"The China Syndrome" The Association between Chinese Aid and Sustainable Development Goals*

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Abstract

China is one of the world's largest providers of foreign aid in Asia, Latin America and especially in Africa. Despite of that, little evidence examined the potential impact of such an investment on Sustainable Development Goals (SDGs). This paper fills this gap by providing both macro and micro evidence for 35 African countries covering the period 2000-2018. Our preliminary results show that Chinese Aid is associated with a decrease in infant and maternal mortality, however when we control for World Bank investments the effect vanishes out.

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1 Introduction

China is one of the world's largest providers of foreign aid in Asia, Latin America, and especially in Africa [10, 22]. Many observers, mainly Western aid agencies, have warned of the real risk of Chinese lending undermining African sovereignty and as well the relationship between Africa and other Western countries [18, 19]. Conversely, proponents of development aid argue that the world's poorest nations are trapped in a cycle of poverty and ill health and that aid can boost them into a cycle of development [21, 12]. Which one of the two drives China is still unclear. Indeed history played and important role in Chinese investments. In effect, China's relations with Africa goes back to to 1415, when Chinese explorers brought shiploads of Chinese porcelains, silks, pepper and rice to the East African coast, and in return, the Kenyan town of Malindi sent a single giraffe, followed by zebras, lions, frankincense and rare spices. Almost 600 years later, a pair of giraffes still played an important role. They accompanied President Moi state visit to China in 1988, which was followed by a Chinese loan to Kenya of US$ 13 million. Obviously giraffes are just a part of the story and the nature of Chinese presence has changed a lot in the last 30 years [6]. According to many China used aid to accomplish strategic goals, such as to counter the influence of the USA or the former Soviet Union. In parallel, the odd China-Africa alliance has indeed let China enter new markets for its exports contributing to current world's fastest-growing major economy. What did Africa get in return? This paper will provide an answer.

While a growing body of the literature has documented the relationship of foreign aid and economic growth, much less abundant is the empirical evidence about the relationship between aid to the health sector and health outcomes [11, 7]. Such a paucity might be explained by the relatively new aid investments into the health sector. Almost 80% of all aid towards health sectors started since 2000 [13]. Moreover, the few studies on the effectiveness of foreign aid shows mixed results. Williamson, Wilson found evidence of the ineffectiveness of foreign aid at increasing overall health [24] and reducing mortality [25]. Conversely, according to Bendavid and Bhattacharya foreign aid to health sector is associated with an increase in life expectancy and a decline in under-5 mortality using data for 140 countries covering the period 1974-2000. However, most of these findings are likely to be biased as the allocation of aid funding tend to be highly selected and more specifically concentrated in some regions. This study fills these gaps by investigating the impact Chinese Aid on African Population health by using a compendium of data covering 35 countries for the period 2000-2018. In so doing, this paper contributes to the literature in several distinctive ways. First, we focus on a specific aid the Chinese one which surprisingly has been largely uncovered in the literature. Second, we address the selection in the funding allocation by using a quasi-experimental design the synthetic control method. This estimates the effect

of intervention, like the allocation of funding in a specific region, by approximating a counterfactual from a weighted combination of outcomes in similar regions which did not receive the funding [1]. Third, we explore the impact not only on health outcomes but also on behaviours, outcomes which appear to be surprisingly quite uncovered in the literature. Fourth, we combine data from several sources constructing a novel and rich dataset. This dataset enables us to study the impact of aid at an exceptionally granular geographical scale while covering a large number of countries and a prolonged period.

The paper proceeds as follows. Section 2 and 3 introduce the data and the methods, respectively, while section 4 presents the preliminary results. Finally section 6 concludes and discussed the policy implications.

2 Data and Methods

To test the association between Chinese aid and Sustainable Development Goals (SDGs) we linked a compendium of data for 35 countries covering the period 2000-2014. Data on China's official financing was taken from the AidData [8] and it covers concessional and non-concessional state financing from China to 138 countries between 2000 and 2014. The dataset includes 3,485 projects. Here, only geo-located projects are considered as the focus of this analysis is on the health of the population which might be directly affected by the aid allocation and at the same time we want to address the selection in the funding allocation. This selection leaves us with 2,213 projects. Finally, we keep only records located in Africa: the area we want to study. The result of this filtering is a dataset documenting 1,082 projects in 2,153 locations. All of them are *recommended for research* by the dataset's authors. Data on the health outcomes comprise both macro and micro data at country and year level. Macro data come from the United Nations, Department of Economic and Social Affairs, Statistics Division and the World Bank Open database. Here, we focus on three SDGs, namely health and well-being, clean water and sanitation and affordable clean energy. We use as proxies of health and well-being: a) health services and b) population coverage. To measure health services, we use the following WHO's suggested indicator: percentage of children obtaining all the three doses of the Diphteria, Tetanus and Pertussis vaccine (DTP3). To measure population health we focus on amenable mortality, namely infant (under one) mortality, under-5 mortality, and maternal mortality [15, 17, 16]. Chinese aid might have also played a relevant impact on other two Sustainable Development Goals (SDGs), namely clean water and sanitation and affordable clean energy. We proxy those two outcomes by using the percentage of people who have access to safe drinkable water and to electricity, respectively. Micro data come from the Demographic Health Survey (DHS) and we focus on two countries, Tanzania and Sierra Leone, using the 1999, 2010, and 2015-2016 waves for Tanzania, and the 2008 and 2013 waves for Sierra Leone. As potential determinants of health outcomes we control for economic development, which is proxied by the Gross Domestic Product taken from the World Bank national accounts data and for the population taken from the United Nations Population Division World Population Prospects: 2019 Revision.

