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DOI: <https://doi.org/10.1016/j.worlddev.2019.03.014>

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ZORA URL: <https://doi.org/10.5167/uzh-170298>

Journal Article

Accepted Version



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Originally published at:

Humphrey, Christopher; Michaelowa, Katharina (2019). China in Africa: competition for traditional development finance institutions? *World Development*, 120:15-28.

DOI: <https://doi.org/10.1016/j.worlddev.2019.03.014>

China in Africa: Competition for Traditional Development Finance Institutions?

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This is the authors' accepted manuscript. Published version: Chris Humphrey and Katharina Michaelowa: China in Africa: Competition for Traditional Development Finance Institutions?, in: World Development Vol. 120, 2019, pp. 15-28, <https://doi.org/10.1016/j.worlddev.2019.03.014>.

Abstract

Official development finance from China has risen tremendously in the past two decades across the globe, including in the world's poorest continent Africa. How has this sudden increase in development resources affected the two major multilateral development banks (MDBs) in the region, the World Bank and the African Development Bank (AfDB)? One might expect that the MDBs would compete with China to maintain influence in Africa. This study uses statistical tests and interviews with government officials in three recipient countries to see if this is the case. The results indicate that total MDB finance by country change little over time in response to Chinese activity. The sectoral allocation of concessional lending to the poorer countries does not show any responsiveness either. In contrast, shifts in levels and sector allocation can be observed for non-concessional countries. Overall, the study suggests that while China's role in African development finance is indeed substantial and growing, it has not had the "game changing" impact on traditional development finance as popular perception might lead one to believe. This may change, however, once more recipient countries develop economically and move to non-concessional lending.

Key Words: China, World Bank, African Development Bank, Africa, Aid, Infrastructure

Acknowledgements

The authors are grateful for feedback from two anonymous peer reviewers as well as participants in the Swiss Political Science Association Conference (February 2018) and the Political Economy of International Organization Conference (February 2018).

This work was supported by the Swiss National Science Foundation (grant number 100010_15616).

Highlights

- Official development finance from China has risen tremendously in the past two decades across the globe, including in Africa.
- However, contrary to public perceptions, this change has not yet significantly impacted the financing patterns of traditional development financiers in Africa.
- In most African countries, neither total financing nor sectoral allocation of World Bank and African Development Bank show statistical reaction to Chinese financing.
- For the less poor African countries receiving non-concessional loans, some evidence suggests a decline in overall lending by the MDBs linked to rising Chinese financing, as well as a shift away from infrastructure.

Understanding the role played by China in international development finance is a topic of increasing interest among policy makers and academics alike. The issue has become even more acute as many OECD countries face foreign aid budget retrenchments and the U.S. steps back from global engagement. In parallel, China has become more confident of its role, not only continuing to expand its bilateral overseas finance through its policy banks like China Ex-Im and China Development Bank, but now setting up brand new multilateral institutions like the Asian Infrastructure Investment Bank (AIIB) and the New Development Bank (NDB). In this context, it is unsurprising that some commentators see China replacing the U.S. as a global financial leader (Gallagher, 2017).

Nowhere is the rise of China's global influence in development finance more controversial than in Africa. The volumes of Chinese money pouring into Africa are impressive, an estimated US\$97 billion in real terms¹ between 2000 and 2014 according to AidData (2017)² and about US\$12 billion per year since 2010. The China Ex-Im Bank alone intends to have invested a total of over US\$1 trillion to Africa by 2025 (Sun, 2014). Official Chinese development finance is now one of the most important sources of finance in Africa (Figures 1 and 2), rivaling the multilateral development banks (MDBs) like the World Bank and the African Development Bank (AfDB), as well as major traditional donor in the Development Assistance Committee (DAC) of the Organisation for Economic Co-operation and Development (OECD). Chinese yearly finance commitments are now on a par with—and in some years substantially exceeded—finance by the U.S., formerly the largest bilateral donor in Africa.

[FIGURES 1 AND 2 HERE]

For the world's poorest region, this shift has quickly established China as a major player. This is particularly the case since the bulk of Chinese official finance has been directed toward lower-income African countries—that is, those classified as “concessional” by the World Bank and the AfDB.³ Concessional countries received 89% of total Chinese finance in Africa between 2000 and 2014 (Figure 2), and the average amount per country/year is more than double that of non-concessional countries (US\$146 million vs. US\$62 million over the period). What is more, over 70% of the resources provided by China has been directed to economic infrastructure, which many African countries have been clamoring for but which traditional aid providers—often focused instead on social and institutional issues like healthcare, primary education or governmental reform—have been less inclined to supply.

[FIGURE 3 HERE]

China's rapidly rising role in African development finance has come with considerable controversy. Some observers consider it a new form of colonialism, noting links between Chinese finance and commodity extraction as well as the use of Chinese labor and companies to build African infrastructure projects (Sanusi, 2013). Others have suggested that Chinese finance has negative political and social impacts, including links to corruption (Dreher et al., 2016, Isaksson and Kotsadam, 2018 and Brazys et al., 2017), dictatorial regimes (Kleine-Ahlbrandt and Small, 2008) and weakened social and environmental standards (Bosshard, 2008; Ben Yishay et al., 2016). In short, China's rising involvement in development finance is perceived by many as “rogue aid”, to use Naim's oft-cited phrase (Naim 2009): undermining the activities of western-controlled development institutions and the rules for efficient development assistance jointly developed

over many years. This has been somewhat tempered by research depicting more nuanced—and sometimes positive—impacts of Chinese aid, including its role in providing much-needed infrastructure (Bräutigam, 2009) and thereby helping and reducing economic inequality (Bluhm et al., 2018), as well as possibly promoting regional development (Dreher et al., 2016). Nonetheless, the overwhelming tone of much academic and popular writing about China’s rapid rise as a development financier is negative (see Asmus et al. 2017 for an overview).

Despite the heated rhetoric, relatively little systematic academic work exists investigating whether and how China’s influence has changed the way traditional development financiers operate in Africa. Are these traditional development finance institutions changing their allocation patterns in reaction to China—either ramping up their lending to compete with China for influence, or taking a more needs-based approach to reduce lending where China is more active and use resources elsewhere? Are borrower countries making use of this huge new player to gain leverage against existing donors, choosing one source of finance over another depending on their circumstances?

Examining these issues in the case of Africa is particularly relevant. It is the poorest and most aid-dependent region of the world, and hence of particular interest to the development agencies and development community more generally. It is also where China has rapidly assumed an outsized importance and influence, more than in other regions due to the fact that private finance is much less available in Africa (compared to, say, Latin America or developing Asia). As such, Africa is probably the most interesting region of the world in which to test these issues, and where one might most likely expect to find a reaction by MDBs to Chinese financing.

This paper addresses these questions by focusing on how flows from the World Bank and the AfDB, and secondarily OECD DAC donors, change over time as Chinese finance increases, in terms of both overall volumes as well as the sectoral breakdown of finance. The study takes Chinese finance as an explanatory variable that might change the activities of other development financiers. The study uses a mixed methods approach, first examining development finance patterns in Africa from 2000 to 2014 using econometric panel analysis and second undertaking a series of interviews with government officials responsible for negotiations with external development financiers in Ethiopia, Tanzania and Malawi.

Existing literature and theoretical underpinnings

Our conceptual ideas build on extant work related to Chinese aid, to donor competition and cooperation, and to the special role of MDBs.

Studies on Chinese aid

A growing body of academic literature as well as policy research considers the motivations and practices of China’s official overseas development finance, both broadly around the world and more specifically in Africa (among others see Bader, 2015; Bräutigam, 2011; Bräutigam and Gallagher, 2014; Dreher et al., 2015, 2016 and forthcoming; Greenhill et al., 2013; and Wako, 2017).

However, considerably fewer studies have considered how Chinese finance is impacting other development actors. Kilama (2015) discusses the possibility that Chinese finance gives recipients more options and greater leverage against traditional donors, following similar points raised by Greenhill et. al. (2013). Lindemann (2013) speculates that China may undermine policy conditionality, and statistical analysis of World Bank loan conditions in Africa by Hernandez (2017) supports this position.

Two papers closely aligned with the interests of the present study are Kilama (2016) and Swedlund (2017). Kilama (2016) carries out a statistical analysis and suggests that donors compete for influence with China by increasing overall financing as well as shifting resources from social sectors into infrastructure in strategically important recipient countries when China is more active. Using a survey of donor officials in combination with case studies in Africa, Swedlund (2017) finds limited evidence that China is shifting the relationship between traditional donors and recipient countries, although findings suggest that as countries become less aid-dependent, the influence of China may be rising.

Our paper specifically focuses on the two major MDBs operating in Africa: the World Bank and the AfDB. These funding agencies are of particular interest for three reasons. First, they are providers of substantial development finance to governments in Africa. On average for 2000-2014, each MDB provided over US\$7.5 billion per year in development finance to African governments—well above the amount provided by any other DAC donor apart from the USA (which also supplied a bit over US\$7.5 billion per year on average). Second, because they are multilateral agencies in which dozens of countries are members—including all recipient countries as well as most wealthy industrialized nations—one may expect the factors shaping the allocation of their finances to be different to bilateral agencies, and therefore worth analyzing separately. And third, both MDBs (especially the World Bank) play an important role in defining the developmental agenda and coordinating the activities of other donors.

Studies on donor competition or coordination

A sizeable literature has arisen testing the motivations of individual donors and MDBs to lend more or less to one or another country over time. However, as noted by Davies and Klasen (2017, p. 4), “...there exists remarkably little analysis on how aid allocation to particular countries is affected by aid flows from other donors.” This has begun to change, notably in recent articles by Macarenhas and Sandler (2006), Frot and Santiso (2011), Steinwand (2015), Fuchs et al. (2015), Davies and Klasen (2017), Gehring et al. (2017) or Reinsberg et al. (2017). Collectively, these articles posit several potential explanations for donors *increasing* aid in line with other donors. One possibility is competitive dynamics driven by “private” interests such as a desire to increase influence in recipient countries or to promote trade or other interests. Other possibilities include a movement among multiple donors to give more to countries with better institutions; herding behavior among donors; or temporary needs shocks such as natural disasters. When a given donor *decreases* aid while other donors increase, this may be a rational response to direct scarce resources to those places where they are more needed and/or could be driven by greater coordination among donors in line with the Paris Accord. Empirically, these studies generally find evidence of competitive or herding behavior among donors (Davies and Klasen, 2017, Fuchs et al., 2015 and Frot and Santiso, 2011), although Steinwand (2015) and Gehring et al. (2017) point

to evidence indicating that the presence of a “lead” donor improves coordination even with multiple donors present at the same place.

One point common to all these studies, as well as most of the aid allocation literature, is (as the term “allocation” suggests) that they are entirely supply-driven. That is, what matters in explaining the direction of aid flows is the views of donors, and not recipients. In the case of OECD DAC donors, this is a reasonable assumption, as almost all of these resources come in the form of grants or heavily subsidized loans, and are hence extremely attractive to recipient countries. However, as Davies and Klasen (2017) point out, the situation of MDBs is different.

The special role of MDBs

MDBs mainly provide loans, which, although less expensive than market rates, still bear a non-negligible cost—more so for non-concessional lending offered to developing countries adjudged to be “middle income”, and less for concessional lending for the poorest countries. Hence recipient countries make their own calculations on the value of obtaining an MDB loan vis a vis other potential financing sources. This complicates the interpretation of the empirical results. If an MDB lends less to a country, is that because the MDB is offering fewer loans, or because the country wants to borrow less? This thorny question is rarely addressed in the literature, despite its increasing relevance due to the proliferation of potential sources of finance available to developing countries, both from non-traditional donors like China as well as greater access to international capital markets and (in some countries) deepening domestic capital markets.

A second relevant issue is the multilateral nature of MDBs, compared to the bilateral nature of DAC donors as well as China. The realist theoretical tradition of international organizations sees MDBs as driven mainly by the self-interested considerations of one or a few powerful nations (mainly the United States) that are seen to control them. Realist-oriented scholars have utilized quantitative methods to investigate statistical links between MDB lending patterns and alignment with US foreign policy priorities (among many others, Andersen et al., 2005; Dreher and Vreeland, 2014; Kilby and Kersting, 2016; and Kilby, 2011), while others have taken a more qualitative approach by analyzing the historical record for evidence of US influence shaping MDB activities (Ascher, 1990; Woods, 2006; Babb, 2009).

If one supposes that i) MDBs are used as a means to exercise power by either punishing enemies or rewarding allies of the major powers, and ii) that China—a major geopolitical rival of the traditional western powers—is using its resources to do the same, then the logical conclusion would be that MDBs would tend to compete with China as a way of maintaining the influence of the traditional powers in recipient countries. As a consequence, they should try to keep the share of their funding at least at par with Chinese funding, implying an increase in absolute volumes. This is what Kilama’s (2016) analysis suggests for G7 donors, and if the realist arguments are correct, the influence of these bilateral donors as shareholders within the MDBs should drive MDB finance allocation in the same direction.

The MDBs may also be trying to compete with China through a more constructivist-oriented desire to remain relevant in their countries of operation as a go-to development agency. As well, financial considerations could play a role, since MDBs have a financial incentive to lend to non-concessional countries due to the revenue this lending generates, which covers MDB

administrative expenses and generates net income used by shareholders for various purposes (see Humphrey 2014 for more on this).

At the same time, there may be constraints on the demand side. If there is only a limited amount of funding desired by the recipient countries, competition through the inflow of Chinese finance could mean that MDBs—with all their unwanted safeguards, complex procedures and other characteristics typically disliked by the recipients—are driven out of the market. From this perspective, one would expect MDB finance to go down. Especially for non-concessional lending, it is hard to imagine unlimited demand. This implies that overall, theory does not give us a clear indication of what to expect. The reaction of MDB lending to Chinese finance remains an empirical question.

Along with reactions in terms of overall lending volumes, there may also be changes in the sectoral allocation of funds. It is primarily the infrastructure sector that is affected by MDB safeguards, e.g., to prevent negative consequences for people living in areas that are flooded in the context of major hydropower projects or the like. At the same time, Chinese lending primarily flows into this sector, and the sector is of high priority in the eyes of most recipient governments. The latter may again drive western stakeholders to push the MDBs into competition by increasing the share of infrastructure lending in MDB finance. In case there are demand-side constraints, the easy access to Chinese lending could, however, also drive the MDBs out of this sector into areas like budget support, in which governments feel less disturbed in their autonomy. Alternatively, it could incentivize MDBs to reduce bureaucratic “hassle factors” like environmental and social safeguards in order to keep their infrastructure lending at least at the same level as before.

MDBs themselves vary with respect to both the institutionalized influence of major western countries, and the complexity of their procedures as well as the emphasis on social and/or environmental safeguards. Rather than lumping together the World Bank and the major regional development banks, newer research has thus taken a more nuanced approach.

Humphrey and Michaelowa (2013), Humphrey (2014) and Humphrey (2015a), building on Lyne et al. (2009) and Copelovitch (2010), suggest that a continuum of governance arrangements characterizes MDBs. These studies focus on Latin America, and highlight that while the Inter-American Development Bank (IDB) is strongly influenced by the U.S. and other G7 powers, it in fact operates substantially differently than the World Bank, in a way that is more in line with the preferences of borrower countries.

The AfDB, like the IDB, is also still majority controlled by borrower African countries (60% of total voting shares), but the AfDB is highly dependent on donations from wealthy shareholders to support its concessional African Development Fund (ADF) lending window, which lends to the majority of African countries. As a result, the AfDB has broadly similar overall policies as the World Bank related to environmental and social safeguards, loan processing times, policy conditionality and sectors of operation. However, the impact of greater borrower country voice at the AfDB suggests that it would be more flexible in how policies are applied and more inclined to follow borrower country lead on where to direct its resources compared to the World Bank. Hence, whether or not there is a difference between the reactions of the two major MDBs active in Africa to Chinese lending also remains an empirical question.

We use econometric analysis to generate some initial evidence to suggest which of the above interpretations appear most plausible. In a second step, we complement our analysis with a series of in-depth interviews with borrower government officials in three African countries where China is active. Obviously, the results of these interviews are also far from definitive, as government officials may well have their own agendas and reasons for making certain statements. However, the combination of the two approaches provides a good starting point for further analysis, and can raise potential interpretations not considered so far.

