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Chinese Investment in Africa:

How Much do we Know?

PEDL Synthesis Series[†] | No. 2

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There is a widespread belief that China plays a fundamental role in African economies, but few rigorous empirical studies to back up this view. Many reports describe China's engagement with Africa as “neo-imperialism” and “authoritarian capitalism”, exploiting natural resources and local labour while undermining democracy. A growing demand for natural resources in China is also credited with boosting growth across the continent, especially in Africa's resource-rich countries.

In this paper, we present a more balanced and data-driven view on what we know about Chinese investment in Africa and what it means for growth. We use official Chinese data to examine the patterns of Chinese engagement in Africa for the period 1998 to 2015. Importantly, these data show large gaps between planned and realised investment. We distinguish between these, and focus only on realised investments.

The data indicate that China's influence in Africa is much smaller than is generally believed, though its engagement on the continent is increasing. Chinese investment in Africa, while less extensive than often assumed, has the potential to generate jobs and development on the continent.

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- Executive Summary¹ -

So much has been written about China's economic engagement in Africa that one is often left with the impression that the Chinese are playing a major role in the development of African economies - for better or worse. While hundreds of thousands of news articles have been written about this topic since 2000, as Brautigam (2009) has pointed out, much of the information in these articles does not hold up under scrutiny. By contrast, the academic literature on Chinese investment in Africa is thin, especially in terms of rigorous empirical studies. Whether popular or academic, most of these articles tend to describe China's engagement with Africa as "neo-imperialism" and "authoritarian capitalism", exploiting natural resources and local labour while undermining democracy. Sometimes though, China is credited with boosting growth across the continent through its impact on the prices of Africa's natural resources.

Yet, China's interest in Africa surely has something to do with the renaissance of economic growth across much of the continent. Average annual GDP growth in 38 African countries was 4.9% between 2000 and 2015; in resource-poor Ethiopia the average was just under 10%. In fact, only seven of the 17 countries in Africa that had annual GDP growth rates above the continental average of 4.9% are considered resource rich.

The fact that growth has been rapid in many resource poor countries, and has continued past the collapse in commodity prices, calls into question the notion that Africa's recent performance is intimately tied to Chinese demand for its commodities (Diao et al. 2017). Are there other ways in which China's interest in Africa relates to the renaissance of economic growth across much of the continent? More importantly, how can Chinese engagement accelerate growth in employment and labour productivity in Africa?

In new research (Brautigam et al. 2017), we aim to present a balanced view on what we know about Chinese investment in Africa and what it means for growth. We take a two-pronged approach to understanding this relationship. We begin by using official Chinese data to examine the patterns of Chinese engagement in Africa for the period 1998 to 2015. Importantly, we distinguish between planned and realised investments, focusing only on the latter. We then evaluate what the available data tell us about how Chinese investment could contribute to African growth and development and compare this to the picture painted in the literature.

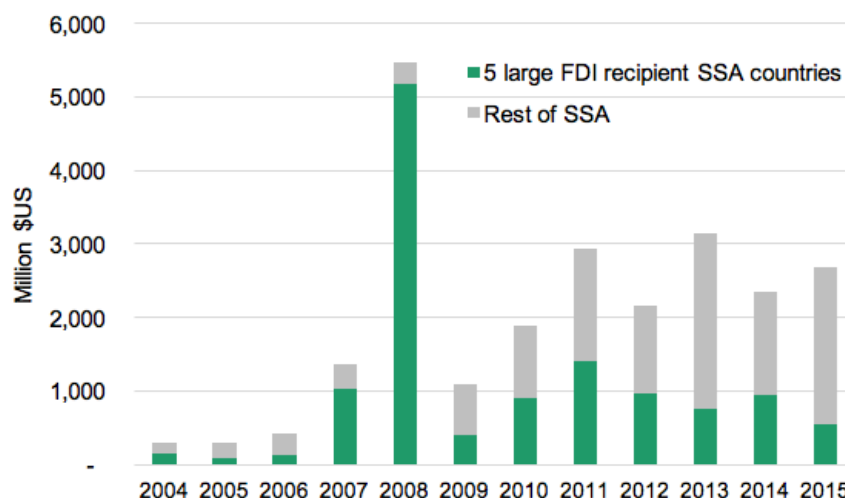
Chinese investment in perspective

African countries make up less than 4% of China's global trade and less than 3% of China's global foreign direct investment (FDI) flows and stocks. Similarly, China only accounted for around 5% of global FDI into Africa in 2015. Africa is much more dependent on China for trade than for FDI. In contrast, roughly 25% of Africa's global trade in 2015 was with China. The relatively low share of Chinese FDI in Africa, revealed by the aggregate statistics, is consistent with work showing that a significant proportion of planned Chinese investments registered with the Ministry of Commerce have not been implemented (Brautigam and Xia 2017).

