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How do Chinese Contractors Perform in Africa? Evidence from World Bank Projects

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**JAMIE
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HOW DO CHINESE CONTRACTORS PERFORM IN AFRICA? EVIDENCE FROM WORLD BANK PROJECTS



The SAIS

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Abstract

Chinese construction firms are playing a prominent role in building African infrastructure, and they have been winning large percentages of World Bank contracts in the Africa region. At the same time, many anecdotal media reports and some scholarly works portray the quality of Chinese construction in a negative light. This paper seeks to initiate a more evidence-based analysis of the quality of Chinese firms' construction work through examining the execution of numerous World Bank transportation contracts in Africa based on information from project completion reports. The results of this analysis indicate that Chinese firms performed similarly to OECD country firms on projects completed between 2000 and 2013; there was no statistically significant difference between their quality of work. The paper also examines possible underlying factors behind the negative perceptions of Chinese construction work, and raises questions for further research.

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The papers in this Working Paper series have undergone only limited review and may be updated, corrected or withdrawn. Please contact the corresponding author directly with comments or questions about this paper.

1. Introduction

Chinese construction firms are deeply involved in filling the infrastructure gap on the African continent. In 2014 alone, Chinese companies signed contracts worth \$53 billion in Africa.¹ This significant amount of business has raised concerns about the quality of work of Chinese firms. Western viewpoints tend to apply all of the perceptions of “made in China” (low quality, cheap, and disposable) to roads “made by China.” One article from *The Economist* claimed that construction work by Chinese firms is often “shoddy” or “slapdash.”² *Business Insider* has referenced the poor quality of some of China’s construction works,³ and *BBC News* published an “In Pictures” report titled, “China’s African road gangs,” which questioned whether Africa had new “masters.”⁴

The idea that the work carried out by Chinese firms is of low quality is of particular concern to the World Bank, especially since according to one of their project reports, “consultant and contractor performance is one of the most important factors affecting the delivery of infrastructure services.”⁵ The World Bank relies heavily on Chinese enterprises for the implementation of their development projects in Africa. From 2007 to 2015, Chinese firms won an average of 30.3 percent of World Bank infrastructure projects in Africa, up from 18.1 percent between 2000 and 2006.^{6*} In fact, Chinese firms have the highest win percentage of any nation for global World Bank contracts.[†]

Most criticism of Chinese firms is limited to anecdotal evidence from a relatively small number of cases. David Bénazéraf conducted a case study of Chinese roads and housing in Nairobi and found quality issues on the Nairobi-Thika Highway, which was built entirely by Chinese contractors.⁷ According to Bénazéraf, the road had some questionable engineering and visible flaws such as cracking concrete, raised edges of the pavement, which can cause tires to burst in case of impact, and iron pieces surfacing from the reinforced concrete.⁸ Howard French also provides anecdotal evidence on the quality of Chinese roads in his book, *China’s Second Continent*. French claims, “almost everywhere [I’ve] been during my travels, Africans [have] questioned the quality of Chinese construction.”⁹ French also interviewed a Chinese contractor who explained, “some projects are not done well. If the Chinese government gives a grant to an African country and a Chinese company gets the work, they will often do the project very quickly in order to save money, and this leads to the quality not being good. That is true.”¹⁰ Finally, two projects—a road project in Zambia and a hospital in Angola—have been cited frequently as anecdotes illustrating quality problems with Chinese projects.¹¹ As *The Economist* claimed, “the Chinese-built road from Lusaka, Zambia’s capital, to Chirundu, 130km (81 miles)...was quickly swept away by rains.”¹² *Fortune* also reported, “a Chinese-built hospital in Angola developed serious structural problems only four years after construction,

*Interestingly, if win percentage is calculated by number of contracts rather than value of contracts, China’s win percentage for 2007-2015 is much lower: only 7.3 percent.

†Calculated as an average over the last five years, and based on contract value. However, even by number of contracts, China places second, behind Vietnam.

and a Zambian road crumbled just as quickly.”¹³ However, according to *Lusaka Times*, only a section of the road in Kapilingozi was washed away due in part to rainfall and falling rocks from nearby mountains.¹⁴ *Lusaka Times* also reported that the same company that received the blame for the poor quality of work on repairs to the road before it was washed away, China Henan International, was contracted again in 2012 to complete repairs on 51 km of the road after the damage.¹⁵

Interestingly, this second contract went through the World Bank procurement process, as the World Bank was involved in the latest repairs to the Lusaka-Chirundu road.¹⁶ Although this indicates little as to whether or not China Henan International was originally at fault for the washed away portion of the road, a World Bank press release does reveal that the geology and environmental conditions on the Lusaka-Chirundu road are extremely challenging.¹⁷ The press release described the incredibly treacherous mountains along the road, and claimed that the part of the road that goes through these mountains is named “Kapili Ngozi or Hills of Danger” in the local language. The press release implied that these environmental conditions, combined with heavy use from mining and trading trucks, make the road a particularly difficult location for construction and maintenance. Anecdotes of Chinese construction firms’ shortcomings, such as those presented above, have played a large part in shaping the general perceptions of the quality of Chinese contracting work.