2.1 Chinese Aid Distribution

The AidData Chinese Aid dataset is particularly rich. It provides us for each financed project: the location, the recipient, the start year, the sector, the flow class, the intent, and a general description. Among these features, the flow class is the most critical. Each investment is classified either as Official Development Assistance (ODA) and Other Official Flows (OOF) flows [23] according to the definition adopted by the Development Assistance Committee (DAC) of the Organization for Economic Cooperation and Development. With the term ODA, DAC defines a transfer of resources from a 'government to another government of a poor country, international organization or nongovernmental entity, with at least a 25 percent grant element (current value) to promote development in the recipient country. Development is broadly defined to include humanitarian relief, debt relief, and other activities intended to bring about a betterment of the human condition. Development may not be the only purpose of the aid transfers' [14]. OOF represents transfer of funds where the grant element is under 25 percent and the financing is more commercial in nature. The residual category, Vague Official Finance, contains all projects for which not enough information is available.

The projects span among 22 sectors. Health, Transport and Storage, and Education collect slightly more than 50 per cent of the projects. Projects in Government, Social infrastructure, and Energy amount to an additional 25 percent (see Figure 3). Looking at types of capital flows, 52.5% are grants, 22.9% are 'soft' loans (where the grant element is at least 25 percent of the total), 18.5% are provisions for freestanding technical assistance. Technical assistance refers to teams of professionals, very often in the health sector. The remaining flow types (Debt Forgiveness, Debt Rescheduling, Export Credits, Foreign Direct Investment, Joint Venture with Recipient, Scholarships/Training in Donor Country, and Strategic/Supplier Credit) amount to 3.5% of the projects. Finally, for 2.6% we lack sufficient information. When we focus on the amount allocated, Figure 1 shows that more than half of the investments are relatively small (below $20 million) while about one fourth are medium-size (between $20 and 100 million). A sizable part of the funds allocation finance large (between $100 and 500 million, 15.5% of the fund allocation) and very large (more than $500 million, 5.5.% of the fund allocation) projects[1]. Finally, in terms of duration (Figure 1), one third of the projects lasts less than one year, one fourth between 1 and three years, two-fifths between three and five years and the rest more than five years, with a few projects lasting more than eight years.

[Figure 1 around here]

With respect to the geographical allocation, Figure 2 shows that Sub-Saharan Africa hosts almost all investments. Within this region, it appears that the vast majority of projects, especially the large ones, are allocated in the coastal areas.

[Figure 2 around here]

[1] All amounts are expressed in 2014 USD ($)

2.1.1 Comparing Chinese and World Bank Projects

To gather evidence of the potential relevance of Chinese Aid in Africa, we need to compare it with other international sources of investments in Africa. A natural comparison is given by the World Bank Aid projects [3]. Unfortunately the dataset on World Bank aid is not as rich as the one on Chinese aid. However, it contains information about the project' sectors, the lending instrument, its duration, and its geographical location.

Figure 3 shows that the World Bank projects' distribution among sectors is quite different from the one we observed for Chinese investments. The funding allocated by the World Bank to Governmental project appears to be almost two times the one allocated by China, 19.6% vis-á-vis 10.5%. Conversely Education and Health tend to receive more funds from China than from the World Bank, 16% vis-á-vis 9.2% as far as Education is concerned and 28.6% vis-á-vis 6.8% as far as Health is concerned. Transport and storage, Energy, and Social infrastructure have a similar weight across the two sources. Education attracts more Chinese than World Bank investments, while the opposite occurs for Water supply and sanitation.

Focusing on the distribution of amounts allocated, Figure 4 shows that World Bank tends to focus on medium-size and large projects. In fact 48% of their funds is allocated to projects whose amount is at least $100 million, wheres China invest 27.5% of its budget on those projects. However, the share of very large projects, while non-negligible among Chinese projects, is insignificant within the World Bank investments. Focusing on the projects lenght, longer appear to be the project financed by World Bank 6.86 years compared with 1.72 for Chinese projects[2].

[Figures 3-4 around here]

Figure 5 presents the geographical allocation of the projects. The projects appear to be allocated among the same country. A few exception should be borne in mind, Chinese investments seems to be concentrated more near ports, whereas the World Bank ones are more likely to be allocated inland.

[Figure 5 around here]

3 The Statistical Methods

3.1 Ordinary Least Square (OLS) Approach

3.1.1 Macro Level Analysis

To assess the association between Chinese aid and SDGs we start by applying an OLS model, as follows:

$$\mathrm{SDG}_{t,c} = \alpha + \beta \cdot \mathrm{ChAid}_{t-2,c} + \gamma \cdot \mathrm{X}_{t,c} + \tau \cdot \mathrm{Year}_t + C \cdot \mathrm{Country}_c + \varepsilon_{t,c} \qquad (1)$$

[2]Part of this difference might be due to the fact that, because of missing data, we were able to compute the duration only for one third of all Chinese projects.

Where SDG is a vector representing the various measures of SDG for country c in year t. $\text{ChAid}_{t-2,c}$ represents the Chinese aid funds allocated to country c in year $t-2$. We tried using different lags for Chinese aid, obtaining similar results. $X_{t,c}$ represents a set of country and year specific covariates, such as GDP and the population of Country c, and Year_t represents a dummy for year t, which controls for time-trend and/or outbreaks, Country_c represents the country-specific fixed effect and $\varepsilon_{t,c}$ is a random error term. We use robust standard errors clusterized at country level to control for serial correlation.

