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DOES THE ONE WHO PAYS THE PIPER REALLY CALL THE TUNE?

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Daniele Pianeselli[†]

Abstract

This paper studies the role of donors' interests, as opposed to recipient needs and merits, in the allocation of infrastructure aid to Sub-Saharan Africa, comparing OECD-DAC donors and China. The empirical analysis, over the period 2000-2012, clearly suggests that the main determinants that dictate aid flows differ between them. There is statistically significant evidence that, *ceteris paribus*, China has allocated aid according to political affinity, and natural resources endowment. However civil liberties and democracy have a significant role in screening aid allocation and Chinese interests reduced their effect during the last four years of analysis. On the other hand, donors' interests did not generally have any role for OECD countries. Still, the evidence of a selective approach towards good economic and political governance, as well as recipients' needs by these donors, is mixed and varies significantly among countries.

Keywords*:* foreign aid, aid allocation, infrastructures, China, emerging donors, Sub-Saharan Africa

JEL code: F350, O110, O550

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1. Introduction

There is extensive empirical research on the allocation pattern of aid by OECD countries that highlights how geo-political and commercial interests are as important in driving the path of aid flows as a recipient's level of governance and needs (Alesina and Dollar 2000, Neumayer 2003a). These findings are in stark contrast to an idealised view of foreign aid, in which aid is solely used to tackle poverty and foster democracy. However, the results of the more recent literature seem to underpin the vision that donors have started to "selectively" allocate aid: rewarding good economic and political governance and targeting recipient's needs (Dollar and Levin 2006). This might be supportive of the view that projects like the UN Millennium Development Goals and Millennium Challenge Account are not just mere declarations of intents.

Despite the fact that these results are still debated and the evidence is far from being definitive, in the last decade the appearance of new donors in the development industry has changed the level and the significance of the current debate. The share of aid from middle income countries like China, India, Venezuela as well as Brazil and Arab countries has become increasingly important for recipient countries, challenging the monopoly of the OECD donor's club, the Development Assistance Committee (DAC). As a result, increasing concerns about the motivations underlying the aid allocation by emerging donors have been commonly expressed in the present debate. Notwithstanding the absence of clear evidence that OECD countries have really undertaken a "selective" approach, aid discourse usually contrasts on a qualitative level the notion of 'rogue aid' by new donors with traditional aid managed by 'well-meaning aid organizations' (Naím 2007: 96).

Empirical analyses that compare old and new donors quantitatively are essential, but not yet frequent. Noticeable exceptions are Neumayer (2003a), Dreher, Nunnenkamp and Thiele (2010) and Dreher and Fuchs (2012). However, only the latter takes into consideration the biggest and the most influential among emerging donors: China. This work contributes to the discussion, attempting to provide an empirical estimate of the aid allocation determinants of old donors and China on a comparative perspective. The aim of the research is to examine if, *ceteris paribus*, China is *"paying the piper"* with aid flows in order to *"call the tune"* and pursue its own national interests. Moreover, it asks to what extent this behaviour is significantly different from the supposed 'well-meaning' donors, namely to what extent they are really adopting the "selectivity" approach towards good governance and recipient needs, highlighted in the recent literature.

Additionally, the paper will use a different approach with respect to the previous literature on new donors' aid allocation. The evidence suggests that new donors tend to specialize in few productive sectors (Kragelund 2008: 579), unlike the majority of OECD countries, which focus on a vast range of aid sectors. This study argues that comparing the allocation pattern of the total amount of aid of different kinds of donors might lead to a bias in case each sector has specific established determinants which distinguish it from the others.

In one of the few studies in this area, Neumayer (2005) shows how the determinants that dictate food aid allocation are different in respect to the general aid. The evidence that Chinese development assistance is very concentrated on economic infrastructure construction (Kragelund 2008: 574; Strange et al. 2014) is suggestive of the need to take into consideration aid heterogeneity influence in the analysis. In fact, it seems plausible that infrastructure aid, due to its idiosyncratic characteristics, might be more prone than education aid to being subject to geo-political or economic interests. For example, Bello (2006: 282) reports how the infrastructure re-building after the 2004 tsunami was seen by the Bush administration as a good opportunity to "show the flag" in order to improve the US image among Muslim populations. Moreover, infrastructure building might be on average more tied to commercial interests than other sectors. Conversely, donors may be aware of the severity of corruption problems in the infrastructure sector (Collier and Hoeffler 2005) and consequently concentrate their aid flows in less corrupted countries. If this was the case, it would be hard to disentangle the effect of donors' determinants from those of the specific sector. Thus, by comparing the aid allocation in the same sector, economic infrastructure, and in the same geographical area, Sub-Saharan Africa (henceforth SSA), the possibility that the influence of specific conditions may drive the results has been mitigated.

The results clearly suggest that, over the period 2000-2012, China and OECD countries allocated infrastructure aid according to different patterns. There is statistically significant evidence that, *ceteris paribus*, China allocated according to political affinity, and with a view to targeting countries rich in natural resources. However civil liberties and democracy had a significant role in screening aid allocation and interests reduced their effect during the last four years of analysis. On the other hand, the self-interest did not generally have any role for the aid allocated by OECD countries. However, the evidence of a selective approach by these countries is mixed and varies significantly among countries.

The paper is organized as follows. Section 2 outlines the most relevant results of the pertinent literature on development aid. Section 3 describes the methodology, data and descriptive statistics. Section 4 illustrates the main results. Finally, Section 5 draws the conclusions.

2. Literature review

The literature on foreign aid has generally focused on two main topics: the effectiveness of aid for growth and the main determinants of aid allocation among recipients. A brief review on the former is crucial to understanding the genesis of the declared radical shift towards institutional selectivity that frames aid allocation patterns and its narrative.

There is a vast and widely-debated literature concerning the effect of official development assistance (ODA) on growth, starting from the 1970s. Mosley (1986) presents the main conflicting findings, pointing out that there exists in the literature a *"micro-macro paradox"*, consisting in the impossibility of observing any statistically significant effect of aid flows on growth at the macroeconomic level, while the micro evidence shows a high-success rate of the projects in their proposed outcomes. Jepma (1997), illustrating a wide review of empirical analysis, highlights the limitation of the existing literature due to sample selection, model specification and endogeneity problems.

A new emphasis on cross-country macro analysis has been provided by the seminal paper of Burnside and Dollar (1997, 2000 henceforth BD). The authors investigate the hypothesis that aid unambiguously affects growth, but that its effect is conditional on sound policies in the recipient country. They find that on average aid is not statistically significant, while the interaction *"aidxpolicy"* has a positive and significant (and causal) effect on growth, above and beyond the direct impact of good policies. Lastly, BD also examine whether aid has been allocated according to good policies. Over the period 1970-1993, there is no statistically significant evidence that bilateral aid has been allocated to recipients with good policies, while there is proof that multilateral agencies have adopted a selectivity approach according to countries' merit. BD's findings, which seem to solve the paradox, hold even at the micro-level. Dollar and Levin (2005) find that indicators of the institutional quality of the recipient countries (property rights/rule of law and democracy), have a positive and causal relationship with the success rate of the projects.

However, many authors have challenged this view. On the one hand, those who can be defined *"aid optimists"*, maintain that aid generally works irrespective of country policies or institutions (Hansen and Tarp 2001; Gomanee, Girma and Morrissey 2002). Clemens, Radelet and Bhavnani (2004), addressing the issue of aid heterogeneity, show how isolating the "short-impact" aid, infrastructure for example, enables a positive, statistically significant and causal relationship with growth, regardless of the quality of policies and institutions. However, the effects become somewhat stronger with the presence of good institutions. On the other hand, some authors underline the difficulty in determining any robust relationship between aid and growth running cross-country regressions, even conditionally to sound policies and institutions (Easterly, Levine and Roodman 2004; Rajan and Subramanian 2008).

Despite the fact that the aid effectiveness debate is not settled yet and regardless of the robustness of BD's conclusions, BD's influential paper has certainly contributed to the emergence of the concept of "good governance" selectivity, whose exact parameters remain ambiguous and uncertain, but in general is identified with sound economic and political institutions. Easterly (2003: 24), despite his scepticism about their results, maintains that BD's work has become a 'healthy stimulus for future research', citing several cases and anecdotal evidence where their findings have been used to underpin the new direction of aid flows. Before BD's paper, only few papers modelled aid allocation choice through a bifurcation between donor interests and recipient merits. In their seminal work McKinley and Little (1979) test the US aid allocation over the years 1960-1970 on those two competing explanations, finding that the former, expressed by power and security concerns, prevails over the latter. A noteworthy exception is Cingranelli and Pasquarello (1985) who find a significant effect of the human rights respect level on US aid commitments to Latin America.

The new aid allocation models, namely those that stemming from BD's conclusions, systematically incorporated the institutional qualities of the recipients in addition to the donors' interests, are of main interest here. Alesina and Dollar (2000) examine the main determinants of bilateral aid allocation of 12 western donors for a sample of recipients from 1970 to 1994. They find that, in general, colonial ties and strategic alliance lead the direction of foreign aid, while openness, democracy and civil liberties do not have any significant effect on it, *ceteris paribus*. Furthermore, donors exhibit a bias toward the more populous countries and there is not a common trend with regard to targeting the receivers' needs expressed by GDP per capita. Building on the previous analysis, Alesina and Weder (2002) include several measures of perceived corruption in the model, concluding that, with the exception of Scandinavian countries, donors do not reward less corrupt recipients. Adopting a normative perspective, Collier and Dollar (2002) find similar results to Alesina and Dollar (2000). They estimate the "poverty-efficient" allocation that maximizes the reduction of global poverty. Comparing this benchmark with the actual aid allocation of 1996, they conclude that aid is allocated partly according to strategic and historical reasons and partly to encourage policy reform in weak institutional environments, resulting in inefficient aid distribution. Gates and Hoeffler (2004), in their empirical analysis of allocation of Scandinavian development assistance from 1980-1999, in concordance with Alesina and Dollar (2000), conclude that these donors differ significantly from other western countries, selecting recipients that have a better score in democracy and respect of human rights. Political alliance and self-interest do not seem to significantly affect the aid distribution of Scandinavian countries.

Analyses of multilateral aid flows usually report a different pattern of aid allocation. Neumayer (2003b) is the first to consider regional development banks and some UN agencies over the period 1983-1995. Crucially, each multilateral organization considered allocates coherently to the main points on their agenda. Unlike bilateral donors, development banks, who mainly focus on infrastructure and growth enhancing projects, significantly target recipients with lower per capita income, while only UN agencies seem to take into account human development needs. A general account of World Bank (IDA) and regional development banks' behaviour is provided in Berthélemy (2006). For these organizations, recipient needs are pivotal to allocation choice, with significant coefficients for GDP per capita and foreign debt. Recipient merits do not play any role, although this result needs to be treated with care, as the author considers only a democracy and a conflict dummy as indicators of governance. In addition, Berthélemy (2006) sheds light on the origin of the geographical disparities in aid distribution, identifying the cause in the bilateralism bias, namely the allocation of aid based purely on bilateral criteria. As far as other determinants are concerned, trade links matter more than colonial ties, *ceteris paribus*. As a consequence, SSA countries that have lower trade volumes compared to other LDCs, receive less aid than they would without bilateral interests. This is further suggestive of the need to treat SSA, with its intrinsic and homogeneous characteristics, as a special case instead of including it in the general analysis.