A World Bank staff member has explained that Chinese government authorities are aware of complaints about their contractors and, although there has been no official dialogue on this between the Chinese government and the World Bank, some authorities are willing to listen, and to address the quality of their firms.¹⁸ Yet aside from the anecdotes described above, there is no evidence on the overall quality of Chinese works. In order to determine whether there is in fact a widespread problem of quality, our understanding of Chinese works needs to move from anecdotes to data. This paper attempts to quantify the quality of completed World Bank contracts in order to compare Chinese construction firms to a baseline of OECD country construction firms. The findings of this paper show that there is no statistically significant difference between the quality of work of Chinese firms and OECD country firms.

Background

The African continent faces an extraordinary gap in infrastructure. A World Bank publication by Foster and Briceño-Garmendia estimates that the continent’s infrastructure spending needs are \$93 billion a year.¹⁹ By filling this gap, African countries could make major strides towards poverty reduction. A lack of infrastructure affects the ability of African economies to grow, makes businesses uncompetitive, reduces regional trade, and makes it difficult for citizens to reach health clinics and schools, among many other disadvantages. Investments in infrastructure have been shown to have very positive results for economies in Africa. According to Foster and Briceño-Garmendia, “infrastructure has been responsible for more than half of Africa’s recent improved growth performance.”²⁰ Additionally, Calderón found that

investments in infrastructure contribute 99 basis points per capita to economic growth compared to 68 basis points for other structural policies.²¹

The experience of China itself is one of the best examples of the significant impact that infrastructure investment can have on economic growth. As China has grown, it has devoted 8.5 percent of its GDP to infrastructure spending, with exceptional results.²² The experience of Chinese firms in delivering low-cost roads in a quick time frame makes them an attractive option for African governments, who often lack local firms with the same capacities. In case studies of Chinese construction firms in Tanzania and Zambia, Christopher Burke notes that Chinese firms usually operate on profit margins under 10 percent, well below the 15 to 25 percent profit margin that is typical of most foreign firms.²³ He also identifies several characteristics of Chinese firms that make them very competitive in Africa including inexpensive high quality labor, engaged management, excellent organization, and easy access to cheap capital.²⁴

Business collaboration between China and Africa in the infrastructure sector could be very beneficial for both sides. Africa, the poorest region in the world,²⁵ could greatly benefit from the technical experience of Chinese firms in building infrastructure that could spur the economy. China, which remains a developing country with nearly 100 million people living below the poverty line, would benefit from the added income of construction firms.²⁶ However, issues raised by critics, primarily the low quality of Chinese construction works, but additionally lax environmental protection, unsafe labor conditions, overuse of foreign laborers, and poor management, must be analyzed and put into perspective before they can be addressed.²⁷

Research Question

This paper seeks to answer the question of how Chinese contractors perform on World Bank contracts in comparison to firms from OECD countries. This question could only be answered with anecdotal evidence before this study. The aim of this work was to create a system through which a large portion of completed contracts won between 2000 and 2007 by Chinese firms on World Bank-funded transportation projects in Africa could be analyzed and rated based on quality, and then compared to a sample group of contracts won by OECD firms, in order to gain an overall comparative sense of the quality of contracts executed by Chinese firms.

Additionally, the paper looks to provide insights into two further questions. First, what are the major drivers behind the perception that Chinese firms perform poorly? Second, do World Bank reports provide any evidence about other commonly cited issues regarding Chinese firms working in Africa such as corruption, lack of environmental consideration, overuse of foreign laborers, and poor project management?

2. Methodology

In order to examine the research question and quantify the quality of work being done on World Bank contracts, a rating system was developed and applied to 96 contracts executed by Chinese firms and 58 contracts executed by OECD country firms. The specific scores given to each contract in this study can be compared and analyzed in order to adequately understand and draw conclusions about the overall quality of work being done by Chinese and OECD country firms.

Scope

The scope of this paper is a review of completed contracts won by Chinese firms and OECD country firms between 2000 and 2007** for work in Africa under the major sector “transportation,” and under the procurement category, “civil works.” The World Bank Group Finances Data table “Major Contract Awards,” was used to compile a list of contracts to be analyzed.²⁸ This list included 84 Chinese contracts and 100 OECD country contracts (see Table 2.1). Twelve additional Chinese contracts that did not meet the original search criteria were later added to this list due to their relevance to the study. These were all contracts that fell under a project that was already going to be assessed, and either the contract was labeled fiscal year 2008 or 2009, or was signed by a major Chinese state-owned enterprise registered in a local African country.^{††} In order to maintain a neutral and unbiased sample group, the decision to include a contract was always made before any analysis.

Table 2.1: Contracts analyzed

	Chinese Contracts	OECD Contracts
Total number of contracts in Africa won between 2000 and 2007, under Civil Works and Transportation	84	100
Contracts added	12	0
Total contracts analyzed	96	58 (sampled from 100)
Number of contracts that could not be scored (insufficient data in ICR [‡])	24	22 [§]
Number of contracts that received a score	72	36

[‡] Implementation Completion and Results Report; see section “Defining Quality.”

[§] Eight of the contracts that could not be scored were for the procurement of goods for project number P067084 in Ethiopia, and therefore did not fit the “civil works” procurement category.

**The analysis of projects labeled fiscal year 2000 to 2007 in the Major Contracts Award Database was a strategic decision based on the long duration of World Bank infrastructure projects and a decision to only analyze completed projects with finalized project reports. All projects analyzed were completed by 2013.

^{††} Six contracts of this nature were identified and added to the sample group, however, there are certainly many more that were not identified and were therefore missed in this analysis.