Chinese FDI in Africa is starting to diversify, both in terms of sector and location. While mining and construction still account for the bulk (54%), the stock of manufacturing FDI increased to 13% of China's FDI stocks in Africa in 2015. Consistent with the increase in the manufacturing stock of FDI, Figure 1 shows how Chinese FDI in Africa has started to diversify away from the traditional recipients of global FDI - the Democratic Republic of the Congo (DRC), Nigeria, South Africa, Sudan and Zambia - into high-growth countries that are not necessarily resource-rich. Once these top five African recipients of global FDI are excluded, China's share of FDI into Africa goes from around 1% in 2004 to almost 9% in 2015.

¹This Executive Summary has been previously published as a VoxDev column by Margaret McMillan, you can access the original version by clicking [here](#).

Figure I: China's FDI flows to Africa, large recipient countries and the rest of Africa



Source: Source: Authors' calculations using data from Table of "China's Outward FDI Flows by Country and Region" in [China Commerce Yearbook](#) (various years) published by Ministry of Commerce (MOFCOM). The data are the same as from the [China Statistical Yearbook: "Overseas Direct Investment by Countries or Regions"](#); and [UNCTAD Bilateral FDI Statistics](#).

We find that in most of Africa's fastest growing economies, investment is going into sectors other than natural resource extraction. Although Chinese FDI did not account for a large share of investment in most of these countries, China's share of FDI and loans increased more rapidly in Africa's fastest growing economies in the period 2012-2015 than in the rest of Africa. This suggests that Chinese FDI in Africa is not radically different than FDI from other countries, and is not isolated in resource extraction in a handful of countries, as is often portrayed.

Qualitative research tends to report on the negative repercussions of Chinese investment - mainly that it is resource focused, associated with authoritarian states, and isolated from local economies. However, the academic literature we review primarily contains empirical studies attempting to explain the determinants of Chinese investment in Africa. The tone of this strand of research seems inconsistent with qualitative research as it shows rapid increases in Chinese investment in Africa's fastest growing non-resource rich countries.

China and Africa: Future potential growth synergies

While the data we analyse are not exhaustive, they shed light on opportunities for research that can address the disconnect between the data and the literature and identify the potential for Chinese investment to spur African growth. The increasing focus on productive sectors in high-growth countries suggests that there could be opportunities for Chinese investment to create jobs, supply local markets and create linkages and knowledge spillovers to local firms. A new strand of research (Brautigam et al. 2017, Abebe et al. 2017) is beginning to address the latter; it demonstrates some positive synergies between Chinese and local manufacturing firms in Ethiopia, and the potential for them to develop in Ghana, Nigeria and Tanzania. All four of these countries belong to the group of Africa's 16 fastest growing economies.

However, we also find that China still has a very small presence in these countries' manufacturing sectors. This highlights our findings from the data - Chinese investment in Africa is not large enough to be either a calamity or panacea, but the evidence from Ethiopia (Abebe et al. 2017) indicates that countries can harness its potential to achieve meaningful growth in jobs and productivity.

CHINESE INVESTMENT IN AFRICA: HOW MUCH DO WE KNOW?

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October 2017

Abstract

There is a widespread belief that China plays a fundamental role in African economies, but few rigorous empirical studies to back up this view. Many reports describe China's engagement with Africa as "neo-imperialism" and "authoritarian capitalism", exploiting natural resources and local labour while undermining democracy. A growing demand for natural resources in China is also credited with boosting growth across the continent, especially in Africa's resource-rich countries. In this paper, we present a more balanced and data-driven view on what we know about Chinese investment in Africa and what it means for growth. We use official Chinese data to examine the patterns of Chinese engagement in Africa for the period 1998 to 2015. Importantly, these data show large gaps between planned and realised investment. We distinguish between these, and focus only on realised investments. The data indicate that China's influence in Africa is much smaller than is generally believed, though its engagement on the continent is increasing. Chinese investment in Africa, while less extensive than often assumed, has the potential to generate jobs and development on the continent.

JEL codes: F2, F3, L6, O1.

Key words: Africa, Chinese Investment, FDI, Industrial Development, Industrialization, Development strategy.

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* We acknowledge Peixun Fang for excellent research assistance. We are very grateful to Ying Xia for helpful conversations and access to her ongoing and as yet unpublished work.