In the same spirit of section 2.1.1, we compare the estimation results of equation 1, with equation 2 which follows where we substitute Chinese Aid with World Bank Aid.

$$\text{SDG}_{t,c} = \alpha_2 + \beta_2 \cdot \text{WBAid}_{t-2,c} + \gamma_2 \cdot \text{X}_{t,c} + \tau_2 \cdot \text{Year}_t + C_2 \cdot \text{Country}_c + \eta_{t,c} \quad (2)$$

Where $\text{WBAid}_{t-2,c}$ represent the World Bank aid allocated in country c in year $t-2$. We are interested in comparing the size and the magnitude of β vis-á-vis β_2, estimating whether Chinese aid vis-á-vis World Bank aid is associated with a better achievement of the targeted SDGs. However, equations 1 and 2 do not keep into account any potential substitution effect between the two funding allocations, which instead is specifically considered in equation 3 in what follows.

$$\text{SDG}_{t,c} = \alpha_3 + \beta_3 \cdot \text{ChAid}_{t-2,c} + \mu_3 \cdot \text{WBAid}_{t-2,c} + \gamma_3 \cdot \text{X}_{t,c} + \tau_3 \cdot \text{Year}_t + C_3 \cdot \text{Country}_c + \psi_{t,c} \quad (3)$$

3.1.2 Micro Level Analysis

As already mentioned in section 1, in many countries foreign aid is geographically concentrated in some regions rather than in the county as a whole. Therefore, even if aid affects the outcomes at regional level, such effects might be negligible when we look at a country as other factors might come into a play [9]. Using geo-located data allows us to plug these gaps and to delve deeper into the mechanisms that might play a role into Chinese investments. To this end, we use data from two countries covered by the DHS: Sierra Leone (1999, 2010, and 2015-2016 waves) and Tanzania (2008 and 2013 waves). Sierra Leone has one of the longest established relationship with China, which dates back to 1971. According to many China has fueled the economic development of the country [20, 2]. Tanzania represents as well another interesting case study, as China's largest aid project, the Tanzam Railway, is mainly located in the country [4].

We decided to focus on infant mortality because it is a relevant outcome, and it is easy to measure with the DHS data. To do so, we used the birth recode of the five geo-located DHS waves available for Tanzania and Sierra Leone. In the dataset, each observation corresponds to a child born to women interviewed in that wave. We know each child's sex, year of birth, and, in case she died, age at death. We also have information about the mother: education level, wealth quintile, age at child's birth, and where she lives.

To study the impact of Chinese and World Bank aid at the individual level, we matched each child with projects located in a fifty kilometres radius around the child's cluster. Unfortunately, for most Chinese projects, we ignore the end date. This lack of information forced us to use a proxy. We matched only those projects with a starting date predating the child's birthdate by at least two years. Given that the average duration of Chinese projects is 1.72 years, this seemed a reasonable choice. We decided not to put a limit in the opposite direction, that is, to exclude too old projects.

Methodologically, to assess the impact of Chinese and World Bank aid on child's health (proxied with mortality below one and five year) we use a logit model as specified in Equation 4:

$$\text{Health}_i = \alpha_4 + \beta_4 \cdot \text{Aid}_i \beta_5 \cdot \text{WBAid}_i + \gamma_4 \cdot \text{Child}_i + \delta_4 \cdot \text{Mother}_i + \omega_i \quad (4)$$

Where Health_i represents the binary health outcome for child i. The two outcomes that we use in this analysis are a binary measure of infant mortality and under 5 mortality. Aid_i measures the total amount of aid delivered either by China or by the World Bank as matched with the procedure described in the previous paragraph. Child_i captures some child specific characteristics including gender and year of birth. Mother_i represents mother's characteristics, namely age at delivery, education, wealth (proxied by quintiles of the wealth distribution), and area of residence (urban vis-á-vis rural area). ω_i represents an individual random error.

4 Results

In what follows we present the estimation results from the macro-level analysis in subsection 4.1 and the the micro one, by focusing on two countries, Tanzania and Sierra Leone, in subsection 4.2.

4.1 The Macro Evidence

Tables 1-2 present the estimation result using data at macro level, whereas 4 presents the estimation results using micro data. In the top panel we exclude GDP from the controls, whereas in the bottom one we include it.

[Tables 1-2 around here]

When we do not control for GDP, Chinese Aid appears to be negatively correlated with maternal mortality. More precisely one billion $ increase in the Chinese aid allocation is significantly associated with a decrease in maternal mortality (40.96 deaths per 100.000 births). No effect on infant, under 5 mortality, DTP3 coverage, access to electricity, and access to clean water has been found. The association between maternal mortality and Chinese Aid appear to be robust to the inclusion of GDP, as a covariate, but its magnitude appears shrink (35.55 deaths per 100.000 births, respectively) .

For World Bank aid, we find very different results. World Bank investments are positively correlated with maternal mortality and negatively correlated with DTP3 coverage. These association are robust to the GDP inclusion. However, the results presented in tables 1-2 refrain from considering any possible substitution effect between those two kinds of foreign investments. Therefore to gather evidence of the complementary between the two institutional aids, we present in Table 3 the estimation results when we use as explanatory variables both the Chinese Aid and The World Bank one. Consistently with Tables 1-2, our results show that one billion $ increase Chinese aid allocation is associated with a decrease in maternal mortality (41.83 deaths per 100.000 births), whereas one billion $ increase World Bank aid is associated with an increase in both maternal mortality (22.86 deaths per 100.000 births) and a decrease in DTP3 immunization coverage (3.25 percentage points increase in children aged 12-23 months years old).

[Tables 3 around here]

4.2 The Micro Evidence

Table 4 shows that at the micro level, only World Bank aid appears to be correlated with infant mortality. In particular, in ares where the World Bank allocates funds, the probability that a child dies before one and before five years is higher. This result holds also when we use the number of projects instead of their total amount.