The control group of OECD contracts was randomly selected and then expanded to include all of the contracts that fell under the same project, for a total of 58 contracts. This was done in order to maintain parallels between the sample group and the group of Chinese contracts under examination. Since every Chinese contract was assessed, the data set of Chinese contracts included some clusters of contracts that fell under the same large project. Therefore, it was important to analyze all of the OECD contracts under each project to ensure the same clustering effects in the OECD country data.

Defining Quality

The rating system in this study is primarily based on information provided in the Implementation Completion and Results Report (ICR) for each project. These reports provide information on three levels:

1. Every project gets an overall score.
2. There are generally sub-component scores and indicators for each portion of the project. For example, a project may have three aims such as road construction, building water pumps in a particular city, and training local citizens in construction work. These sub-components often receive a rating from highly unsatisfactory to highly satisfactory that can be different from the overall project rating. Indicators generally measure the achievement of specific targets such as, “reduction in average travel time on main roads compared to baseline.”²⁹ While indicators can provide important insight, they also tend to be more dependent on the original project expectations than component scores.[#]
3. There are often specific comments in the completion reports regarding the work of contractors that can be linked to a specific firm based on the location and type of work.

The individual contract scores for this study are based on the second and third levels of information. An attempt was made to match each contract description to a description of work that was completed in the ICR, and scores were based on the relevant sub-component score within the document or a specific indicator (level two). For example, if the overall project outcome score was moderately satisfactory (4), but the roads component received a rating of satisfactory (5), a contract for building roads received a rating of satisfactory (5). If there was uncertainty as to how the contract was categorized under the outlined components, and no other contract-specific information was provided, the contract was not given a score. In many cases, the sub-component rating from the ICR was the only specific information given about a contract, in which case the contract received the same score as the sub-component score. However, some ICRs addressed work completed in specific locations and this information

[#] This study relied more heavily on component scores than indicators. See section “*Limits to the Data*” below for a more detailed explanation of the difference between the two.

(level three), was also considered in the assigning of a score for the contract, along with any details from the Project Performance Assessment Report (PPAR), if available.

If a report specifically mentioned poor quality or good quality of work in a specific location that matched the location and type of work of the contract, this could change the specific contract score significantly. Other references to factors related to the work but not necessarily the quality of the product, such as debilitating delays, major cost increases, environmental, and social problems that were the fault of the contractor, changed the score from the sub-component rating by a half point. While there is a level of judgment that was unavoidable in this rating system, much effort was put into ensuring that contracts were scored by the same standards, and in an even way. Every score has been justified by specific quotes or paraphrasing from the ICR.³⁰

The numerical scores produced in this study correspond to World Bank ratings as displayed in Table 2.2.

Table 2.2: Rating scale

World Bank Rating	Number Score	Definition ³¹
Highly Satisfactory	6	There were no shortcomings in the operation's achievement of its objectives, in its efficiency, or in its relevance.
Satisfactory	5	There were minor shortcomings in the operation's achievement of its objectives, in its efficiency, or in its relevance.
Moderately Satisfactory	4	There were moderate shortcomings in the operation's achievement of its objectives, in its efficiency, or in its relevance.
Moderately Unsatisfactory	3	There were significant shortcomings in the operation's achievement of its objectives, in its efficiency, or in its relevance.
Unsatisfactory	2	There were major shortcomings in the operation's achievement of its objectives, in its efficiency, or in its relevance.
Highly Unsatisfactory	1	There were severe shortcomings in the operation's achievement of its objectives, in its efficiency, or in its relevance.

Limits to the Data

This study involves subjective judgment on two sides; on the part of the authors of the World Bank reports, and on the part of the interpretation of those reports. ICRs can vary widely in their coverage and different authors focus on different elements of the project. Some reports focus on the contractors while others do not mention them. Additionally, scores given by the World Bank in their reports are generally based on completion of original targets. Therefore,

overall project scores are affected by initial targets and project expectations. For example, one report states, “while outcome indicators of the project could not be met partially due to overly optimistic targets, it was clear when visiting Dakar that the project has made strides in improving mobility in the city although this could not be captured by the current indicators.”³² Because of the potential problem of overly optimistic or pessimistic targets, this study relies more heavily on component ratings than indicators, and some human judgment was needed to decide if the score was applicable to the work of the contracting firm. If the ratings were heavily impacted by outside factors, the contract was not scored.

3. Major Findings

The major finding of this study is that, on average, Chinese firms and OECD country firms produced work of similar quality on World Bank contracts in the African transportation sector won between 2000 and 2007 and completed by 2013. The difference in average scores for Chinese firms and OECD country firms was not statistically significant either when individual contract scores were weighted equally, or when each contract was weighted by its monetary value. Both the Chinese and the OECD country average scores represent a rating between moderately satisfactory (4) and satisfactory (5). See Annex 1 for a detailed explanation of the highest and lowest rated Chinese contracts.

In addition, the majority of Chinese contracts were won by a small number of firms: seven Chinese firms won over three-quarters of the 96 transportation contracts in Africa between 2000 and 2007. Contracts with OECD countries have been dispersed far more widely among European firms, although French construction firms won 45 percent of the OECD contracts that were analyzed as part of this study.

Finally, for the contracts analyzed within the scope of this study, Chinese scores were more volatile than OECD country scores, and World Bank Reports noted environmental and social problems caused by Chinese firms in only two out of the 72 contracts analyzed.