The most recent literature on aid allocation seems to find more evidence of selectivity among DAC donors. Berthélemy and Tichit (2004) study a large sample of bilateral donors and recipients over 20 years (1980-1999), showing how, since the end of the Cold War, there is a shift in donors' priorities from colonial links toward trade interests. In concordance with the previous findings, recipient needs expressed by GDP per capita do not play a significant role in allocation. A dummy variable for civil liberty and political freedom is positive and significant for almost all donors and there is evidence that the selectivity approach towards good economic performances has increased since the 1990s. Dollar and Levin (2006) substantially confirm the increasing selectivity in aid disbursement, in terms of democracy and property rights. Comparing the same model specification with four earlier time periods from the mid-1980s, they find that bilateral and multilateral donors have been constantly rewarding democracy since 1984. Taking into consideration economic governance, they conclude that many donors have implemented the aid selectivity model, shifting from a strong negative relationship during the 1980s to a positive and significant relationship by 2000-03. These results are somewhat at odds with a study undertaken by Easterly (2007), where the selectivity in allocation according to income, openness, democracy and corruption is analysed over time. He concludes that there is an 'increased sensitivity to per capita income of the recipient (although it happened long ago in the 1970's), but at the same time, that there is 'little or no sign of increased selectivity with respect to policies and institutions' (Ibid.: 668). Consequently, Clist (2009: 40) suggests that 'much of the disagreement appears to be the inevitable result of distinct methodologies, specifically in defining which variable or variables represent policy'. Using a two-part model approach, he does not find a change over time in needs or policy sensitivity, but considerable donor heterogeneity, similar to the previous analysis. He indicates that in the slowness of the implementation of new policies lies one of the reasons for the lack of significance of the selectivity model.

In light of the literature reviewed, we may conclude that there is a general agreement on the heterogeneity in allocation pattern by different donors and that there is some evidence of increasing selectivity over time, even if it is not robust in the face of different model specifications. However, these results are centred on the cohesive group of OECD countries, joined together in the Development Assistance Committee (DAC). The last decade has seen the emergence of an increasing number of new donors whose aid allocation pattern does not seem to mirror the DAC patterns. Arab countries, China, India, Brazil and Venezuela represent such countries and are new subjects of "aid industry". The most recent literature on aid has attempted to draw some stylized facts regarding their allocation choice. Woods (2008: 1) maintains that 'common to most of these donors is the quest for energy security, enlarged trading opportunities and new economics partnerships, coupled with rapidly growing strength and size in the global economy'. Despite the growing importance of non-DAC aid, there is still a lack of information on their distribution pattern. Reliable data are missing for almost all emerging donors, while China and India do not disclose their aid disbursement at all. As a result, the majority of the evidence is provided on a qualitative or anecdotal base and a contentious debate has arisen around this. On the one hand, some argue that new donors, pursuing their national interests, will severely undermine the efforts of the old-donors club towards a selectivity approach on democracy and governance. Despite this there is still uncertainty regarding the claim that DAC countries are effectively taking into consideration economic governance and corruption (Easterly 2007, Alesina and Weder 2002). The concept of 'rogue aid' that 'pushing an alternative development model, will succeed in underwriting a world that is more corrupt, chaotic, and authoritarian' (Naím, 2007: 96) pictures an extreme view of the experts' concerns on aid allocation by non-DAC contributors. On the other hand, other authors adopt a milder position, or even a positive attitude towards new donors. Kragelund (2008) describes the return of the principal non-DAC donor to Africa, China, providing an historical account of its activity in the last 50 years. He outlines the main characteristics of the Chinese aid scale-up of the last decade, which focused mainly on turnkey infrastructure projects financed by interest-free loans. Woods (2008: 2), by focussing on the alternatives offered by emerging donors to recipient countries, suggests that they are weakening the power position of the DAC donors by introducing competitive pressures to existing 'standards and processes that are out of date and ineffectual'. Rather than criticize the non-DAC approach based on the defence of sovereignty and non-intrusion in recipients' politics, she highlights the fact that the claim of DAC selectivity is more declared than actuated. This fundamentally agrees with the acknowledgment of some old donors' deficiencies reported by the former OECD DAC chair in Manning (2006). Lastly, some authors, like Paulo and Reisen (2009), highlight positive aspects of non-DAC funding, pointing out that with the Chinese "pre-packaged" approach, aid is not usually fungible, implementation is guaranteed and corruption remains low.

Very little empirical analysis of non-DAC aid allocation has been published. The seminal work of Neumayer (2003a), using a two-stage model, compares western bilateral and multilateral donors with Arab ones from 1991 to 2000. The author interestingly concludes that at the eligibility stage both donors screen countries according to population, poverty level, colonial links and some good governance aspects. At the level stage old donors are more likely to allocate aid to middle-income countries, former colonies or trade and military partners. Aspects of good governance such as democracy, human rights and low military expenses seem to affect allocation only for some donors and strikingly Scandinavian countries do not appear to allocate more according to good governance. It is more difficult to trace a clear pattern for Arab countries on the second stage as all the variables, apart from affinity and low military expenses, lose significance. Conversely, Dreher, Nunnenkamp and Thiele (2010), expanding the sample to 16 non-DAC donors between 2001 and 2008, find that allocation of new donors does diverge from the traditional path. They maintain that almost all new donors are more likely to allocate to more corrupt and badly governed countries than traditional ones even if these countries do not use aid to support trade-interests. However, comparisons between these contrasting results need to be taken with care as they refer to different periods and different donors.

Yet, the main drawback of previous analyses is constituted by the fact they do not include any empirical attempt to model Chinese aid allocation in comparison with DAC donors. There are some exceptions. Berthelemy (2011) analyses Chinese aid flows, measured as turnover of economic cooperation, concluding that good political relations and natural resources endowments increase the probability to receive aid from China. However, in the recent years Chinese commitments to Africa has broadened, including almost every country and beyond its own strategic interests. Dreher and Fuchs (2012) study the number of Chinese aid projects completed over the 1956-2005 period and compare its aid allocation choices in the 1996-2005 period with those of DAC donor countries and other new emerging donors.

Authors find that Chinese aid allocation is shaped by politics and independent of institutional characteristics or natural resource endowment. Still, they do not find that China's aid is more biased towards dictatorial or corrupt governments than old donors as maintained by its critics. However, this first analysis does not consider the amount of aid committed and does not address aid heterogeneity as explained above. Such an attempt is carried out in this study. As stated in the introduction, this paper aims to empirically analyse infrastructure aid flows to SSA from 2000 to 2012, comparing OECD countries, multilateral agencies and China, explicitly testing the donors' interest hypothesis versus the governance selective allocation.

3. Research design

3.1 *Aid to infrastructure: definition, data sources and descriptive statistics*

The objective of this section is to identify the dependent variable used in the analysis, describe the sources of data and briefly analyse the main trends in aid to infrastructure allocation to the 48 countries which compose SSA[1] over the period 2000-2012.

First, it is fundamental to define what aid is and what aid to infrastructure is. Here, an operational definition of aid has been adopted. In the OECD DAC Reporting Directives (OECD 2007: 8) aid (ODA) is defined as 'grants or loans provided by the official agencies' in order to promote 'economic development and welfare' at 'concessional financial terms with the minimum grant element of 25 per cent'. Aid to infrastructure is defined as the 'economic infrastructure' in OECD directives, covering transport, communications and energy sectors. It is essential to underline the difference between "economic infrastructure" and "social infrastructure", which covers the sectors of education, health, population, water, government and civil society, but will not be part of the present analysis. Therefore, in the rest of the paper the term infrastructure will be used with reference to economic infrastructure.

The choice between aid commitment rather than disbursement is also key. A commitment is a 'firm written obligation by a government or official agency' whereas a disbursement is the 'placement of resources at the disposal of a recipient country or agency' (OECD 2007: 11). In accordance with the recent literature (Neumayer 2003a, Bethelémy and Tichit 2004), this paper argues that it is the area of commitments where donors exercise exclusive control that better reflects the determinants of donor choice in aid allocation, with respect to actual disbursements which even partly involve the recipient's capacity and participation. However, as pointed out by Neumayer (2003a), the choice does not affect the results much, as the two measures are likely to be highly correlated.

Annual aid commitment data for 23 "old donors"[2] has been taken from the Aid Activity database (Creditor Reporting System) of the OECD DAC (2015). It reports the face value of the commitment in constant US dollars for all OECD members. Since China is not a member of DAC, does not report its aid to the OECD and does not disclose data at the level of disaggregation required by the present study, Chinese aid commitments to SSA have been collected from the dataset developed by AidData and published in Strange et al. (2013a) and updated in Dreher et al. (2014). AidData, a research consortium among scholars from fifty universities and think tanks, has developed a new methodology for Tracking Under-reported Financial Flows (TUFF)[3] to systematically collect open-source information about

[1] Defined as in UNSD (2015), excluding the two "overseas departments" of France (Mayotte and Réunion), Saint Helena and South Sudan.

[2] New OECD members (Czech Republic, Korea, Poland, Slovak Republic and Slovenia) have been excluded from the analysis.

[3] Detailed information on TUFF methodology can be found in Strange et al. (2013b).

development finance flows from suppliers that do not report their own project-level data. A similar methodology has been used for the seminal work by World Bank-PPIAF Chinese Projects Database, published in Foster et al. (2009), but limited to the period 2001-2007. It is a rigorous and replicable methodological approach which provides a project-by-project estimate of the Chinese official finance in a two-step process. It uses media reports, collected using Dow Jones Factiva, only as a departure point for tracking Chinese official finance and it is 'supplemented with case studies undertaken by scholars and non-governmental organizations, project inventories supplied through Chinese embassy websites, and grants and loan data published by recipient governments' (Strange et al. 2013: 4). This approach takes advantage of the fact that the Chinese authorities do disclose data on their involvement at single-project level. The database has been constructed using a conservative approach and reporting only confirmed projects. Despite its rigorous methodology it is evident how this methodology is vulnerable to possible errors and detection biases and *caveats* should be taken into consideration when interpreting the results.

A further concern regarding the comparability of Chinese aid with DAC aid is the qualification of the former as official development assistance (ODA). Foster et al. (2009) reports that the Chinese financial flows commitments to infrastructures between 2001 and 2007, have on average a grant element of around 36 percent, compared to 66 percent of DAC countries, which, however, 'qualifies them as concessional according to official definition' (Ibid.: x). However, even considering the fact that Chinese loans are provided on average on harsher financial terms than DAC's ones, this does not change the objective of the analysis as the reasons for the allocation of aid to a specific country can still be analysed in the presence of different concessional terms.