[Tables 4 around here]

4.3 Selection into Investments

One possible avenue to interpret this possibly surprising result is that World Bank allocates funding in areas with worse health and economic conditions, whereas it might not be the case for Chinese Aid. To this end in what follows in Table 6 we examine the possible correlation between Aid allocation funding and wealth, proxied by GDP. Table 6 suggest that while Chinese investments are positively correlated with GDP, the relationship is negative for World Bank aid. This finding suggests that, to some extent, China selects countries where to invest based on the size of their economies, preferring richer countries to poorer ones. The World Bank does the opposite, although the relationship is not so strong, and is more likely to select poorer countries for its projects.

[Tables 6 around here]

5 Robustness

To test the validity of our preliminary results we run a battery of robustness test. As describe in section 1, many studies argue that Aid appears to be largely ineffective in achieving economic growth and therefore health, with the ones exception when Sid is targeted at specific health problems []. Conversely, Foreign Direct Investment (FDI) appears to be effective in achieving economic growth and therefore

health. In parallel, part of the investment included in the FDI, but not in the Aid definition concerns general infrastructures, such as roads, which might play a significant role in improving health outcomes. As far as China is concerned, we know the amount and the geo-location of the total Foreign Direct Investments (FDI). In what follows we test whether our results are consistent to the inclusion of other flows allocation. Tables 7 and 8 report the estimation results. Unfortunately for World Bank database is much less rich and this refrain us from including other sources of investments different from aid when we estimate the association between the SDGs and WB FDI.

[Tables 7-8 around here]

In line with our main results, when we do not control for GDP, Chinese FDI appears to be negatively correlated with maternal mortality. However conversely to out main results it appears also to be negatively correlated with infant, under 5 mortality. More precisely one billion $ increase in the Chinese FDI allocation is significantly associated with a decrease in infant mortality (1.48 deaths per 1000 live births), under 5 mortality (3.32 deaths per 1000 live births) and maternal mortality (23.95 deaths per 100.000 births). No effect on DTP3 coverage, access to electricity, and access to clean water has been found. The association between under-5 mortality, maternal mortality and Chinese FDI appear to be robust to the inclusion of GDP, as a covariate, but their magnitude appears shrink (2.12 deaths per 1000 live births and 15.96 deaths per 100.000 births, respectively) and as well their statistical significant appears to diminish as they are significant only at 10% level.

6 Conclusion

In this paper we have investigated the role of Chinese Aid in achieving the SDGs. Using a compendium of both micro and macro data from at most 35 countries over the period 2000-2018, our results suggest that Chinese aid is associated with a reduction in maternal mortality. However, our initial findings suggest that the actual picture on the foreign aid in achieving SDGs may be more complex than previously thought. In fact, when we compare Chinese Aid with World Bank Aid our evidence suggests that the latter might be detrimental to health. Our results allow us to speculate about at one potential underlying mechanism, although the extent to which we can test any specific mechanisms in detail here remains limited: China appears to select the countries where allocate its funds. More specifically China chooses the richer one. In additional analysis (reported in the full paper) we deal with the endogenity in the funds allocation and we delve deeper into the underline mechanisms that might play a role in this association.

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A Figures and Tables

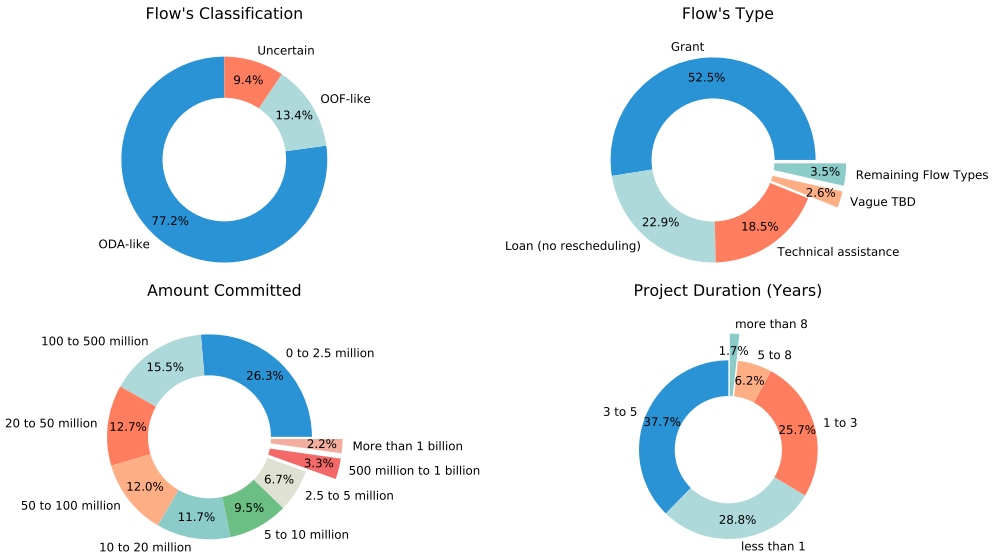

Figure 1: Describing the projects' main features (Chinese FDIs). Source: Authors' elaboration on AidData.