Statistical analysis of development finance in Africa, 2000-2014

The most straightforward way to examine how the World Bank, the AfDB and DAC donors are reacting to China's rising role in African development finance is to examine finance patterns over time. We consider the period from 2000 onwards because it is only since the new millennium that Chinese development finance has increased so dramatically.

Data and methods

The central variables for this study are development finance for Africa. We use project information in total amounts and broken down by sector, aggregated by year and recipient country. We focus on commitments—the amount agreed at the start to be supplied by the financier for the totality of each project—rather than disbursements—the amount transferred each year from the financier to the borrower. All finance commitments were converted into real (2013) US dollars, using the U.S. Consumer Price Index. Two countries—Sudan and Zimbabwe—were excluded from the analysis, as they received no financing from the World Bank or AfDB during the period (an issue which we address below in the “Discussion of Findings” section).

Data for World Bank and AfDB commitments come from the respective annual reports of each MDB (World Bank, 2000-2014; AfDB, 2000-2009). The AfDB has not included project-by-project descriptions of annual commitments in their annual report since 2010, but provided the complementary data directly to the authors (AfDB, 2010-2014). Information on bilateral DAC donors is sourced from the OECD DAC database (OECD, 2017a), and AidData's Global Chinese Official Finance Dataset, 2000-2014, Version 1.0 provides the information for Chinese resources (Dreher et al., 2017). Despite deficiencies regarding the accuracy of the Chinese data (see Bräutigam and Hwang, 2016), this is the only realistic technique to build such a database in the absence of comprehensive data from Chinese authorities.⁴

We distinguish between development finance to recipients classified as concessional and non-concessional countries by MDBs.⁵ Because most Chinese finance is directed to concessional countries (see Figure 2 above), the impact of Chinese activity on MDB lending in these countries is the main focus of this study. Countries accessing concessional MDB finance are generally very poor, and receive financing in the form of mainly zero interest, long maturity loans from the MDBs, along with some grants. Non-concessional countries, on the other hand, receive loans at terms closer to market rates. African countries also receive DAC resources at varying terms—Official Development Assistance (ODA), which is mostly grant resources, and Other Official Flows (OOF), which are loans closer in financial terms to MDB non-concessional loans, but represented only 1.6% of DAC flows to Africa in 2000-2014. Chinese finance comes at financial terms that vary

substantially by project, and are usually a bit above MDB non-concessional rates but still below what private markets would offer the borrowers (see Bräutigam and Gallagher, 2014, or Gallagher et. al, 2012 for more on Chinese financing terms).

We consider the MDBs' differentiation between concessional and non-concessional at recipient level because it relates to their strategic interests to remain in business with certain borrowers, and because access to concessional MDB finance may substantially alter demand for funding by the borrowing countries. In contrast, the project-by-project distinction of financial terms by the bilateral donors is less relevant for our analysis. For each recipient, we hence consider all development funding independently of financial terms.

In terms of sectoral categories, we distinguish between infrastructure, social, and budget support. When MDB projects had more than one component—for example building rural roads, promoting good crop management, and supporting village councils—we allocated resources to different sectors based on the project description. The infrastructure category includes physical infrastructure in areas such as transport, water, housing, urban renewal, and energy. However, it does not include loans intended to support infrastructure-related institutions. “Social” includes health, education, gender, youth and social protection. “Budget support” is all resources put directly in a government's budget, without earmarked spending purposes.

We undertook sectoral coding ourselves on a project-by-project basis, as the sectoral categorizations provided by the World Bank and AfDB are neither consistent with one another, nor with those used by the OECD DAC and AidData. Furthermore, there is reason to doubt in some cases the accuracy of the aggregate sectoral breakdowns provided by the MDBs.⁶ In the interests of consistency, this same categorization framework for MDBs was then also applied to Chinese financing, rather than using AidData's categories. We did not do the same for OECD DAC because i) the volume of projects is too high for this to be practical and ii) DAC donors are not the main interest of the paper.

As to be expected, the majority of finance (71% over the period) was for physical infrastructure, and Chinese sources provided almost no budget support (Table 1). For the MDBs, nearly half of lending is for infrastructure and about one-third in budget support, while DAC ODA donors emphasize in particular the social sectors.

[TABLE 1 HERE]

For the selection of control variables we follow the traditional aid allocation literature and include a series of indicators for recipient need, recipient merit, and donor interest: GDP per capita, under 5 child mortality, population, the ratio of hard currency reserves to external debt (as a proxy for short-term country financial needs), resource rents in % of GDP, voting alignment with United States in the United Nations, and the Political Freedom Index (as an indicator of good governance and hence recipient merit). In robustness tests, we add additional controls, namely trade openness, political stability, the Institutional Investor index on investor perception of likelihood of default (II-index), and inflation. For the definitions of all variables and data sources, see Appendix, Table A1.

The use of panel regressions requires important choices regarding the time structure of the model. Some type of time lag is necessary, as it is not likely that the MDBs or DAC donors would

be able to react immediately to the activities of Chinese financiers in a given country. Preparing projects takes time, particularly in the case of the traditional donors—this is a complaint often leveled against them by recipient countries. According to data from the MDBs themselves, average time from the start of project preparation to the commitment stage at the World Bank was 16 months in 2008 (the earliest year for which data is available), declining slightly to 14 months in 2013 (World Bank, 2008 and 2013). In the case of the AfDB, lead time for commitments has averaged around seven months from 2012 (the earliest available data) to 2014. Furthermore, one can logically assume that the MDBs may not react sharply to each year's changes in Chinese finance, but rather to the pattern of ongoing activity over more than one year. To address these issues, our main specification is based on two-year period averages for our main explanatory variable (Chinese finance) and for all control variables. Hence, we consider the effect of Chinese financing and control variables in years $t-1$ and $t-2$ (averaged) on commitments by the MDBs and DAC in year t . In our robustness tests, we include alternative models with different time lags.

Since our dependent variables are censored, with a sizeable number of zeros especially in the regressions at sector level, we use poisson pseudo-maximum likelihood (ppml) regression as our main specification. As compared to a standard tobit model for censored data, this has the advantage that we can include both recipient and period fixed effects (FE).

Results for overall financial flows

Table 2 presents the results in terms of overall finance volumes. The initial four columns refer to lending to all countries in our sample (concessional and non-concessional). The second block then introduced this differentiation through an interaction term. The coefficient estimate for Chinese finance must then be interpreted as the effect of Chinese finance in concessional countries only, while the estimate for the coefficient of the interaction term shows the difference for concessional and non-concessional countries, and the effect of Chinese funding for non-concessional countries is given by the addition of the two. Since we use ppml we take the log of Chinese finance⁷ so that the coefficients can be interpreted as elasticities.

It appears that for concessional countries—and hence the bulk of the recipients of Chinese aid—there is no systematic relationship between Chinese funding and the finance volumes of either the World Bank (WB, column 5), the AfDB (column 6) or MDBs taken together (column 7). As opposed to what earlier studies suggest, such a relationship is not observable for DAC donors either.

The situation for MDBs is different for non-concessional countries, however. While the interaction term is insignificant for the DAC donors, it is significantly positive for both MDBs (columns 5-7) suggesting that for non-concessional countries, an increase of Chinese finance by 1% during the previous two years is associated with an increase of MDB lending of 0.2-0.4%.⁸ For the AfDB, which has a relatively higher share of non-concessional lending than the World Bank in Africa, this effect also translates into a significant coefficient when non-concessional and concessional countries are considered jointly (column 2).

[TABLE 2 HERE]

The lack of any kind of relationship for concessional countries is remarkably robust across different specifications. In the Appendix, Table A2 shows alternative regressions based on

different plausible estimation methods. Only in one out of the 28 regressions in Tables 2 and A2 is the coefficient of Chinese finance for concessional countries significant (at the 10% level) for any of the MDBs or for DAC donors.

Table A2 also confirms that the situation for MDBs is different for non-concessional countries. The interaction of the non-concessional country dummy and Chinese finance is highly significant and positive in all regressions for the World Bank and for both MDBs jointly. We also verified that this result is not driven by any single country.⁹ The result presented in Table 2 for the AfDB alone is, however, less clearly confirmed. Yet, for the AfDB as well, we can conclude that if there is an effect at all, this is an effect driven entirely by lending to the non-concessional countries.

Regarding DAC finance, in Tables 2 and A2 taken together, there is only a single significant coefficient in all eight DAC-related regressions. This suggests that for DAC donors, in non-concessional just as in concessional countries, there is no systematic link to Chinese lending.

These results do not change when adding further control variables. Instrumenting Chinese aid following Dreher et al. (2016), Bluhm et al. (2018) and Gehring et al. (2018) confirms the non-results for concessional recipients, and casts some doubts even on the causal interpretation of the positive result for MDBs in non-concessional countries. Testing different lag structures does not suggest that our assumptions about reaction time drive the lack of donor response observed. These additional robustness tests are discussed in detail in the Appendix (Part 2); results are presented in Tables A3-A5.

Results for sector allocation

Table 3 presents the results regarding potential shifts in sector allocations. The lag structure is as in Table 2. The upper panel presents the relationship between Chinese aid in % of total development finance (by the MDBs, the DAC, and China), and the funding the MDBs and DAC donors allocated to physical infrastructure in % of their own resources spent in the country. The second and third panel show similar relationships, but for social sector finance and budget finance respectively. Controls are not shown, but are identical to those in Table 2 above. Using ppml, as before, we log Chinese aid so that the coefficients can be interpreted as elasticities.

Again, there is not much evidence for an effect of Chinese aid. Table 3 shows no significant coefficients at all when looking at concessional and non-concessional recipients combined (columns 1-4). There is no evidence that Chinese finance is associated with any change in the allocation of MDB funding to concessional countries (columns 5-7). The only significant coefficient we find for MDBs relates to World Bank infrastructure funding that seems to decrease as a response to Chinese aid. For concessional countries, we obtain the only (marginally) significant positive coefficient in the context of DAC budget aid. Neither of these two significant coefficients are robust to changes in estimation methods.

Yet, our robustness tests suggest that in non-concessional countries, some donors may indeed decrease their share of infrastructure lending. While some of the models with alternative estimation methods (Appendix, Table A6) or replacing ‘% Chinese’ by Chinese finance in % of recipient GDP (Appendix, Table A7) suggest that this might rather be the AfDB or the DAC donors, robustness tests adding additional controls confirm the negative reaction by the World Bank (Table 8). Looking at different periodicities and time lags in Table A9 does not add further clarity.

What remains is again a very robust null-result for concessional countries, and some plausibility for a reduction of infrastructure finance in non-concessional countries as a response to Chinese aid inflows. Further details on all robustness tests are presented in the Appendix (Part 2).

[TABLE 3 HERE]

Overall, these findings reveal that in concessional countries, both finance amounts and sector shares are not associated (either positively or negatively) with Chinese lending. Hence, based on the data we employ here, it does not appear that MDBs and bilateral donors have reacted in any systematic way to the influx of Chinese finance to concessional countries in Africa. By contrast, evidence suggests that this might possibly be different for the economically more advanced non-concessional recipient countries. Especially the World Bank seems to adjust lending volumes upward in response to Chinese finance, and some evidence exists that both MDBs and the DAC donors reduce infrastructure lending. Yet the latter results are way less robust and the causal interpretation remains debatable.

We now turn to qualitative evidence from interviews in three African countries. The econometric findings are discussed jointly with the qualitative evidence in a subsequent section.

Qualitative evidence from interviews: Ethiopia, Tanzania and Malawi

To get a better sense of if and how increasing Chinese finance might be influencing traditional development financiers, we undertook 17 interviews with government officials in three African countries: Ethiopia, Tanzania and Malawi. The intention is to better understand the factors that might cause recipient countries to favor one source of finance over another, if any; and the perception of recipient countries on the motivations of traditional development financiers. Because of the preponderance of Chinese official finance to concessional African countries and the relevance of poorer countries to international development policy—particularly in Africa—the interviews were conducted in three countries eligible for concessional financing by the MDBs. This should also help us to understand whether the null-results we obtained for these countries are indeed plausible. The interview material can only speak indirectly to higher-income non-concessional countries.

Background and justification of interview strategy

The choice of focusing on recipient government officials was driven by three main considerations. First, the literature has heretofore overly focused on the “supply side” of development finance: the internal factors shaping the supply of finance, such as development needs as perceived by external actors, geopolitical considerations, internal bureaucratic factors, etc. While these factors are clearly relevant, it is important not to neglect the agency of recipient governments, particularly in an era of increasing financial options (Greenhill et al., 2013; Humphrey and Michaelowa, 2013). Second, while recipient government officials clearly have their own agendas and interviews must be interpreted with caution, in our experience they are quite open—and in fact enjoy—discussing the relative merits and motivations of external development financiers with whom they engage regularly. As opposed to officials within bilateral and multilateral agencies, who are less likely to be open about factors driving their lending that do not match their

stated mandates of reducing poverty, government officials have no official mandates to defend in this respect and hence no direct incentive to polish up their statements. Third, Swedlund (2017) already undertook a survey of development agency officials in Africa, with the results generally showing little impact of Chinese aid on their decision-making and negotiating power with recipient countries. Rather than replicate that work, our study chose to focus instead on recipient officials to generate fresh evidence from the “demand” side of the development finance relationship.

The three countries chosen are similar in having remained generally politically stable and peaceful in recent years, and have all actively engaged with external traditional and new development finance providers during the period of observation. At the same time, they provide significant variation in the inflows of Chinese finance of relevance to the research questions, to ascertain if this generates variation in the response of traditional development financiers. Ethiopia has received a huge amount of Chinese resources—nearly US\$11 billion between 2000 and 2014—the second highest of any country in Africa (after Angola, at US\$14.6 billion). Tanzania has received substantial amounts as well, but considerably less—\$4 billion over the period—while Malawi has received only about US\$500 million.

The majority of the interviews (11) were with officials currently (or in two cases, formerly) in the ministries of finance, while the remainder were in line ministries heavily engaged with external development finance, including electric power, transportation and agriculture. All officials had regular interactions with a variety of development finance providers, including traditional sources as well as (in most but not all cases) the Chinese. All interviews were undertaken on the understanding that respondents could be listed (see reference section), but would not be individually identified in relation to specific statements or opinions. With one exception (done by telephone), each interview was conducted face-to-face in government offices.

Main findings

We focus on two main themes from the interviews of particular relevance to the research questions posed in this paper and on which there was a very high degree of correspondence (and in some cases unanimity) among respondents:

- Overall available development finance envelope
- Sectoral allocation of resources

Overall development finance envelope

A critical finding which helps explain the insignificant results from the statistical analysis above, particularly in relation to the MDBs, is that all three countries took every available dollar of concessional and ODA resources on offer, for purely financial reasons. First, and most obviously, concessional resources offer the best financial terms available, with usually zero interest rate and very long repayment periods. DAC ODA resources are even better, often in the form of grants—that is, entirely free money. Second, all three countries have limits imposed by the IMF on the level of non-concessional resources their governments are allowed to borrow each year, due to their participation in either the Highly Indebted Poor Country (HIPC) or the Multilateral Debt Relief Initiative (MDRI) (or both, for Ethiopia and Malawi).

Hence, the countries generally take all concessional/ODA resources available, regardless of the type of project attached or the characteristics of the lending source. “We take every penny [of IDA], and we push for more,” said a Finance Ministry official from one country. “We might not always like them [the World Bank and the AfDB], but we need them for the money. We can’t not use them,” said an official from another country. A third official from an infrastructure line ministry explained in more detail why he could not borrow more from export credit agencies (ECA) like the China Ex-Im: “The problem is that the Ministry of Finance is mostly refusing. Every time we bring these ECA proposals, which are still cheaper than commercial finance, they will look at the IMF debt ceiling. And that’s an inhibitor. It’s only about US\$800 million per year, which is not very much, and everybody is fighting for that small window. And there isn’t enough concessional money.”