Unweighted Specific Contract Scores

The average unweighted specific contract score for Chinese firms was 4.736, based on 72 contracts of Chinese firms for which a specific score for the firm could be assigned. This is very close to the average unweighted specific contract score for the control group of OECD countries, based on 36 contracts, which was 4.792. Chinese firms scored less than 1 percent lower than the OECD control group; a negligible amount. Both scores fall between World Bank ratings of moderately satisfactory (4) and satisfactory (5), with both much closer to a score of satisfactory.

Specific Contract Scores, Weighted by Contract Value

The average specific contract score, weighted based on contract value, was 4.452 for Chinese firms and 4.769 for OECD country firms. The weighting causes the spread between average

scores to increase; in this case Chinese firms scored .317 points or 5.3 percent lower than OECD firms. However, this difference was still not statistically significant based on a two-tailed t-test at a 95 percent confidence level.^{§§} Again, both scores fall between World Bank ratings of moderately satisfactory (4) and satisfactory (5).

4. Exploration of the Negative Perception of Chinese Work

This study offers three insights into the origins and perseverance of negative perceptions of Chinese construction work in Africa. First, Chinese scores were more volatile than OECD country scores in this study. Since Chinese firms worked on more very low-scoring projects (along with very high-scoring projects) these lower-scoring projects may stand out in the media and fuel anecdotal evidence against Chinese firms. Secondly, 77% of all Chinese contracts analyzed in this study were completed by only seven large state-owned Chinese firms, of which four have been sanctioned by the World Bank in the years following the completion of the contracts under analysis. These cases may have tainted the reputations of all Chinese engineering firms. Thirdly, World Bank Reports noted environmental and social problems caused by Chinese firms in only two out of the 72 contracts analyzed. This is much lower than what would have been expected if environmental and social faults were the main drivers of negative perceptions of Chinese firms.

Volatility of Chinese Scores

Based on the data analyzed in this study, Chinese firms had higher percentages of contracts in both the low and the high end of the ratings, indicating that the quality of work completed by Chinese firms may be more volatile than OECD country firms. This is supported by a higher standard deviation in Chinese contract scores than OECD country scores in this data set; the standard deviation for Chinese firms is 0.83, compared to 0.67 for OECD firms.

On the high end of the scale, Chinese firms performed very well. Chinese firms had a higher percentage (by value of contracts) that received scores above satisfactory (greater than 5) than OECD country firms. For Chinese firms, 8% of contracts were above satisfactory, compared to only 6.2% for OECD country firms. Five Chinese contracts received a score of 6 (highly satisfactory), and another five contracts received a score of 5.5.^{***} All of the scores of 6 went to China Geo-Engineering Corporation, which was later debarred due to collusive practices under a major Bank-financed roads project in the Philippines.³³ Based on an extrapolation of the control group, OECD firms would likely have received four scores of 6 and four scores of 5.5.

^{§§} The weighted scores gave a p-value of .0585 which was greater than the chosen alpha of .05 and therefore the null hypothesis that there was no difference in the means could not be rejected.

^{***} Contracts that received 5.5 were executed by: M/S China International Water and Electric Corp., China Electric Power Technology Im/Ex Corp, China Henan International Economic Technical Cooperation Corp, China National Water Resources and Hydropower Engineering Corporation (CWHEC), and Sinohydro Corporation.

Table 3.1: Breakdown of specific contract scores (number of contracts)

Score (Rating)	Chinese Contracts	Percentage by Value, Chinese	OECD Contracts (Extrapolated)	Percentage by Value, OECD
6	5	1.0%	4	0.7%
5.5	5	7.0%	4	5.5%
5	39	36.4%	42	53.9%
4.5	9	18.5%	14	31.1%
4	9	27.3%	2	6.7%
3	3	3.8%	6	2.1%
2	1	3.2%	0	0%
1	1	0.9%	0	0%

However, Chinese firms had a smaller concentration of scores in the mid-range, between 4.5 and 5, than OECD country firms. For the OECD countries, 85 percent of the contracts by value received a score between 4.5 and 5, while only 55 percent of Chinese contracts scored in the mid-range. A large portion of Chinese firms, 27.3 percent, scored slightly lower with a 4.

Another major difference in scores between Chinese firms and OECD firms arises from the low end of the scale. The OECD countries did not receive a single score lower than 3.^{†††} Chinese firms had five contracts that scored 3 or lower. This indicates that while the majority of Chinese firms are performing well, and there are more high-performers on Chinese contracts than OECD contracts, a handful of Chinese contracts had quality problems that brought the overall score down. Two rather large Chinese contracts which received very low ratings brought the average down significantly. These contracts are:

- Contract 1239735 for \$9,309,250 for the rehabilitation of the Zanzibar Airport Runway from project P002770 Integrated Roads Project (02): Tanzania, 2000. Contractor: China Huashi Enterprises Corporation.
- Contract 1246958 for \$32,625,978 for the upgrading of Adigrat-Adwa-Shire Road from project P044613 ET- Road Sector Development Phase 2: Ethiopia, 2004. Contractor: China Railway Engineering Corporation

A sensitivity analysis that excluded these two contracts demonstrated the extent to which they affected the Chinese firms' weighted average score. Without the two contracts, the average weighted score of Chinese firms rose to 4.566, reducing the spread from the OECD country control group from 5.3 percent to 3.4 percent. Although a larger sample size would reveal the robustness of this observation overall, in this data set the quality of work completed by Chinese

^{†††} Part of this could be due to a smaller sample size, which may have randomly missed the “poor performers.”