I. Introduction

So much has been written about Chinese economic engagement in Africa that one is often left with the impression that the Chinese are playing a major role in the development of Africa's economies - for better or worse¹. For example, a search on LexisNexis for the term Chinese investment and Africa reveals hundreds of thousands of news articles on the topic since 2000 alone (see Figure 1). As Brautigam (2009) has pointed out, much of the information in these articles does not hold up under close scrutiny. By contrast, the academic literature on Chinese investment in Africa is thin. For example, a search in Econlit - the premier search engine for articles by academic economists - for the same terms used in the LexisNexis search reveals only 15 journal articles. Scholars and journalists have focused on China's motives for investing in Africa, and it is not uncommon to see its involvement characterized as "neo-imperialism" and "authoritarian capitalism": exploiting natural resources and local labor while undermining democracy. On the other hand, China is sometimes credited with boosting growth across the continent through its impact on the prices of Africa's natural resources.

Yet, China's interest in Africa surely has something to do with the renaissance of economic growth across much of the continent. As we show in Figure 2, average annual GDP growth in 38 African countries was 4.9 percent between 2000 and 2015; in resource-poor Ethiopia the average was just under 10 percent. In fact, 17 countries in Africa had annual GDP growth rates above the continental average of 4.9 percent and only 7 of these countries are considered resource rich. The fact that growth has been rapid in many resource poor countries and the fact that growth has continued to be rapid in many countries past the collapse in commodity prices calls into question the notion that Africa's recent performance is intimately tied to Chinese demand for its commodities². Are there other ways in which China's interest in Africa has something to do with the renaissance of economic growth across much of the continent?

Our goal in this paper is to present a balanced view on what we know about Chinese investment in Africa. We take a two-pronged approach first using official Chinese data, among other published sources, to examine the trends and second evaluating the literature through the lens of our data analysis. We structure our inquiry around the following broad sets of questions. First, what is the relative importance of Chinese investment in Africa? Second, what role has Chinese investment played in Africa's fastest growing economies? Third, what have we learned from the academic literature on Chinese investment in Africa? And fourth, what have we learned about Chinese investment in African manufacturing based on in-depth fieldwork? We devote a separate section to manufacturing because of its potential to speed up structural change in African economies (McMillan and Rodrik, 2011).

To uncover trends in Chinese investment in Africa, we rely primarily on official statistics from China which we call the MOFCOM OFDI flow data. These are data on actual outward foreign direct investments by Chinese firms and are published in the China Commerce Yearbook, which is published by the Ministry of Commerce (MOFCOM)³. The MOFCOM OFDI flow data capture the value of realized outward FDI by Chinese firms by country of destination. These same data are used by UNCTAD the official organization charged with collecting international statistics on FDI and by the IMF in its balance of payments statistics. Most of these data from recent years are publicly available online and we provide links to the websites in our tables and figures and in the references. For the most recent data (2015) which has not been published in the yearbooks, the official source we use is the China Annual Bulletin of Statistics, which is published by China's National Bureau of Statistics.

A second official source of data on Chinese investment in Africa is project level data collected by MOFCOM both centrally and at the province level. We will call these data the MOFCOM OFDI project data. These data comprise summaries of officially approved investments by Chinese firms in foreign countries including sector of investment. Thus, an attractive feature of the approved project data is that the project descriptions

¹We will use Africa to refer to the economies of Sub-Saharan Africa. Almost all of our data analysis focuses on Sub-Saharan Africa; we flag the cases in which the data cannot be disaggregated.

²For more on Africa's recent growth performance see "The Recent Growth Boom in Developing Economies: A Structural-Change Perspective" (Diao, McMillan and Rodrik, 2017).

³The China Statistical Yearbook also reports investment data which is consistent with the China Commercial Yearbook.

may be used to code projects by industry (see for example Chen et al. 2015). However, there are two serious drawbacks to the project level data. First, dollar values of projects are not recorded making it difficult to assess the relative importance of these projects. Second, the project data do not appear to correspond closely with what is happening on the ground (Brautigam and Xia, 2017). As we will show, this is because many approved projects are not yet or will never be operational. We discuss this in greater detail the paper drawing on the example of Ethiopia.

There are at least three other sources of statistics on Chinese investment in Africa - two official and one unofficial. A well known unofficial sources is the FDI Markets database published by the Financial Times. Like the MOFCOM project data, the FDI Markets data include several projects which are not operational. The primary source for the FDI Markets database is announcements in the press or other media outlets about project plans⁴. In theory two other sources of official data lie in African countries: firm level census data and administrative data collected by investment agencies. However, at present, firm level censuses covering an extended period of time are rare in Africa and administrative data collected by investment agencies often does not distinguish between planned and realized investments.