In addition, because of the nature of their own refinancing, MDB concessional windows cannot react in a meaningful way to Chinese finance increases. These windows (for both the World Bank and the AfDB) are replenished every three years through laborious rounds of negotiations, and the willingness of governments to donate has been on the wane (Figure 4), due in large measure to budgetary restrictions. Nor can the allocations be easily shifted among borrower countries to react to Chinese inflows: both the World Bank’s IDA and the AfDB’s ADF have relatively transparent “performance-based” criteria defining each country’s allocation (Kanbur, 2005; World Bank, 2017b, World Bank, 2014; AfDB, 2018).¹⁰ Thus, if an MDB were to perceive China’s rising activity in a concessional country as a threat for some reason, it would not easily be able to increase the amount of resources it provides to that country to retain its influence, even if it wanted to.

[FIGURE 4 HERE]

Sector allocation

In terms of sectoral allocation, all officials in each of the three countries expressed a clear priority order for receiving resources: best is budget support finance not earmarked to any sector, second is physical infrastructure (transportation, energy and water, mainly), third is social spending like health and education, and least favored is capacity building and institutional reform. However, recipient country ability to achieve these priorities varied substantially both by recipient country and by financing source.

The AfDB is perceived by borrower governments as quite responsive to their requests, and gives a markedly higher share of its resources to infrastructure than the World Bank or DAC donors in two of the three recipient countries (Figure 5), as well as generally in all African countries (see Table 1 above). “They are Africans too,” said one official. “It’s true that the rich countries have a big influence on their policies, but the staff understand what we need and try to help. Because they are a regional bank, maybe they sympathize with us more.” Officials in all countries maintained that the AfDB’s activities were not in reaction to the increase in Chinese finance, but rather an honest desire to help the country achieve its development goals. The main problems recipients have with the AfDB is that the size of available resources is simply too small to undertake many of the major infrastructure projects they would like, as well as procedural issues (discussed in more detail below).

[FIGURE 5 HERE]

DAC donors, on the other hand, showed very little flexibility in relation to sectoral allocation, with the vast majority going to social projects and institutional support. While Ethiopian officials suggested overall DAC amounts may have increased in response to Chinese activity, they were clear that it had little influence on project sectors. “These bilaterals, they have very strong ideas on where their money should go, and we can’t do much about it,” said one Ethiopian official. “But most of it is grant money anyway. Some [bilaterals] have said they might start giving less grants, and offering more as loans, and if they do we might have to think a bit more on what we take.” Another official pointed out that since most DAC money is in relatively small grants, the amounts are only sufficient for social projects and are not useful for infrastructure anyway. Tanzanian and Malawian officials agreed that DAC donors are by far the most rigid in defining project sectors.

The World Bank showed some tendency to adapt to government demands in recent years. This was most obvious in the case of Ethiopia (with by far the highest amounts of Chinese finance of the three countries). Ethiopian officials noted their influence in shaping World Bank project allocations had grown. “We have been aggressively working with the World Bank, saying ‘Please invest in roads.’ And they say, ‘What about capacity building, or something else?’ and we say, ‘No, roads.’ And they have responded.” Tanzanian officials also noted greater willingness of the World Bank to offer infrastructure support, but not as much as they desired. Asked if the influx of Chinese investment had improved his negotiating leverage with the World Bank, a Finance Ministry official said, “Yes of course. That’s the direction we are moving in now, because we have more options. If you can’t get the World Bank to fund it, you can find someone else.” Malawian officials, in contrast, felt they had essentially no ability to shape World Bank sector allocation, but could only passively accept what was offered. “The World Bank should invest more in the productive sectors to help this country boost its economic activity [...] But we still find that the Bank will still want to invest in HIV/AIDS, even though the bilaterals mostly want to spend there too.”

One issue which officials in all three countries noted as limiting their own demand for infrastructure lending from the World Bank and to a lesser degree the AfDB is the “hassle factor” implicit in these types of projects from project design rules and environmental and social safeguards. Officials from all governments concurred that the World Bank is particularly difficult. “For hydroelectric and railroads, we don’t even talk to them, we just go straight to the Chinese,” said an Ethiopian official. Discussing a major gas pipeline project, a Tanzanian official said, “The Chinese are a bit more expensive, but they are a lot easier and a lot faster for this kind of project. We didn’t even send a request to the World Bank for support, we went straight to the Chinese.” Even in Malawi, with only small amounts of Chinese finance, officials were experiencing these dynamics with a planned new coal-fired power plant, to be funded by the Chinese at market-based interest rates. “The World Bank and AfDB wouldn’t fund it because the powerful shareholders would not agree to that kind of thing for environmental reasons. So we went with the Chinese.” Hence, even though World Bank project staff showed some willingness to accommodate borrower country desire for infrastructure, higher-level policies mandated by shareholders limited their ability to do so effectively.

While all officials noted that the AfDB and the World Bank had similar policies on these matters, due to the influence of major wealthy-country shareholders, a majority of interviewees (but not all) felt that the AfDB was more flexible in the application of these policies, and is more willing to work with countries to find a workable solution, while the World Bank was more rigid and process-focused. This finding parallels that found in another study comparing the World Bank with the IDB in Latin America (Humphrey 2015a).

By comparison, Chinese finance involved minimal safeguard reviews, limited only to the approval of the relevant recipient government ministry. Procurement is also substantially easier, since it is often arranged ahead of time with the Chinese Ex-Im Bank as financier, saving considerable paperwork (although also leading to some complaints on value for money, according to several officials). And while some officials noted that the quality of Chinese infrastructure—particularly roads—was sometimes sub-par, they all lauded how fast the Chinese worked, an important factor for governments wanting to show quick results to their population.

Discussion of findings

How can these different interview-based findings combined with the statistical results shed light on the research question of how traditional development financiers are responding to the influx of Chinese finance in Africa? We first consider the evidence in relation to the total amount of finance from the World Bank and the AfDB as well as DAC donors, and subsequently to the question of how those resources are allocated to different project sectors. In both cases, we start by discussing the results for the majority of poorer, concessional countries (37 in our sample), followed by the results for non-concessional countries (nine countries in our sample).

Total financing levels: concessional countries

Multivariate analysis finds no statistically significant association between the financing commitments of the World Bank and the AfDB, and also the DAC donors to Chinese financing in concessional African countries between 2000 and 2014. Despite the influx of over US\$70 billion in new Chinese resources to these countries in only 15 years, the main traditional development financiers appear to have not reacted by adjusting their funding levels. Qualitative interview evidence helps clarify why this is the case. Officials in all three countries stated that they took all concessional resources available because of the highly attractive financial terms, making these overall amounts essentially a supply-driven phenomenon. For the MDBs, the amounts each country receives, in turn, are determined by lengthy donation rounds and relatively rigid formulas. Hence, even if MDB staff or shareholders wanted to increase funding levels to respond to the increase in Chinese activity, doing so would be an extremely difficult and lengthy process. This interpretation matches the qualitative work of Swedlund (2017), who similarly found little evidence that development agency staff are reacting to greater Chinese financing.

Furthermore, based on our results, there is little evidence that major shareholders would even want to put up pressure in this respect, since we find a non-result for DAC donors as well. This does not necessarily contradict Kilama (2016), whose arguments about the DAC donors' competitive increase in funding rely on cases of strategically important recipients, and poor concessional countries might typically not belong to this group. As DAC donors face less

bureaucratic obstacles to changing aid allocation than MDBs, nothing would stop them if they really wanted to react. The only plausible explanation is that their concerns about the effect of Chinese finance on the goals of their own funding (be they geopolitical or developmental) are rather limited and do not challenge earlier priorities determined by domestic interests and recipient need. A demand-side explanation is even more unlikely than for the MDBs, as DAC resources are almost entirely grants (i.e., completely free resources), and hence one can safely assume limitless demand on the part of poor African nations.

A final point worth noting here in relation to MDBs is that two African countries—Sudan and Zimbabwe—did not receive any financing from either the World Bank or the AfDB over the period, due to a combination of unresolved arrears on past MDB loans and political considerations.¹¹ However, China lent very heavily to both countries over the 2000-2014 period—\$7.4 billion to Sudan (the third most of any African country) and US\$4.6 billion to Zimbabwe (the seventh highest amount in Africa). These two examples in themselves point to the limits of MDB reaction to China: major geopolitical considerations and MDB rules on arrears clearance prior to further lending are clear red lines that MDBs will not cross, even if one finds other instances where MDBs may be acting competitively in response to China.

Total financing levels: non-concessional countries

The multivariate statistical tests show markedly different results for non-concessional countries. For the World Bank and both MDBs jointly, the interaction term between the dummy for non-concessional countries and Chinese lending is significant at the 1% level and positive in almost all regressions. As the coefficient for concessional countries is never distinguishable from zero, we can interpret this directly as evidence for a positive association of the World Bank lending to Chinese financing in non-concessional countries (significantly different from zero). In some models, the AfDB regressions also show a positive and significant interaction term. Only for DAC lending, we continue to find a null-result (except for a single case in which the interaction term is significant, but very small). This result is rather difficult to reconcile with Kilama (2016).

What could explain the differential result between non-concessional and concessional countries for MDBs? Since the reaction by DAC donors is null (or very small), it is again implausible that any potential reaction by MDBs would be driven by pressure from its major shareholders. The answer should therefore lay within the MDBs if the increase is driven by the supply side, or with recipient governments. Intuitively, supply-side dynamics make more sense here, as it is difficult to imagine why a country's demand for MDB resources would increase at the same time that it accesses greater Chinese financing. Rather, in the context of non-concessional as opposed to concessional countries, one would expect a reduction of demand, since lending is more expensive for these borrowers, so that overall demand should be limited, and Chinese funding that comes without additional "hassle factors" could simply provide an attractive substitute for MDB finance. This suggests a supply-driven explanation.

MDBs' own financial considerations could play a role. Their budget for non-concessional countries is not restricted by complex negotiations about replenishments. The revenue generated by non-concessional lending is very important to the overall functioning of MDBs, paying for administrative costs and generating net income that is used for various purposes of interest to shareholders (see Humphrey 2014 for more on this point). Hence, MDBs have at least some

financial interest in holding onto non-concessional borrowers. Since this incentive is present at all times and in all non-concessional countries, whether China is active or not, an additional assumption required is that the MDBs fear to lose these countries completely if China starts dominating and building up a stronger relationship with the relevant governments. An alternative (and not mutually exclusive) explanation is that MDBs are driven internally by the desire of staff and management to maintain relevance as go-to sources of development expertise in recipient countries. While this same motivation may be present in concessional countries, the fact that concessional resources are more limited for reasons discussed previously implies that the banks' actual reaction is restricted to non-concessional countries.

If the above argument is correct, it may surprise to see that the statistical results are stronger for the World Bank than for the AfDB. In fact, financial considerations are substantially more pressing for the AfDB in the Africa region, since it has so few non-concessional borrowers to work with (see Humphrey 2015c). However, our statistical result may be partly driven by the fact that the AfDB has lower lending volumes to allocate. This interpretation is consistent with the clearer AfDB results when looking at relative change in financing, namely in ppml and logarithmic models.

Furthermore, the more constructivist interpretation of MDBs competing for relevance in borrowers for internal reasons may be more pressing at the World Bank, due to the World Bank's self-perception as the preeminent global finance institution. As a result, World Bank staff and management may be much less inclined to give up their relevance in a given country, compared to AfDB staff.

However, we have to be cautious not to over-interpret these findings because the IV-regressions—albeit with rather weak instruments—do not confirm a causal interpretation of the effects for non-concessional countries.

Sectoral allocation: concessional countries

As with the overall level of financing, the allocation to different sectors in concessional countries showed no systematic reaction by MDBs or DAC to Chinese financing in the multivariate statistical tests. Again, the results are extremely robust across different specifications.

The initially most expected result of a huge increase in aid from China—most of which is in infrastructure—would have been a decline in infrastructure lending by the MDBs and DAC. Yet in concessional countries, the unlimited demand for development finance as a whole also holds for infrastructure finance. Unless recipients see the opportunity to convince bilateral donors and MDBs to shift their resources into the even more preferred area of budget support, they will not oppose the funding of infrastructure. To the contrary, our qualitative evidence suggests that governments try to push the MDBs into shifting further funds from other, rather disliked areas such as capacity building and institutional reform, into even more infrastructure financing, but with only limited success. Given unlimited demand, MDBs do not even need to weaken their environmental and social safeguard policies or other “hassle factors” like procurement rules in response to Chinese competition. This is in fact a much-voiced concern in the broader development community (see, e.g., Buntaine, 2016: 104, 222). In concessional countries, this concern seem to be without much foundation. This also holds for DAC donors whose strong

supply-side preference for supporting social projects as opposed to infrastructure has not been affected by Chinese lending so far.

Sectoral allocation: non-concessional countries

Statistical tests on the sectoral allocation of MDB resources to non-concessional countries again reveal possible differences as compared to concessional countries. For all donors, some regressions suggest that their infrastructure lending may be negatively associated with higher Chinese lending. Yet, these results are less robust here than in the case of overall lending volumes to the countries. In addition, we cannot establish to which other sectors these resources might be shifted. For the alternative sectors we consider, namely social sector lending and budget support, we do not find any evidence that they may absorb the extra resources withdrawn from infrastructure lending in non-concessional countries. Of course, there are a number of other sectors not considered here.

Our qualitative evidence related to the countries' perceptions of the different donor agencies suggests that a possible negative association between Chinese aid inflows and financing by other donors must be interpreted differently for the different donors. For the AfDB, the negative coefficient is consistent with the interpretation that it is a more client-led, responsive MDB, particularly in non-concessional countries that may be pickier about their financing sources (due to higher MDB loan costs and greater options).

For the DAC donors, qualitative evidence suggests that a shift even further away from infrastructure financing might suite their preferences, and thus, they might simply seize the opportunity when they see that the most obvious infrastructure needs are covered by the Chinese.

In contrast, the World Bank might be constraint by reduced demand. Given the much disliked “hassle factors” and the opportunity of non-concessional countries to be selective, the World Bank may not be able to lend more. In this case, for non-concessional countries, the concern that China's lack of interest in safeguards will drag down global development standards in the long run, may be of some relevance.¹² It is certainly true that in recent years the World Bank and other major regional MDBs—the AfDB included—have already worked to reduce the perceived “hassle factor” on their operations. However, the most important and frequently-voiced obstacle—environmental and social safeguards—have not substantially changed during the period of this study. A reform of World Bank safeguards is currently underway, but will not be fully implemented for several years, and is a relatively minor set of changes compared to the country systems approach used by the Chinese. This could have been a limiting factor for the further expansion of the World Bank's infrastructure lending in non-concessional countries.

Conclusions

The principle purpose of this study has been to determine if the finance activities of traditional development financiers in Africa—in particular, the World Bank and the African Development Bank (AfDB), as well as secondarily DAC bilateral donors—have been directly affected by the influx of Chinese development finance in the past two decades. This possible effect is examined in two

ways: i) whether total finance levels to a given country change depending on the level of Chinese finance, and ii) whether the sector allocation of project resources changes depending on Chinese activity. To investigate this question, the study undertakes a series of statistical tests combined with expert interviews with government officials in three African countries who deal directly with external development financiers.

Contrary to the heated rhetoric in the development community about the potential impact of Chinese official finance in Africa on traditional development activities, our statistical tests find no evidence that MDBs or DAC donors are shifting their overall level of finance, nor its allocation among different sectors, in response to Chinese finance in the majority of poorer (concessional) African countries. Qualitative interview evidence suggests that this is in good part because i) recipient countries generally take all concessional resources available to them due to the very attractive financial terms (limiting potential demand-side impacts), and ii) concessional financing from MDBs is not easily shifted, due to the nature of concessional funds (limiting potential supply-side impacts). Hence, for a large majority of African countries, the rise of Chinese finance in recent years has had little apparent impact on flows of traditional development finance. Rather, Chinese finance appears additional to MDBs and traditional bilateral donors—a potentially positive result for African countries badly in need of investments, particularly in infrastructure.

