. This implies that countries that do well economically receive more aid from the US. This is perhaps because some donors may perceive countries with growing economies to have the ability to efficiently utilize the aid received and thus further improve or enhance growth.

Regarding the governance variables, the expectation is that of an inverse relationship between these variables and aid as this indicates that the lower the scores, the freer the country and therefore the more aid the country will be allocated. Political rights have a negative and significant impact on US aid allocation to SSA. It suggests therefore that the United States pays considerable attention to the degree of governance in the recipient country. The higher the level of political rights repression, the less aid is provided.

The political rights and civil liberty dummies in essence capture the institutional characteristics of the recipient. One of the characteristics of a number of SSA countries is non-political conflict periods. In such periods, Western donors tend to pledge more aid to countries in the region. A conflict dummy is thus included to capture episodes of unrest in the recipient country. From the results, US provides increased aid during conflict periods to conflict ridden SSA countries.

The education and health sectors in many SSA countries are plagued by numerous challenges including but not limited to funding constraints and skills

[4]For example Dreher and Fuchs (2011) find a negative and significant impact while Neumayer (2003) find a negative but insignificant impact. The time periods under consideration for both studies differ from this current study. Dreher and Fuchs (2011) considered 1996-2005 and Neumayer (2003) considered
1991-2000.

shortages that hamper improvements in observable outcomes. A major reason provided to support the continued involvement of Western donors in SSA is to improve the social and economic sectors. This is further highlighted by the increased US aid to both the health and education sectors of SSA countries. Generally SSA countries experienced high infant mortality rates in the 1980's and 1990's. In Mozambique for example, infant mortality rate in 1980 was 172 deaths per 1000 children. Since 2000 there has been a downward trend in the rate, however in some SSA countries like Sierra-Leone, infant mortality rate continues to be as high as 109 deaths per 1000 children (WDI, 2014). The coefficient of the infant mortality rate is negative and significant implying that a decrease in the mortality rate attracts more US aid. It appears that improvements in health outcomes such as the infant mortality rate encourage the US to continue to provide more aid. An explanation for the continued increase in aid as mortality rate decreases can be gleamed from Mishra and Newhouse (2007) who, using health aid, find that health aid has a minimal impact on infant mortality. More importantly, they find that doubling of health aid in the current period only results in a 2 percent reduction in mortality rate in the next period. This suggests the need for continued aid investment in health outcomes even as the outcomes improve. A similar result for infant mortality rate is observed by Berthelemy and Tichit (2004) and Hossain (2014). According to Hossain (2004), the relationship between infant mortality rate and foreign aid can be negative if lower mortality rate is considered to be a sign of good performance by donors. Turning to the third basic need factor, the coefficient of secondary school enrolment rate is positive though not statistically significant.

One of the arguments that have risen in the aid donor literature is that non-traditional donors like China are driven by resource motives compared to Western/OECD donors and this motive partly colors donor considerations of recipient country governance. This hypothesis is tested in this study with the inclusion of a resource dummy which captures the impact of oil resource as a motive for aid. Recipient countries that produce oil are given a value of 1 and non-oil producers take on the value of zero. The coefficient of the resource variable is negative and statistically significant suggesting that SSA countries that are oil rich tend to receive about thirty seven cents less aid than non-oil rich SSA countries. There is therefore no evidence that US aid is targeted to oil producers in SSA. Similar results are observed by Dreher and Fuchs (2011) who employ fifteen measures of natural resource endowment. [5]

5.4 Determinants of US aid allocation Pre and Post China

China's aid policy seems geared towards cementing the country as a superpower thus directly or indirectly providing a challenge to other Western superpowers like the United States. Tull (2006) notes that China attempts to utilise its aid for its political interest by building coalitions to shield Beijing from Western

[5] The inclusion of dummy variables in models 2 to 5 that captures various economic and strategic interest of the US in the estimation does not change the signs and the magnitude of the coefficients drastically.

criticism. According to Ramo (2004), Chinese foreign aid is aimed at garnering enough power in order to challenge the US as the dominant world power. Dreher and Fuchs (2011) point to the fact that between 1956 and 1987, 62 percent of Chinese aid was destined for Africa which according to the authors highlighted China's aspirations to become the dominant power in the third world". It therefore becomes interesting to determine whether or not China's aid policy has in any way changed the US aid policy framework. The regression results are shown in table 7.