AidData has increased considerably the information related to every single project with respect to previous datasets which used TUFF methodology. They classified financial flows into eleven categories, including official and unofficial finance. In this study, the analysis is restricted only to official government financing in economic infrastructures, which is comparable to ODA. Starting from the whole dataset, only the confirmed official finance projects which reported the amount committed (72% of projects reported) were selected. Subsequently, all "Official investments" and "Other Official Finance (OOF)" were excluded (including export credits and other funds not primarily directed to development). It resulted in 217 projects directed to economic infrastructures in Sub Saharan Africa over thirteen years, then aggregated by recipient country and year. Those include 93 projects defined as "Official Development Assistance (ODA-like)" and 124 defined as "Vague (Official Finance)", which are either ODA-like or OOF, but for which there is not sufficient information to assign to one of the two categories. Clearly, both choices (including or excluding vague flows) may lead to possible biases. In order to attenuate this concern, every projects classified as "vague" has been screened and only those solely aimed to development were kept in the database. However, this remains the main drawback of the present comparison between old donors and China.

The usage of total ODA instead of ODA per capita as the dependent variable stems from the theory behind allocation choice. Generally in the literature there is much disagreement on the two choices, but as Neumayer (2005) correctly argues, in most cases donors are likely to distribute aid on a fixed quantity for each recipient and not on a per capita basis. Moreover, population size is included among the independent variables, to take into account that, *ceteris paribus*, bigger countries receive more aid than smaller ones. However, considering total ODA may lead to a heteroscedastic distribution of residuals, since 'residuals would be probably, in absolute value, much bigger for large recipients than for small recipients' (Bethelémy and Tichit 2004: 255). Thus, heteroscedasticity concerns have been mitigated with a monotonic transformation, using the log (1+*aid*). Given that the dependent variable is zero for a non-trivial fraction of cases, this transformation allows the observations with zero aid not to be excluded from the analysis.

Lastly, in order to have a better idea of donors' activity and geographical distribution of aid, descriptive statistics will be used in this paragraph. Figure 1 shows the average aid allocation by each donor over the period 2000-2012. China and multilateral agencies represent by far the biggest donors, accounting alone for more than 80 percent of total commitments. Moreover, the fact that China is the largest contributor makes apparent the need to include it in the analysis. Stemming from this consideration, the choice of the other donors analysed[4] has been driven mainly by their respective share of the total aid to infrastructure.

To give a dynamic account of aid activity, it is appropriate to put in perspective Chinese aid with multilateral and OECD aid, observing the trend over time. The comparison indicates terrific growth of Chinese aid to economic infrastructures in the recent years (figure 2a). The growth is concentrated after 2004, peaking in 2006, China's officially declared "Year of Africa", reducing slightly in the following two years but gaining momentum again between 2009 and 2010. As can be seen in the disaggregation by sector (figure 2, b-c-d) the rise of Chinese aid does not come at the cost of a significant overlap in sector allocation. With the exception of 2006 and 2010, the contribution of China to transport infrastructure is significant but still modest compared to other donors. Instead, China shows a prominent role in communications and energy (even if for ICT, it should be considered the marginal amount allocated). Despite the large complementarities, the infrastructure financing gap of US$ 22 billion per year, estimated by the Commission for Africa in 2005 (Foster et al. 2009), is far from being fulfilled.

Finally, a geographical analysis of aid allocation confirms that the tendency towards specialization holds even when considering recipients instead of sectors. The map in figure 3 indicates that donors disproportionally distribute aid to SSA. Old donors tend to allocate a positive amount to almost every country, while China selects relatively few recipients. However, looking at the areas, it is clear that China on one side and OECD bilateral and multilateral aid on the other, target different countries, without a significant overlap. The reasons behind this differentiation are the object of the following paragraphs.

3.2 Model specification

The model presented below was obtained by building on the recent aid allocation literature surveyed in the previous paragraph, which tests the prevalence of donors' interest or good governance and needs on aid allocation and specified similarly to Neumayer (2003a). The estimated equation reported here is defined as follows:

$$log\ (aid\ infra_{ijt}) = \alpha + \beta_1 (self\text{-}interest_{ijt}) + \beta_2 (merit_{jt}) + \beta_3 (needs_{jt}) + \beta_4 (population_{jt}) + \varepsilon_{ijt}$$

where the left-hand side variable is the natural logarithm of the aid flows from donor i to recipient j in time t, *self-interest* is the vector of variables which measures geo-political, colonial and commercial interests of the donor i respect to country j, *merit* is the vector of variables including indicators of good-governance of the recipient j in time t, *needs* and *population* are, respectively, the set of controls for poverty and infrastructure status and population level of country j in time t. In the analysis all the right-hand side variables are

[4] The analysis will include China, the aggregated aid flow from all the multilateral agencies reported in OECD DAC (2010), the aggregation of aid from 23 OECD countries, as well as the bilateral aid flows from Germany, France, Scandinavian countries (Denmark, Norway, Sweden and Finland), United Kingdom, Portugal, Japan, Belgium and United States.

assumed to be exogenous with regards to aid to infrastructure. Possible endogeneity of the variables and the robustness check will be discussed at the end of the analysis. Following the previous aid allocation studies (Alesina and Dollar 2000, Alesina and Weder 2002, Collier and Dollar 2002 and Neumayer 2003a) a full model is estimated for each country to test the statistical significance and sign of each aid determinant.

3.2.1 Self-interest of the donors

The first variable appearing in this group is the affinity on interests between donor *i* and recipient *j*. In the literature it is usually represented by the correlation in UN General Assembly voting patterns between the recipient and the donor (Alesina and Dollar 2000, Neumayer 2003a). The idea is that UNGA voting patterns may not be interesting on their own, but that they may efficiently proxy for the latent variable of interest, alliance and similarity of strategic interests between countries. The 'United Nations General Assembly Voting Data' (Strezhnev and Voeten, 2013) is utilised here, using a one year lag period. Indeed, it seems reasonable that affinity affects aid allocation with at least a one year delay: this means that aid allocation at time *t* might be correlated with changes in the affinity index at time t_{-1}. The index varies from -1 to 1, where the former limit expresses complete dissimilarity, while the latter complete similarity. The appropriate measure of affinity for multilateral and OECD aggregated aid flows is the weighted average for the 23 DAC members, where the weights represent the share of aid given each year. Similarly, the index for Scandinavian countries has been constructed weighting the share of the single country on the aid flow.

Second, colonial status indicator is introduced, expressed by the number of years a recipient country has been a colony of a donor country in the twentieth century. For the aggregation of OECD countries, multilateral agencies and Scandinavia, the appropriate variable represents the number of years each country was colonized by any European country. Data are taken from the World Factbook (CIA 2015).

Third, in order to proxy for recipient endowment of natural resources, the logarithm of the sum of the depletion of mineral and energy resources World Development Indicators (World Bank 2015) is calculated as the average of the depletion from the year 1998 to 2000 and held fixed, to mitigate the concerns of simultaneity. Moreover, the proportion seems to be quite stable over the period 2000-12, allowing us to assume that the variable sufficiently proxies a mere indicator of the presence of resources.

Lastly, the amount of goods a donor exports to a recipient country as a share of donor's overall exports is employed to account for commercial interests of the donor. Data are taken from the Direction of Trade Statistics (DOT) database (IMF 2015). Data are one year lagged in order to take into account the delayed effect on aid allocation. As in the case of the affinity index, multilateral aid and the aggregation of different countries has been regressed on an *ad hoc* weighted percentage representing the respective contribution of each country to the total of aid to infrastructure of each year.

3.2.2 Recipients' merits

The first indicator of good governance is constituted by the measure of political rights and civil liberties as indicated in the Freedom in the World Country Ratings, published by Freedom House (2014). Summing the lagged unweighted scores of both indices for each year, a new index which varies from 2 (best) to 14 (worst) scale has been created. Despite its popularity, the use of Freedom House indices is not uncontroversial; for a more detailed discussion refer to Neumayer (2003a: 53). However, they have been chosen because data is available for all the countries in the sample, while its well-known alternative, Polity IV index (Marshall, et al. 2013), has numerous missing data which reduce considerably the sample size.

The second variable measures the degree of guarantee and protection of private property rights, the level of regulation in property acquisition and the probability of expropriation. One of the most famous institutional indicators, the ICRG (PRS Group 2015), provides such a measure in the Investment Profile subsection. Unfortunately, the level of coverage of SSA countries is very low and the dataset is not publicly available. Instead of this, here a new composite index from the Ibrahim Index of African Governance (Mo Ibrahim Foundation 2014) is used, the 'Property Rights' indicator, which is produced as an average of five indices from different sources[5]. It varies in a scale of 0 to 100, where 100 is the best possible score.

Third, it is introduced an expert assessment-based indicator of corruption published by World Bank in the Worldwide Governance Indicators 2014 (World Bank 2015), which measures the 'perceptions of the extent to which public power is exercised for private gain, including both petty and corruption, as well as "capture" of the state by elites and private interests' (Kaufmann, Kraay and Mastruzzi 2010: 4). The index measures the control of corruption and ranges from -2.5 (weak) to 2.5 (strong) governance performance.

3.2.3 Recipients' needs and controls

On this regard the most commonly used need indicator, the GDP per capita level, is controlled here. As it is likely that it might be affected itself from aid to infrastructure flows, the lagged value of this variable is taken from the previous year. Given the one-year lag and the nature of the aid flow (commitment and not actual disbursement), this choice is likely to reduce the endogeneity concerns, without notably biasing the analysis. Income per capita data in purchasing power parity are taken from World Development indicators (World Bank 2015).

The second need indicator is deeply connected with the specific aid flow analysed. The infrastructure status might be as important as income per capita in targeting aid allocation. However, it is certain that aid to infrastructure flows affect infrastructure status, thus, by the same token of natural resources indicator, the lagged value of every variable is held fixed at the year 2000. The level indicators for transport, communication and energy are proxied respectively by road density measure (km of road per 100 sq. km of land area), telephone availability (mainlines and mobile phone subscribers per 100 people) and KWh per capita of electricity production. Road density and telephone availability are taken from Africa Development Indicators (World Bank 2015), while the electricity production is constructed using the World Factbook (CIA 2015) data on electricity production in kWh, dividing the quantity for the population of the country in 2000 to obtain the per capita measure. Instead of aggregating these indicators in an overall index for infrastructure status, a procedure which presents a highly subjectivity on the weights choice, the indicator 'Quality of Infrastructure' from the Ibrahim Index of African Governance (Mo Ibrahim Foundation 2014), which assesses the reliability and efficiency for business needs, is included as control in the overall aid to infrastructure regressions. It varies from 0 to 100, where 100 is the best possible score.

Lastly, logged population data, provided by World Development indicators (World Bank 2015), is included in order to take into account the fact that total aid to infrastructure is used as dependent variable. Moreover, a dummy for whether the country is landlocked is

[5] More information on the methodology of the index can be found in the website of the Ibrahim Foundation: http://www.moibrahimfoundation.org/iiag-methodology/ (accessed 2 January, 2015).

added in order to consider the possible need of transport infrastructure and for the period 2009-2012 in order to take into account a possible structural change in aid allocation.