In the few more developed non-concessional countries considered in the study, however, Chinese financing seems to trigger reactions of traditional donors. Overall lending volumes by the World Bank and the MDBs jointly show a strongly significant positive statistical association with Chinese finance levels. This suggests that in non-concessional countries, the MDBs may be willing to increase lending in a competitive fashion. For DAC donors, by contrast, there is no evidence for such a competitive behavior. Their limited interest suggests that the MDB reaction should not be driven by major stakeholders. Rather, the MDBs' own interests in maintaining political influence in these countries, which may in turn be instrumental to maintaining their role as important lenders to these countries in the medium and long run, may be driving this reaction. This could be due to the financial incentive MDBs have in lending to non-concessional countries (through the net income generated), or because MDB staff and management have an incentive to maintain their own relevance with borrower countries, or both. However, given the results of the IV-regressions, we must interpret this finding with caution.

Overall, it appears that the notion that the huge increase in Chinese finance to Africa is going to re-order the development landscape is somewhat overblown, at least based on our evidence and during the period we examine (2000-2014). Evidence does suggest that the World Bank and, to a lesser degree, the AfDB, might compete with the Chinese in a few non-concessional countries, but this does not seem to be happening in the majority of African countries. Furthermore—in contrast to the existing literature—for traditional bilateral donors, our evidence for competitive behavior is even less.

It may be the case that MDBs would act similarly in concessional countries, but are unable to do so because of the difficulties of concessional resource gathering and allocation. Should concessional funding mechanisms change—as has begun to occur at the World Bank with IDA's new ability to issue bonds, and which is being considered at the AfDB—MDBs could become more reactive to Chinese activities in concessional countries as well. Furthermore, our evidence

suggests that if China becomes more active in non-concessional countries, and/or as countries graduate into non-concessional status, competition may increase further. Hence, while our findings do not indicate a substantial effect of Chinese finance on traditional development actors in Africa up to 2014, the future may be quite different. The dynamics might also be different in other parts of the world and at the sub-national level, and it may be worth undertaking further studies to see if our results are more broadly generalizable.

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List of interviews

Ethiopia (October 12-14, 2016)

Fisseha Aberra, Director, International Financial Institutions Cooperation Directorate, Ministry of Finance

Dr. Tesfaye Alemu, Director, Debt Management Directorate, Ministry of Finance

Tilahun Tadesse, Head, Ethio-Chinese Development Cooperation Office, Ministry of Finance

Tesfaye Berhanu, Coordinator, Regional Trade Programs, Ministry of Finance

Daniel Mengestie, Director, Planning and Program Management Directorate, Ethiopian Roads Authority

Seifu Feyissa, External Funds Coordinator, Ethiopian Electric Power Corporation

Tanzania (October 17-21, 2016)

Adrian Njau, Assistant Commissioner, Aid Coordination, External Finance Commission, Ministry of Finance

John Mavura, Desk Officer, World Bank, External Finance Commission, Ministry of Finance

Ngosha Magonya, Commissioner, Ministry of Foreign Affairs (former Commissioner for External Finance, Ministry of Finance)

Deckland Mhaiki, Deputy Managing Director (Investments), Tanzania Electric Supply Company (TANESCO)

Aunyisa Boniface Meena, Assistant Director, Monitoring and Evaluation, Ministry of Works, Transport and Communication

Malawi (October 24-27, 2016)

Dr. Ronald Mangani, Treasury Secretary, Ministry of Finance

Madalo Nyambose, Director for Debt and Aid Management, Ministry of Finance

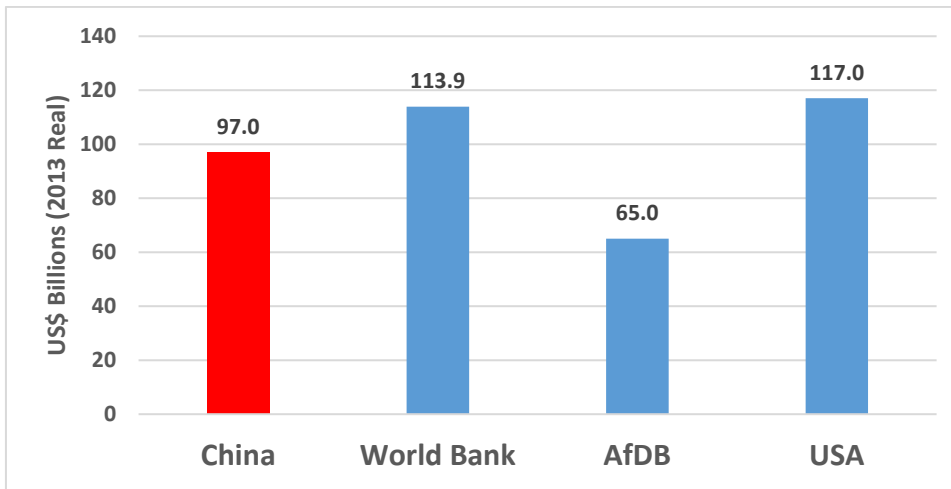
Betty Ngoma, Assistant Director for Debt and Aid Management, Ministry of Finance

Naomi Ngwira, Deputy Governor, Malawi Central Bank (former Director of Debt and Aid Management, Ministry of Finance)

Allan Kaziputa, Project Planning, National Roads Authority

FIGURES

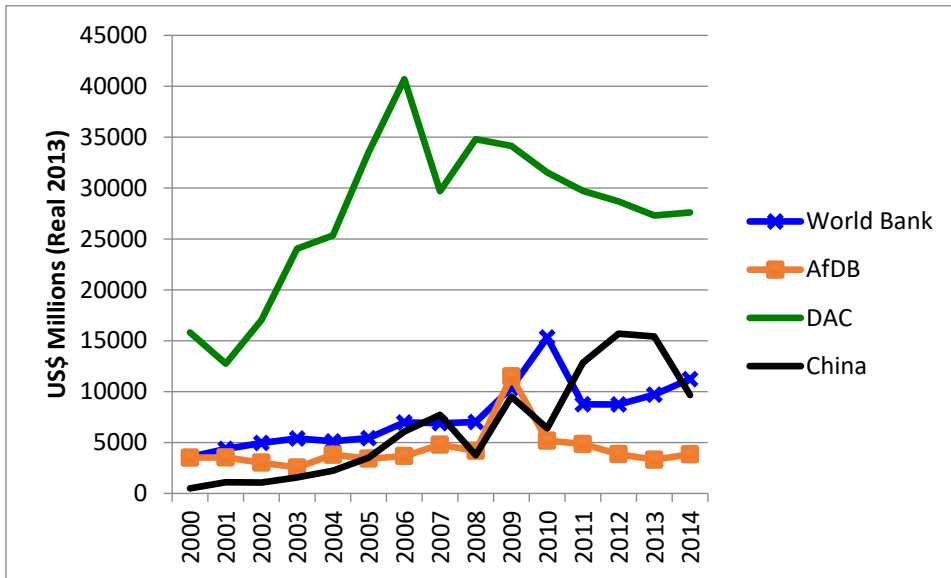
Figure 1. Cumulative development finance commitments to Africa, 2000-2014



Sources: China from AidData (Dreher et al., 2017), USA from OECD (2017a); AfDB and World Bank from respective annual reports AfDB (2000-2009, 2010-2014) and World Bank (2000-2014).

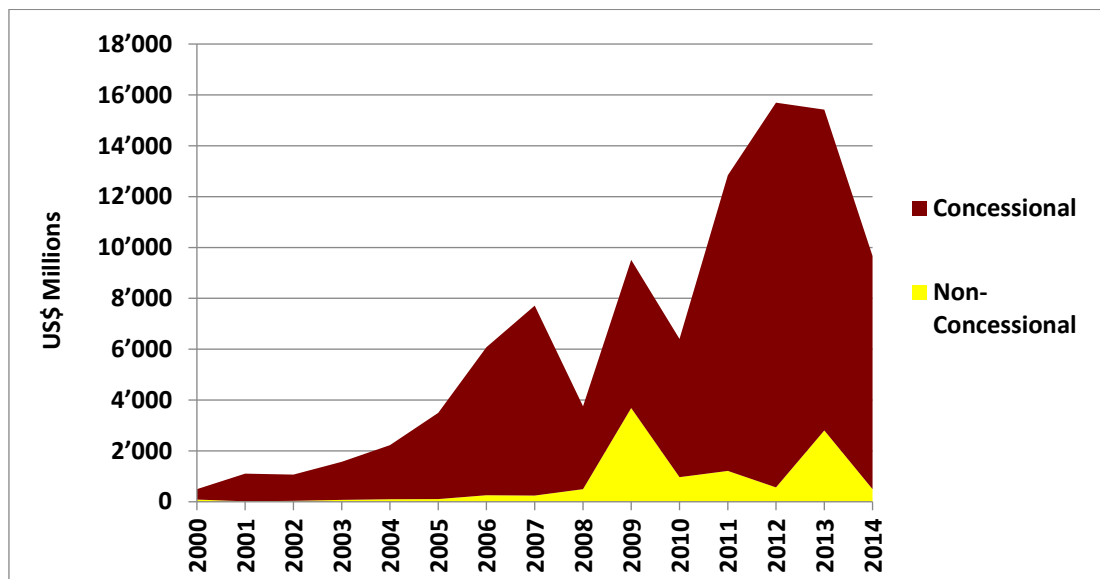
Note: Real 2013 US\$. Includes all official finance regardless of financial terms for all African countries.

Figure 2. Total lending commitments, all countries, 2000-2014



Sources: AidData (Dreher et al., 2017), OECD (2017b), World Bank (2000-2014), AfDB (2000-2009; 2010-2014).

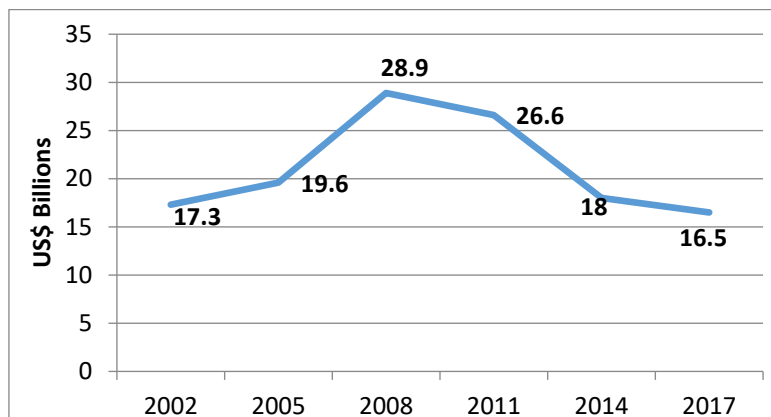
Figure 3. Chinese official finance to Africa, by country classification (2000-2014)



Source: AidData (Dreher et al., 2017).

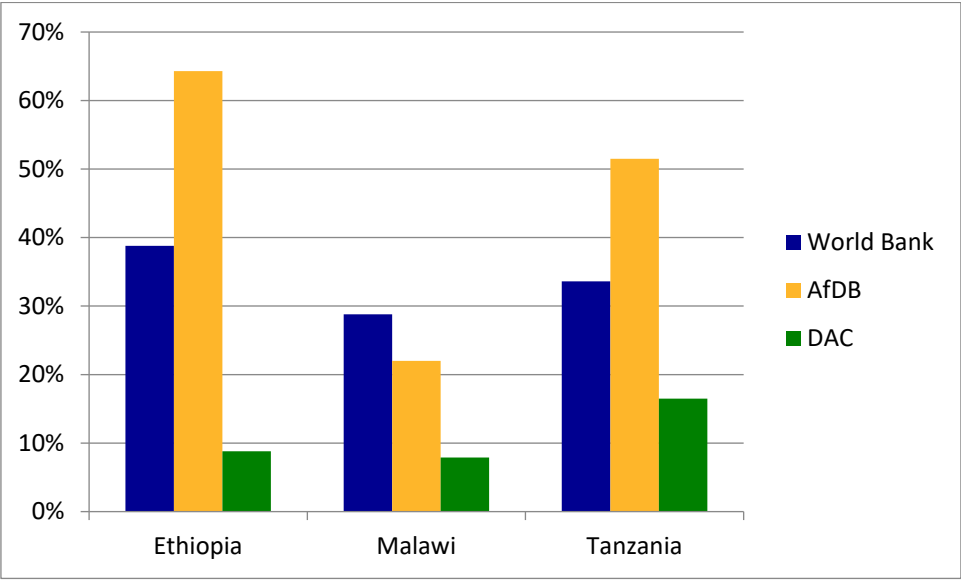
Notes: Real 2013 US\$. The dominance of Chinese lending to concessional countries is driven by both the greater number of concessional countries as well as substantially greater amount lending to the individual countries within this group.

Figure 4. Country donations, IDA replenishment rounds



Source: World Bank IDA (2002, 2005, 2008, 2011, 2014 and 2017).

Figure 5. Share of infrastructure in total lending, 2000-2014 average



Sources: OECD (2017a), World Bank (2000-2014), AfDB (2000-2009; 2010-2014).

TABLES

Table 1. Sectoral Shares of Total Commitments by Provider, 2000-2014

		Infrastructure	Social	Budget Support	Other	Cumulative Commitments (US\$ billions)
World Bank	Concessional	35.6%	17.5%	23.8%	23.1%	\$91.2
	Non-Concessional	49.5%	3.1%	35.7%	11.7%	\$22.7
AfDB	Concessional	45.1%	8.3%	33.5%	13.2%	\$33.6
	Non-Concessional	46.7%	4.0%	35.2%	14.1%	\$33.3
DAC	ODA	18.1%	38%	10.9%	32.9%	\$423.5
	OOF	15.8%	0.2%	0	84.1%	\$17.1
China		70.9%	1.0%	1.7%	26.4%	\$97.0

Sources: AidData (Dreher et al., 2017), OECD (2017b), World Bank (2000-2014), AfDB (2000-2009; 2010-2014).

Notes: Real 2013 US\$. Sectoral categorization done on project-by-project basis by authors for World Bank, AfDB and China. DAC sectoral categorization taken from OECD (2017b). The distinction between ODA and OOF is only for illustrative purposes. Our statistical analysis only uses the distinction between concessional and non-concessional countries relevant for the MDBs.

Table 2: Response to Chinese lending in funding volumes

	a. For all recipient countries jointly				b. Distinguishing between concessional and non-concessional countries			
	(1) WB finance	(2) AfDB finance	(3) MDB finance	(4) DAC finance	(5) WB finance	(6) AfDB finance	(7) MDB finance	(8) DAC finance
Chinese finance	0.076 (0.33)	0.106** (0.04)	0.083 (0.17)	0.040 (0.26)	-0.022 (0.45)	0.006 (0.87)	-0.010 (0.66)	0.042 (0.39)
Non-concessional* Chinese finance					0.378*** (0.00)	0.204** (0.01)	0.263*** (0.00)	-0.006 (0.94)
Recipient-FE	YES	YES	YES	YES	YES	YES	YES	YES
Period-FE	YES	YES	YES	YES	YES	YES	YES	YES
Observations	260	266	267	268	260	266	267	268
Number of recipients	44	44	45	46	44	44	45	46
R-squared	0.615	0.858	0.759	0.635	0.671	0.880	0.790	0.636

Notes: ppml-regression. Chinese finance in logs. Dependent variables refer to the year (t) following the two-year period considered for the explanatory variables and controls (average for t-1 and t-2). *, **, and *** show significance at the 10, 5, and 1% level respectively; p-values in parentheses. Standard errors are clustered by recipients. Controls include GDP per capita, under 5 mortality, population, population squared, reserves, resource rents, UN voting with US, political freedom index, and a dummy for non-concessional countries.