Columns two and three focus on US aid allocation pre and post China. Regarding exports, there is evidence of a decreased focus on exports as a determinant of aid allocation between the two periods. Prior to 2000, exports had a significant effect on US foreign aid allocation however post 2000, the impact becomes insignificant. This can be attributed to three factors; (1) the decline in US trade with SSA since the 2000's, (2) increased share of China-Africa trade between 2000 and 2012 and (3) narrow destination and export composition base. Since 2000, China-Africa trade has increased at a faster rate than US-Africa trade in the same period. China's trade with Africa increased from 8.9 billion USD in 2000 to 127.3 billion USD in 2011(Jones and Williams, 2012). At the same time, US trade with SSA accounts for only between 1-2 percent of its total trade with the rest of the world and is limited to mainly Nigeria, Angola, Ghana and Togo in mostly machinery, vehicles, mineral fuels and aircraft. Therefore compared to the pre China period, exports are not significant in foreign aid allocation decisions.

Turning to per capita income, a difference in the sign and significance of the variable is observed between the two periods. Specifically, prior to 2000 there is no significant effect of GDP on aid allocation decisions, however post 2000; there is evidence of significance of recipient need in US aid allocations. Post 2000, a 1 percent increase in per capita GDP reduces a recipient's share of US foreign aid by 15 percent. The findings on post China GDPC are in line with Dreher and Fuchs (2011), Neumayer (2003) who indicate that US aid allocation is geared towards recipient country need.

Regarding population size, a difference is again observed between the two periods. Prior to 2000, there is no significant effect on the aid allocated to recipient countries. However, from 2000, evidence points to the fact that larger countries receive more US aid. The results are again comparable to those found by Dreher and Fuchs (2011) for the US. Trends in US foreign aid to SSA shows that the top 10 recipients of US aid between 2000 and 2012 are also the most populous SSA countries (see table 3).

The two variables that capture the social and economic (education and health) aspects of recipients; secondary school enrolment rate and infant mortality rate do not differ in their effects on US aid allocation decision between the two periods. For SSA countries, the coefficient of the infant mortality rate is negative and highly significant. This implies that a decrease in the mortality rate attracts more US aid. It appears that an improvement in health outcomes such as the mortality rate encourages the US to continue to provide more aid. The coefficient of secondary school enrolment rate is positive though not statis-

tically significant.

The coefficient of the resource variable suggests that the US is not a driving factor behind US aid allocation to SSA. The resource incentive or strategic motive did not change between the two periods. There is therefore no evidence that the US provides more aid to natural resource abundant SSA countries. Oil rich SSA countries received between 40 – 48 cents less aid than non-oil rich SSA countries.

The separation of US foreign aid allocation into the two distinct pre and post china period shows some insight into the factors that determined US aid allocation and more importantly allows an insight into whether or not China's emergence as a major player on the African continent altered the way in which US allocates aid. From the estimation results, it appears that pre china, both donor interest and recipient need were equally factored into the aid allocation decision of the US, however post China, recipient need became more of a significant factor than donor interest in the allocation decision. China's increasing importance on the continent as an economic and strategic partner seems to have reduced the space within which US can play a role in terms of its economic force in Africa. This "squeezing" out of the US seems to have resulted in a shift in US foreign aid focus towards the "needs" aspects of foreign aid. In the last decade there has been a shift in US foreign aid focus to the socio- economic sectors in recipient countries and especially to the social sectors with more aid being focused on health and education and less directly on the real economy of the recipient country. According to Wang and Ozanne (2010), the West and indeed it would appear, the US focuses on direct aid, especially microfinance for the poor and assistance for educational and health programmes. It would seem that the US has pulled back from certain sectors and also altered the mode it delivers the aid (more project related) in the last decade, and while it is difficult to determine empirically whether this is as a direct result of China's entry into SSA, the empirical results point to a shift in US aid allocation determinants between the two periods, pre and post China.