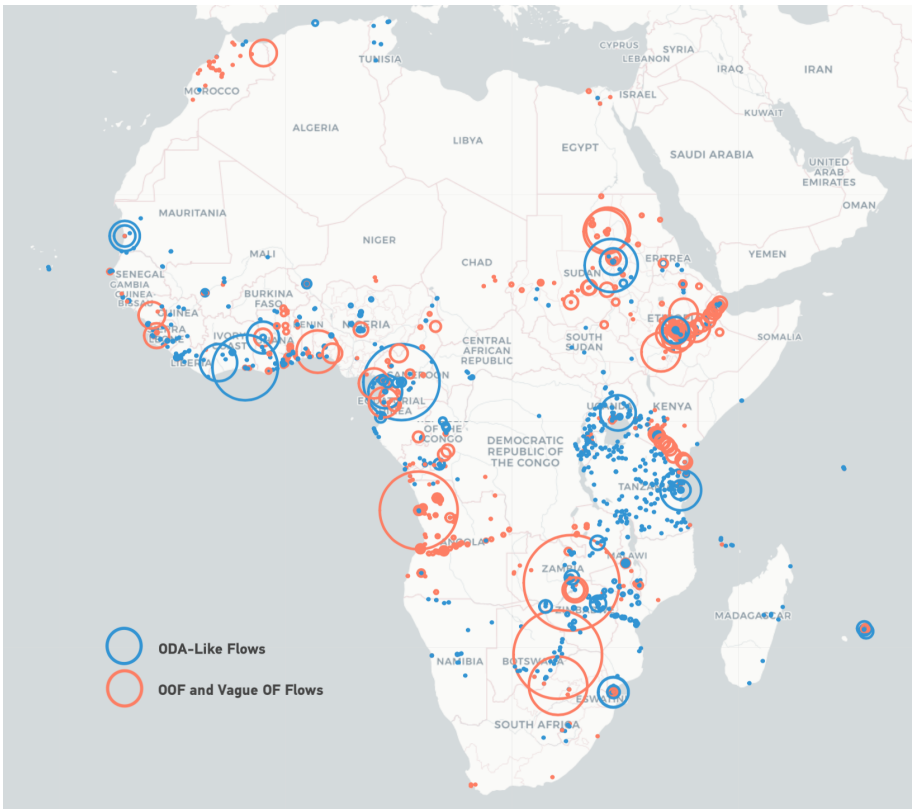

Figure 2: Geographical location of Chinese projects

Notes: Authors' elaboration on AidData. Each circle represent a project's location. There are projects with multiple locations. The circles' radius is proportional to the amount invested in the project. For projects with multiple locations, the radius is proportional to the location's share of the total amount.

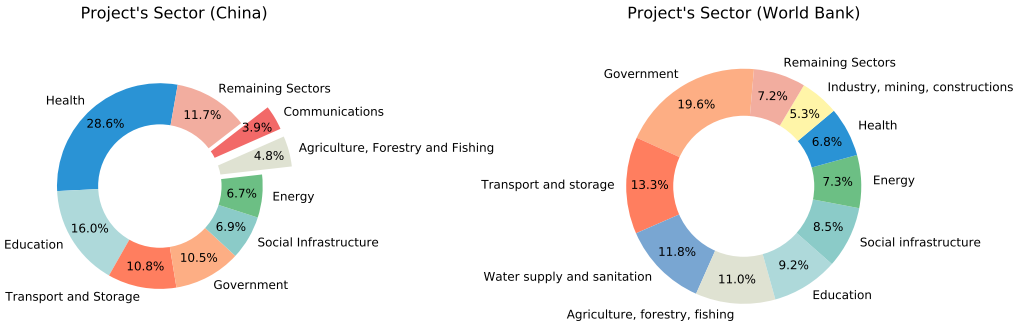

Figure 3: Distribution of projects' sectors across Chinese and World Bank aid. Source: Authors' elaboration on World Bank Aid.

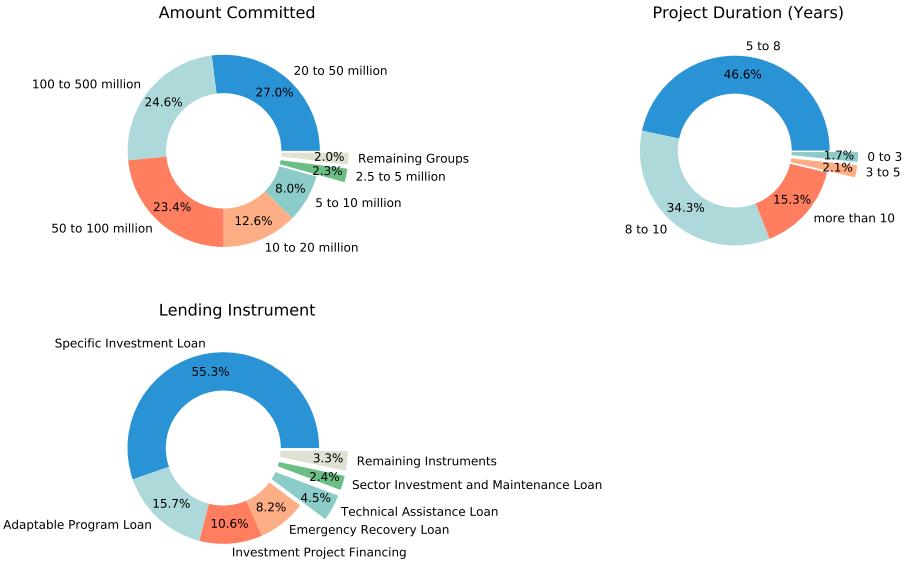

Figure 4: Describing the projects' main features (World Bank). Source: Authors' elaboration on World Bank Aid.