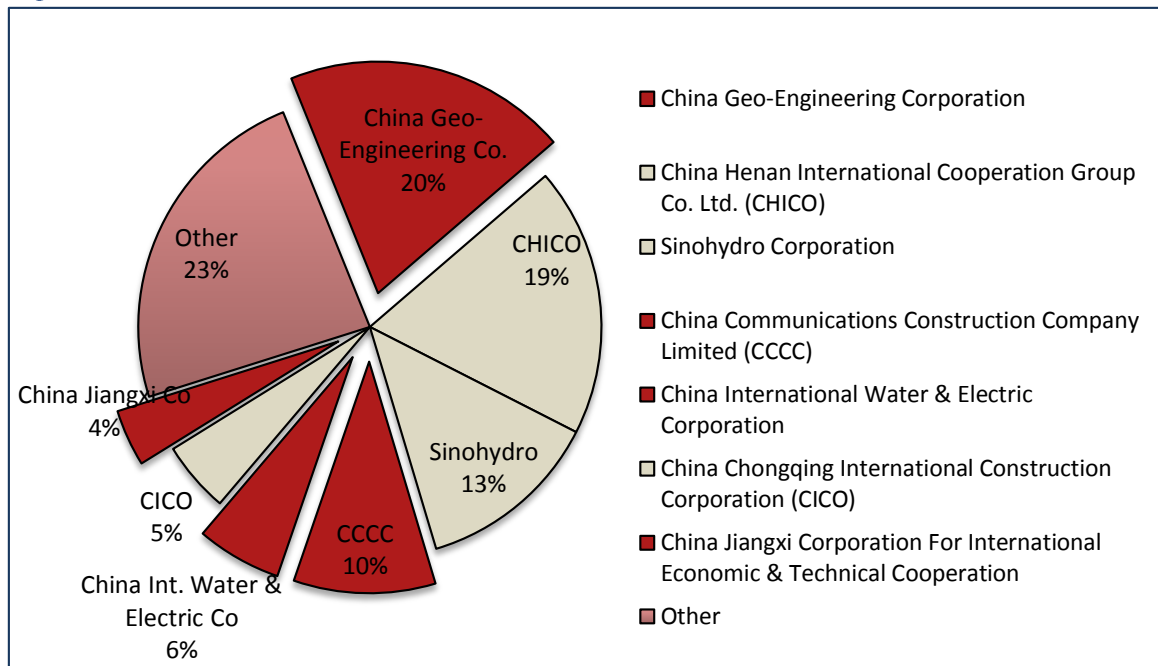
firms varied more and had a higher standard deviation than the quality of work completed by OECD country firms.

Composition of Construction Firms and Debarments

Large state-owned enterprises won the lion's share of Chinese firms' contracts in the African transportation sector from 2000 to 2007. Additionally, just under 40 percent of the contracts executed by Chinese firms in that time frame were completed by major Chinese firms that were later officially sanctioned by the World Bank for procurement misconduct.

The composition of Chinese firms that won transportation contracts in Africa from 2000 to 2007 is rather striking. An analysis of the 96 Chinese firm contracts reveals that only seven firms, all of which are state-owned enterprises, won over three-quarters of Chinese contracts. China Geo-Engineering Corporation won the most contracts (20), China Henan International Cooperation Group Co. Ltd. (CHICO) was second with 19 contracts, and Sinohydro Corporation was third with 13 contracts. These top three firms alone won just over half of all Chinese contracts under analysis.

Figure 1: Distribution of contracts and debarments of Chinese firms



**The highlighted wedges indicate the firm was debarred at some point after the completion of the contracts under analysis*

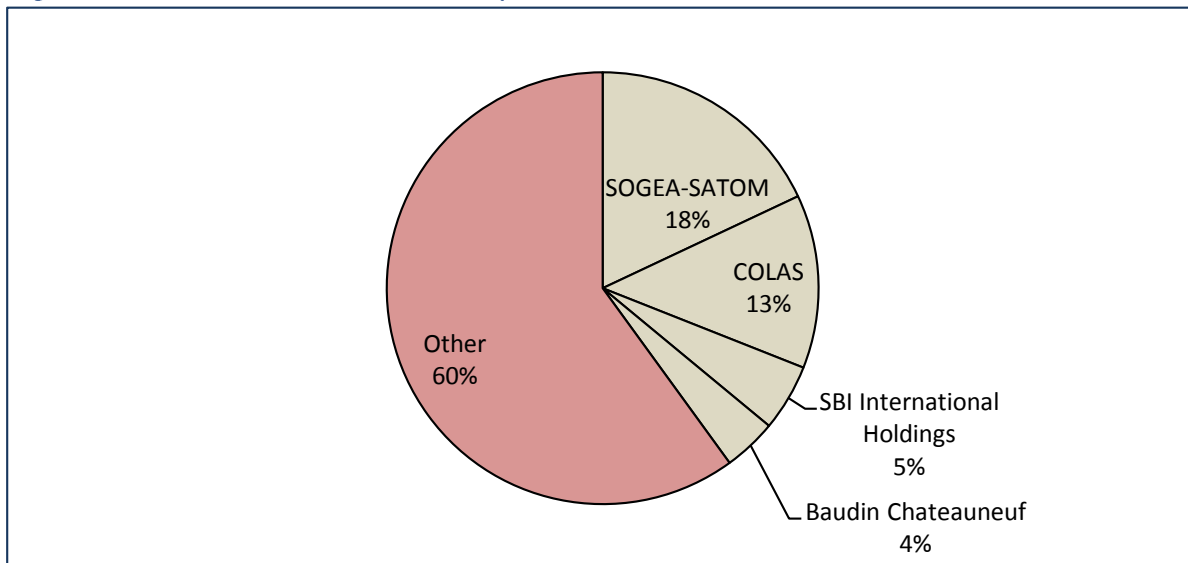
The concentration of contracts in the hands of a few major firms had serious consequences beginning in 2009 when the World Bank announced the first corruption sanctions against Chinese firms.³⁴ Four of the seven top firms for contracts in Africa were debarred at some point after the completion of the contracts under analysis (see Figure 1). This means that just under 40 percent of contracts won by Chinese firms between 2000 and 2007 were executed by firms