Table 3: Response to Chinese lending in sector allocation

	a. For all recipient countries jointly				b. Distinguishing between concessional and non-concessional countries			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	WB	AfDB	MDBs	DAC	WB	AfDB	MDBs	DAC
	<i>Infrastructure finance</i>							
% Chinese	-0.020	-0.070	-0.039	0.028	0.010	-0.056	-0.037	0.047
	(0.81)	(0.34)	(0.56)	(0.63)	(0.91)	(0.44)	(0.61)	(0.57)
Non-concessional*					-0.449**	-0.219	-0.019	-0.053
% Chinese					(0.04)	(0.46)	(0.88)	(0.64)
	<i>Social sector finance</i>							
% Chinese	0.128	0.153	0.065	0.015	0.128	0.097	0.041	0.029
	(0.48)	(0.33)	(0.53)	(0.48)	(0.48)	(0.59)	(0.70)	(0.21)
Non-concessional*					0.084	1.055	0.328	-0.053
% Chinese					(0.84)	(0.12)	(0.17)	(0.23)
	<i>Budget finance</i>							
% Chinese	-0.063	-0.057	-0.015	0.078	-0.068	-0.064	0.019	0.144*
	(0.47)	(0.68)	(0.83)	(0.43)	(0.49)	(0.65)	(0.82)	(0.09)
Non-concessional*					0.024	-0.329	-0.193	-0.270
% Chinese					(0.93)	(0.41)	(0.37)	(0.89)
Recipient-FE	YES	YES	YES	YES	YES	YES	YES	YES
Period-FE	YES	YES	YES	YES	YES	YES	YES	YES

Notes: ppml-model. % Chinese in logs. Dependent variables refer to the year (t) following the two-year period considered for the explanatory variables and controls (average for t-1 and t-2). *, **, and *** show significance at the 10, 5, and 1% level respectively; p-values in parentheses. Standard errors are clustered by recipients. Controls include GDP per capita, under 5 mortality, population, population squared, reserves, resource rents, UN voting with US, political freedom index, and a dummy for non-concessional countries.

APPENDIX

Table A1: Variable description and sources

Variable	Observations	Mean	Std. Dev.	Min	Max	Description	Sources
WB finance	735	155.07	289.95	0	4008	World Bank concessional and non-concessional combined, in millions of 2013 US\$	World Bank (2000-2014)
AfDB finance	735	108.81	314.33	0	5437.2	AfDB concessional and non-concessional, in millions of 2013 US\$	AfDB (2000-2009, 2010-2014)
MDB finance	735	263.88	512.82	0	7740.5	World Bank and African DB, concessional and non-concessional combined, in millions 2013 US\$	
DAC finance	735	530.02	812.63	3.3	13374.1	DAC bilateral donors, ODA and OOF combined, in millions of 2013 US\$	OECD (2017a)
Chinese finance	735	115.63	367.17	0	3779.8	Chinese official finance, in millions of 2013 US\$.	AidData (Dreher et al., 2017)
% Chinese	735	9.29	18.47	0	94.67	Chinese lending in % of total (MDBs + DAC + Chinese)	
% Chinese_GDP	732	1.101527	4.84	0	70.93	Chinese lending in % of recipient GDP	
WB infra	526	29.89	33.51	0	100	Infrastructure lending in % of total WB lending	
AfDB infra	527	39.94	41.33	0	100	Infrastructure lending in % of total AFDB lending	
MDB infra	606	34.48	32.38	0	100	Infrastructure lending in % of total MDB lending	
DAC infra	735	11.15	14.60	0	90.36	Infrastructure lending in % of total DAC ODA	
WB social	526	18.27	28.15	0	100	Social lending in % of total WB lending	
AfDB social	527	12.89	28.72	0	176.92	Social lending in % of total AFDB lending	
MDB social	606	16.47	24.89	0	107.89	Social lending in % of total MDB lending	
DAC social	735	34.17	19.54	1.22	93.47	Social lending in % of total DAC finance	
WB budget	526	27.11	33.30	0	100	Budget support in % of total WB lending	
AfDB budget	527	25.05	36.05	0	100	Budget support in % of total AFDB lending	
MDB budget	606	26.17	30.67	0	100	Budget support in % of total MDB lending	
DAC budget	735	4.43	9.15	0	73.14	Budget support in % of total DAC finance	
Non-concessional	735	0.24	0.43	0	1	Recipient not eligible for concessional funding by IDA and AfDF	

Table A1 (continued)

Variable	Observations	Mean	Std. Dev.	Min	Max	Description	Sources
GDP per capita	732	4674.55	5939.91	503.83	40015.82	GDP per capita, PPP, 2011 intl. \$	World Bank (2017a)
Under 5 mortality	735	98.08	47.68	13.8	235.8	Probability per 1000 that a newborn baby will die before reaching age five	World Bank (2017a)
Population	732	18.53	26.96	0.08	176.46	Population in millions	World Bank (2017a)
Reserves	559	118.82	402.15	0.01	3840.12	Ratio of hard currency reserves to external debt, in %	World Bank (2017a)
Resource rents	727	13.29	13.71	0.001	89.17	Resource rents in % of GDP	World Bank (2017a)
UN voting with US	637	0.34	0.13	0	0.7	Alignment on important votes	Kilby (2011, updated)
Political Freedom Index	735	4.23	1.52	1	7	Political freedom, 1=best,...,7=worst	Freedom House (2017)
Trade openness	686	79.39	41.90	20.96	351.11	Exports +Imports in % of GDP	World Bank (2017a)
Political stability	686	-0.45	0.85	-2.67	1.19	Political stability and absence of violence /terrorism measured through perceptions of the likelihood of political instability and/or politically motivated violence, incl. terrorism. Higher values indicate higher stability.	World Bank (2018)
II index	633	26.86	13.92	7.10	66.80	Institutional Investor index on investor perception of likelihood of default (lower number means more likely to default)	Institutional Investor (2000-2014)
Inflation	707	9.00	27.93	-9.62	513.91	Inflation, consumer prices (annual %)	World Bank (2017a)
Chinese steel production	735	422105	229573	124260	822000	Chinese production of crude steel in kt, lagged by 1 year	Gehring et al. (2018)
Probability to receive Chinese finance	686	0.46	0.33	0	1	Share of years in 2000-2014 in which the country received Chinese aid.	AidData (Dreher et al., 2017)

Notes: Descriptive statistics refer to the annual data. Generally, no sources are mentioned for composed variables computed from data for which the sources have already been provided.

APPENDIX (Part 2: Robustness tests)

1. Robustness tests for overall financial flows

Table A2 presents robustness tests for the results of the ppml-model in Table 2 using different methodological specifications found for aid allocation models in the literature. All of them have certain advantages, but also disadvantages. For instance, the tobit-model correctly considers the censored nature of aid data, but—given the limited length of our time series—cannot include recipient-FE without a potentially serious incidental parameter problem. Other models are presented with different combinations of fixed effects to show the effect, if any, of these changes. Finally, to allow a better comparison to different extant specifications in the literature, along with ppml- and log-models, in which the relevant coefficients can be interpreted as elasticities (blocks a and b), we also show models using the finance volumes directly (blocks c-f).

The resulting estimations strongly confirm the null-result for concessional countries and the positive relationship between Chinese aid and MDB funding for non-concessional countries. The result presented in Table 2 for the AfDB alone is, however, confirmed only in the log model (Table A2, block b).

Table A2: Replication of Table 2, block b, using different estimation methods

	a. ppml (with recipient-FE only) ¹				b. log model (recipient and period-FE) ²			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	WB	AfDB	MDB	DAC	WB	AfDB	MDB	DAC
	finance	finance	finance	finance	finance	finance	finance	finance
Chinese finance	0.007 (0.71)	0.014 (0.69)	0.007 (0.81)	0.044 (0.48)	0.019 (0.77)	-0.122* (0.05)	-0.080 (0.14)	-0.017 (0.59)
Non-concessional* Chinese finance	0.189*** (0.01)	0.150 (0.15)	0.243*** (0.00)	-0.022 (0.81)	0.432*** (0.00)	0.292** (0.05)	0.529*** (0.00)	0.083** (0.04)
GDP per capita	0.000 (0.87)	0.000** (0.05)	0.000 (0.26)	0.000 (0.63)	-0.000 (0.90)	0.000* (0.08)	0.000** (0.04)	0.000 (0.37)
Under 5 mortality	-0.007*** (0.00)	-0.023** (0.02)	-0.013 (0.13)	-0.006* (0.08)	-0.013 (0.27)	-0.037*** (0.00)	-0.035*** (0.00)	-0.009* (0.07)
Population	-0.031 (0.16)	-0.178* (0.06)	-0.076 (0.34)	0.001 (0.97)	-0.034 (0.58)	-0.064 (0.42)	-0.085 (0.22)	-0.062 (0.14)
Population squared	0.000 (0.37)	0.001* (0.06)	0.000 (0.28)	-0.000 (0.43)	0.000 (0.84)	0.000 (0.31)	0.000 (0.31)	0.000 (0.22)
Reserves	-0.000 (0.28)	-0.000 (0.65)	-0.000 (0.81)	-0.000 (0.51)	-0.000* (0.09)	-0.000 (0.61)	-0.000 (0.72)	-0.000 (0.99)
Resource rents	-0.020*** (0.01)	-0.003 (0.96)	-0.011 (0.65)	0.005 (0.72)	-0.069*** (0.00)	0.000 (0.98)	-0.041*** (0.01)	-0.005 (0.48)
UN voting with US	-0.306 (0.39)	-1.192 (0.28)	-0.806 (0.16)	-1.620* (0.09)	-0.683 (0.70)	-0.894 (0.52)	-1.184 (0.41)	0.241 (0.72)
Political freedom index	-0.049 (0.49)	0.338 (0.20)	0.063 (0.66)	-0.162** (0.02)	-0.308 (0.21)	-0.433 (0.18)	-0.310 (0.14)	-0.110 (0.19)
Recipient-FE	YES	YES	YES	YES	YES	YES	YES	YES
Period-FE	NO	NO	NO	NO	YES	YES	YES	YES
Observations	260	266	267	268	268	268	268	268
Number of recipients	44	44	45	46	46	46	46	46
R-squared ³	0.624	0.684	0.585	0.503	0.208	0.104	0.209	0.243

Table A2 (continued)

	c. FE-model (recipient- and period-FE)				d. FE-model (recipient-FE only)			
	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	WB finance	AfDB finance	MDB finance	DAC finance	WB finance	AfDB finance	MDB finance	DAC finance
Chinese finance	0.018 (0.76)	0.086 (0.21)	0.104 (0.19)	-0.079 (0.82)	-0.021 (0.86)	0.053 (0.67)	0.032 (0.88)	-0.124 (0.71)
Non-concessional* Chinese finance	0.678*** (0.00)	-0.005 (0.96)	0.672*** (0.00)	0.203 (0.59)	0.820*** (0.00)	0.076 (0.79)	0.896* (0.06)	0.120 (0.87)
GDP per capita	0.019 (0.41)	0.046* (0.09)	0.065 (0.13)	0.048 (0.55)	0.026 (0.42)	0.038 (0.27)	0.064 (0.26)	0.029 (0.75)
Under 5 mortality	1.019 (0.55)	-0.730 (0.18)	0.289 (0.88)	-2.939 (0.40)	0.316 (0.83)	-0.370 (0.81)	-0.053 (0.98)	-2.071 (0.62)
Population	15.565 (0.21)	4.814 (0.59)	20.377 (0.21)	73.549* (0.07)	17.380 (0.30)	2.915 (0.87)	20.292 (0.50)	68.070 (0.15)
Population squared	0.039 (0.32)	0.004 (0.89)	0.043 (0.42)	-0.417*** (0.00)	0.035 (0.59)	0.013 (0.85)	0.047 (0.67)	-0.394** (0.03)
Reserves	-0.057** (0.01)	-0.033 (0.25)	-0.090** (0.02)	-0.121 (0.23)	-0.049 (0.54)	-0.034 (0.69)	-0.083 (0.56)	-0.149 (0.50)
Resource rents	-1.344 (0.60)	0.558 (0.89)	-0.786 (0.89)	1.109 (0.91)	-1.196 (0.79)	0.927 (0.84)	-0.268 (0.97)	2.871 (0.82)
UN voting with US	-219.331 (0.21)	-106.025 (0.76)	-325.396 (0.47)	-1050.166 (0.38)	-199.650 (0.40)	-219.723 (0.38)	-419.400 (0.32)	-1138.357* (0.09)
Political freedom index	-27.982 (0.36)	26.978 (0.27)	-1.011 (0.98)	-65.310 (0.24)	-34.160 (0.44)	10.914 (0.82)	-23.252 (0.77)	-104.969 (0.40)
Recipient-FE	YES	YES	YES	YES	YES	YES	YES	YES
Period-FE	YES	YES	YES	YES	NO	NO	NO	NO
Observations	268	268	268	268	268	268	268	268
Number of recipients	46	46	46	46	46	46	46	46
R-squared ³	0.193	0.054	0.140	0.085	0.149	0.027	0.095	0.055

Table A2 (continued)

	e. RE-model (period-FE only)				f. Tobit-model ⁴ (period-FE only)			
	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
	WB finance	AfDB finance	MDB finance	DAC finance	WB finance	AfDB finance	MDB finance	DAC finance
Chinese finance	0.104 (0.19)	0.080 (0.46)	0.173 (0.25)	0.145 (0.54)	0.058 (0.62)	0.091 (0.50)	0.092 (0.64)	0.065 (0.81)
Non-concessional	31.390 (0.71)	325.148* (0.06)	397.607* (0.06)	-330.164 (0.37)	-132.869 (0.44)	299.498 (0.19)	160.280 (0.60)	-408.345 (0.27)
Non-concessional* Chinese finance	0.697*** (0.00)	-0.018 (0.90)	0.619** (0.01)	-0.261 (0.41)	0.962*** (0.00)	0.088 (0.80)	0.959** (0.05)	-0.128 (0.85)
GDP per capita	-0.010 (0.17)	-0.015 (0.18)	-0.030** (0.04)	0.006 (0.84)	-0.009 (0.59)	-0.027 (0.25)	-0.021 (0.51)	0.013 (0.73)
Under 5 mortality	-1.315** (0.02)	-0.893 (0.15)	-2.383** (0.02)	-3.877** (0.01)	-1.722** (0.04)	-1.613 (0.14)	-2.408 (0.11)	-3.525* (0.06)
Population	6.135** (0.02)	7.561* (0.08)	13.816** (0.02)	24.154*** (0.00)	7.225*** (0.01)	9.104** (0.01)	13.073*** (0.01)	25.553*** (0.00)
Population squared	0.001 (0.93)	-0.029 (0.16)	-0.028 (0.35)	-0.065 (0.13)	0.002 (0.93)	-0.034 (0.22)	-0.015 (0.69)	-0.079* (0.09)
Reserves	-0.090*** (0.00)	-0.103** (0.05)	-0.224** (0.01)	-0.199** (0.03)	-0.364** (0.03)	-0.205* (0.09)	-0.365** (0.03)	-0.181 (0.26)
Resource rents	0.557 (0.83)	-1.002 (0.49)	-0.081 (0.98)	3.695 (0.59)	-0.688 (0.79)	0.550 (0.87)	-1.431 (0.75)	3.397 (0.55)
UN voting with US	25.063 (0.84)	-164.939 (0.60)	-172.513 (0.65)	168.101 (0.78)	-105.303 (0.72)	-301.787 (0.42)	-365.068 (0.48)	3.793 (1.00)
Political freedom index	1.410 (0.89)	37.850 (0.10)	38.493 (0.20)	-7.568 (0.85)	1.360 (0.95)	30.881 (0.28)	32.423 (0.39)	-8.543 (0.85)
Recipient-FE	NO	NO	NO	NO	NO	NO	NO	NO
Period-FE	YES	YES	YES	YES	YES	YES	YES	YES
Observations	268	268	268	268	268	268	268	268
Number of recipients	46	46	46	46	46	46	46	46
R-squared/ χ -squared ³	0.364	0.259	0.350	0.277	111.3	39.15	80.55	76.87

Notes: Dependent variables refer to the year (t) following the two-year period considered for the explanatory variables and controls (average for t-1 and t-2). *, **, and *** show significance at the 10, 5, and 1% level respectively; p-values in parentheses. Standard errors are clustered by recipients. Fixed effects not shown, and dummy for non-concessional countries not shown for models with recipient-FE. As concessionality it is almost completely time-invariant in our sample (the only exception being Algeria with a change between 2013 and 2014) it is highly collinear with recipient-FE and drops out of many specifications.

¹Chinese finance in logs so that the relevant coefficients can be interpreted as elasticities.

²All donor funding (dependent variables and Chinese finance) in logs so that the relevant coefficients can be interpreted as elasticities.

³R-squared refers to within R-squared in the fixed effects regressions of blocks b-d. In the tobit-model (block f) general model fit is shown by the χ -squared statistics (no R-squared available).

⁴In terms of the latent variable (utility of funding allocation) the coefficients can be interpreted directly (including the coefficient of the interaction term). Number of left censored observations: WB 62, AfDB 71, MDB 35, DAC 0.