5.5 Multilevel estimation of income bias: USA Regression

The finding above from the full sample period regression indicates that well off recipients receive more aid. This overall picture can be misleading. By separating recipients into the different income groupings as per the World Bank; low income, lower middle income and middle income[6], one is able to have a deeper insight into the allocation of aid to countries within SSA of different income groups. The results are provided in table 8.

Across all three models, exports, per capita GDP, population size, infant mortality rate political rights and the conflict variable are still significant considerations in the US aid allocation. When the income categories are factored in, the coefficients on the lower middle and low income dummy variables are insignificant while the coefficient of the upper middle income dummy is sta-

[6]The list of income groupings is available in appendix 1.

tistically significant and negative. It appears that upper middle income SSA countries receive less US aid than lower middle and low income SSA countries. Specifically for every dollar in aid allocated, upper middle income SSA countries receive about 50 cents less than the other income groups. Similar findings are observed by Neumayer (2003) who points to a middle income bias in US aid in which proportional increases in income are associated with a less than proportional decrease in aid.

5.6 Determinants of Chinese aid to Sub-Sahara Africa: Heckman regression results.

Table 9 shows the estimated marginal effects of the Heckman model. Contrary to the hypothesis that poorer countries receive more aid it appears that countries with high per capita income receive more Chinese aid. A potential reason for this is that countries with growing economies are better able to utilize the foreign aid provided than poorer countries. Isenman (1966), Dowling and Hiemenz (1985) and Neumayer (2004) posit that donors might perceive smaller poorer countries as lacking the ability to administer large aid inflows. They also link this to the perception of donors that aid is relatively more effective in countries with higher income levels.

The significance of strong economic ties in Chinese aid allocation decision is highlighted by the positive and statistically significant coefficient of the export variable. Fast growing markets in SSA provides China with potential customers for Chinese manufactured goods. The increasing demand for cheaper Chinese goods has made the continent a significant role player in china's economic growth. As Yang (2014) suggests, China's rapid economic growth has deepened the countries ties with Africa in terms of increased trade volumes.The provision of aid is in part to enable China's expansion into new markets and also to revive its multinational corporations activities in Africa that were fledgling. The importance of trade in aid allocation is also highlighted in China's aid policy through the introduction of new instruments that linked aid, trade and investment between china and Africa

Turning to the population variable, the results suggests that countries with larger populations receive more Chinese aid than less populous countries, This contradicts the hypothesis that more populous countries are deemed to have a low aid absorption ability or that the more populous the country, the less impact the aid provided will have compared to countries with smaller populations. There is no evidence of a population bias against more populous SSA countries in terms of the amount of Chinese aid allocated. Similar evidence for large Western donors such as the UK, Germany, France and Italy is observed by Neumayer (2004) who finds evidence that at the level (outcome) stage, more populous recipient countries receive more aid.

The coefficients of the two proxies for governance both have a negative sign, however only political instability is significant. This implies that china considers the degree of political rights afforded in the recipient country than civil liberty

in its aid allocation decision. As political instability increases, there is a decline in Chinese aid to recipients.

The coefficient of the resource variable is positive and statistically significant when political rights is included as the governance variable, suggesting that oil rich SSA countries are likely to receive more Chinese aid than non-oil producing SSA countries. This suggests that resource motives are an important factor in Chinese aid allocation thus adding credence to the many suggestions that Chinese aid is resource driven.