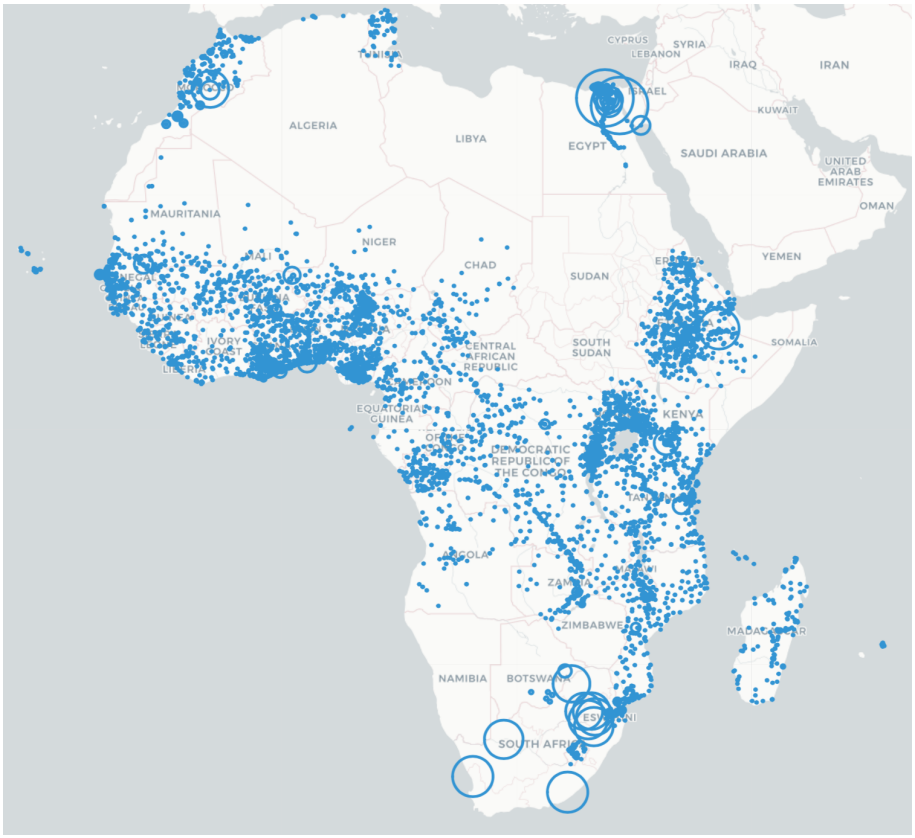

Figure 5: Geographical location of World Bank projects

Notes: Authors' elaboration on World Bank Aid. Each circle represent a project's location. There are projects with multiple locations. The circles' radius is proportional to the amount invested in the project. For projects with multiple locations, the radius is proportional to the location's share of the total amount.

Table 1: The Association between Chinese Aid and SDGs

	(1) Infant Mortality	(2) Under 5 Mortality	(3) Maternal Mortality	(4) DTP3 coverage	(5) Access to Electricity	(6) Access to safe water
ChAid	-1.09	-2.16	-40.96**	2.41	-1.03	-0.64
	(1.24)	(2.34)	(16.29)	(1.68)	(1.97)	(1.19)
Population	-0.24	-0.33	-1.40	0.37*	-0.18	-0.17
	(0.17)	(0.32)	(2.30)	(0.21)	(0.12)	(0.10)
Constant	76.33***	122.21***	666.93***	62.46***	37.90***	26.68***
	(2.73)	(5.18)	(37.24)	(3.57)	(1.69)	(2.70)
ChAid	-0.66	-1.35	-35.55***	2.22	-1.14	-0.69
	(1.19)	(2.23)	(13.23)	(1.64)	(1.97)	(1.42)
Population	-0.07	-0.02	0.66	0.28	-0.23*	-0.18
	(0.15)	(0.29)	(2.17)	(0.21)	(0.12)	(0.11)
GDP	-14.34***	-27.26***	-179.90***	7.13	3.89	1.26
	(4.52)	(8.12)	(64.84)	(4.69)	(4.84)	(7.80)
Constant	399.86***	737.23***	4733.97***	-98.31	-49.90	-2.78
	(102.36)	(183.47)	(1468.54)	(106.00)	(109.68)	(182.91)
N. of Observations	658	658	645	655	615	104

Notes: Results from the estimation strategy presented in section 3.
Level of significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Robust SE-values clusterized at area level in parentheses.
The dependent variable represents: (1) infant mortality rate (below 1 year), measured as deaths per 1,000 live births; (2) under five mortality rate (deaths per 1,000 live births); (3) martenal mortality ratio (per 100.000 births); (4) proportion of the target population with access to 3 doses of diphtheria-tetanus-pertussis (DTP3); (5) proportion of population with access to electricity; (6) proportion of population using safely managed drinking water services;. For reference to SDGs indicators, the outcomes correspond, in order, to indicators: 3.2.1 (1 and 2); 3.1.1 (3); 3.b.1 (4); 7.1.1 (5); and 6.1.1 (6).

Table 2: The Association between World Bank Aid and SDGs

	(1) Infant Mortality	(2) Under 5 Mortality	(3) Maternal Mortality	(4) DTP3 coverage	(5) Access to Electricity	(6) Access to safe water
WBAid	1.06	1.49	21.71***	-3.21***	-1.05	-0.40
	(0.76)	(1.96)	(7.49)	(1.03)	(1.17)	(1.24)
Population	-0.20	-0.29	-1.94	0.35*	-0.27**	-0.17
	(0.17)	(0.32)	(2.51)	(0.20)	(0.13)	(0.09)
Constant	78.79***	126.87***	702.33***	61.37***	36.63***	26.74***
	(2.84)	(5.41)	(42.46)	(3.56)	(2.21)	(2.59)
WBAid	0.70	0.78	16.26**	-2.93***	-1.11	-0.36
	(0.70)	(1.85)	(6.40)	(0.99)	(1.19)	(1.16)
Population	-0.01	0.08	0.90	0.22	-0.24*	-0.18
	(0.16)	(0.30)	(2.41)	(0.18)	(0.13)	(0.10)
GDP	-17.20**	-33.89**	-257.91**	11.99	-2.67	1.16
	(7.16)	(13.38)	(104.29)	(7.18)	(3.18)	(7.72)
Constant	466.45***	890.67***	6514.35***	-208.73	96.81	-0.36
	(161.54)	(301.72)	(2352)	(162.46)	(71.52)	(180.78)
N. of Observations	567	567	567	564	546	104

Notes: Results from the estimation strategy presented in section 3.
Level of significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Robust SE-values clusterized at area level in parentheses.
The dependent variable represents: (1) infant mortality rate (below 1 year), measured as deaths per 1,000 live births; (2) under five mortality rate (deaths per 1,000 live births); (3) martenal mortality ratio (per 100.000 births); (4) proportion of the target population with access to 3 doses of diphtheria-tetanus-pertussis (DTP3); (5) proportion of population with access to electricity; (6) proportion of population using safely managed drinking water services;. For reference to SDGs indicators, the outcomes correspond, in order, to indicators: 3.2.1 (1 and 2); 3.1.1 (3); 3.b.1 (4); 7.1.1 (5); and 6.1.1 (6).