Table A3 further examines our results when instrumenting for Chinese aid. Endogeneity of the results should not be too much of an issue here, since our main result is a non-result, and the potential problem of reverse causality or also herding that would come to mind should lead to stronger effects rather than to a bias towards zero. In addition, the lag structure of our regression provides some protection against issues of reverse causality. Yet, to be sure, we follow Dreher et al. (2016), Bluhm et al. (2018) and Gehring et al. (2018) by instrumenting Chinese aid with the interaction of the plausibly exogenous time-series variable ‘Chinese steel production’, interacted with an (endogenous) cross-sectional difference, namely the probability to receive Chinese aid. Provided that the individual parts of the interaction term are included as controls in the regression, just as in any difference-in-difference (DiD) setup, the identifying assumption is that in absence of a change in Chinese steel production, there would be common trends in lending to countries with different probabilities to receive Chinese aid.

In contrast to the studies previously using this instrument, our data is not at the sub-national level (and averaged over periods of two years) so that we have much fewer observations. This affects the power of the tests for the quality of the instrument. Since the model specifications discussed in the context of Table A2 did not really matter in terms of our results, we select the one for which the Kleibergen-Paap statistics turn out to be relatively most convincing (simple FE model as in Table A2, block d).

If Chinese finance were endogenous, the interaction term of Chinese finance with non-concessional countries in Table A2 should be expected to be endogenous, too. Hence replicating Table A2, block d, directly would require an additional instrument. We avoid this further complication by carrying out the IV-regressions first for all recipients, second for non-concessional countries only, and third for concessional countries only.

According to these regressions, Chinese finance does not seem to affect any of the other donors in either type of countries. This further confirms the robust non-result for concessional countries, and raises some doubts even regarding the causal interpretation of the positive result for MDBs in non-concessional countries.

As the Kleibergen-Paap statistics remain rather unconvincing and the instrument is only significant at the 10% level for the sub-groups of concessional and non-concessional countries, some caution is required, however, in interpreting the outcome of the IV-regressions. Further research may be required to more firmly establish whether or not MDBs react to Chinese lending in non-concessional countries.

Table A3: Instrumental variable regression

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	All recipients				Non-concessional countries				Concessional countries			
Second stage, dep. variable:	WB finance	AfDB finance	MDB finance	DAC finance	WB finance	AfDB finance	MDB finance	DAC finance	WB finance	AfDB finance	MDB finance	DAC finance
Chinese finance	-0.002 (1.00)	0.021 (0.93)	0.019 (0.97)	-2.294 (0.16)	-0.596 (0.72)	0.460 (0.68)	-0.136 (0.95)	0.634 (0.44)	0.772 (0.21)	0.158 (0.45)	0.930 (0.18)	-6.574 (0.18)
First stage, dep. variable:	Chinese finance											
Chinese steel production* probability to receive Chin. finance		0.0006 (0.03)				0.0016 (0.08)					0.0004 (0.05)	
Kleibergen-Paap weak identification F-statistic		5.053				3.979					4.048	
Kleibergen-Paap under- identification test p-value		0.041				0.056					0.088	

Notes: Fixed effects regression with recipient-FE. Dependent variables refer to the year (t) following the two-year period considered for the explanatory variables and controls (average for t-1 and t-2). *, **, and *** show significance at the 10, 5, and 1% level respectively; p-values in parentheses. Standard errors are clustered by recipients. Controls in both stages of the regressions are as in Tables 2 or A2, and, additionally, include the individual parts of the interacted instrument, namely Chinese steel production and the probability to receive Chinese finance. Separate regressions for concessional and non-concessional countries are presented to avoid the inclusion of a potentially endogenous interaction term that would require an additional instrument.

As shown in Table A4 below, adding further control variables to the base-model model without instrumentation presented in Table 2 of the main text does not change the initial results. In none of the 16 additional regression specifications do we obtain a significant coefficient for concessional countries. Both individually and jointly, the MDBs show a significant reaction to the inflow of Chinese funding by increasing their funding to non-concessional countries, however. As before, no such reaction can be observed for DAC donors.

Table A4: Replication of Table 2, block b, adding further controls

	a. Adding Trade openness				b. Adding Political stability			
	(1) WB finance	(2) AfDB finance	(3) MDB finance	(4) DAC finance	(5) WB finance	(6) AfDB finance	(7) MDB finance	(8) DAC finance
Chinese finance	-0.022 (0.43)	0.025 (0.50)	-0.004 (0.85)	0.040 (0.38)	-0.034 (0.21)	0.005 (0.89)	-0.020 (0.33)	0.042 (0.34)
Non-concessional* Chinese finance	0.361*** (0.00)	0.169** (0.02)	0.241*** (0.00)	0.004 (0.95)	0.363*** (0.00)	0.165** (0.02)	0.242*** (0.00)	0.001 (0.98)
GDP per capita	-0.000 (0.63)	0.001** (0.05)	0.000 (0.50)	0.000 (0.62)	-0.000 (0.31)	0.000 (0.13)	0.000 (0.99)	0.000 (0.49)
Under 5 mortality	0.003 (0.83)	-0.036** (0.01)	-0.011 (0.19)	-0.009 (0.31)	0.019 (0.15)	-0.019 (0.19)	0.007 (0.48)	-0.013 (0.12)
Population	0.006 (0.94)	-0.086 (0.27)	-0.033 (0.65)	0.011 (0.79)	0.007 (0.93)	-0.045 (0.55)	-0.011 (0.85)	0.009 (0.82)
Population squared	0.000 (0.65)	0.000 (0.29)	0.000 (0.48)	-0.000 (0.24)	0.000 (0.40)	0.000 (0.30)	0.000 (0.34)	-0.000 (0.16)
Reserves	-0.001 (0.30)	-0.001 (0.40)	-0.001 (0.29)	-0.000 (0.44)	-0.001 (0.31)	-0.001 (0.35)	-0.001 (0.26)	-0.000 (0.50)
Resource rents	-0.019 (0.33)	-0.032 (0.42)	-0.024 (0.26)	0.002 (0.89)	-0.010 (0.63)	-0.021 (0.60)	-0.013 (0.57)	-0.001 (0.94)
UN voting with US	-1.066 (0.27)	0.893 (0.47)	-0.455 (0.67)	-1.621 (0.25)	-0.925 (0.39)	1.130 (0.32)	-0.215 (0.83)	-1.674 (0.24)
Political freedom index	-0.163 (0.32)	0.338 (0.12)	0.041 (0.75)	-0.090 (0.26)	-0.134 (0.49)	0.375* (0.09)	0.065 (0.67)	-0.103 (0.23)
Trade openness	0.007 (0.19)	0.006 (0.16)	0.006 (0.19)	-0.005 (0.45)	0.008 (0.13)	0.007* (0.08)	0.008* (0.09)	-0.005 (0.41)
Political stability					0.743** (0.02)	0.650** (0.05)	0.750*** (0.00)	-0.227 (0.26)
Recipient-FE	YES	YES	YES	YES	YES	YES	YES	YES
Period-FE	YES	YES	YES	YES	YES	YES	YES	YES
Observations	239	240	246	247	239	240	246	247
Number of recipients	42	40	43	44	42	40	43	44
R-squared	0.666	0.887	0.793	0.664	0.691	0.899	0.819	0.663

Table A4 (continued)

	c. Adding II-index				d. Adding Inflation			
	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	WB finance	AfDB finance	MDB finance	DAC finance	WB finance	AfDB finance	MDB finance	DAC finance
Chinese finance	-0.012 (0.71)	0.028 (0.47)	0.002 (0.94)	0.038 (0.38)	-0.021 (0.48)	0.018 (0.64)	-0.007 (0.74)	0.050 (0.28)
Non-concessional* Chinese finance	0.416*** (0.00)	0.212** (0.01)	0.290*** (0.00)	-0.024 (0.74)	0.433*** (0.00)	0.234*** (0.01)	0.310*** (0.00)	-0.043 (0.56)
GDP per capita	-0.001* (0.06)	0.000 (0.24)	-0.000 (0.46)	0.000 (0.43)	-0.001* (0.06)	0.000 (0.27)	-0.000 (0.42)	0.000 (0.36)
Under 5 mortality	0.032** (0.02)	-0.025* (0.09)	0.011 (0.38)	-0.014 (0.14)	0.034** (0.02)	-0.025* (0.09)	0.012 (0.35)	-0.011 (0.23)
Population	-0.023 (0.69)	-0.044 (0.50)	-0.019 (0.70)	0.012 (0.77)	-0.014 (0.82)	-0.039 (0.54)	-0.010 (0.83)	0.014 (0.76)
Population squared	0.000 (0.24)	0.000 (0.33)	0.000 (0.43)	-0.000 (0.25)	0.000 (0.31)	0.000 (0.35)	0.000 (0.49)	-0.000 (0.24)
Reserves	-0.002 (0.12)	-0.001 (0.16)	-0.002* (0.08)	-0.000 (0.92)	-0.002 (0.12)	-0.001 (0.15)	-0.002* (0.08)	-0.000 (0.83)
Resource rents	-0.012 (0.49)	-0.027 (0.48)	-0.019 (0.35)	0.002 (0.88)	-0.012 (0.49)	-0.026 (0.50)	-0.019 (0.36)	0.000 (0.99)
UN voting with US	-1.031 (0.34)	1.429 (0.20)	-0.213 (0.83)	-1.537 (0.24)	-1.025 (0.35)	1.583 (0.17)	-0.145 (0.89)	-1.579 (0.20)
Political freedom index	-0.260 (0.28)	0.191 (0.33)	-0.102 (0.46)	-0.010 (0.91)	-0.263 (0.27)	0.184 (0.35)	-0.102 (0.44)	0.018 (0.83)
Trade openness	0.008 (0.10)	0.006 (0.14)	0.007 (0.11)	-0.005 (0.39)	0.009* (0.08)	0.006 (0.16)	0.007* (0.08)	-0.007 (0.31)
Political stability	-0.027 (0.94)	-0.054 (0.91)	-0.020 (0.96)	-0.061 (0.78)	0.031 (0.94)	-0.139 (0.79)	-0.031 (0.94)	0.076 (0.70)
II-index	0.115** (0.02)	0.081* (0.06)	0.103** (0.01)	-0.039* (0.08)	0.111** (0.02)	0.085* (0.06)	0.102** (0.02)	-0.034* (0.08)
Inflation					-0.015 (0.32)	-0.007 (0.21)	-0.011* (0.10)	0.011** (0.02)
Recipient-FE	YES	YES	YES	YES	YES	YES	YES	YES
Period-FE	YES	YES	YES	YES	YES	YES	YES	YES
Observations	222	224	229	230	215	217	222	223
Number of recipients	41	40	42	43	40	39	41	42
R-squared	0.754	0.911	0.857	0.677	0.756	0.910	0.858	0.711

Table A5 considers different lags structures to ensure that we did not miss any important donor response simply by making wrong assumptions about the MDBs' or the DAC donors' reaction time. In the first block of regressions, we regress lending by MDBs and DAC donors in t on the average values for Chinese aid and control variables in the three-year period $t-1$, $t-2$, and $t-3$ (rather than in a two year period as in Table 2). In the following blocks, we use an annual panel (no averaging) with a one-year lag, two-year lag, and three-year lag for Chinese aid respectively. We find very few significant coefficients here. The annual panel with a one-year lag comes close to the results in Tables 2 and A2, with significant interaction terms suggesting a potentially positive reaction of World Bank lending (and overall MDB lending) to Chinese aid inflows. In the blocks with other lag structures, not even Chinese inflows in non-concessional countries shows any significant effect.

Table A5: Replication of Table 2, block b, with different period and lag specifications

	a. Chinese finance and all controls averaged over years $t-1$, $t-2$ and $t-3$				b. Annual panel, Chinese finance and all controls for $t-1$			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	WB finance	AfDB finance	MDB finance	DAC finance	WB finance	AfDB finance	MDB finance	DAC finance
Chinese finance	-0.003 (0.97)	-0.121 (0.28)	-0.032 (0.66)	0.083** (0.02)	0.015 (0.49)	-0.010 (0.64)	0.002 (0.90)	0.052 (0.15)
Non-concessional* Chinese finance	0.010 (0.94)	-0.113 (0.52)	-0.102 (0.48)	-0.045 (0.40)	0.268** (0.02)	0.082 (0.18)	0.140*** (0.00)	-0.039 (0.38)
GDP per capita	-0.000 (0.70)	-0.000 (0.99)	-0.000 (0.81)	-0.000* (0.07)	0.000 (0.11)	0.000 (0.19)	0.000* (0.10)	0.000 (0.28)
Under 5 mortality	0.011 (0.28)	0.004 (0.78)	0.008 (0.45)	0.000 (0.95)	0.003 (0.64)	0.003 (0.64)	0.004 (0.49)	-0.008 (0.25)
Population	-0.125** (0.04)	-0.057 (0.46)	-0.103* (0.07)	-0.055 (0.15)	0.023 (0.56)	-0.024 (0.69)	0.014 (0.73)	0.039 (0.30)
Population squared	0.000** (0.02)	0.000 (0.55)	0.000* (0.08)	0.000 (0.16)	-0.000 (0.76)	0.000 (0.13)	0.000 (0.95)	-0.000** (0.04)
Reserves	-0.003** (0.05)	-0.000 (0.58)	-0.001 (0.25)	0.000* (0.07)	-0.000 (0.60)	0.001 (0.28)	0.000 (0.55)	-0.000 (0.27)
Resource rents	-0.057** (0.01)	-0.095*** (0.01)	-0.070*** (0.00)	-0.039*** (0.00)	-0.019** (0.04)	-0.007 (0.70)	-0.014 (0.17)	-0.003 (0.83)
UN voting with US	-5.127** (0.03)	-4.330 (0.24)	-4.916* (0.07)	0.018 (0.99)	0.774 (0.35)	0.183 (0.91)	0.422 (0.69)	-1.183 (0.10)
Political freedom index	-0.207 (0.36)	0.340 (0.36)	-0.024 (0.92)	-0.084 (0.45)	-0.211* (0.06)	0.040 (0.75)	-0.108 (0.30)	-0.200** (0.03)
Recipient-FE	YES	YES	YES	YES	YES	YES	YES	YES
Period-FE	YES	YES	YES	YES	YES	YES	YES	YES
Observations	146	154	158	158	473	487	487	489
Number of recipients	43	45	46	46	42	44	44	46
R-squared	0.835	0.750	0.804	0.816	0.674	0.699	0.764	0.606

Table A5 (continued)

	c. Annual panel, all controls for t-1, Chinese finance for t-2				d. Annual panel, all controls for t-1, Chinese finance for t-3			
	(9) WB finance	(10) AfDB finance	(11) MDB finance	(12) DAC finance	(13) WB finance	(14) AfDB finance	(15) MDB finance	(16) DAC finance
Chinese finance	0.035 (0.17)	-0.041 (0.30)	0.003 (0.92)	0.025 (0.26)	-0.015 (0.64)	-0.061** (0.02)	-0.040 (0.18)	-0.008 (0.66)
Non-concessional* Chinese finance	-0.147 (0.19)	0.023 (0.70)	-0.065 (0.26)	0.011 (0.84)	-0.033 (0.70)	0.026 (0.77)	0.014 (0.86)	0.017 (0.57)
GDP per capita	0.000 (0.18)	0.000 (0.11)	0.000 (0.12)	0.000 (0.32)	0.000 (0.34)	0.000 (0.10)	0.000* (0.09)	0.000 (0.25)
Under 5 mortality	0.016 (0.10)	-0.001 (0.85)	0.008 (0.20)	-0.007 (0.32)	0.015 (0.17)	0.003 (0.65)	0.009 (0.17)	-0.008 (0.28)
Population	0.051 (0.30)	-0.041 (0.39)	0.024 (0.57)	0.062 (0.12)	0.037 (0.43)	-0.053 (0.37)	0.011 (0.81)	0.081* (0.05)
Population squared	-0.000 (0.47)	0.000* (0.05)	-0.000 (0.91)	-0.000** (0.01)	-0.000 (0.65)	0.000* (0.06)	0.000 (0.83)	-0.000*** (0.00)
Reserves	-0.000 (0.28)	0.001 (0.30)	0.000 (0.62)	-0.000 (0.26)	-0.000 (0.56)	0.002*** (0.00)	0.001* (0.08)	-0.000 (0.25)
Resource rents	-0.014 (0.26)	-0.004 (0.82)	-0.009 (0.38)	0.003 (0.84)	-0.013 (0.22)	-0.005 (0.80)	-0.009 (0.39)	0.006 (0.71)
UN voting with US	0.711 (0.51)	-0.085 (0.96)	0.200 (0.85)	-1.113 (0.15)	0.988 (0.44)	-0.050 (0.97)	0.427 (0.71)	-1.267 (0.13)
Political freedom index	-0.273* (0.05)	0.108 (0.39)	-0.109 (0.39)	-0.220** (0.03)	-0.241 (0.11)	0.115 (0.36)	-0.091 (0.47)	-0.213* (0.09)
Recipient-FE	YES	YES	YES	YES	YES	YES	YES	YES
Period-FE	YES	YES	YES	YES	YES	YES	YES	YES
Observations	433	445	445	445	397	408	408	408
Number of recipients	37	38	38	38	37	38	38	38
R-squared	0.573	0.686	0.713	0.608	0.574	0.710	0.734	0.634

The two further significant coefficient estimates we get are, first, for DAC donors in concessional countries with a lagged three-year period average of Chinese finance and all controls, and, second, for AfDB in the annual panel with a three-year lag of Chinese funding. However, the first result is probably only driven by the averaging of the control variables or the related change in observations; otherwise, it should also find its reflection in at least one of the three annual lag models. The result thus appears rather spurious and does not suggest a wrong choice of the reaction period in the main model of Table 2. In the second case, the coefficient is very small (with a point estimate of the elasticity of -0.061). Hence, even if this result were not spurious, it would not be substantively very meaningful.