5.7 Estimates of Income Bias: China Regression

The contrary finding on the GDPC variable warrants a further understanding of the allocation of aid amongst income groups. The marginal effects of Chinese income bias, provided in table 10 shows that further examination of the income bias indicates that priority is given to poorer SSA countries. Specifically, lower middle income SSA countries tend to receive more aid than upper middle income and low income SSA countries.

6 Conclusion

This study sought to answer four specific questions. First, what are the determinants of Chinese and American aid allocation decisions to SSA countries? Second, how has US aid allocation determinants changed with the arrival of China into the aid field in SSA? Third, is there any credence to assertions that China is primarily motivated by access to resource in SSA? Fourth, how significant is recipient governance in the decision of both countries aid allocation decision to SSA. There are only a handful of studies that have sought to explain the growing importance of Non-Western aid donors in developing countries, furthermore, very few have sought to empirically examine the determinants of Chinese aid to SSA and also examine what impact China's emergence in SSA's foreign aid field has had on American aid allocation determinants.

Empirical findings from the study confirm the significance of both recipient need and donor interests in US and China's aid allocation. The findings also lead to the conclusion that generally, US aid has more consideration for recipient need than Chinese aid. At the top of the SSA aid debate is the notion that Western donor countries are more considerate of the degree of governance in recipient SSA countries while their Chinese counterparts are assumed to overlook the level and type of governance. This notion at first glance might be seen to be true; however this is not necessarily the case. In both countries recipient governance is a significant determinant of aid allocation. In the case of the US especially, both political rights and civil liberty are considerations in their decision to allocate aid to SSA. More politically free countries and countries that allow civil liberty receive more aid. For China, political rights are a more important than civil liberty in influencing who receives Chinese aid. Empirical results point to the acceptance of a strategic resource motive in Chinese aid allocation determinants

and no resource motive in US aid allocation determinants. US provides less aid to resource rich SSA countries while their Chinese counterparts provide more aid to resource rich SSA countries. Additional support for this finding is observed in the fact that in the last 10 years, amongst the top 10 recipients of Chinese aid, almost half were in return for access to oil wells and the granting of first rights to prospect for oil in countries like Angola and Nigeria.

The separation of US foreign aid allocation into the two distinct pre and post China period shows some insight into the factors that determined US aid allocation and more importantly allows an insight into whether or not China's emergence as a major player on the African continent altered the way in which US allocates aid. From the estimation results, it appears that pre China, both donor interest and recipient need were equally factored into the aid allocation decision of the US, however post China's entry, recipient need became more of a significant factor than donor interest in the allocation decision. China's increasing importance on the continent as an economic and strategic partner seems to have reduced the space within which US can play a role in terms of its economic strength in Africa. This "squeezing" out of the US seems to have resulted in a shift in US foreign aid focus towards the "needs" aspects of foreign aid. In the last decade there has been a shift in US foreign aid focus to the socio- economic sectors in recipient countries and especially to the social sectors with more aid being focused on health and education and less directly on the real economy of the recipient country. According to Wang and Ozanne (2010), the West and indeed it would appear, the US focuses on direct aid, especially microfinance for the poor and assistance for educational and health programmes. It would seem that the US has pulled back from certain sectors and also altered the mode it delivers the aid (more project related) in the last decade, and while it is difficult to determine empirically whether this is as a direct result of China's entry into SSA, the empirical results point to a shift in US aid allocation determinants between the two periods, pre and post China.