3.3 Estimation strategy

Aid allocation literature presents several examples of different estimators, each of them having, at the same time, benefits and drawbacks. This paper is going to employ three different estimation strategies used in the previous studies in order to test the robustness of the results. The simplest estimator used to model aid allocation is a linear model (OLS). Despite the ease of interpreting directly the coefficients, OLS may lead to an inconsistent estimation in case the dependent variable is a corner solution outcome, loosely speaking a variable with a non-trivial fraction of zeroes. In fact, running an OLS regression with a corner solution will violate the linearity in the parameters (Gauss-Markov assumptions), possibly biasing the results (Wooldridge 2002: 524-525). However, in aid allocation literature it is common to find OLS specifications even in the case of zero allocation of aid to several recipients. Alesina and Dollar (2000), using OLS, argue that the number of zeroes is small enough as to not significantly bias the results. Thus, a pure cross-section OLS will be estimated first, averaging each variable over the period analysed. Despite the reduction in the sample size, averages offer two main advantages. First, especially for bigger donors, it is likely that the number of zeroes will be noticeably reduced over a thirteen-year period. Second, they may increase the explanatory power of the model. In fact, Dreher, Nunnenkamp and Thiele (2010: 6) correctly argue that aid allocation models are more likely to predict the variability over the average of some years rather than the yearly fluctuations of aid due to other unexplained factors not captured by them. However, even considering these advantages, OLS will be considered solely as a first approximation of the following analysis. At this stage a parsimonious specification is used, Chinese, OECD and multilateral aid to infrastructures is analysed even at subcategory level, while for corner solution concerns only the total aid to infrastructure is included for single smaller donors. Lastly, the degree of multicollinearity has been checked with the *variance inflation factor* (VIF) test, reporting a result well below the tolerance limit. Heteroscedasticity may be a more serious concern as, at least in some cases of single small donors, the Breusch-Pagan test rejects the homoscedasticity hypothesis. Even considering the small sample size, as a cautionary approach every regression has been tested using heteroscedasticity robust standard errors, bootstrapping and robust regressions, using iteratively reweighted least squares. The results substantially hold with every method, but bootstrapping is reported here, as generally it results in the provision of a more conservative estimate.

A further step in the analysis stems from the consideration that each single donor regression might not be unrelated to the others. This may be the case when different donors' allocation choices are influenced by common underlying factors, leading to a positive or negative correlation. Frot and Santiso (2009: 34) in their study on the "herding behaviour" in aid allocation hypothesize that positive correlation among donors' choices may happen "rationally", when political influence and communality shape their decision or "irrationally" when donors are followed by others 'in an informational cascade fashion with no clear rationale'. Negative correlation may happen when donors, for political or humanitarian reasons, decide to allocate aid to recipients that do not obtain aid from the others (aid orphans). This section will test the correlation of the error terms among the equation system, in order to apply Zellner's (1962) method of Seemingly Unrelated Regressions (SUR). This method, allowing the equation disturbances to be correlated, 'yields to coefficient estimators at least asymptotically more efficient than single-equation least-squares estimators' (Zellner 1962: 348). However, when either error terms are uncorrelated between equations or the exact same set of regressors is used across equations, SUR is equivalent to single-equation OLS, without providing any efficiency gain. Thus, correlation in error terms is checked using the Breusch-Pagan test of independence, while the second requirement is met exploiting the fact that affinity and export variables refer jointly to donor *i* and recipient *j* and vary across regressions. Therefore, SUR estimation with a small-sample adjustment is carried out and compared with OLS.

The last step is to deal with the corner solution characteristic of the dependent variable and test if the results previously obtained hold in a model designed for this kind of outcomes. The choice of the model is not uncontroversial. A basic Tobit model (type 1) is commonly used in the aid allocation literature (Alesina and Dollar 2000, Alesina and Weder 2002, Berthélemy and Tichit 2004), but it has the main limitation of modelling the same variables and assuming their effects to be constant in the eligibility stage and the level stage. Theoretically, this may not be the case here. Aid allocation choice may be thought of in two-steps: first the decision on *whether* to allocate aid to certain recipients and then, conditional on a positive answer on the first step, *how much* aid to allocate. In order to test this hypothesis and model separately the two choices, a Type 2 Tobit or hurdle model is employed. The choice of a two-part model, proposed by Cragg (1971), seems preferable over a Heckman's estimator for the absence in the model of an exclusion restriction, namely a variable which significantly affects aid-eligibility (first step), but not the level of aid (second step)[6]. This model estimates a Probit model to determine the probability of $y > 0$ and a truncated normal model for those observations which are strictly positive. Contrary to the Tobit model it considers both estimations as independent, but does not require an exclusion restriction, as in the Heckit[7].

Lastly, using a model specifically designed for corner solution outcomes allows the avoidance of the averaging of the variables. For each donor the yearly amount of aid is regressed on the independent variables over the period 2000-2012. Due to the use of one-year lag for regressors, regressand has twelve observations for each country (2001-2012). However, the use of longitudinal data implies the choice of one method to deal with the joint cross-section and time series dimension of the sample. The main difficulty is taking into account the heterogeneity bias, that is to say the fact that the independent variables may be correlated over time with the unobserved time-invariant factors, which affect aid allocation. Using a Fixed Effects estimator comes at the cost of losing several pivotal time-invariant independent variables, while the Random Effects model is based on the assumption that the unobserved effect is uncorrelated with every explanatory variable, which is an unlikely event in case of countries as units of observation (Wooldridge 2009: 493). Given all these considerations, using a pooled regression with robust standard errors clustered at recipient level appears to be the best option in order to preserve the model specification, dealing at the same time with the panel data[8].

[6] Refer to Wooldridge (2002, 564) for a technical explanation of the Heckman's estimator (Heckit).

[7] It should be noted that Cragg's (1971) model assumes zero correlation of the errors between the two equations. This assumption is not explicitly tested here. However, Neumayer (2003: 38) reports evidence that usually, the potential bias is likely to be small.

[8] In order to take a cautious approach, correlated random effect (Mundlak 1978) has been estimated using GLS RE probit and tobit for the two stages, including individual means of time-varying characteristics in the model. While Mundlak model substantially confirms all the results of Cragg's pooled regression, tests of $Cov(u_i , x_{it}) =0$ are rejected, in some cases, only for the population control variable.

4. Results

OLS estimation is first presented here, using the averages of the variable over the period 2000-2012. Table 1 reports the results for China. A “base” specification for economic infrastructure aid allocation is presented first, including natural resources indicator, share of exports, population and the income controls. Column 1 shows that more populous and richer countries significantly receive more Chinese aid with an elasticity less than unity, so, *ceteris paribus*, for each percentage increase in population and GDP per capita, aid rises, on average, by 0.95% and 0.84%, respectively. Noticeably, one of the two donor’s interests proxies, natural resources endowment of the recipient, seems to positively influence aid allocation, while commercial interests is not significant at conventional levels. The indicators of governance, donor’s interests and recipient’s needs are broadened in column 2, with the inclusion of political affinity as well as respect of civil liberties and democracy, property rights and the infrastructure status. Once all these factors are controlled for, the results show that population and GDP per capita are still positive and significant, while the amount of aid allocated increases in countries with a lower respect of property rights and in case the recipient owns natural resources, both significant at the 5 percent level of significance. In the latter case, all else equal, 1% increase in natural resource endowment (assuming depletion as fixed at the maximum level available) increases the Chinese commitments by 0.24%. Strikingly, political affinity does not exert any significant influence over allocation choice, while more liberal countries seem to benefit more from China (the sign is negative as the Freedom House index uses an inverse ranking). Other covariates, including corruption and landlocked country dummy, are shown only when significant. To what extent the results change considering Chinese aid divided by sector is shown in column 3 to 5. Considering aid to transport infrastructures, solely population, GDP per capita and civil liberties have a similar positive and significant effect on the response variable, while the other variables remain insignificant. Communications infrastructures are positively and significantly affected only by population size and respect of civil liberties and negatively from enforcement of property and contract rights, while commitments in the energy sector are positively influenced by population and GDP per capita, respectively, at the 1 and 5 percent level of significance. We can conclude that the sector analysis substantially confirms the mixed evidence on rewarding recipient merits and neglecting their needs, but does not confirm the prevalence of natural resource interest as a driver of aid flows.

In table 2, column 1 we turn to testing the base model to multilateral aid. Population size has the expected positive sign and it is significant at the 1 percent level, even if in this case the impact is somewhat smaller with respect to China. Interestingly, the GDP per capita coefficient enters with the expected sign (negative) and is significant in the regression, confirming the existence of a selectivity approach to poorer countries. Once we control for property rights, in column 2, it becomes significant, only at 10%, while population and GDP per capita enter with the expected sign and remain significant at the 1 percent level. The inclusion of all the relevant covariates, in column 3, confirms the results, strengthening the effect and the significance of property rights variable. The inclusion of the landlocked country dummy, shows how being enclosed by land, diminishes the access to aid to infrastructure from multilateral organizations by 99%. These results suggest that interests do not play any role in multilateral aid, while the only aspect of governance that affects aid allocation is property rights. Evidence on selectively tackling recipients’ needs is mixed. While the negative sign of GDP per capita suggests that multilateral organizations, *ceteris paribus*, are targeting poorer countries, they seem to neglect the special need of regional infrastructure corridors predicted in the literature (Collier 2008: 107) and indicated as pivotal for their growth by the 2008 World Bank report on the implementation of the Almaty Ministerial

Conference (2003) on landlocked developing countries (World Bank 2008). The results hold to the inclusion of infrastructure status variable. The values of the coefficients signal that the effects are economically significant too. The sector disaggregation (column 4-6) confirms the results for aid to transport and to energy infrastructure, while aid to ICT does not seem to be affected by these indicators.

The analysis of the aggregated bilateral aid flow from the 23 OECD countries in table 3 shows similarities to multilateral aid. The inclusion of the property rights indicator (significant at 1 percent), in column 2, renders civil liberties and democracy term insignificant. This result suggests that due to a certain degree of correlation, democracy acted as a proxy for property rights. Adding all the other variables in column 3 indicates that OECD aid is significantly affected solely by population size and respect of property rights (at 5 percent level). While multilateral organizations appear to target needs in the form of low income per capita, OECD bilateral aid does not seem to address specifically any of recipient needs. The significance of population, property rights holds to the sector analysis, apart from ICT where population-size alone seems to affect aid commitments (column 4-6).

Table 4 provides information on the results of estimations at country level. Only the total infrastructure estimations have been undertaken for those countries and will be discussed briefly here. However, as discussed in the methodological section, these results have to be taken with the *caveat* of possible biases of being small donors, increasing the probability of having a corner solution response and of the possible existence of heteroscedasticity. Population size plays a positive and significant role for every country except Portugal, in general with a lower elasticity respect to the donors considered before. As expected, the former colonial powers, France, United Kingdom, Portugal and Belgium, are affected in their aid decision by their past. The other indicators of donor interests remain insignificant for all countries. Moreover, none of the countries analysed seems to allocate more aid to better governed countries. Only in the base specification for Germany, France, Scandinavia and United States (columns 1, 3, 5 and 12) do civil liberties and democracy coefficients enter with the right sign (negative) and significant almost everywhere at 1 percent, but once property rights are controlled for, these coefficients remain negative but not significant at conventional levels. Only Japan allocates more aid where property rights are better implemented, despite the fact that coefficient is significant only at 10 percent level. Bilateral aid does not seem to target recipient needs either, in particular from United Kingdom, which allocates more aid to countries with better quality of infrastructures and 45% less to landlocked countries (column 8).