that were later debarred for procurement misconduct. Additionally, there was considerable confusion over which firms were subsidiaries of the major debarred firms, which further reduced confidence in Chinese firms.³⁵

China Geo-Engineering Corporation and China Communications Construction Company Limited were both sanctioned in 2009 for collusive practices under a roads project in the Philippines.³⁶ China International Water & Electric Corporation was sanctioned for misconduct in Africa and in South East Asia. An investigation found that the company had falsely represented its experience in the procurement process for two projects.³⁷ China Jiangxi Corporation was debarred for including false past experience documentation during the bidding process for a project in Ghana.³⁸

In comparison, the composition of OECD firms is much less concentrated in the hands of a few companies and none of the most active OECD country firms in the scope of this study were debarred (see Figure 2). Sixty percent of the OECD companies analyzed won three or less contracts. The companies that won the most contracts were Sogea-Satom with 18, followed by Colas with 13 contracts, both of which are French firms. In fact, French construction firms won 45 percent of the OECD contracts that were analyzed.

Figure 2: Distribution of OECD country firms



The sheer number of contracts in Africa that were executed by Chinese firms that were later debarred for misconduct on the continent and elsewhere certainly raises questions as to these firms' conduct in Africa. Regardless of the actual conduct of these firms, the knowledge that they or their affiliates had been debarred could be a major source of fuel for the negative perceptions of Chinese work.

Prevalence of Chinese Environmental and Social Faults in World Bank Reports

This study treated environmental and social aspects of construction as somewhat minor contributors to the overall quality score of a work. When reports mentioned poor handling of environmental regulation or any social shortfall of the contracting firm, half a point was deducted from the score. However, the way in which a contracting firm interacts with the community and environment in which they operate is very important in shaping local perceptions of that firm.

Although Chinese companies are often accused of disregarding environmental standards and caring less about local contribution and acceptance of projects, only two out of 72 contracts that were analyzed in depth made any reference to these types of problems.

Both of these contracts were from Project number 044613, Road Sector Development Phase 2 in Ethiopia. This project has an ICR that is particularly candid in its descriptions of the social issues, environmental issues, and labor difficulties with contractors in general. Sinohydro and China Railway Engineering Corporation were the two Chinese firms involved in this project. Although it is not possible to attribute any of the generalized complaints in the ICR directly to either Chinese firm involved, it is likely that at least some of the complaints are applicable to the Chinese firms since both received very low scores (without the general complaints being taken into consideration) and three out of four major road projects were done by these firms. The fourth was done by an Indian firm who also turned out to be a poor-performer.

Social Issues

Overall in this project, some contractors seemed to have difficulty interacting with local people and taking their concerns into consideration during project implementation. As explained in Annex 1, China Railway Engineering Corporation was criticized in the report for their lack of English communication skills. The report also made the following more general comment about the contractors overall:

"A consistently weak point in the social protection performance of the project was the lack of attention to the needs of town dwellers in the towns and villages through which the roads passed...In a number of instances, the Bank supervision team noted shortcomings related to pedestrian safety, safeguarding access of adjacent properties, neighborhood continuity, and quality of workmanship in the urban road amenities that the contractors may have considered ancillary (such as drain covers)."³⁹

Environmental Issues

China Railway Engineering Corporation caused erosion problems because they did not properly protect the construction site during the rainy season. They also mobilized on this project without the consent of the head engineer, which complicated standard environmental

mitigation procedures. Another more general problem encountered on this project, which is not attributable to any one contractor, was that, "contractors were slow to formulate work plans to implement the EMPs, [Environmental Management Plans] and, initially at least, slow to appreciate the need for and importance of compliance."⁴⁰

Foreign Laborers

According to anecdotal evidence on this project, some firms brought in more laborers from their home country than was allowed by their contract.⁴¹ There is no specific mention of any particular firm; however, because Chinese firms held three out of five international civil works contracts on this project, it would not be surprising if Chinese firms were involved in the alleged contract breach. While the World Bank is interested in timely and high-quality work, it is usually also focused on improving local employment levels, and providing temporary incomes to local people. While borrower governments also benefit from employment and income boosts, they have an equal interest in rapid completion of projects at a competitive price. In this project, the use of foreign laborers, "probably resulted in less local employment generation than had been anticipated...particularly for skilled laborers."⁴²

Again, these issues are not necessarily applicable only to Chinese firms. Other contractors experienced difficulties on this project as well. For example, IRCON International Limited from India had no previous experience working in Ethiopia, and they underestimated some of their rates, which caused cash flow problems and made it difficult for them to complete the work on time.⁴³ Furthermore, although this project reflects some of the common complaints against Chinese contracting firms, it is perhaps significant that the large majority of reports that described the work of Chinese contractors made no mention of any of these social or environmental problems.