We argue in section 2 that although the official FDI flow data may miss some of the smaller projects or understate investment that goes through offshore tax havens, it is for now the most accurate source of data for describing broad trends in Chinese investment in Africa. These data reveal that African countries make up less than four percent of China's global trade and less than three percent of China's global FDI flows and stocks. We also show that mining and construction account for the bulk of Chinese FDI in Africa (54 percent). However, the stock of manufacturing FDI is increasing and reached 13 percent of China's FDI stocks in Africa in 2015. Consistent with the increase in the manufacturing stock of FDI, we find that Chinese FDI in Africa has started to diversify away from the traditional recipients of global FDI - Democratic Republic of the Congo (DRC), Nigeria, South Africa, Sudan and Zambia - and into other less resource rich African countries.

Turning to Africa, we find that OFDI by Chinese firms into Africa only accounted for around 5 percent of global FDI into Africa in the most recent year for which we have data - 2015. The relatively low share of Chinese FDI in Africa revealed by the aggregate statistics is consistent with work showing that a large proportion of planned Chinese investments registered with the Ministry of Commerce have not been implemented (Ethiopian Investment Commission 2016, Brautigam and Xia, 2017). Chinese FDI into Africa has however been diversifying away from resource rich countries in more recent years. In particular, once one excludes the top five African recipients of global FDI - all resource rich countries - China's share of FDI into Africa goes from around 1 percent in 2004 to almost 9 percent in 2015. This mirrors what we learned about the diversification of Chinese FDI in Africa when we investigated Chinese engagement in Africa from the Chinese perspective and indicates that in some African countries, China is becoming an increasingly important investor.

Armed with these stylized facts we move back to Africa to examine the role of investment (including Chinese investment) in Africa's 16 fastest growing economies. We find that rapid GDP growth was accompanied by even more rapid growth in investment in Africa's fastest growing economies. We also find that in the majority of Africa's fastest growing economies, investment is going into sectors other than natural resource extraction, consistent with the fact that the majority of Africa's fastest growing economies are not resource rich. With the exception of Ethiopia, which pursued a more heterodox strategy (World Bank, 2016), most of this investment was financed the old fashioned way by loans, foreign aid or FDI. Finally, we find that although Chinese FDI did not account for a large share of investment in most of these countries, China's role in investment increased more rapidly in Africa's fastest growing economies in the period 2012-2015 than in the rest of Africa.

Having established these stylized facts, we turn to the academic literature on Chinese investment in Africa. We focus on the period 2000 to present, the period during which Chinese engagement in Africa started to

⁴See <https://www.fdimarkets.com/faqs/> for a description of the data.

take off. We begin with general articles and then turn to country-specific articles. We mostly evaluate this literature in light of what we have learned from our data analysis, noting in particular research that contradicts or is consistent with our findings. We find that most of the empirical research focuses on the determinants of Chinese investment in Africa without delving much further and that more attention has been paid to Chinese trade with Africa than investment. On the other hand, more qualitative studies focus on the common negative associations with Chinese investment, mainly that it is resource focused, associated with authoritarian states, and isolated from local economies. In general, there is a major disconnect between the stylized facts we present and the overall tone of the literature.

However, there is a budding strand of research that is so new that it has not yet made its way to academic journals. Since the work is central to the question at hand, and because it focuses exclusively on Chinese manufacturing investment in Africa which has the potential to be transformational, we choose to review this work in a separate section of the paper⁵. This research consists of two related but distinct components designed to produce both qualitative and quantitative evidence on the role of Chinese and other Asian investment in catalyzing the development of manufacturing by local firms in Africa. This work demonstrates some positive synergies between Chinese and local manufacturing firms in Ethiopia and the potential for them to develop in Ghana, Nigeria and Tanzania; all four of these countries belong to the group of Africa's 16 fastest growing economies. However, consistent with the rest of the evidence in this paper, we also find that China still has a very small presence in these countries' manufacturing sectors.

The remainder of this article is organized in the following way. In Section 2, we describe our data. Sections 3 and 4 use these data to examine the relative importance of Africa to China and China to Africa documenting the stylized facts. In Section 5 we take a closer look at Africa's 16 fastest growing economies and the role that China has played in these economies. In Section 6, we review the literature on Chinese investment in Africa comparing what has been written with the stylized facts we uncovered in Sections 3 and 4. In Section 6, we present new research which examines the linkages between Chinese and local firms in Africa. Section 7 concludes with a reiteration of the major findings and directions for future research.

II. The Data

Many of the common perceptions about Chinese investment in Africa are not well supported by evidence (Brautigam, 2009). For this reason, we devote this section to describing our data sources, acknowledging weaknesses where they exist and explaining why different data sources may lead to somewhat different conclusions. Where appropriate, we draw on the work of others to support our arguments.