The next step in the analysis consists in checking the robustness of the results with the SUR estimator. Two different Seemingly Unrelated Regressions are run here, one including China, multilateral aid and the whole group of OECD countries (OECD23), reported in table 5, (columns 1-3) and the other comprising China, the eight single bilateral donors analysed and a sub-group of OECD countries (OECD14) which do not include them (columns 4-12). Crucially, running only one SUR estimation that includes the OECD23 group together with the eight OECD countries would have biased the results, given that their errors are partially correlated for definition. In the correlation matrix of residuals, not shown here, the null hypothesis of independence is rejected at 1 percent level of significance, guaranteeing that SUR provides a more efficient estimator. Moreover, the fact that there is correlation among the unobserved determinants of aid allocation is very interesting in itself. In general there is a considerable positive correlation between OECD and multilateral aid residuals, while for China and to a less extent US, the results are negatively or not correlated with other countries. This may suggest that there is a common pattern of underlying factors which are not captured by this model specification, but that influences the allocation choice in a herding behaviour. The fact that Chinese aid residuals are not correlated, is additional evidence of its diversity in allocation patterns, above and beyond the present observed factors. Turning to the results, from table 5 it is clear that the sign and significance of the coefficients are comparable to the OLS estimates. However, the standard errors are generally smaller, increasing the level of significance, therefore strengthening the previous conclusions. Interestingly, commercial interests for China, multilateral aid and OECD countries, maintain the negative sign as in the OLS estimations, but in SUR appear to be statistically significant at 1 percent.

The last step consists in using Cragg's (1971) two-part model, allowing the same set of variables to differently affect the eligibility (tier 1) and level stage (tier 2). This estimator will be used for the aggregated infrastructure aid flows of China, multilateral agencies and OECD countries, while the aid determinants from the single OECD countries will be estimated using a Tobit model[9]. For each covariate, the analysis is restricted to the comparison of the statistical significance and sign of the coefficients which have not been post-estimated. A time dummy equal to 1 for years between 2009 and 2012, has been introduced and interacted with relevant variables in order to test for the presence of structural breaks over the period 2000-2012. The choice of the time span would allow answering two main questions. First, the dummy will ask to what extent the global financial crisis and the following recession, which has shrunk public budgets of every donor country, has impacted on the level of aid to infrastructure allocated. Secondly, interactions will test if the declared process of aid harmonization and increase in selectivity, started with the Paris declaration in 2005 and implemented with the Accra Agenda for Action (AAA) in 2008, can be traced out in our results. However, both outcomes will not by any means be interpreted as causal, but as pure correlation, due to the possibility of the presence of omitted variable bias.

Table 6 illustrates the two-part model. Column 1 and 2 show that the probability of being eligible to receive Chinese aid increases, *ceteris paribus*, with the population size, GDP per capita, both highly significant. Commercial interests play a negative role at this stage. Evidence of the selection according to good tracks on civil liberties is confirmed at the eligibility stage. On the other hand, control of corruption diminishes the probability to receive aid. The effect of the single variables changes when, conditional on the eligibility, the decision focuses on the amount of aid to allocate. Column 3 and 4 present the level stage. Here, population and GDP are still highly significant in every specification, while political affinity is positive and significant at the 5 percent. In column 3 the years 2009-2012 dummy shows how aid to infrastructure has increased significantly respect to the previous period, while the presence of natural resources has a positive effect on the amount of aid committed, but the significance of both coefficients does not hold to the inclusion of others covariates (column 4). As in the OLS estimation, China allocates less aid where property rights are more enforced. Importantly, interactions seem to suggest the presence of a structural break which reshaped allocation choices. Interaction terms for political affinity and property rights, which describe the marginal effect of those variables during the last four years, switch sign, highlighting a possible move towards selective approach of China in these fields. Column 5 provides information on the gate-keeping stage for multilateral aid allocation. At this stage, more populous countries are more likely to be eligible for multilateral aid as are those with better governance meant as civil liberties and democracy. During the last four years the probability to be funded by multilateral organizations, increased significantly, as showed by the time dummy. Donor's interests domain, apart from colonial past, does not play any significant role and there is a statistically significant evidence that in the last four years, colonial past has reversed its effect on the probability to receive aid. As in the case of Chinese aid, commercial partners of developed countries are more likely to receive less aid than more. The contrast in recipient needs between landlocked country bias and poorer countries

[9] This is due to the impossibility of finding a convergence in the MLE with the models for bilateral OECD donors.

selection is confirmed even with this estimation. At the level stage, column 6, the sole factors that increase aid commitments are bigger population size and more democratic institutions, both significant at the 1 percent level, while political affinity and commercial interests exert a negative effect at 5 percent level, confirming that donor's interests do not dictate aid flows. However, interaction term between time dummy and political affinity is positive and significant, showing how lately geopolitical reasons have increased their effect. Strikingly these outcomes may partially challenge the declared improvements in aid selectivity after the Paris declaration and Accra agenda. Column 7 and 8 look at the OECD countries as a group. In the eligibility stage population size, colonial past and the time dummy significantly increase the likelihood of being eligible to aid flows. Interaction terms of better democracy and property rights are highly significant. These results signal that in the last four years, OECD countries have started targeting more democratic countries, but not those with better economic governance. While in the first stage evidence of governance selectivity approach is mixed, in the second more aid is selectively allocated to more democratic countries, at the 1 percent level of significance, but the effect loses its significance in the interaction term. Moreover bigger countries receive more aid, while political affinity exerts a negative effect on the amount of aid committed. Remarkably, as in the case of multilateral aid, the export coefficient is highly significant and negative. Concluding, there is no evidence of significant effect of donor's interests (apart from colonial past) or recipient's needs in aid allocation in OECD aid allocation, while there is significant evidence of selectivity only according to civil liberty and democracy.

Table 7 summarises the main finding of Tobit analysis for the eight bilateral donors. The picture here confirms some of the main findings of OLS analysis. As in the previous regressions, the amount of aid significantly increases with population for all the countries, but Portugal, and, poverty level expressed in GDP per capita does not significantly affect aid flows in any country, with the exception of United Kingdom.

There is strong evidence that some donors are rewarding countries with more political freedom. Germany, Portugal, Belgium and United States increase their aid in more democratic countries. Even the Scandinavian countries do so, but this result is significant only at the 10 percent of significance. Property rights play a role only for France, Portugal and Japan, entering positive and significant, respectively, at the 1 percent for France and Portugal and 10 percent level for Japan (column 2, 5 and 6). However, interaction terms for these countries are insignificant or negative and significant for Portugal, showing how economic governance selectivity has decreased lately. Corruption instead remains insignificant for all the donors. Only in the recent years Portugal seems to allocate aid to less corrupted countries. The rest of the results confirm the conclusions that donor's interests do not affect aid choice, apart from the political affinity for France which turns to be insignificant in the last years and the colonial interests of France, United Kingdom, Portugal and Belgium. However, all interactions terms are not significant at conventional levels. Landlocked country bias exists, *ceteris paribus*, for France, United Kingdom and Belgium, but none of the interaction terms with the time dummy is significant. Even in these regressions, commercial interests show a negative sign for all donors, but they are significant at conventional level solely for Japan and Belgium and United States.

4.1 Tests for robustness and endogeneity concerns

It is useful to examine whether the results are sensitive to the use of different time lags or governance indicators. Firstly, all estimations have been replicated using no lag and two-year lag for all time-variant covariates. Secondly, the Freedom House index and Ibrahim index of property rights are substituted with “Polity 2” from the Polity IV index of democracy (Marshall, et al. 2013) and the CPIA property rights and rule-based governance indicator by World Bank (2015), respectively. Both tests, carried out for China, multilateral and OECD aid, not shown here, give qualitatively similar results and confirm the previous conclusions.

Furthermore, we may consider including a non-monetary measure of poverty instead of the GDP per capita level, in order to capture the multi-dimensional aspect of poverty and deprivation. Due to the lack of data of Multidimensional Poverty Index (MPI) by UNDP over the 2000s, HDI (as aggregated in Mo Ibrahim Foundation 2014), the pioneering measure of capability that was created to go beyond income, to reflect welfare, health and education is used here. Interestingly, including a measure of society well-being, while confirming all the other key determinants highlighted before, shows how the supposed poverty targeting of multilateral aid holds only considering the income measure. Indeed, lack of achievements in human development does not significantly drive aid allocation from multilateral aid, while OECD donors seem to fund more, countries where capabilities are higher.

Finally, as discussed before, the potential endogeneity of income and infrastructure status has been mitigated using lagged values. Arguably, even exports and affinity may be endogenous. The simultaneity concerns on the first arise taking into consideration the practice of “tied aid”, allocated to stimulate donor’s exports. However, data do not show that commercial interests have a positive effect on aid allocation and the one year lag and the commitment characteristic of aid flows helps to separate in time the registered export value from the actual disbursement of aid. Moreover, the variable used here reports only the goods exported, while in the case of tied aid the most part of it would have been registered as construction services. Thus, for this variable any instrumentation attempt has not been undertaken. The second variable presents a more subtle interpretation. It may be that affinity (UN votes) causes aid or that aid causes affinity. Following Alesina and Dollar (2000), the former interpretation is preferred and UN votes considered exogenously determined with respect to aid.

5. Discussion and conclusions

Is aid to infrastructure in SSA allocated according to a donor’s interests or a recipient’s needs and merits? The evidence shows that the answer depends on the donor considered. In particular, all the estimators robustly confirm that China appears to behave fairly differently with respect to old donors across several dimensions. Most noticeably, in all the analysis, China allocates aid according to geo-political alliance and natural resources endowment. Even though political affinity and natural resources have played a significant role, it is solely on the amount of aid allocated, not on the likelihood of being eligible. Noticeably, *ceteris paribus*, China on average tends to concentrate aid where the level of GDP per capita is relatively higher. Lastly, the hypothesis that China screens the recipients only according to his own interests is rejected, as civil liberty and democracy proxy is highly significant in every specification and estimation strategy. Moreover there is evidence of a structural change on the domain of geopolitical interests and property rights respect. In the last four years, China appears to tie less its aid to political alliance and natural resources endowment and more on effective legal system in which property and contract rights are reliably respected. A word should be spent about the sign and significance of commercial interests proxy. The fact that, *ceteris paribus*, China allocates less aid to its relatively bigger African partners, highlights that present trade flows give no privilege in boosting infrastructure aid commitments. Even considering the present marginal but growing importance of bilateral trade with African recipients (Pigato and Tang 2015), there is a possible explanation to this puzzle. As reported in a case-study commissioned by DFID (Department for International Development of United Kingdom), 'aid, mainly in the form of concessional loans, but also commercial financing, serves as a platform for mainly Chinese state-aligned enterprises to establish a foothold in the African market' (Davies et al 2008:52). However, if it is the case, it would be difficult to trace it out with this analytical framework. Interestingly, the same speculation about the role of future commercial interests in dictating present aid flows may apply to multilateral and OECD aid too, as the sign and significance of the coefficients do not differ from Chinese regressions.