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Table 1: Example of sector pervasiveness of Chinese aid in SSA

COUNTRY	SECTOR	YEAR	PROJECT	AMOUNT (US $)
Sierra Leone	telecommunications	2006	Fibre optic installation	15 million
Guinea	Health	2008	Construction of 150 bed hospital	2 billion
Tanzania-Zambia	Transport	2000	Tanzania Zambia railway construction	23.5 million
Namibia	Transport	2012	Loan for road upgrade	126 million
DRC	Budgetary support	2012	Budgetary support	1 billion
Angola	Government	2001	Government	50 million
Guinea Bissau	Agriculture	2004	Agriculture loan	60 million
Angola	Agriculture	2009	Agricultural Development	1.2 billion
Nigeria	Agriculture	2012	Cassava flour processing plant	200million
Equatorial Guinea	Minerals/ mining	2006	Oil backed loan	2 billion
Africa	Debt Relief	2000	Debt relief	1 billion

Source: Strange *et al*., (2013). Tracking Chinese Development Finance to Africa

Table 2: Top 10 largest recipients of Chinese official finance to Africa (ODA and OOF), 2000-2011

Country	Amount($Billion)
Ghana	11.4
Nigeria	8.4
Sudan	5.4
Ethiopia	5.4
Mauritius	4.6
Angola	4.2
Zimbabwe	3.8
Equatorial Guinea	3.8
Cameroon	3.0
South Africa	2.3

Source: Strange *et al.,* (2013). China's development finance to Africa: A media-based approach to data collection.

Table 3: Top 10 recipients of US aid (1980-2012, Billion US dollar)

Full Period (1980-2012)		Pre China (1980-1999)		Post China (2000-2012)	
Country	Amount (Billion US dollar)	country	Amount (Billion US dollar)	Country	Amount (Billion US dollar)
Sudan	10.30	Sudan	3.19	Ethiopia	7.98
Ethiopia	10.07	Somalia	2.95	Sudan	7.11
Kenya	8.31	Ethiopia	2.08	Democratic republic of Congo	6.24
Democratic republic of Congo	7.59	Kenya	2.17	Kenya	6.14
Mozambique	5.04	Mozambique	1.73	Nigeria	4.50
Tanzania	5.09	Senegal	1.353	South Africa	4.21
Uganda	5.01	Democratic Republic of Congo	1.351	Uganda	3.98
Nigeria	4.93	Zambia	1.33	Tanzania	3.92
South Africa	4.85	Zimbabwe	1.27	Mozambique	3.36
Somalia	4.42	Liberia	1.22	Zambia	2.66

Source: Author's calculations from OECD-Credit reporting system, online data.

Table 4: Baseline OLS regression results: China and US aid[1]

Variable	USA			CHINA
	Full model(1980-2012)	Pre China(1980-1999)	Post China(2000-2012)	Full Model(2000-2012)
LGDPC	-0.51***	-0.74***	-0.08	0.65***
	(0.07)	(0.69)	(0.09)	(0.22)
LPOP	0.29***	-0.10	0.91***	0.80***
	(0.06)	(0.07)	(0.08)	(0.21)
LEXPORTS	0.16***	0.18***	0.06	0.36***
	(0.42)	(0.05)	(0.05)	(0.13)
LMORTALITY	-0.59***	-0.47***	-0.65***	0.28
RATE	(0.09)	(0.12)	(0.13)	(0.40)
LENROLLMENT	0.35***	0.25***	0.40***	0.11
RATE	(0.06)	(0.08)	(0.11)	(0.31)
POLITICAL	-0.02*	0.002	-0.05***	0.02
RIGHTS	(0.01)	(0.01)	(0.01)	(0.03)
RESOURCE	-0.14**	-0.072	-0.24***	0.004
	(0.06)	(0.08)	(0.93)	(0.22)
CONFLICT	0.33***	0.036	0.34***	-0.006
	(0.05)	(0.15)	(0.63)	(0.13)
Prob>F	Prob>F =0.0000	Prob>F =0.0000	Prob>F =0.0000	Prob>F =0.0000
R^2	0.34	0.18	0.57	0.31

* ** ***indicates significance at 1%, 5%, and 10% level of significance

[1]Similar regression using Civil liberty as a proxy for governance does not change the results.