Getting a handle on the extent and type of Chinese investment in Africa is challenging. One reason is that planned investment projects - the data captured for example in MOFCOM OFDI project - typically differ significantly from realized investment projects - the data captured by MOFCOM OFDI flow. This problem is not unique to Chinese investment. However, using data on planned and approved projects can wildly overstate actual investment. For example, Shen (2015) compares data on the number of Chinese FDI projects from six African countries to the corresponding data from MOFCOM and finds that the number of projects according to host country data was at least 2.5 times greater than the amount recorded in the MOFCOM OFDI project data. Statistics produced by the Ethiopian Investment Commission (2016) reveal an even greater disparity between planned projects and projects in the operational phase. For example, in 2013 only 5% of all projects had moved from the planned stage to the implementation or operational stage. More recent fieldwork by Brautigam et al (2017) reveals a very low correspondence between project approvals recorded in the MOFCOM OFDI project data and actual investments on the ground.

Because the Chinese government requires all state-owned and private firms investing abroad to submit detailed information on a regular basis, official Chinese data (MOFCOM OFDI flow) tend to be relatively reliable compared to other sources when it comes to tracking actual investments by Chinese companies in Africa. However, there are some important caveats. First, the MOFCOM OFDI flow data is likely to miss

⁵The research was carried out under PEDL grant 1386, "The Role of Asian Investment in Manufacturing in Catalyzing Economic Development in Africa" - PI McMillan and co-PI Brautigam.

smaller projects since in the past it has only tracked projects valued above \$10 million. The aggregate value of these ‘missing’ projects is almost impossible to estimate without digging in country by country. While projects under \$10 million are likely to account for a small share of total investment, the size of unrealized projects is unknown since the MOFCOM OFDI project data does not record project values (Brautigam et al 2017). In addition, the MOFCOM OFDI flow data misses investments that go to Africa through offshore tax havens.

An alternative source of information on Chinese investment in Africa is project level data also collected by MOFCOM⁶. The project level data is a database of all registered Chinese firms with investments in Africa. This database includes projects above \$100 million that have been approved at the central level and projects between \$10 and \$100 million that have been approved through provincial offices. The database includes the name of the parent company and its African subsidiary, the scope of its business, and the date its application was approved by MOFCOM. This level of detail makes it possible - at least in theory - to code investment by ISIC sector. However, most projects span several sectors, making coding difficult. An additional drawback of these data is that the dollar amounts of the projects are not revealed. Finally, like the data on planned investments collected by African governments, approved investments often do not come to fruition, meaning that one must be careful about drawing conclusions about Chinese investment in Africa based on these data alone (Brautigam et al 2017).

Thus, to describe broad trends in Chinese investment in Africa we draw primarily on the MOFCOM OFDI flow data. These same data are also deemed the most reliable source of Chinese OFDI by UNCTAD and are used in UNCTAD’s World Investment Report. The official source on overseas investment and cooperation in China is the China Commerce Yearbook, which is published by the Ministry of Commerce. This ministry is charged with collecting and reporting all such data and is our primary data source. In addition, the China Statistical Yearbook includes investment data consistent with the China Commerce Yearbook. All of these data are publicly available online and we provide links to the websites in our references. For the most recent data (2015), which has not been published in the yearbooks, the official sources are the China Annual Bulletin of Statistics of Contracted Projects and Labor Cooperation with Foreign Countries, which can also be accessed online on the website of the National Bureau of Statistics of China.

We use UNCTAD data on bilateral foreign direct investment to compile investment into Africa from all other countries. As noted, the UNCTAD data for China comes from official sources and matches exactly the Chinese government data on outflows to Africa. It is therefore a useful source for comparing inflows from China into Africa to inflows from other countries into Africa.

Of course, an alternative approach would be to collect data on FDI inflows from African countries. This is done by the IMF through the Coordinated Direct Investment Survey (CDIS), in which individual countries are asked to submit data on their inward and outward direct investment stocks. However, there are large disparities between the CDIS and the MOFCOM OFDI flow/UNCTAD data, with the former indicating much higher levels of Chinese FDI as compared to the latter. Based on work by Shen (2015) and Brautigam et al (2017), our view is that a large part of the discrepancy is likely to be the difference between planned and actual investments. This is because most of the African data comes from understaffed investment agencies which are often not able to keep up with what is happening on the ground.

By comparison, international trade data is a lot easier to find and tends to be more reliable. Part of the reason for this is that there is no such thing as ‘planned trade’. A second reason has to do with the fact that exports and imports mostly pass through official customs agencies in at least two countries making it possible to verify transactions without extensive fieldwork. There are of course issues with smuggling and invoicing but having two sets of accounts can alleviate some of these issues. Our source for all of the trade data we use in this paper is UN COMTRADE.