Moreover, it has been highlighted that in general none of the self-interests variables have a significant effect on the old donors' allocation choice. Colonial past is a distinctive exception. These results strongly suggest that the critics' claim that China has pursued its national interests in allocation choice, following a diverse pattern of aid allocation determinants, is underpinned by empirical evidence, at least in the case of aid to infrastructures to SSA. However, those are not all the reasons which shape Chinese aid allocation. It has been highlighted how relatively more democratic countries receive more aid and how in the last four years there is evidence of improvements toward a better selectivity.

On the other hand, the extent to which this diverse allocation is actually undermining the current action of 'effectively pricing responsible and well-meaning aid organizations' (Naím, 2007:96) is still disputable. In fact, despite the confirmation of a certain degree of good governance selectivity during 2000-2012, considering all old donors alike it is hardly supported by empirical evidence. The results show that the selective approach significantly varies among donors and they are robust to alternative indicators of good governance. Moreover, there is significant evidence that recipient's needs are hardly considered by any donor. The present paper finds that the whole group of OECD countries do screen for political governance at the level stage of decision, though not targeting poverty levels and infrastructure lack. Unlike them, multilateral aid significantly targets poorer (as measured by GDP per capita) and more democratic countries when selecting the recipients in "gate-keeping" stage, but it considers only democracy and civil rights in deciding the amount of aid to allocate.

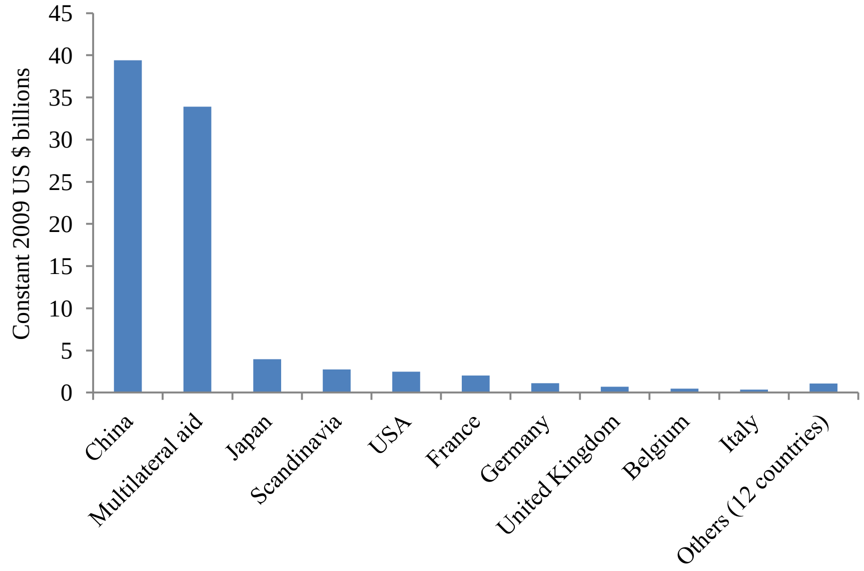
For the eight OECD bilateral donors considered here there is mixed evidence on good governance selectivity. In general, the analysis, excludes any effect of a donor's interests on their aid activity, though colonial ties are significant in the first part of the period considered. Only five countries seem to target more democratic recipients, while only France, Portugal and Japan significantly reward economic governance. However, there is not a single country which emerges as an outstanding case of "well-meaning" donor in every domain considered. It is more appropriate to conclude that there is a tendency towards selectivity approach, especially towards recipient's merits, but not needs, and the claim that all old donors behave alike is not supported by the present results. Strikingly, there is little reason to blame China for not considering corruption level in its allocation, as it does not find almost any room in old donors' considerations either.

The growth consequences of this different allocation pattern have not been examined by the present paper as they would be the objects of a proper aid effectiveness analysis. However, it has been shown how these differences have led to geographical and sector-based complementarities that may have helped to reduce, but not yet bridge, the infrastructure financing gap in SSA.

Overall, this work provides a *ceteris paribus* comparison of aid to infrastructure allocation that includes China. However, it constitutes only a starting point in order to assess the impact of new donor's entrance in the "infrastructure aid market". The quest for improvements in data reliability is pivotal to progress in this direction.

In the last part of the analysis, it highlights interesting dynamics and possible structural changes in aid allocation choice, during the last four years, without attempting a causal interpretation. The global financial crisis and the following recession significantly correlate with an increase in recipient countries benefited by China, multilateral and OECD aid, but do not significantly impact the amount of aid to infrastructure committed. Besides, it remains unclear if Paris declaration or Accra Agenda for Action processes have significantly impacted on old donors' allocation choice. Moreover, qualitative research is required in order to explain according to which political and economical reasons China has recently modified its allocation path in the donor's interests domain. Finally, the presence of georeferenced project data in Dreher et al. (2014) may allow sub-national level analyses. This may open completely new roads to research, highlighting phenomena which may be blurred or invisible at country level. For example, Dreher et al. (2014) ask to what extent Chinese aid is subject to patronage by African leaders. They show that within country allocation choices are biased towards leaders' birth regions, but do not favour their ethnicity. Moreover environmental and biodiversity impact of Chinese activity in Africa has been usually empirically analysed using country-sector data (van Gelder et al. 2013). Geocoded data may be a valid empirical alternative to field work and case-study approach in order to draw attention to local phenomena. Thus, all these topics might constitute an interesting area for future research.

Figure 1: Infrastructure aid by donor in Sub-Saharan Africa, 2000-2012



Source: own elaboration on AidData (2014) and OECD database as of 2015.

Figure 2:. Aid to infrastructure by sector and donor in Sub-Saharan Africa, 2000-2012

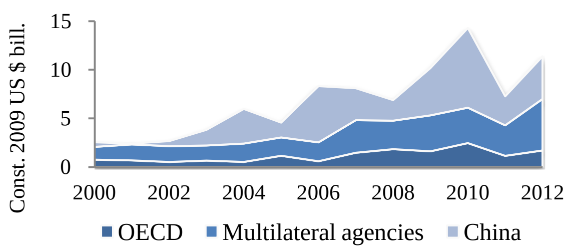


Fig. 2a - Economic Infrastructure

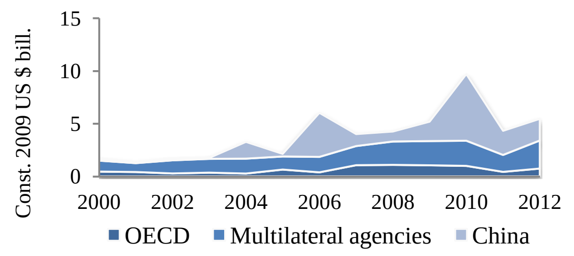


Fig. 2b - Transport

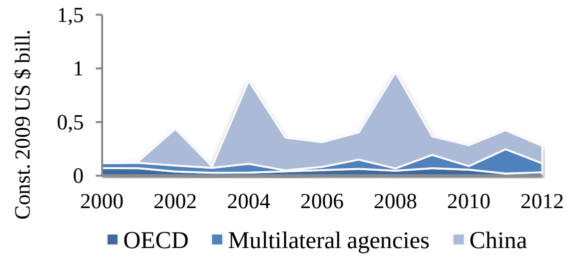


Fig. 2c - Communications

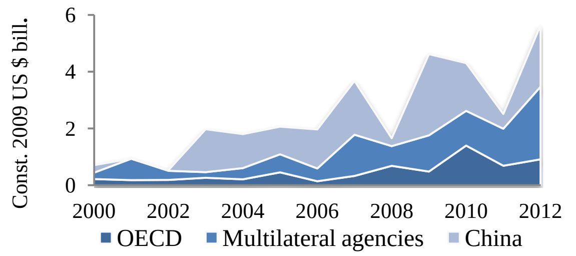
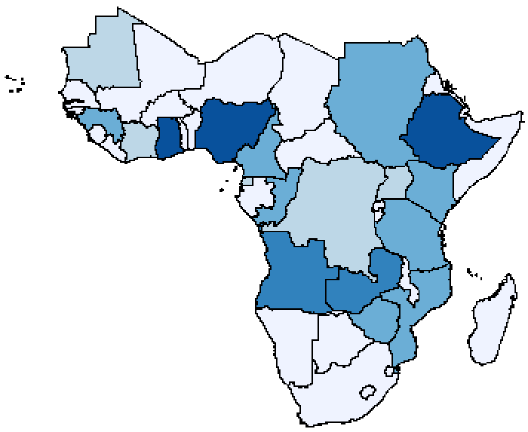


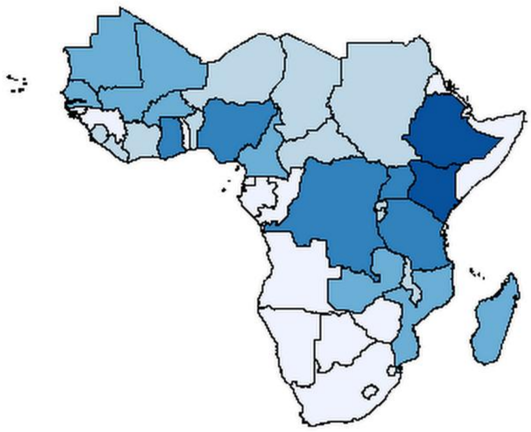
Fig. 2d - Energy

Source: own elaboration on own elaboration on AidData (2014) and OECD database as of 2015

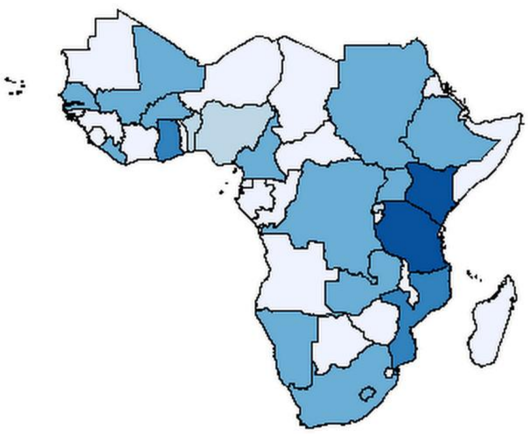
Figure 3: Geographic specialization of donors in Sub-Saharan Africa, 2000-2012.



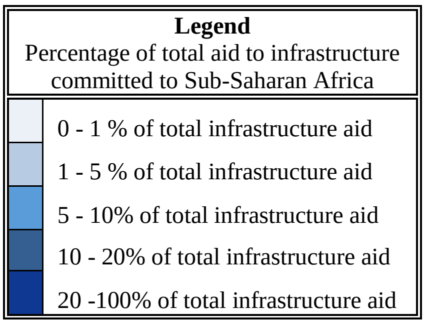
China



Multilateral agencies



OECD countries



Source: own elaboration on AidData (2014) and OECD database as of 2015.