Table 5: Maximum likelihood Estimates for Null Model for equation 1

	Coefficient	Std Err.
Fixed part		
β	1.55	0.771
Random Part		
$\sqrt{\psi}$	0.411	
$\sqrt{\phi}$	0.553	

Table 6: Multilevel model results of the determinants of US foreign aid

Variable	**Model (1)**	**Model (2)**	**Model (3)**	**Model (4)**	**Model (5)**	**Model (6)**
FIXED EFFECTS						
LEXPORTS	0.19**	0.16**	0.15**	0.15**	0.15**	**0.15*** **
	(0.75)	(0.07)	(0.07)	(0.72)	(0.73)	**(0.73)**
LGDPC	1.81***	1.82***	1.81***	1.81***	1.35***	**1.37*** **
	(0.52)	(0.52)	(0.52)	(0.52)	(0.51)	**(0.51)**
LPOP	-10.58***	-10.36***	-10.61***	-10.61***	-10.90***	**-10.70*** **
	(3.68)	(3.63)	(3.63)	(3.63)	(3.52)	**(3.53)**
LENROLMENT	0.85	0.87	0.85	0.85	0.47	**0.50**
RATE	(0.55)	(0.55)	(0.55)	(0.55)	(0.53)	**(0.53)**
LMORTALITY	-14.36***	-14.31***	-14.36***	-14.36***	-12.29***	**-12.20*** **
RATE	(1.68)	(1.68)	(1.68)	(1.68)	(1.66)	**(1.66)**
POLITICAL	-0.29**	-0.26**	-0.029**	-0.029**	-0.029**	**-0.027***
REPRESSION	(0.13)	(0.13)	(0.13)	(0.13)	(0.013)	**(0.013)**
RESOURCE-DUMMY	-	-0.29	-	-	-	**-0.37** **
		(0.13)				**(0.19)**
COLONY-DUMMY	-	-	0.31	-	-	**0.29**
			(0.35)			**(0.19)**
LANGUAGE-DUMMY	-	-	-	-0.03	-	**-0.08**
				(0.13)		**(0.35)**
CONFLICT-DUMMY	-	-	-		0.42***	**0.42*** **
					(0.05)	**(0.05)**
RANDOM EFFECTS						
$\sqrt{\varphi}$	0.25	0.22	0.25	0.26	0.23	0.21
$\sqrt{\phi}$	0.33	0.32	0.33	0.33	0.34	0.31
Constant	1.75***	1.77***	1.77***	1.75***	1.72***	1.78***
Prob > χ2	Pr>χ2=0.000	Pr>χ2=0.000	Pr>χ2=0.000	Pr>χ2=0.000	Pr>χ2=0.000	Pr>χ2=0.000
Number of Observations	930	930	930	930	930	930

* ** ***indicates significance at 10%, 5%, and 1% level of significance. Standard errors are in parentheses.

Table 7: Multilevel estimates of USA aid allocation pre and post Chinese entry into SSA aid field.

Variable	Full Model (1980-2012)	Pre China (1980-1999)	Post China (2000-2012)
FIXED EFFECTS			
LEXPORTS	0.15***	0.22***	-0.10
	(0.73)	(0.06)	(0.08)
LGDPC	1.37***	0.50	-1.50*
	(0.51)	(0.54)	(0.93)
LPOP	-10.70***	-5.92	44.05***
	(3.53)	(3.92)	(12.48)
LENROLMENT RATE	0.50	-0.18	1.34
	(0.53)	(0.61)	(0.98)
LMORTALITY RATE	-12.20***	-7.59***	-8.07***
	(1.66)	(2.33)	(2.68)
POLITICAL	-0.027*	0.01	0.006
REPRESSION	(0.013)	(0.01)	(0.02)
RESOURCE DUMMY	-0.37**	-0.44**	-0.48*
	(0.19)	(0.19)	(0.26)
COLONY DUMMY	0.29	0.24	0.19
	(0.19)	(0.35)	(0.49)
LANGUAGE DUMMY	-0.08	-0.09	0.012
	(0.35)	(0.13)	(0.19)
CONFLICT DUMMY	0.42***	0.18	0.01
	(0.05)	(0.13)	(0.07)
RANDOM EFFECTS			
$\sqrt{\varphi}$	0.21	0.13	0.27
$\sqrt{\phi}$	0.31	0.31	0.44
Prob>χ2	Pr>χ2=0.000	Pr>χ2=0.000	Pr>χ2=0.000
Number of Observations	930	540	330

* ** ***indicates significance at 10%, 5%, and 1% level of significance. Standard errors are in parentheses.