Table 3: The Association between Chinese Aid, World Bank Aid and SDGs

	(1) Infant Mortality	(2) Under 5 Mortality	(3) Maternal Mortality	(4) DTP3 coverage	(5) Access to Electricity	(6) Access to safe water
ChAid	-0.82	-0.82	-41.83**	1.52	0.14	-0.60
	(1.32)	(2.21)	(18.80)	(1.55)	(1.45)	(1.21)
WBAid	1.08	1.51	22.76***	-3.25***	-1.05	-0.33
	(0.77)	(1.97)	(7.36)	(1.01)	(1.15)	(1.23)
Population	-0.19	-0.28	-1.64	0.34	-0.27**	-0.16
	(0.17)	(0.32)	(2.41)	(0.20)	(0.13)	(0.09)
Constant	78.70***	126.78***	697.41***	61.55***	36.65***	26.62***
	(2.87)	(5.52)	(40.62)	(3.62)	(2.25)	(2.62)
N. of Observations	567	567	567	564	546	104

Notes: Results from the estimation strategy presented in section 3.
Level of significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Robust SE-values clusterized at area level in parentheses.
The dependent variable represents: (1) infant mortality rate (below 1 year), measured as deaths per 1,000 live births; (2) under five mortality rate (deaths per 1,000 live births); (3) martenal mortality ratio (per 100.000 births); (4) proportion of the target population with access to 3 doses of diphtheria-tetanus-pertussis (DTP3); (5) proportion of population with access to electricity; (6) proportion of population using safely managed drinking water services;. For reference to SDGs indicators, the outcomes correspond, in order, to indicators: 3.2.1 (1 and 2); 3.1.1 (3); 3.b.1 (4); 7.1.1 (5); and 6.1.1 (6).

Table 4: The Association between Chinese Aid, World Bank Aid and SDGs

	(1) Infant Mortality	(2) Under 5 Mortality	(3) Infant Mortality	(4) Under 5 Mortality	(5) Infant Mortality	(6) Under 5 Mortality
ChAid	1.70	1.64			0.64	0.51
	(0.58)	(0.54)			(0.37)	(0.30)
WBAid			2.28***	2.34***	2.96***	3.37***
			(0.61)	(0.58)	(1.16)	(1.24)
The Child is a Girl	0.89***	0.89***	0.89***	0.89***	0.89***	0.89***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
			Mother's Living Area (ref: Living in Rural Area)			
Urban Area	1.06*	1.11***	1.05	1.11***	1.05	1.11***
	(0.04)	(0.03)	(0.04)	(0.03)	(0.04)	(0.03)
			Mother's Wealth (ref: First Quintile)			
Second Quintile	0.95	0.95*	0.95	0.95*	0.95	0.95*
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Third Quintile	0.91***	0.92***	0.91***	0.92***	0.91***	0.92***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Fourth Quintile	0.85***	0.84***	0.85***	0.84***	0.85***	0.84***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Fifth Quintile	0.70***	0.65***	0.69***	0.64***	0.69***	0.64***
	(0.04)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
			Mother's Education (ref: No Education)			
Primary Education	0.63***	0.64***	0.63***	0.64***	0.63***	0.64***
	(0.02)	(0.01)	(0.02)	(0.01)	(0.02)	(0.01)
Secondary Education	0.74***	0.74***	0.74***	0.74***	0.74***	0.74***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Higher Education	0.68***	0.63***	0.67***	0.63***	0.67***	0.63***
	(0.10)	(0.08)	(0.10)	(0.08)	(0.10)	(0.08)
Mother's Age (in years)	0.99***	0.99***	0.99***	0.99***	0.99***	0.99***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Constant	0.61	0.67	0.61	0.68	0.61	0.68
	(0.21)	(0.21)	(0.21)	(0.21)	(0.21)	(0.21)
N. of Observations	115679.00	120410.00	115679.00	120410.00	115679.00	120410.00

Notes: Results from the estimation strategy presented in section 4.
Level of significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Robust SE-values clusterized at area level in parentheses.
The dependent variable represents: (1, 3, 5) dummy variable equal to 1 if the child died before the age of 1; (2, 4, 6) dummy variable equal to 1 if the child died before the age of 5. Coefficients represents odd ratios.

Table 5: The Association between Chinese Aid, World Bank Aid and SDGs

	(1) Infant Mortality	(2) Under 5 Mortality	(3) Infant Mortality	(4) Under 5 Mortality	(5) Infant Mortality	(6) Under 5 Mortality
ChAid	0.05	0.06			-0.05	-0.08
	(0.03)	(0.04)			(0.06)	(0.07)
WBAid			0.08***	0.11***	0.11***	0.15***
			(0.03)	(0.03)	(0.04)	(0.05)
The Child is a Girl	-0.01***	-0.01***	-0.01***	-0.01***	-0.01***	-0.01***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
	Mother's Living Area (ref: Living in Rural Area)					
Urban Area	0.01*	0.01***	0.01	0.01***	0.01	0.01***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
	Mother's Wealth (ref: First Quintile)					
Second Quintile	-0.01	-0.01*	-0.01	-0.01*	-0.01	-0.01*
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Third Quintile	-0.01***	-0.01***	-0.01***	-0.01***	-0.01***	-0.01***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Fourth Quintile	-0.02***	-0.02***	-0.02***	-0.02***	-0.02***	-0.02***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Fifth Quintile	-0.04***	-0.05***	-0.04***	-0.05***	-0.04***	-0.05***
	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)
	Mother's Education (ref: No Education)					
Primary Education	-0.05***	-0.06***	-0.05***	-0.06***	-0.05***	-0.06***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Secondary Education	-0.03***	-0.04***	-0.03***	-0.04***	-0.03***	-0.04***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Higher Education	-0.04***	-0.06***	-0.04***	-0.06***	-0.04***	-0.06***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Mother's Age (in years)	-0.00***	-0.00***	-0.00***	-0.00***	-0.00***	-0.00***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
N. of Observations	115679.00	120410.00	115679.00	120410.00	115679.00	120410.00