Table 1. OLS estimation: aid to infrastructure from China. Average 2000-2012

Dependent variable: ln(1 + Total Aid - Million of 2009 Constant $)	(1) Economic Infrastructure	(2) Economic Infrastructure	(3) Transport	(4) ICT	(5) Energy
Log (GDP per capita)	.849***	.974***	.904***	.401	.897**
	[.25]	[.29]	[.32]	[.29]	[.42]
Log (population)	.956***	1.051***	1.006***	.435***	.734***
	[.17]	[.18]	[.26]	[.15]	[.23]
Natural resources	.194**	.241**	.169	.001	.188
	[.09]	[.11]	[.12]	[.09]	[.14]
Exports	-9.106	-10.388	-8.378	-1.226	-5.678
	[6.30]	[6.52]	[7.49]	[4.00]	[6.60]
Political affinity		-.910	-.689	-6.345	1.641
		[3.91]	[4.89]	[4.16]	[6.07]
Civ. lib.& democracy		-.196**	-.242**	-.154*	-.070
		[.09]	[.11]	[.08]	[.11]
Property rights		-.041**	-.023	-.034**	-.023
		[.02]	[.02]	[.01]	[.02]
Ec. infra. status		.015			
		[.02]			
Transport infrastructure			.013		
			[.02]		
ICT infrastructure				-.006	
				[.03]	
Energy infrastructure					-.000
					[.00]
Adjusted R^2	.53	.53	.36	.18	.29
Chi-squared	79.055	85.562	37.380	18.525	25.962
P-value	<.001	<.001	<.001	.018	.001
Observations	48	48	48	48	48

NOTE.– Bootstrap standard errors with 2.000 repetitions are in brackets. Corruption and Landlocked country variables are included only where statistically significant.
* Significant at the 10 percent level.
** Significant at the 5 percent level.
*** Significant at the 1 percent level.

Table 2. OLS estimation: aid to infrastructure from multilateral institutions. Average 2000-2012

Dependent variable: ln(1 + Total Aid - Million of 2009 Constant $)						
	(1) Economic Infrastructure	(2) Economic Infrastructure	(3) Economic Infrastructure	(4) Transport	(5) ICT	(6) Energy
Log (GDP per capita)	-.781***	-.716***	-.795***	-.835**	-.209	-.674**
	[.24]	[.22]	[.30]	[.33]	[.17]	[.32]
Log (population)	.434***	.407***	.612***	.554***	.137	.582***
	[.16]	[.16]	[.14]	[.14]	[.10]	[.16]
Natural resources	.079	.044	.103	.077	.009	.121
	[.09]	[.08]	[.08]	[.08]	[.05]	[.09]
Civ. lib.& democracy	-.075		.045	.006	-.024	.060
	[.07]		[.08]	[.07]	[.05]	[.09]
Property rights		.029*	.043**	.053**	.008	.037**
		[.02]	[.02]	[.02]	[.01]	[.02]
Ec. infra. status		-.026	-.019			
		[.02]	[.02]			
Political affinity			3.964	3.710	2.402	3.343
			[3.27]	[3.07]	[2.21]	[3.57]
Exports			-9.930	-9.580**	-2.490	-7.140
			[6.61]	[4.79]	[3.92]	[8.19]
Landlocked country			-.994**	-.878**		-.776*
			[.42]	[.37]		[.41]
Transport infrastructure				-.000		
				[.01]		
Corruption				-1.029*		
				[.57]		
ICT infrastructure					-.007	
					[.02]	
Energy infrastructure						-.000
						[.00]
Constant	2.528	1.305	-3.190	-3.515	-.627	-5.131
	[3.66]	[3.50]	[3.09]	[2.94]	[2.21]	[3.67]
Adjusted R^2	.531	.569	.690	.706	.190	.577
Chi-squared	82.166	58.957	105.005	131.344	13.901	51.739
P-value	<.001	<.001	<.001	<.001	.084	<.001
Observations	48	48	47	47	47	47

NOTE.– Bootstrap standard errors with 2.000 repetitions are in brackets. Corruption, Former colony and Landlocked country variables are included only where statistically significant.
* Significant at the 10 percent level.
** Significant at the 5 percent level.
*** Significant at the 1 percent level.

Table 3. OLS estimation: aid to infrastructure from the aggregation of the 23 OECD countries. Average 2000-2012

Dependent variable: ln(1 + Total Aid - Million of 2009 Constant $)						
	(1) Economic Infrastructure	(2) Economic Infrastructure	(3) Economic Infrastructure	(4) Transport	(5) ICT	(6) Energy
Log (GDP per capita)	.213	.036	.120	.318	.127	-.024
	[.17]	[.18]	[.26]	[.24]	[.10]	[.28]
Log (population)	.692***	.643***	.740***	.654***	.239***	.584***
	[.12]	[.13]	[.15]	[.16]	[.07]	[.17]
Natural resources	-.052	-.056	-.031	-.081	-.027	-.014
	[.07]	[.07]	[.07]	[.07]	[.04]	[.08]
Civ. lib.& democracy	-.181***	-.060	-.090	-.091	-.056*	-.069
	[.05]	[.06]	[.07]	[.07]	[.03]	[.09]
Property rights		.028***	.028**	.026**	.000	.028*
		[.01]	[.01]	[.01]	[.01]	[.01]
Political affinity			-2.180	-1.930	-.539	-.188
			[2.71]	[2.57]	[1.20]	[3.68]
Exports			-5.298	-7.327	.875	-2.987
			[7.34]	[7.67]	[1.81]	[6.82]
Ec. infra. status			.006			
			[.01]			
Landlocked country			-.482			-.588
			[.33]			[.37]
Transport infrastructure				-.010		
				[.01]		
ICT infrastructure					-.004	
					[.01]	
Energy infrastructure						.000
						[.00]
Constant	-8.294***	-8.515***	-9.756***	-9.988***	-3.483**	-7.773**
	[2.95]	[2.91]	[3.52]	[3.76]	[1.48]	[3.67]
Adjusted R^2	.567	.611	.630	.527	.420	.463
Chi-squared	57.419	74.432	97.256	64.817	27.938	41.978
P-value	<.001	<.001	<.001	<.001	<.001	<.001
Observations	48	48	47	47	47	47

NOTE.– Bootstrap standard errors with 2.000 repetitions are in brackets. Corruption, Former colony and Landlocked country variables are included only where statistically significant.
* Significant at the 10 percent level.
** Significant at the 5 percent level.
*** Significant at the 1 percent level.

Table 4. OLS estimation: aid to economic infrastructure from single bilateral donors. Average 2000-2012

Dependent variable: ln(1 + Total Aid - Million of 2009 Constant $)													
	(1) Germany	(2) Germany	(3) France	(4) France	(5) Scandin. countries	(6) Scandin. countries	(7) U.K.	(8) U.K.	(9) Portugal	(10) Japan	(11) Belgium	(12) U.S.A.	(13) U.S.A.
Log (GDP per capita)	.028	-.164	.247	.173	-.127	-.071	.114	.029	.028	-.112	.071	-.085	.106
	[.14]	[.19]	[.15]	[.23]	[.18]	[.27]	[.11]	[.15]	[.05]	[.23]	[.10]	[.18]	[.22]
Log (population)	.258***	.213**	.291***	.266**	.357***	.467***	.206***	.254***	-.016	.358**	.128**	.280**	.380***
	[.08]	[.10]	[.11]	[.11]	[.14]	[.14]	[.06]	[.07]	[.04]	[.15]	[.06]	[.11]	[.14]
Civ. lib.& democracy	-.093***	-.052	-.080**	-.037	-.117***	-.050	-.034	-.049	-.013	.011	-.049	-.150***	-.086
	[.03]	[.05]	[.04]	[.06]	[.04]	[.07]	[.03]	[.04]	[.02]	[.08]	[.04]	[.06]	[.08]
Former Colony	.026	.023	.013***	.013***	-.005		.005*	.007**	.013**		.024***		
	[.04]	[.04]	[.00]	[.00]	[.02]		[.00]	[.00]	[.01]		[.01]		
Political affinity	.086	.437	.071	.623	2.257	2.185	-1.696	-1.498	-.502	.071	-.959	.088	.571
	[1.99]	[2.11]	[1.89]	[2.24]	[2.28]	[2.16]	[1.75]	[1.85]	[.63]	[2.16]	[1.50]	[2.43]	[2.80]
Natural resources		.044		.009		-.115		-.019	-.011	-.007	-.002		-.144
		[.06]		[.08]		[.10]		[.05]	[.02]	[.08]	[.04]		[.10]
Property rights		.006		.011		.008		-.012	.003	.023*	-.004		.014
		[.01]		[.01]		[.01]		[.01]	[.00]	[.01]	[.01]		[.01]
Ec. Infr. status		.011		-.003		.003		.014*	-.002	.004	-.000		-.014
		[.01]		[.01]		[.01]		[.01]	[.00]	[.02]	[.01]		[.01]
Landlocked country								-.457***					
								[.18]					
Constant	-2.917	-1.996	-5.237**	-5.256**	-3.475	-6.550**	-3.124**	-2.818*	.287	-4.868	-1.314	-1.639	-4.670
	[1.84]	[2.30]	[2.25]	[2.43]	[3.50]	[3.22]	[1.40]	[1.56]	[.94]	[3.15]	[1.26]	[3.72]	[4.02]
Adjusted R^2	.269	.267	.243	.198	.280	.295	.248	.372	.415	.226	.365	.220	.241
Chi-squared	18.521	19.318	29.082	31.582	17.269	19.389	22.396	28.949	4.439	19.486	20.011	14.940	16.564
P-value	.002	.013	<.001	<.001	.004	.007	<.001	.001	.815	.007	.010	.005	.020
Observations	48	48	48	48	48	48	48	48	48	48	48	48	48

NOTE.– Bootstrap standard errors with 2.000 repetitions are in brackets. Corruption, Exports, Former colony and Landlocked country variables are included only where statistically significant.
* Significant at the 10 percent level.
** Significant at the 5 percent level.
*** Significant at the 1 percent level.