2. Robustness tests for the share of funding for infrastructure

In the following, very similar robustness tests are carried out as for overall aid allocation to a country in the previous section of this appendix. While the previous section refers to Table 2 in the main text as its baseline, this section refers to Table 3. Note, however, that Table 3 is more complex, including results for three different sectors. Our robustness tests only refer to the infrastructure sector (upper panel of Table 3), as this is where the bulk of Chinese lending goes.

Using the same types of methods as Table A2 for aid overall financial flows, Table A6 presents the results for the percentages of the MDBs' and the DAC donors' finance flowing into infrastructure. In the 24 regressions of this table, the coefficient for the share of Chinese aid becomes significant for concessional countries in only one case, and the interaction term with non-concessional countries becomes significant in only three cases and for different donors (the AfDB and the DAC, rather than the World Bank in Table 3).

Table A6: Replication of Table 3, block b, using different estimation methods

	a. ppml (with recipient-FE only) ¹				b. log model (recipient and period-FE) ²			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	WB	AfDB	MDB	DAC	WB	AfDB	MDB	DAC
	infra	infra	infra	infra	infra	infra	infra	infra
% Chinese	-0.030 (0.76)	-0.043 (0.60)	-0.051 (0.52)	0.078 (0.37)	0.059 (0.73)	-0.273** (0.04)	-0.078 (0.58)	0.012 (0.88)
Non-concessional* % Chinese	-0.064 (0.78)	-0.174 (0.45)	0.076 (0.62)	-0.094 (0.45)	-0.098 (0.77)	-0.226 (0.67)	0.192 (0.30)	-0.087 (0.58)
GDP per capita	0.000 (0.20)	-0.000 (0.68)	0.000 (0.19)	0.000 (0.17)	-0.000 (0.95)	-0.000 (0.68)	0.000 (0.38)	0.000 (0.26)
Under 5 mortality	-0.009 (0.12)	-0.006 (0.32)	-0.006 (0.10)	-0.002 (0.80)	0.009 (0.56)	-0.008 (0.68)	-0.012 (0.23)	0.005 (0.48)
Population	-0.045 (0.31)	0.042 (0.48)	0.020 (0.57)	0.014 (0.75)	-0.085 (0.42)	-0.014 (0.90)	0.025 (0.76)	-0.012 (0.82)
Population squared	0.000 (0.83)	-0.000 (0.64)	-0.000 (0.45)	0.000 (0.84)	0.000 (0.41)	0.000 (0.66)	-0.000 (0.85)	0.000 (0.50)
Reserves	0.003*** (0.00)	0.003** (0.03)	0.001*** (0.01)	-0.001*** (0.00)	0.005 (0.11)	0.003** (0.04)	0.001 (0.18)	-0.001*** (0.00)
Resource rents	-0.003 (0.81)	0.007 (0.61)	0.019* (0.05)	-0.002 (0.90)	-0.021 (0.40)	0.009 (0.80)	0.031 (0.20)	-0.023 (0.17)
UN voting with US	-0.969 (0.38)	1.615** (0.03)	0.154 (0.82)	1.349* (0.06)	-0.776 (0.78)	4.097* (0.07)	1.632 (0.32)	2.446** (0.02)
Political freedom index	0.199 (0.42)	-0.214 (0.27)	0.106 (0.51)	-0.233 (0.20)	0.166 (0.64)	-0.205 (0.56)	0.153 (0.60)	-0.649*** (0.00)
Recipient-FE	YES	YES	YES	YES	YES	YES	YES	YES
Period-FE	NO	NO	NO	NO	YES	YES	YES	YES
Observations	184	174	213	259	206	197	233	268
Number of recipients	36	34	39	43	44	44	45	46
R-squared ³	0.241	0.296	0.334	0.532	0.173	0.242	0.168	0.243

Table A6 (continued)

	c. FE-model (recipient- and period-FE)				d. FE-model (recipient-FE only)			
	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	WB infra	AfDB infra	MDB infra	DAC infra	WB infra	AfDB infra	MDB infra	DAC infra
% Chinese	0.018 (0.95)	-0.189 (0.46)	-0.223 (0.45)	0.029 (0.69)	-0.121 (0.73)	-0.215 (0.45)	-0.270 (0.38)	0.054 (0.48)
Non-concessional* % Chinese	-0.523 (0.20)	-3.090* (0.07)	-0.474 (0.29)	-0.178 (0.53)	-0.101 (0.79)	-1.204 (0.38)	-0.045 (0.92)	-0.104 (0.75)
GDP per capita	-0.005 (0.42)	-0.012 (0.16)	-0.000 (0.99)	0.003 (0.26)	0.005 (0.40)	-0.002 (0.66)	0.005 (0.14)	0.006* (0.05)
Under 5 mortality	0.312 (0.29)	0.120 (0.75)	0.112 (0.56)	0.210** (0.03)	-0.188 (0.26)	-0.341 (0.16)	-0.192 (0.12)	0.069 (0.33)
Population	-1.509 (0.34)	0.182 (0.93)	0.500 (0.72)	0.496 (0.54)	-0.836 (0.60)	1.096 (0.59)	0.734 (0.58)	0.759 (0.30)
Population squared	0.004 (0.47)	0.003 (0.70)	-0.001 (0.85)	-0.001 (0.64)	0.001 (0.91)	-0.002 (0.81)	-0.002 (0.60)	-0.002 (0.34)
Reserves	0.137*** (0.01)	0.039 (0.28)	0.040** (0.02)	-0.014*** (0.00)	0.140*** (0.00)	0.066** (0.05)	0.049*** (0.00)	-0.013*** (0.00)
Resource rents	-0.213 (0.64)	0.157 (0.81)	0.759* (0.09)	-0.139 (0.37)	0.133 (0.79)	0.445 (0.49)	0.973** (0.04)	-0.054 (0.74)
UN voting with US	0.219 (1.00)	78.467 (0.14)	41.948 (0.24)	23.121 (0.10)	-21.303 (0.53)	77.666** (0.03)	6.855 (0.80)	23.431** (0.01)
Political freedom index	4.884 (0.46)	-5.134 (0.41)	4.597 (0.39)	-4.277** (0.02)	4.975 (0.44)	-5.934 (0.37)	3.325 (0.52)	-4.129** (0.02)
Recipient-FE	YES	YES	YES	YES	YES	YES	YES	YES
Period-FE	YES	YES	YES	YES	NO	NO	NO	NO
Observations	206	197	233	268	206	197	233	268
Number of recipients	44	44	45	46	44	44	45	46
R-squared ³	0.143	0.255	0.160	0.249	0.057	0.199	0.120	0.210

Table A6 (continued)

	e. RE-model (period-FE only)				f. Tobit-model ⁴ (period-FE only)			
	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
	WB	AfDB	MDB	DAC	WB	AfDB	MDB	DAC
	infra	infra	infra	infra	infra	infra	infra	infra
% Chinese	-0.068 (0.82)	-0.210 (0.38)	-0.229 (0.39)	-0.020 (0.81)	-0.172 (0.62)	-0.529 (0.24)	-0.350 (0.16)	-0.053 (0.54)
Non-concessional	-2.655 (0.88)	6.729 (0.61)	5.756 (0.72)	5.216 (0.63)	-8.009 (0.79)	22.358 (0.55)	18.455 (0.47)	-2.092 (0.81)
Non-concessional* % Chinese	0.218 (0.67)	-1.519** (0.01)	-0.439 (0.29)	-0.321 (0.34)	0.374 (0.72)	-2.369 (0.17)	-0.592 (0.40)	-0.366* (0.08)
GDP per capita	-0.001 (0.82)	-0.000 (0.87)	-0.000 (0.92)	0.002 (0.14)	-0.001 (0.84)	-0.002 (0.54)	-0.001 (0.62)	0.003*** (0.00)
Under 5 mortality	-0.014 (0.86)	-0.193** (0.03)	-0.070 (0.37)	-0.021 (0.65)	-0.004 (0.98)	-0.417** (0.03)	-0.116 (0.34)	-0.003 (0.95)
Population	0.397 (0.20)	-0.005 (0.99)	0.162 (0.56)	0.132 (0.32)	0.957** (0.04)	0.120 (0.84)	0.459 (0.26)	0.282* (0.05)
Population squared	-0.002 (0.31)	0.000 (0.82)	-0.001 (0.71)	-0.001 (0.35)	-0.005 (0.12)	0.001 (0.86)	-0.002 (0.48)	-0.002 (0.11)
Reserves	0.058*** (0.00)	0.028*** (0.00)	0.030*** (0.00)	-0.014*** (0.00)	0.088** (0.04)	0.038 (0.18)	0.036* (0.07)	-0.015*** (0.00)
Resource rents	0.137 (0.64)	0.149 (0.48)	0.210 (0.50)	-0.037 (0.71)	0.175 (0.68)	0.230 (0.65)	0.338 (0.34)	-0.070 (0.58)
UN voting with US	3.827 (0.91)	45.807 (0.22)	11.497 (0.73)	1.718 (0.86)	-3.928 (0.94)	74.353 (0.23)	24.349 (0.55)	7.603 (0.60)
Political freedom index	3.540** (0.03)	1.136 (0.71)	4.154** (0.04)	-0.249 (0.83)	7.440* (0.05)	1.802 (0.72)	6.092* (0.06)	-0.461 (0.68)
Recipient-FE	NO	NO	NO	NO	NO	NO	NO	NO
Period-FE	YES	YES	YES	YES	YES	YES	YES	YES
Observations	206	197	233	268	206	197	233	268
Number of recipients	44	44	45	46	44	44	45	46
R-squared/ χ -squared ³	0.161	0.179	0.175	0.335	37.39	43.43	44.46	76.21

Notes: Dependent variables refer to the year (t) following the two-year period considered for the explanatory variables and controls (average for t-1 and t-2). *, **, and *** show significance at the 10, 5, and 1% level respectively; p-values in parentheses. Standard errors are clustered by recipients. Fixed effects not shown, and dummy for non-concessional countries not shown for models with recipient-FE. As concessionality it is almost completely time-invariant in our sample (the only exception being Algeria with a change between 2013 and 2014) it is highly collinear with recipient-FE and drops out of many specifications.

¹% Chinese in logs so that the relevant coefficients can be interpreted as elasticities.

²All donor funding (dependent variables and % Chinese) in logs so that the relevant coefficients can be interpreted as elasticities.

³R-squared refers to within R-squared in the fixed effects regressions of blocks b-d. In the tobit-model (block f) general model fit is shown by the χ -squared statistics (no R-squared available).

⁴In terms of the latent variable (utility of funding allocation) the coefficients can be interpreted directly (including the coefficient of the interaction term). Number of left censored observations: WB 62, AfDB 71, MDB 35, DAC 0.

The results for the AfDB and the DAC did not seem very robust in Table A6. However, when looking at an alternative specification of the relevance of Chinese finance in a country, namely replacing Chinese aid in % of total aid ('% Chinese') by Chinese aid in % of GDP ('% Chinese_GDP'), the negative effects for both of these donors in non-concessional countries gain some credibility (Table A7).

Table A7: Replication of Table 3, block b, and Table A6, block c, with Chinese finance in % of GDP

	a. ppml-model (recipient- and period-FE) ¹ (cf. Table 3, block b)				b. FE-model (recipient- and period-FE) ² (cf. Table A6, block c)			
	(1) WB infra	(2) AfDB infra	(3) MDB infra	(4) DAC infra	(5) WB infra	(6) AfDB infra	(7) MDB infra	(8) DAC infra
% Chinese_GDP	0.060 (0.76)	-0.083 (0.44)	-0.070 (0.57)	0.246* (0.09)	1.204 (0.19)	0.397 (0.44)	0.159 (0.85)	0.251 (0.24)
Non-concessional* % Chinese_GDP	0.980 (0.73)	-3.067** (0.02)	0.295 (0.50)	-0.658** (0.02)	1.569 (0.47)	-24.191*** (0.00)	2.081 (0.69)	-2.449** (0.04)
GDP per capita	-0.000 (0.23)	-0.000 (0.17)	0.000 (0.98)	-0.000 (1.00)	-0.005 (0.30)	-0.003 (0.56)	0.002 (0.48)	0.004 (0.30)
Under 5 mortality	0.018 (0.11)	0.002 (0.81)	0.003 (0.67)	0.005 (0.41)	0.211 (0.42)	-0.078 (0.83)	0.054 (0.78)	0.193* (0.06)
Population	-0.132** (0.01)	0.014 (0.84)	0.007 (0.85)	0.015 (0.76)	-1.114 (0.40)	0.139 (0.95)	0.347 (0.78)	0.555 (0.49)
Population squared	0.000** (0.02)	-0.000 (0.84)	-0.000 (0.77)	0.000 (0.71)	0.003 (0.51)	0.001 (0.88)	-0.001 (0.84)	-0.001 (0.58)
Reserves	0.003** (0.01)	0.002** (0.02)	0.001 (0.15)	-0.001*** (0.00)	0.125** (0.02)	0.085*** (0.00)	0.045* (0.06)	-0.014*** (0.00)
Resource rents	-0.022 (0.12)	-0.002 (0.90)	0.010 (0.30)	-0.010 (0.51)	-0.100 (0.82)	0.252 (0.69)	0.784* (0.09)	-0.123 (0.43)
UN voting with US	-0.995 (0.55)	1.581 (0.23)	0.935 (0.32)	1.673 (0.12)	-3.375 (0.94)	85.199 (0.12)	46.265 (0.19)	24.044* (0.06)
Political freedom index	0.176 (0.48)	-0.143 (0.40)	0.151 (0.37)	-0.226* (0.10)	4.502 (0.46)	-4.403 (0.47)	3.891 (0.44)	-4.263** (0.03)
Recipient-FE	YES	YES	YES	YES	YES	YES	YES	YES
Period-FE	YES	YES	YES	YES	YES	YES	YES	YES
Observations	180	172	213	242	206	197	233	268
Number of recipients	36	34	39	43	44	44	45	46
R-squared	0.330	0.373	0.363	0.742	0.158	0.278	0.148	0.253

Note: As opposed to the earlier regressions Chinese aid is now considered in % of the recipient's GDP rather than in % of financing by the MDBs, DAC donors and China combined. Otherwise, the specifications are unchanged.

¹% Chinese_GDP in logs so that the relevant coefficients can be interpreted as elasticities.

²R-squared refers to within R-squared in the fixed effects regressions of block b.