It should also be noted that some experts believe that Chinese companies no longer rely as heavily on foreign laborers as they once did. One World Bank employee explained that in the past, many Chinese firms brought their own workers into Africa.⁴⁴ This had many benefits, including an ease of communication with employees and quicker project completion. Chinese laborers who arrived in Africa usually came alone. Generally, they wanted to work 16 hours a day so that they could finish the contract quickly, get paid, and travel home to their families. Local laborers also want to go home to their families, but this means that they only want to work eight hours a day. The World Bank employee explained that Chinese firms are beginning to understand that difference. He also noted that Chinese firms have seen that bringing foreign laborers to Africa can cause tensions with local communities, and overall Chinese firms have learned from their past experiences and are hiring more locally now. The Chinese Economic Counsellor in Tanzania, also explained the need for Chinese companies to hire locally in Tanzania in a personal interview with Deborah Brautigam conducted in 2008.⁴⁵ He explained that the Tanzanian government would not grant many work visas and bringing Chinese laborers to Tanzania had become very costly. The salary for an ordinary Chinese laborer could be 10 or 20 times more than that of a local laborer. The Counsellor explained

that, “localization is the only way,” due to the higher cost of Chinese labor, and since Africans need to learn how to do construction work on their own.⁴⁶ This anecdote is supported by evidence collected by researchers Barry Sautman and Yan Hairong.⁴⁷ The World Bank employee referenced above also provided some insight into how African laborers had been learning construction skills from Chinese firms.⁴⁸ He explained that on a trip to Liberia he spoke with a Chinese firm representative about how they managed their labor. The Chinese firm representative explained that it was difficult to find skilled labor, but that his firm had trained one group of workers, and those same workers had been rehired for multiple new projects, and had relocated to work on projects in other parts of the country.⁴⁹

5. Questions for Further Research

Baseline Project Riskiness and Bid Prices

Without any weighting, the average overall score for projects in which Chinese firms played a role was 4.434, while projects in which OECD country firms were engaged had an average overall project score of 4.62. There is probably very little causal relationship between the nationality of the contractors and the overall project scores, since many of the construction contracts make up only a small portion of the larger project. Yet, these statistics do raise many additional questions. Why are Chinese firms involved in lower rated projects? Do they engage in riskier projects, or in riskier countries such as post-conflict zones, more often than firms from OECD countries? One of the ICR reports from the Democratic Republic of Congo, in which Chinese firms were heavily engaged, noted the difficulty of finding reliable contractors to work in post-conflict regions. The author of the report expressed some appreciation of the firms that did agree to work in the DRC, explaining, “the selected enterprise worked in difficult circumstances and it was recognized that its task of rehabilitating portions of the road (instead of re-building it) was complex.”⁵⁰

Additionally, can anything be said about the typical bid prices that Chinese firms make compared to OECD country firms? Could this provide a link to overall quality of performances? It is worth highlighting a quote from the ICR describing the failed Zanzibar Airport runway project which is described in detail in Annex 1: “The client’s preferred lowest bidder for the works contract that was supported by Bank procurement team turned out to be a non-performer.”⁵¹ Do Chinese firms usually place lower bids than OECD country firms, and if so, do lower bid prices usually translate into lower overall project scores?

Domestic Construction Firms

Many of the ICR reports place a heavy emphasis on the aim of strengthening the capacity of domestic contractors. This is an official indicator in many projects, and the inability for governments to hire quality local construction firms for the maintenance of their roads is often cited as a difficulty. In their study on aid procurement, Zhang and Gutman demonstrate that contractors in Sub-Saharan Africa won a smaller percentage of regionally supplied civil works

contracts, by number of contracts, in 2013 than in 1995.⁵² The authors cite strong competition from China and India, and local industry weakness as the driving factors behind this. Unfortunately, African companies may be trapped in a vicious cycle; if they are underqualified for World Bank contracts, they do not win contracts, and therefore do not get as many opportunities to gain experience.

The reports examined in this study demonstrate the difficulties of hiring local companies. One report from Kenya explained; “due to the low activity in the construction industry in the previous years many local contractors could not meet the required criteria for participation. Even those who made it to qualify had to struggle to compete.”⁵³ A decision was made to lower the standards to enable smaller firms to qualify to bid, however, “not so good performances by the same small contractors was witnessed even on very small health contracts.”⁵⁴ The lack of experienced local contractors is especially problematic in post-conflict regions. A project from South Sudan ended up contracting all foreign firms, explaining, “there was very low construction industry capacity in South Sudan at the time of both project appraisal and implementation. This was coupled with limited financial and technical capacities of contractors.”⁵⁵

This theme raises the question of how the quality of African contracting firms would compare to Chinese and OECD country firms, using the same methodology. While no African firms were specifically analyzed in this report, one insight into this question was presented from the data. Occasionally, reports mentioned an especially problematic contractor. Unfortunately, many of these comments could not be linked to a specific firm. However, there were seven such firms that could be reasonably identified by contract signing dates or by the type of work and location of work. Of these seven poor performers, five were African firms. The Chinese firm that did not perform on the Zanzibar airport project was the sixth, and a firm from Turkey was the seventh. A similar quantitative study could shed light onto the question of why African governments often choose to hire Chinese firms rather than local firms.