Table 8: Estimates of US income bias

Variable	Model (1)	Model (2)	Model (3)
FIXED FFECTS			
LEXPORTS	0.15***	0.15***	0.15***
	(0.73)	(0.73)	(0.73)
LGDPC	1.37***	1.37***	1.38***
	(0.51)	(0.51)	(0.51)
LPOPULATION	-10.72**	-10.66***	-10.77***
	(3.52)	(3.53)	(3.53)
LENROLMENT RATE	0.48	0.50	0.49
	(0.53)	(0.53)	(0.53)
LMORTALTY RATE	-12.14***	-12.22***	-12.16***
	(1.66)	(1.66)	(1.66)
POLITICAL	-0.03**	-0.02*	-0.02**
REPRESSION	0.13)	(0.13)	(0.13)
CONFLICT-DUMMY	0.42***	0.42***	0.42***
	(0.05)	(0.05)	(0.05)
RESOURCE-DUMMY	-0.11	-0.35*	-0.26
	(0.21)	(0.18)	(0.21)
LANGUAGE-DUMMY	-0.06	-0.12	-0.01
	(0.13)	(0.15)	(0.15)

COLONY-DUMMY	0.25	0.30	0.15
	(0.33)	(0.36)	(0.36)
UPPER MIDDLE INCOME DUMMY	-0.45**	-	-
	(0.23)		
LOW MIDDLE INCOME DUMMY	-	0.08	-
		(0.16)	
LOW INCOME DUMMY	-	-	0.14
			(0.16)
RANDOM EFFECTS			
$\sqrt{\varphi}$	0.22	0.23	0.18
$\sqrt{\phi}$	0.29	0.31	0.31
Constant	1.81***	1.78***	1.65***
Prob>χ2=0.000	Pr>χ2=0.000	Pr>χ2=0.000	Pr>χ2=0.000
Number of Observations	930	930	930

* ** ***indicates significance at 10%, 5%, and 1% level of significance
Standard errors are in parentheses

Table 9: Determinants of Chinese aid allocation

Variable	Model(1)	Model(2)
LGDPC	0.62***	0.66***
	(0.20)	(0.20)
LPOP	0.94***	0.86***
	(0.23)	(0.19)
LEXPORTS	0.30**	0.36***
	(0.13)	(0.11)
LENROLLMENT RATE	0.59	0.29
	(0.54)	(0.44)
LMORTALITY RATE	-0.43	-0.51
	(0.96)	(0.74)
POLITICAL REPRESSION	-0.11**	-
	(0.05)	
CIVIL LIBERTY	-	-0.06
		(0.07)
RESOURCE DUMMY	0.78*	0.68
	(0.47)	(0.38)
CONFLICT DUMMY	0.25	0.22
	(0.19)	(0.19)
DISTANCE	-0.0002***	-0.0002***
	(0.00008)	(0.00008)
Wald Test	Prob>chi^2 =0.000	Prob>chi^2 =0.000

* ** ***indicates significance at 10%, 5%, and 1% level of significance.
Standard Errors are in parenthesis.