Table 5. Seemingly Unrelated Regressions (SUR) estimation: aid to economic infrastructure. Average 2000-2012

Dependent variable: ln(1 + Total Aid - Million of 2009 Constant $)	(1) China	(2) Multilateral	(3) OECD23	(2) China	(4) Multilateral	(5) OECD12	(6) Germany	(7) France	(8) Scandin. countries	(9) U.K.	(10) Portugal	(11) Japan	(12) Belgium	(13) U.S.A.
Log (GDP per capita)	1.036***	-.852***	.127	.966***	-.847***	-.133	-.159	.158	-.058	.040	.031	-.101	.078	.102
	[.32]	[.26]	[.22]	[.32]	[.26]	[.16]	[.17]	[.23]	[.24]	[.15]	[.09]	[.25]	[.11]	[.23]
Log (population)	1.109***	.606***	.734***	1.057***	.543***	.213**	.212**	.255**	.474***	.257***	-.021	.349***	.131**	.378***
	[.19]	[.13]	[.12]	[.19]	[.13]	[.09]	[.09]	[.12]	[.13]	[.07]	[.05]	[.13]	[.06]	[.13]
Political affinity	-.838	4.014	-2.254	.311	3.681		.286	.776	2.021	-1.411	-.564	-.544	-.700	-.200
	[4.27]	[2.65]	[2.36]	[3.98]	[2.47]		[1.80]	[2.17]	[2.15]	[1.37]	[.87]	[2.24]	[1.08]	[1.97]
Natural resources	.234**	.104	-.033	.233**	.089	-.007	.043	.009	-.117	-.019	-.011	-.007	-.004	-.140*
	[.10]	[.07]	[.06]	[.10]	[.07]	[.05]	[.06]	[.07]	[.08]	[.04]	[.03]	[.08]	[.04]	[.08]
Exports	-10.726***	-8.592***	-4.988**	-9.493***	-6.445***									
	[2.72]	[2.74]	[2.30]	[2.49]	[2.47]									
Civ. lib.& democracy	-.193*	.050	-.093	-.176*	.050	-.012	-.053	-.035	-.051	-.051	-.018	.003	-.048	-.084
	[.10]	[.08]	[.07]	[.10]	[.08]	[.05]	[.06]	[.08]	[.08]	[.05]	[.03]	[.08]	[.04]	[.08]
Property rights	-.040**	.043***	.027**	-.038*	.041***	.005	.006	.011	.008	-.012	.003	.022	-.004	.015
	[.02]	[.02]	[.01]	[.02]	[.01]	[.01]	[.01]	[.01]	[.01]	[.01]	[.01]	[.02]	[.01]	[.01]
Ec. infra. status	.015	-.016	.005	.015	-.020	.010	.011	-.003	.003	.014*	-.002	.004	-.001	-.014
	[.02]	[.01]	[.01]	[.02]	[.01]	[.01]	[.01]	[.01]	[.01]	[.01]	[.01]	[.01]	[.01]	[.01]
Former colony		.008			.004		.022	.012***		.006**	.012***		.027***	
		[.01]			[.01]		[.02]	[.00]		[.00]	[.00]		[.00]	
Landlocked country		-.917***	-.422		-.742**	.120				-.400**				
		[.33]	[.30]		[.31]	[.19]				[.19]				
Constant	-18.998***	-3.328	-9.649***	-18.931***	-1.918	-2.085	-1.939	-4.978*	-6.672**	-2.931*	.451	-4.413	-1.529	-5.116
	[5.46]	[3.19]	[2.83]	[5.27]	[3.13]	[2.07]	[2.30]	[2.84]	[3.11]	[1.75]	[1.18]	[3.40]	[1.50]	[3.27]
R^2	.623	.749	.702	.619	.740	.293	.384	.332	.395	.487	.513	.326	.467	.346
F-test	7.846	10.769	9.596	7.679	10.196	2.420	3.010	2.949	3.644	3.852	5.372	2.716	7.786	2.962
P-value	<.001	<.001	<.001	<.001	<.001	.019	.003	.003	.001	<.001	<.001	.009	<.001	.005
Observations	47	47	47	47	47	47	47	47	47	47	47	47	47	47

NOTE.– Small sample statistics and small-sample adjustment have been computed. Standard errors are in brackets. Equations 1-3 and 4-14 has been estimated with two different SUR models. Corruption, Exports, Former colony and Landlocked country variables are included only where statistically significant.

* Significant at the 10 percent level.

** Significant at the 5 percent level.

*** Significant at the 1 percent level.

Table 6. Cragg's two-part model estimation: aid to economic infrastructure. 2000-2012

Dependent variable: ln(1 + Total Aid - Million of 2009 Constant $) – 12 observations (2001-2012), 48 countries								
	(1) China – Tier 1	(2) China – Tier 1	(3) China – Tier 2	(4) China - Tier 2	(5) Multilat. Tier 1	(6) Multilat. Tier 2	(7) OECD - Tier 1	(8) OECD - Tier 2
Log (population)	.403***	.371***	.686***	.746***	.323***	.807***	.248**	1.601***
	[.09]	[.09]	[.20]	[.21]	[.08]	[.15]	[.12]	[.27]
Log (GDP per capita)	.353***	.310**	.811***	.911***	-.366**	-.332	-.274	.064
	[.13]	[.13]	[.24]	[.26]	[.16]	[.33]	[.18]	[.47]
Years 2009-2012	1.279	1.678	9.173**	5.181	2.398***	-1.017	6.450***	-1.652
	[1.45]	[1.50]	[3.65]	[3.25]	[.75]	[1.24]	[2.17]	[2.45]
Civ. lib.& democracy	-.095***	-.105***	.009	.031	-.090**	-.165***	-.053	-.330***
	[.03]	[.03]	[.07]	[.06]	[.04]	[.06]	[.06]	[.13]
Years09-12*Civ. lib.& dem.					-.017	.087	-.415***	.095
					[.04]	[.09]	[.12]	[.16]
Political affinity	-.212	-.055	8.217**	7.159**	-.128	-1.802**	.105	-3.154***
	[1.04]	[1.04]	[3.39]	[3.11]	[.50]	[.75]	[.86]	[1.19]
Years09-12*Pol.affinity	-1.196	-1.528	-9.395**	-7.310**	.527	2.708**	-.578	2.115
	[1.69]	[1.69]	[4.10]	[3.67]	[1.03]	[1.30]	[.94]	[1.40]
Exports	-3.526**	-3.59***	-1.436	-.890	-6.10***	-10.15**	2.482	-8.072***
	[1.43]	[1.32]	[2.58]	[2.37]	[1.33]	[4.68]	[4.01]	[2.69]
Property rights	-.013**	-.004	-.003	-.027*	.011	.021	.007	.027
	[.01]	[.01]	[.01]	[.02]	[.01]	[.02]	[.01]	[.03]
Years09-12*Prop.rights		-.001		.039**			-.048**	.018
		[.01]		[.02]			[.02]	[.02]
Natural resources	.039	.038	.165*	.112	.053	.082	.076	-.056
	[.03]	[.03]	[.09]	[.09]	[.05]	[.05]	[.08]	[.11]
Years09-12*Nat.resources	-.008	-.018	-.140	-.053				
	[.05]	[.05]	[.12]	[.10]				
Ec. infra. status	.001	.006	.006	.004	-.010	-.032	.004	.004
	[.01]	[.01]	[.01]	[.01]	[.01]	[.02]	[.01]	[.03]
Corruption		-.476*		.579	-.150	.399	.065	.178
		[.29]		[.40]	[.21]	[.40]	[.24]	[.87]
Former colony					.012*	-.005	.011*	-.007
					[.01]	[.01]	[.01]	[.02]
Years09-12*Former col.					-.023**	-.000		
					[.01]	[.01]		
Landlocked country					-.473**			
					[.22]			
Constant	-8.19***	-8.27***	-21.20***	-20.40***	-1.85	-5.34	-.776	-22.29***
	[2.25]	[2.04]	[5.88]	[5.63]	[1.80]	[3.44]	[2.80]	[6.25]
Chi-squared	41.453	56.173	41.453	56.173	227.865	227.865	155.678	155.678
P-value	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001
Observations	576	576	576	576	564	564	564	564

NOTE.– Robust standard errors clustered at recipient level are in brackets. Landlocked country and interaction term variables are included only where statistically significant.
* Significant at the 10 percent level.
** Significant at the 5 percent level.
*** Significant at the 1 percent level

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Table 7. Tobit model estimation: aid to economic infrastructure. 2000-2012

Dependent variable: ln(1 + Total Aid - Million of 2009 Constant $) – 12 observations (2001-2012), 48 countries								
	(1) Germany	(2) France	(3) Scandin. countries	(4) U.K.	(5) Portugal	(6) Japan	(7) Belgium	(8) U.S.A.
Log (GDP per capita)	-.307	-.240	-.229	-.953***	.518*	-.114	.123	-.067
	[.21]	[.16]	[.33]	[.20]	[.30]	[.14]	[.24]	[.32]
Log (population)	.514***	.207*	.983***	.997***	.083	.559***	.575***	.653***
	[.11]	[.11]	[.20]	[.15]	[.10]	[.12]	[.11]	[.18]
Years 2009-2012	.313*	.217	.069	1.119***	6.556***	.330	.086	1.041*
	[.18]	[.82]	[.21]	[.34]	[2.27]	[.49]	[.48]	[.57]
Civ. lib.& democracy	-.152***	-.028	-.115*	.008	-.211**	-.072	-.155**	-.178**
	[.05]	[.07]	[.06]	[.07]	[.08]	[.05]	[.07]	[.08]
Years09-12*Civ. lib.& dem.					.103		-.044	.014
					[.10]		[.08]	[.07]
Former colony	.049*	.018***		.019**	.044***		.042***	
	[.03]	[.00]		[.01]	[.01]		[.01]	
Years09-12*Former col.		.003		-.004	-.013		.012	
		[.01]		[.01]	[.01]		[.01]	
Political affinity	-.307	.980**	.390	-.163	.444	.614	-.977	-1.954**
	[.46]	[.47]	[.74]	[.71]	[.34]	[.48]	[.85]	[.85]
Years09-12*Pol.affinity		-1.717			-.468			
		[1.22]			[.48]			
Exports	-.086	-.273	-.080	.841	.105	-4.75***	-5.84***	-4.57**
	[.72]	[1.83]	[.52]	[.63]	[.09]	[1.56]	[1.93]	[2.02]
Natural resources	.036	.041	-.189	-.036	.097	.044	.004	.029
	[.06]	[.06]	[.12]	[.06]	[.07]	[.07]	[.06]	[.05]
Years09-12*Nat.resources					.012			
					[.06]			
Property rights	.000	.038***	.011	-.004	.046***	.015*	-.004	.021
	[.01]	[.01]	[.02]	[.01]	[.01]	[.01]	[.01]	[.01]
Years09-12*Prop.rights		.005			-.104***	.007		
		[.01]			[.03]	[.01]		
Corruption	.300	-.438	-.237	-.114	.324	-.149	-.040	.110
	[.29]	[.42]	[.52]	[.48]	[.41]	[.25]	[.31]	[.38]
Years09-12*Corruption					3.256***		-.074	
					[.70]		[.43]	
Ec. infra. status	.018	.002	.028	.039***	-.095***	.020*	.008	.004
	[.01]	[.02]	[.02]	[.01]	[.02]	[.01]	[.01]	[.01]
Years09-12*Ec.infr.status						-.001		
						[.01]		
Landlocked country		-.876***	-.101	-1.269**			-.552**	-.704*
		[.29]	[.46]	[.51]			[.27]	[.37]
Years09-12*Landlocked		-.149		.450			-.198	
		[.45]		[.59]			[.33]	
Constant	-5.608**	-4.466*	-14.31***	-12.13***	-6.338**	-9.03***	-9.22***	-11.36**
	[2.68]	[2.50]	[4.28]	[2.83]	[2.87]	[2.61]	[2.65]	[4.85]
Pseudo R^2	0.167	0.087	0.173	0.263	0.718	0.123	0.213	0.162
F-test	30.51	4.010	5.832	9.822	13707	9.309	11.28	7.262
P-value	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001
Observations	576	576	576	576	576	576	576	576

NOTE.– Robust standard errors clustered at recipient level are in brackets. Landlocked country and interaction term variables are included only where statistically significant.
* Significant at the 10 percent level.
** Significant at the 5 percent level.
*** Significant at the 1 percent level

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