III. How Important is Africa to China?

⁶These data were available from NBS until 2016 but they have since been removed and so do not appear to be publicly available.

In this section, we present a series of stylized facts using the data we just described, which helps to put China's engagement in Africa in the context of China's overall engagement with the rest of the world. China's economic engagement with the rest of the world including Africa started to accelerate rapidly soon after China joined the WTO in December 2001. Broadly speaking, China's economic engagement with the rest of the world can be classified into the following four categories: international trade; foreign direct investment (FDI); loans; and construction projects ("economic cooperation"), part of which overlaps with Chinese loans to and FDI in Africa.

While not all of these channels of economic engagement entail investment per se, to fully understand Chinese investment abroad, we need to put it in the context of these other channels of economic engagement. To see this, consider Chinese FDI in the mining and construction sectors. These types of FDI have often been accompanied by loans from the Chinese government to African governments which in turn contract Chinese firms to extract resources or build infrastructure. In turn, the repayment of these loans is often tied to commodity exports from African borrowers to China. We do not consider humanitarian and grant-based development assistance from China to the rest of the world for two reasons. First, it has not been a big part of China's economic engagement with the rest of the world and second, it would not fall into the traditional categories mentioned above (Brautigam, 2011). A summary of the different channels of China's engagement with Africa is presented in Table 1.

Trade

In US dollar terms, the most important channel through which China has engaged with the rest of the world is international trade and Africa is no exception in this respect. As can be seen in Figure 3, China's international trade started to accelerate just after China joined the WTO in December 2001. By 2015, China's share of world exports had grown from just 4.6 percent in 2001 to 15.4 percent in 2015. China's share of world imports also grew rapidly from just 3.9 percent in 2001 to 9.9 percent in 2015. Figures 4a and 4b show that China's trade with Africa follows similar patterns; its magnitude increased rapidly after China joined the WTO in 2001. However, trade with Africa accounts for a very small share of China's global trade. China's imports from Africa started at around 1 percent in 1998 and peaked at almost 6 percent in 2012. The share of China's imports from Africa fell to only 3.5 percent in 2015, possibly as a result of the downturn in global commodity prices. China's exports to Africa continued to grow after 2012 (Figure 4a). Figures 4a and 4b also clearly show that China ran a trade deficit with Africa in all of the years up to 2014.

Foreign Direct Investment

Like trade, China's global FDI has increased rapidly over the past 16 years but FDI annual flows still amount to less than 10 percent of the value of Chinese exports (Figure 5a). Since 2001 the Chinese government has pursued what is known as the 'go out' policy, which encourages Chinese investment abroad. The main reasons for encouraging domestic investment abroad are the large amounts of foreign reserves accumulated by China, Chinese industry's need for raw materials, and a desire to make Chinese firms competitive with mostly Western multinationals. The Chinese government together with the China Council for the Promotion of International Trade (CCPIT) has introduced a number of incentives which are intended to encourage domestic firms (both public and private) to invest overseas.

Figures 5a and 5b show that African countries account for a very small share - roughly 2 percent of flows and 3 percent of stocks - of China's global FDI. There was a one-time spike in Africa's share of Chinese FDI flows in 2008 but this was a result of China's acquisition of 20 percent of the shares of Standard Bank in South Africa. However, China's FDI outflows to Sub-Saharan Africa continue to make up a very small portion of its total FDI outflows, and the share of FDI outflows to Sub-Saharan Africa has not been increasing relative to other regions. For example, in 2015, FDI from China to Africa comprised only 2.5% of China's FDI flows. The majority of Chinese FDI (58.3%) still goes to Hong Kong, although Europe, South America and the rest of Asia all continue to receive more FDI than Sub-Saharan Africa.

However, when we disaggregate the data, we get a slightly more nuanced story. Figures 6a and 6b show the amounts of Chinese FDI to Africa going to the five largest recipients as a group - Democratic Republic of

the Congo (DRC), Nigeria, South Africa, Sudan and Zambia - and the rest of Africa. Figure 6b shows that Chinese FDI stocks in Africa have increased rapidly from \$840 million in 2004 (in current terms), which is the first year for which we have comprehensive data, to \$31.2 billion in 2015, corresponding to a 38-fold increase⁷.