Notes: Results from the estimation strategy presented in section 4.
Level of significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Robust SE-values clusterized at area level in parentheses.
The dependent variable represents: (1, 3, 5) dummy variable equal to 1 if the child died before the age of 1; (2, 4, 6) dummy variable equal to 1 if the child died before the age of 5. Coefficients represent Average Marginal Effects.

Table 6: The Association between Wealth and Chinese and Wold Bank Aid and

	(1) GDP (in Logs)	(2) GDP (in Logs)	(3) GDP (in Logs)
ChAid	0.06***		0.06***
	(0.01)		(0.02)
WBAis		-0.02*	-0.02*
		(0.01)	(0.01)
pop	0.01**	0.01**	0.01**
	(0.00)	(0.01)	(0.00)
Constant	22.53***	22.48***	22.50***
	(0.07)	(0.09)	(0.08)
N	593	502	502

Notes: Level of significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Robust SE-values clusterized at area level in parentheses.
The dependent variable represents: GDP at country level in Logs.

Table 7: The Association between Chinese FDI and SDGs

	(1) Infant Mortality	(2) Under 5 Mortality	(3) Maternal Mortality	(4) DTP3 coverage	(5) Access to Electricity	(6) Access to safe water
ChFDI	-1.48**	-3.32**	-23.95**	2.08	-0.49	-0.67
	(0.66)	(1.25)	(10.06)	(1.67)	(1.02)	(0.61)
Population	-0.23	-0.33	-1.54	0.37*	-0.18	-0.17
	(0.17)	(0.31)	(2.30)	(0.21)	(0.12)	(0.09)
Constant	76.31***	122.12***	669.05***	62.40***	37.97***	26.71***
	(2.64)	(4.97)	(37.30)	(3.48)	(1.69)	(2.57)
ChFDI	-0.84	-2.12*	-15.96*	1.76	-0.67	-0.76
	(0.61)	(1.15)	(9.19)	(1.60)	(1.01)	(0.91)
Population	-0.07	-0.02	0.50	0.29	-0.23*	-0.18
	(0.15)	(0.28)	(2.18)	(0.20)	(0.12)	(0.11)
GDP	-14.24***	-26.98***	-178.98***	6.91	3.96	1.48
	(4.51)	(8.09)	(65.27)	(4.63)	(4.83)	(7.90)
Constant	397.54***	731.03***	4715.41***	-93.63	-51.38	-7.99
	(102.13)	(182.89)	(1478.06)	(104.57)	(109.33)	(184.90)
N	658	658	645	655	615	104

Notes: Results from the estimation strategy presented in section 3.
Level of significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Robust SE-values clusterized at area level in parentheses.
The dependent variable represents: (1) infant mortality rate (below 1 year), measured as deaths per 1,000 live births; (2) under five mortality rate (deaths per 1,000 live births); (3) martenal mortality ratio (per 100.000 births); (4) proportion of the target population with access to 3 doses of diphtheria-tetanus-pertussis (DTP3); (5) proportion of population with access to electricity; (6) proportion of population using safely managed drinking water services;. For reference to SDGs indicators, the outcomes correspond, in order, to indicators: 3.2.1 (1 and 2); 3.1.1 (3); 3.b.1 (4); 7.1.1 (5); and 6.1.1 (6).

Table 8: The Association between Chinese FDI, World Bank Aid and SDGs

	(1) Infant Mortality	(2) Under 5 Mortality	(3) Maternal Mortality	(4) DTP3 coverage	(5) Access to Electricity	(6) Access to clean water
ChFDI	-1.39*	-2.88*	-27.84**	2.29	0.09	-0.64
	(0.81)	(1.48)	(12.44)	(1.87)	(1.04)	(0.64)
WBAid	1.09	1.55	22.31***	-3.26***	-1.05	-0.27
	(0.78)	(2.01)	(7.31)	(0.99)	(1.16)	(1.28)
Population	-0.19	-0.27	-1.76	0.33*	-0.27**	-0.17
	(0.17)	(0.31)	(2.39)	(0.20)	(0.13)	(0.09)
Constant	78.65***	126.58***	699.47***	61.60***	36.64***	26.66***
	(2.75)	(5.25)	(40.42)	(3.50)	(2.25)	(2.49)
N. of Observations	567	567	567	564	546	104

Notes: Results from the estimation strategy presented in section 3.
Level of significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Robust SE-values clusterized at area level in parentheses.
The dependent variable represents: (1) infant mortality rate (below 1 year), measured as deaths per 1,000 live births; (2) under five mortality rate (deaths per 1,000 live births); (3) martenal mortality ratio (per 100.000 births); (4) proportion of the target population with access to 3 doses of diphtheria-tetanus-pertussis (DTP3); (5) proportion of population with access to electricity; (6) proportion of population using safely managed drinking water services;. For reference to SDGs indicators, the outcomes correspond, in order, to indicators: 3.2.1 (1 and 2); 3.1.1 (3); 3.b.1 (4); 7.1.1 (5); and 6.1.1 (6).