Table 10: Marginal Effects of Chinese income Bias

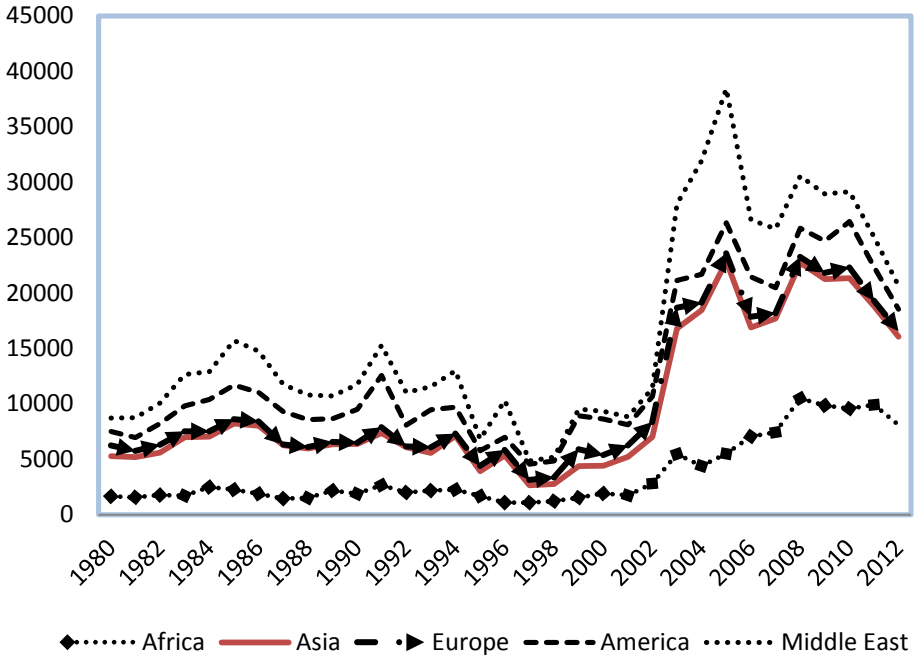
Variable	Model(1)	Model(2)	Model(3)
LGDPC	0.69***	0.47**	0.59**
	(0.21)	(0.28)	(0.24)
LPOP	1.06***	1.05***	0.94***
	(0.24)	(0.22)	(0.23)
LEXPORTS	0.25*	0.30**	0.31**
	(0.14)	(0.13)	(0.13)
LENROLLMENT RATE	0.32	0.44	0.60
	(0.58)	(0.56)	(0.55)
LMORTALITY RATE	-1.17	-1.25	-0.46
	(1.04)	(1.02)	(0.96)
RESOURCE DUMMY	1.09**	0.94**	0.77*
	(0.50)	(0.48)	(0.47)
POLITICAL RIGHTS	-0.11**	-0.11**	-0.11**
	(0.05)	(0.05)	(0.05)
CONFLICT DUMMY	0.25	0.25	0.25
	(0.19)	(0.19)	(0.19)
DISTANCE	-0.0002***	-0.0002***	-0.0002***
	(0.00008)	(0.00008)	(0.00008)
LOW MIDDLE INCOME DUMMY	0.45*** (0.14)	-	-
UPPER MIDDLE INCOME DUMMY	-	-0.38*** (0.12)	-
LOWER MIDDLE INCOME DUMMY	-		0.05
WALD TEST	Prob>chi^2 =0.000	Prob>chi^2 =0.000	Prob>chi^2 =0.000

* ** ***indicates significance at 1%, 5%, and 10% level of significance
Standard errors are in parenthesis

APPENDIX 1: Classifications of SSA countries across income groups

UPPER MIDDLE INCOME	LOWER MIDDLE INCOME	LOW INCOME
Angola, Botswana, Gabon,	Cameroon, ghana, Ivory Coats, Lesotho, Nigeria, Senegal, Swaziland, Zambia	Benin, Burkina Faso, Chad, DRC, Ethipia, Guinea, Kenya, Liberia, Madagascar, Malawi, Mali, Mozambique, Niger, Rwanda, Sierria-Leone, Togo, Tanzania, Uganda

Figure 1: Regional distribution of US aid allocation. 1980-2012



Source: OCED-DAC Credit reporting system, online database.