Early FDI by China in Africa was intimately linked with China's demand for natural resources and was primarily done by China's State Owned Enterprises (SOEs). This explains why Chinese FDI in Africa was primarily concentrated in the top five countries, which are predominantly resource rich economies. Figure 6a shows that the flows of FDI to the top five countries have been declining since 2011, an indication that Chinese FDI in Africa has started to diversify away from resource rich countries into other economies in Africa. Moreover, while the top five countries possess significant natural resources, these are not necessarily the main reasons for their Chinese investment presence. For example, the surge of Chinese FDI flows to South Africa was driven by the one-time purchase of shares in Standard Bank as described above, while Chinese investment in Nigeria is not limited to oil, given that the majority of Nigeria's oil investment is from Dutch, Italian and American companies and the diversity of Chinese investment activities described by Chen et al (2016).

Figures 7a (FDI flows) and 7b (FDI stocks) are consistent with the idea that Chinese FDI to the world is becoming more diverse in terms of sectoral structure. In 2004, the mining sector accounted for one third of Chinese FDI flows but by 2015, mining accounted for less than 8 percent of total FDI flows. Instead, business services, which includes leasing and potentially investment going into offshore financial centers, has become the most important sector for Chinese FDI rising from 14 percent in 2004 to 25 percent in 2015. In terms of Chinese FDI stocks, Figure 7b shows that mining accounts for a relatively stable share of total Chinese FDI and never becomes dominant in total FDI. At the peak in 2006, mining accounted for 20 percent of Chinese FDI stocks, falling to 13 percent in 2015. In fact, in every year since 2004 - the year when data became available - the share of business services in China's overall FDI stocks is the highest, possibly driven by FDI going to Hong Kong, where more than half of China's FDI has gone in every year since 2004.

There are only three years of data (2013-2015) for China's FDI stocks in Africa at the sector level and these data only represent the top five sectors⁸. In contrast to the global sector structure of Chinese FDI stocks presented in Figures 7a and 7b, Figure 8 shows that the majority of Chinese FDI in Africa was still in mining in 2013, 2014 and 2015. However, Chinese FDI in manufacturing is increasing. The sectoral structure of FDI stocks are also available for other regions, but of course the top five sectors vary by region. In Figure 9 we show the relative importance of the five sectors by industry and region for 2015. Although we only show the breakdown for 2015, in total these sectors capture 70-80 percent of the Chinese FDI stock in all three years. Within sectors we rank the regions from high to low according to their share of the Chinese FDI stock in that sector. Only four of the five sectors that comprise the majority of China's total FDI stock are important in Africa; African countries have received so little Chinese FDI in the business services sector that it shows up as missing in Figure 9. This may relate to the lack of tax havens in Africa, apart from Mauritius.

Consistent with Figure 8, Figure 9 shows that the Chinese FDI stocks in Africa are more concentrated in mining and construction, each of these sectors accounts for 27 percent of total Chinese FDI stocks in Africa in 2015. Notably, Africa is the only region where construction is one of top five sectors in terms of the share of FDI stocks. However, Figure 9 shows that mining is important for Chinese FDI not only in Africa, but also in Oceania and Europe; in Oceania more than 60 percent of Chinese FDI stocks are concentrated in mining. Manufacturing appears as a top five sector for Chinese investment only in three regions: Africa, Europe and North America. In fact, the shares of manufacturing in Chinese total FDI stocks in the two developed regions are higher than in Africa, where manufacturing accounts for around 13 percent of Chinese FDI stocks.

Construction

⁷These numbers are not in constant terms but even after adjusting them, the increase would be substantial.

⁸The data for the top five sectors for FDI to Africa is at the regional level and includes North Africa.

As noted above, the China Annual Bulletin of Statistics of Contracted Projects and Labor Cooperation with Foreign Countries records the annual value of engineering projects won by Chinese firms. Africa accounts for a significant share of Chinese overseas construction projects, relative to its share of Chinese trade and FDI. In 2004, Africa's share of these projects was 16 percent and rose to almost one third of the value of global contracts engaged in by Chinese companies in 2015 (Figure 10). Given Africa's infrastructure deficit, this is perhaps not surprising. The fact that the value of fulfilled (as opposed to planned) contracts outnumbers FDI stocks in construction by 4 to 1 means that the vast majority of infrastructure built by China in Africa is not financed by Chinese FDI. However, according to data on Chinese loans from SAIS-CARI and ICA (2016), about a quarter of African infrastructure project value is financed by Chinese loans, many of which include clauses requiring the purchase of goods and services from China (Brautigam and Gallagher 2014).