6. Conclusion

This study made a first attempt to quantify the quality of Chinese contractors as compared to OECD country contractors in order to analyze whether or not the commonly held perception that Chinese firms produce particularly low quality work has any validity. The results of this study indicate that for World Bank projects in Africa, there was no significant difference between the quality of construction of Chinese firms and firms from OECD countries in civil works in the transportation sector from 2000 to 2007. Both groups of contractors have average scores between “moderately satisfactory” and “satisfactory.” Additionally, reports on only two out of 72 Chinese contracts mentioned the environmental and social problems commonly attributed to Chinese firms. However, this study indicates that a higher volatility in the quality of Chinese works in the African transportation sector, and the debarment of a few large Chinese firms that were deeply involved in work in Africa could be two forces that strengthen the negative perceptions of Chinese firms.

Annex 1: Overview of the Five Highest and Lowest Scoring Chinese Contracts

Contracts that Received Scores of Highly Satisfactory

Urban Sector Rehabilitation Project: Tanzania. P002758, 2000.

Contracts 1222230, 1237158, and 1237161, for a combined \$3.9 million, were all completed by China Geo-Engineering Company, and all received a score of 6. Each of these contracts fell under the road and storm water drainage component of the project which was completed at a very high quality. According to the ICR, "the achievement of this subcomponent was *highly satisfactory*. In the eight project towns a total of 102 km of roads, with side lined drains were rehabilitated to tarmac standards...as a result, the share of the tarmac network reached 33 percent above the target of 21.6 percent."⁵⁶

Rural Sector Support Project: Rwanda. P064965, 2005.

Contracts 1251822 and 1251819 for \$4.0 million and \$2.5 million respectively, each received a score of 6. These two contracts, completed by China Geo-Engineering Company, both fell under the component of studies/design and rehabilitation/construction of irrigation infrastructures. According to the ICR, this component was, "highly successful since the project achieved more than originally planned."⁵⁷ The work of the contractors in this component allowed local farmers to have larger areas of irrigated land for agricultural production than originally anticipated. Overall, 3093 hectares of land were rehabilitated, when the original target was only 2500. In the Kanyonyomba marshland, which was the site of the first contract, the area under cultivation increased from 55 ha to 600 ha.

Contracts that Received Scores Below Moderately Satisfactory

Integrated Roads Project 2: Tanzania. P002770, 2000.

Contract 1239735 for \$9.3 million for the rehabilitation of the Zanzibar Airport Runway received a score of 1. This contractor, China Huashi Enterprises Corporation was unable to finish the work due to poor performance. According to the ICR, "the client's preferred lowest bidder for the works contract that was supported by Bank procurement team turned out to be a non-performer."⁵⁸ Some Chinese officials were aware of and disappointed by this contract. When the Chinese Economic Counsellor, Dar es Salaam, Tanzania, was asked about the contract by Deborah Brautigam, he shook his head and explained that the firm, Huashi from Sichuan, was inexperienced and worked very slowly.⁵⁹ The Counsellor explained, "Chinese companies normally mobilize slowly, but once the equipment is here, they do [the work] properly."⁶⁰

Rural Transport Project: Madagascar. P073689, 2004.

Contract 1240911 for \$1.25 million for improvements to rural roads, and contract 1236560 for \$3.7 million for spot repairs of rural roads were both executed by China Geo-Engineering Corporation, and both received a score of 3.

Overall, this project had huge difficulties in the contracts for rural roads, which is rather common in Madagascar. An extra consultant was hired to monitor the execution of rural roads, which was helpful, however, “in some cases, the realized rural road works were not of a good quality standard.”⁶¹ The ICR repeatedly mentions the poor performance of rural contractors.⁶² Spot repairs were especially problematic in this project, since in many cases the contractors on these jobs completed a full rehabilitation instead.⁶³ Some of the rural road contracts for this project were also completed by firms from France, and these contracts account for the lowest OECD country scores.

Road Sector Development Phase 2: Ethiopia. P044613, 2004.

Contract 1246958 for \$32.6 million for the upgrading of Adigrat-Adwa-Shire Road received a score of 2. Under the contractor, China Railway Engineering Corporation, the project “suffered from such mobilization delays that the contractor was unable to recover within the contract period. Progress remained well below 50 percent of expected performance, throughout much of the contract period, for a number of reasons, including: repeated changes in project management of the contractor, lack of support to the site by the Contractor’s headquarters, lack of equipment and experienced staff, poor quality of the equipment that was available on-site, lack of communication skill in English, and poor site protection practices prior to and during the rainy season (leading to the subsequent need to rectify erosion problems).”⁶⁴ Additionally, the contractor had difficulties working through the usual World Bank procedures; they did not understand the role of the consultant which made the supervision difficult, and they mobilized before receiving the consent of the Engineer, which complicated standard environmental mitigation procedures.⁶⁵

Contract 1242065 for \$34.5 million for road upgrading on Nekempt-Mekenajo road received a score of 3. Sinohydro Corporation, the executor of this contract, had quality issues. According to the ICR, “the lack of [Resident Engineer] in this contract seems to have exacerbated some of the quality performance problems of the contractor in urban areas in particular, such as Nekempt.”⁶⁶ In addition, the contractor was behind schedule.⁶⁷ Although they were able to complete the project on time, it is likely that having to quicken the pace may have contributed to worse quality.

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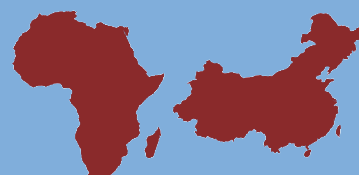
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