In turn, robustness tests adding further control variables to the original model in Table 3 add some credibility to a potential effect for the World Bank (Table A8). The table is constructed in the same way as Table A4 above. Note that in Table A8, for all donors, the coefficient estimates of the interaction term are consistently negative, even when they do not reach statistical significance.

Table A8: Replication of Table 3, block b, adding further controls

	a. Adding Trade openness				b. Adding Political stability			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	WB infra	AfDB infra	MDB infra	DAC infra	WB infra	AfDB infra	MDB infra	DAC infra
% Chinese	0.064 (0.51)	-0.018 (0.80)	-0.019 (0.78)	0.068 (0.43)	0.020 (0.84)	-0.031 (0.66)	-0.028 (0.71)	0.052 (0.57)
Non-concessional* % Chinese	-0.505** (0.03)	-0.183 (0.53)	-0.048 (0.66)	-0.153 (0.20)	-0.543** (0.02)	-0.163 (0.54)	-0.299** (0.02)	-0.091 (0.44)
GDP per capita	0.000 (0.72)	-0.000 (0.42)	-0.000 (0.79)	0.000 (0.53)	-0.000 (0.39)	-0.000 (0.34)	-0.000* (0.05)	-0.000 (0.97)
Under 5 mortality	0.015 (0.14)	-0.003 (0.79)	0.005 (0.47)	0.009 (0.26)	0.045*** (0.01)	0.002 (0.87)	0.024*** (0.01)	0.012 (0.18)
Population	-0.123*** (0.00)	0.027 (0.75)	-0.010 (0.84)	-0.002 (0.98)	-0.110** (0.04)	0.027 (0.74)	-0.012 (0.80)	0.004 (0.95)
Population squared	0.000* (0.08)	-0.000 (0.68)	0.000 (0.92)	0.000 (0.63)	0.000** (0.02)	-0.000 (0.75)	0.000 (0.42)	0.000 (0.46)
Reserves	0.003** (0.02)	0.002 (0.18)	0.001*** (0.01)	-0.002*** (0.00)	0.004*** (0.01)	0.002 (0.15)	0.000 (0.45)	-0.002*** (0.00)
Resource rents	-0.026** (0.03)	0.006 (0.68)	0.010 (0.31)	-0.015 (0.35)	-0.009 (0.48)	0.009 (0.55)	0.019* (0.07)	-0.010 (0.54)
UN voting with US	-1.503 (0.33)	1.944 (0.14)	0.910 (0.39)	1.295 (0.29)	-1.996 (0.21)	1.853 (0.17)	-0.140 (0.89)	1.022 (0.32)
Political freedom index	0.246 (0.37)	-0.110 (0.57)	0.174 (0.38)	-0.237 (0.16)	0.338 (0.20)	-0.083 (0.66)	0.226 (0.17)	-0.237* (0.06)
Trade openness	-0.006* (0.06)	-0.010* (0.07)	-0.002 (0.46)	0.000 (0.98)	-0.001 (0.71)	-0.009* (0.06)	-0.000 (0.85)	0.000 (0.93)
Political stability					1.292** (0.02)	0.241 (0.38)	0.827*** (0.01)	0.359 (0.17)
Recipient-FE	YES	YES	YES	YES	YES	YES	YES	YES
Period-FE	YES	YES	YES	YES	YES	YES	YES	YES
Observations	168	160	195	244	168	160	186	227
Number of recipients	34	31	37	41	34	31	37	41
R-squared	0.361	0.345	0.383	0.573	0.390	0.345	0.517	0.743

Table A8 (continued)

	c. Adding II-index				d. Adding Inflation			
	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	WB	AfDB	MDB	DAC	WB	AfDB	MDB	DAC
	infra	infra	infra	infra	infra	infra	infra	infra
% Chinese	-0.028 (0.74)	-0.013 (0.86)	-0.050 (0.47)	0.041 (0.66)	-0.033 (0.72)	-0.013 (0.86)	-0.081 (0.23)	0.025 (0.79)
Non-concessional* % Chinese	-0.884*** (0.00)	-0.232 (0.45)	-0.297** (0.02)	-0.154 (0.25)	-0.559** (0.02)	-0.248 (0.43)	-0.015 (0.89)	-0.154 (0.24)
GDP per capita	-0.000 (0.81)	-0.000 (0.36)	-0.000 (0.22)	0.000 (0.66)	-0.000 (0.22)	-0.000 (0.24)	-0.000 (0.61)	0.000 (0.69)
Under 5 mortality	0.050*** (0.00)	-0.005 (0.60)	0.023** (0.02)	0.018* (0.05)	0.055*** (0.00)	-0.003 (0.68)	0.016 (0.18)	0.020** (0.03)
Population	-0.041 (0.53)	0.048 (0.62)	0.029 (0.56)	0.014 (0.82)	-0.080 (0.19)	0.037 (0.72)	0.021 (0.69)	0.027 (0.65)
Population squared	0.000 (0.35)	-0.000 (0.65)	-0.000 (0.98)	0.000 (0.70)	0.000 (0.13)	-0.000 (0.78)	-0.000 (0.93)	0.000 (0.92)
Reserves	0.005** (0.02)	0.001 (0.24)	0.000 (0.34)	-0.002*** (0.00)	0.005** (0.01)	0.001 (0.25)	0.001*** (0.00)	-0.002*** (0.00)
Resource rents	-0.015 (0.35)	0.010 (0.50)	0.012 (0.30)	-0.012 (0.56)	-0.006 (0.71)	0.015 (0.32)	0.014 (0.22)	-0.011 (0.59)
UN voting with US	-1.867 (0.25)	3.158** (0.04)	0.536 (0.61)	1.109 (0.34)	-2.232 (0.18)	3.013* (0.05)	1.073 (0.39)	0.968 (0.41)
Political freedom index	0.300 (0.28)	0.152 (0.40)	0.278* (0.10)	-0.298* (0.08)	0.362 (0.22)	0.165 (0.36)	0.324* (0.08)	-0.244 (0.15)
Trade openness	-0.001 (0.75)	-0.008 (0.15)	-0.000 (0.91)	0.001 (0.84)	-0.001 (0.70)	-0.008 (0.17)	-0.000 (0.90)	-0.001 (0.88)
Political stability	1.420*** (0.01)	0.185 (0.50)	0.846*** (0.01)	0.306 (0.35)	1.355*** (0.01)	0.275 (0.31)	0.691** (0.04)	0.297 (0.37)
II-index	-0.032 (0.51)	-0.033 (0.21)	-0.015 (0.50)	0.022 (0.36)	-0.009 (0.83)	-0.038 (0.14)	-0.009 (0.69)	0.021 (0.40)
Inflation					0.022 (0.28)	0.010 (0.52)	0.012 (0.24)	0.007* (0.05)
Recipient-FE	YES	YES	YES	YES	YES	YES	YES	YES
Period-FE	YES	YES	YES	YES	YES	YES	YES	YES
Observations	148	154	173	223	156	153	182	214
Number of recipients	33	31	37	40	33	31	36	39
R-squared	0.380	0.386	0.506	0.571	0.405	0.391	0.381	0.580

Table A9 corresponds to Table A5 above, and presents results for different periods and lags of Chinese finance, now looking at its effect on lending to the infrastructure sector. As none of the coefficients for ‘% Chinese’ in concessional countries is significant, results clearly confirm that a different choice of the lag structure would not lead to different results than those presented on the basis of Table 3. Table A9 does not suggest either that we may have chosen a wrong lack structure to detect any effect for non-concessional countries.

Table A9: Replication of Table 3, block b, with different period and lag specifications

	a. % Chinese and all controls averaged over years t-1, t-2 and t-3				b. Annual panel, % Chinese and all controls for t-1			
	(1) WB infra	(2) AfDB infra	(3) MDB infra	(4) DAC infra	(5) WB infra	(6) AfDB infra	(7) MDB infra	(8) DAC infra
% Chinese	-0.100 (0.61)	0.167 (0.39)	-0.096 (0.50)	0.128 (0.44)	0.007 (0.92)	-0.008 (0.87)	-0.016 (0.74)	0.004 (0.94)
Non-concessional* % Chinese	0.195 (0.65)	0.099 (0.82)	-0.038 (0.92)	0.001 (1.00)	-0.019 (0.86)	-0.034 (0.76)	0.105 (0.20)	-0.520*** (0.00)
GDP per capita	-0.001* (0.10)	0.000 (0.19)	0.000 (0.94)	0.000* (0.07)	0.000 (0.24)	-0.000** (0.01)	-0.000 (0.35)	-0.000 (0.88)
Under 5 mortality	0.003 (0.85)	-0.007 (0.66)	-0.012 (0.40)	-0.005 (0.65)	-0.008 (0.45)	0.000 (0.96)	-0.005 (0.37)	-0.001 (0.92)
Population	-0.164 (0.16)	0.230** (0.05)	-0.010 (0.88)	-0.079 (0.29)	-0.027 (0.60)	0.009 (0.87)	0.004 (0.92)	0.017 (0.74)
Population squared	0.001 (0.18)	-0.001** (0.02)	-0.000 (0.78)	0.000 (0.13)	-0.000 (0.85)	-0.000 (0.97)	-0.000 (0.88)	0.000 (0.84)
Reserves	0.003 (0.31)	0.002 (0.14)	-0.001 (0.39)	-0.000 (0.58)	-0.000 (0.78)	-0.000* (0.08)	-0.000 (0.41)	-0.001*** (0.00)
Resource rents	-0.005 (0.85)	-0.005 (0.89)	-0.004 (0.85)	0.025 (0.47)	-0.005 (0.59)	0.013 (0.31)	0.021*** (0.00)	0.013 (0.22)
UN voting with US	-6.515 (0.11)	6.577** (0.03)	-4.482* (0.08)	3.508 (0.31)	0.026 (0.98)	-0.220 (0.77)	-0.354 (0.52)	0.691 (0.20)
Political freedom index	-0.209 (0.66)	0.300 (0.39)	0.006 (0.98)	-0.080 (0.82)	0.027 (0.90)	-0.099 (0.44)	0.025 (0.87)	-0.403*** (0.00)
Recipient-FE	YES	YES	YES	YES	YES	YES	YES	YES
Period-FE	YES	YES	YES	YES	YES	YES	YES	YES
Observations	114	101	129	145	328	349	417	475
Number of recipients	36	35	41	42	38	39	41	43
R-squared	0.340	0.501	0.386	0.633	0.296	0.220	0.280	0.524

Table A9 (continued)

	c. Annual panel, all controls for t-1, % Chinese for t-2				d. Annual panel, all controls for t-1, % Chinese for t-3			
	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	WB infra	AfDB infra	MDB infra	DAC infra	WB infra	AfDB infra	MDB infra	DAC infra
% Chinese	0.018 (0.71)	-0.008 (0.90)	0.021 (0.57)	0.070 (0.13)	-0.013 (0.81)	0.026 (0.62)	0.010 (0.82)	0.077 (0.14)
Non-concessional* % Chinese	0.191 (0.39)	-0.002 (0.99)	-0.056 (0.43)	-0.094 (0.18)	-0.121 (0.54)	-0.287*** (0.00)	-0.217** (0.02)	-0.002 (0.99)
GDP per capita	-0.000 (0.40)	-0.000** (0.02)	-0.000* (0.07)	0.000*** (0.01)	-0.000 (0.57)	-0.001*** (0.00)	-0.000 (0.46)	0.000*** (0.00)
Under 5 mortality	0.014 (0.10)	0.004 (0.62)	0.006 (0.34)	-0.012** (0.03)	0.007 (0.40)	0.004 (0.65)	-0.001 (0.83)	-0.022*** (0.00)
Population	-0.088** (0.02)	0.078 (0.18)	0.038 (0.26)	-0.004 (0.92)	-0.044 (0.32)	0.063 (0.27)	-0.043 (0.23)	-0.101** (0.02)
Population squared	0.000 (0.14)	-0.000 (0.40)	-0.000 (0.43)	0.000 (0.70)	0.000 (0.87)	-0.000 (0.34)	0.000 (0.43)	0.000*** (0.01)
Reserves	0.000* (0.09)	-0.000* (0.05)	-0.000 (0.36)	-0.001*** (0.00)	0.001 (0.21)	0.000* (0.09)	-0.000 (0.88)	-0.001*** (0.00)
Resource rents	-0.002 (0.88)	0.015 (0.22)	0.021** (0.01)	0.004 (0.72)	-0.001 (0.92)	0.005 (0.69)	0.021** (0.02)	0.001 (0.91)
UN voting with US	-0.807 (0.33)	0.153 (0.85)	-0.015 (0.98)	1.009* (0.08)	-0.006 (0.99)	0.237 (0.81)	0.021 (0.97)	0.518 (0.37)
Political freedom index	-0.067 (0.73)	-0.073 (0.60)	-0.013 (0.93)	-0.243** (0.02)	-0.083 (0.69)	-0.112 (0.51)	0.048 (0.75)	-0.107 (0.30)
Recipient-FE	YES	YES	YES	YES	YES	YES	YES	YES
Period-FE	YES	YES	YES	YES	YES	YES	YES	YES
Observations	308	303	365	427	269	262	335	381
Number of recipients	35	36	38	37	34	35	38	36
R-squared	0.319	0.225	0.301	0.523	0.322	0.306	0.348	0.566

¹ This paper takes AidData's nominal figures for China financing to Africa, and adjusts them (along with all other financing data used, including from DAC and the MDBs) for inflation with the U.S. Consumer Price Index for 2013. Thus, the numbers differ somewhat from AidData's aggregate numbers, which are adjusted with the GDP deflator. AidData reports total Chinese official flows to Africa at US\$121 billion for the 2000-2014 period.

² US\$86.3 billion, according to Bräutigam and Hwang (2016), based on the SAIS-CARI database.

³ During the time period in question, non-concessional countries included: Algeria, Botswana, Egypt, Equatorial Guinea, Gabon, Mauritius, Morocco, Namibia, Seychelles, South Africa, Swaziland and Tunisia. All other countries were classified as concessional or blend (concessional and non-concessional).

⁴ Bräutigam and Hwang (2016) present different numbers from AidData for the 2000-2014 period, based on the database of the SAIS-CARI project, but this data unfortunately cannot be broken down by country-year-sector, as AidData's can, and thus was not usable for this project.

⁶ This is particularly true in infrastructure, where for example (based on one of the author's experiences working in the World Bank), projects that are in reality for institutional strengthening in a infrastructure-related ministry or for preparing an infrastructure-related state-owned enterprise for privatization are categorized as "infrastructure". The present study, however, wishes to focus on actual physical infrastructure facilities.

⁷ A value of "one" is added prior to taking logs to deal with cases in which there are no financial flows. We follow the same strategy when taking logs of other variables with zero values in the robustness tests.

⁸ As the base value for concessional countries is essentially zero, the significant interaction terms also indicate that the overall effect for non-concessional countries is significantly different from zero.

⁹ We test this by repeating the computation of Table 2 while leaving out, one by one, each of the nine non-concessional African countries in our sample. The interaction term for the World Bank and both MDBs remains highly significant in each case.

¹⁰ The World Bank's criteria for IDA allocation have changed over the years, but have during the entire period of this study followed a relatively similar and transparent formula. The most recent formula involves giving each country a "base" allocation of US\$4.5-6 million, with further amounts depending on a formula that includes: GNI per capita, population, and the country performance rating. The latter is, in turn, derived from four sets of Country Policy and Institutional Assessment (CPIA) ratings and the IDA Portfolio Performance Rating (PPR), as follows: $CPR = (.24 * CPIA [A-C] + .68 * CPIA [D] + .08 * PPR)$. For details, see World Bank 2014, Annex 2. Since 1999, ADF has used a similar allocation formula, with minor differences. For details, see AfDB 2018.

¹¹ Both countries would almost certainly be classified as concessional if lending were to restart now, due to their economic conditions, although Zimbabwe was prior to the halt of lending in 2000 a non-concessional borrower from both the World Bank and the AfDB. (As MDB funding is zero throughout the period of observation, these countries are not included in the econometric analysis.)

¹² In non-concessional countries, MDBs also have more freedom of action in this respect than in concessional countries where they depend on the replenishment procedures, which in turn often serve as a platform for discussions about these safeguards (Buntaine, 2016: 122).