How many Chinese workers are employed on construction projects in China? This is an important question because public works projects are typically a way for governments to boost employment and because jobs are a top priority for every government in Africa. The numbers in Figure 11 provide some insight into this issue and suggest that it is unlikely that the Chinese government is using infrastructure projects in Africa to export surplus workers. Figure 11 shows the number of Chinese workers in Africa by year since 2009 broken down by workers who are under labor service arrangements and workers who are tied to contracted projects. Workers under labor service agreements are workers who have gotten visas similar to the H1-B visa in the U.S, which allows foreign workers to legally be hired in the U.S. Workers who are tied to contracted projects are workers who work in foreign countries for the Chinese firms with whom the projects have been contracted. These workers are almost all engaged in construction projects. Figure 11 makes it clear that the vast majority of Chinese workers in Africa are attached to contracted construction projects, rather than labor service arrangements.

Recall that Figure 10 shows that African construction projects account for one third of the value of global contracts engaged in by Chinese companies. We can see from Figure 11 (the red line) that Africa's share of Chinese workers in contracted projects reflects its share of Chinese construction projects (as shown in Figure 10). By contrast, the share of Chinese workers in Africa who go abroad through labor service arrangements is very small, at around 5-6 percent in 2011-2015 (the green line at the bottom of Figure 11). The implication is that the ratio of the number of Chinese workers to the number of Chinese construction projects in Africa is similar in the rest of the world. Moreover, the number of Chinese workers has been relatively stable over the past few years despite the rapid growth in the value of overseas contracted projects. Currently, there is a ratio of 3-4 Chinese workers per million dollars of project value, suggesting that any displacement of potential African workers on these projects would not be large. This corresponds to Sautman and Yan (2015), who cite findings that 87% of employees in Chinese projects in Africa were local.

Loans

The size and influence of China's banks have increased rapidly in recent years. The two major banks in operation are the China Development Bank (CDB) and the Export-Import Bank of China (CHEXIM). China has also played a major role in establishing the Asian Infrastructure Investment Bank as well as at least 13 smaller regional funds. Together, CDB and CHEXIM hold more than \$2 trillion in assets, which is more than twice the assets of the major Western-backed multilateral development banks combined. \$684 billion of these assets are invested overseas. Their capital base is also growing much more rapidly, putting China on track to become the largest lender to developing countries. China's international lending has a major focus on energy, with \$117.5 billion in energy financing provided between 2007 and 2014. (Gallagher et al 2016).

In comparison, Chinese governments, banks, and contractors extended loans totaling \$86.9 billion to African governments and state owned enterprises between 2000 and 2014. Of this, \$24.2 billion was for transportation, \$17.6 billion for energy and \$9.0 billion for mining (Hwang et al 2016). 54 percent of Chinese loans in this period were made to five countries: Angola, Ethiopia, Sudan, Kenya and the DRC. Lending to Angola is heavily tied to the country's oil, with about half of loans being made to the state-owned oil company and the other half being oil-backed infrastructure loans, while the loan portfolio in Ethiopia is spread out across transportation, communications and energy (hydropower), among other sectors (Hwang et al 2016).

About 56 percent of China's loans to Africa from 2003 to 2011 were backed by commodities (Brautigam and Gallagher 2014). This has exposed their portfolio to serious risk in the face of falling oil prices and may prompt them to diversify their loan portfolio away from commodity - especially oil - backed lending (Gallagher et al 2016).

While some of China's loans can be considered concessional or preferential, those backed by commodities are typically made at rates similar to those in global capital markets (Brautigam and Gallagher 2014). Nevertheless, at the Forum on China Africa Cooperation (FOCAC) in December 2015, China pledged to provide \$35 billion in concessional and preferential loans and non-preferential export credits along with an additional \$5 billion in interest-free loans and grants to African countries (Hwang et al 2016). However, given the slow realization of past commitments, China's economic slowdown and falling commodity prices, there are some doubts about if or how this funding will be made available.

Summarizing, we can say the following about Africa's relative importance to China. African countries make up a very small share of China's global trade and FDI. Put differently, if growth were to slow down in Africa, the impact on the Chinese economy would likely be minimal. This has implications for African countries' bargaining power vis a vis Chinese investors, although a discussion of these issues is beyond the scope of this paper. On the other hand, a slowdown in Africa would be a blow to Chinese construction companies who did roughly 30 percent of their business in Africa in 2015. This could have repercussions for Chinese banks heavily invested in infrastructure lending but again, these loans make up a tiny share of China's financial portfolio.

IV. How Important Is China to Africa?

China's ascension into the global economy via world trade and investment occurred almost simultaneously with the renaissance in growth in a great number of African economies. Thus, it would not be surprising to find that African economies rely heavily on China for investment and trade. As we will show below, the numbers don't always bear this out.

Trade

Africa's growth renaissance was accompanied by rapid growth in Africa's total value of imports and exports (Figures 12a and 12b). The blue line in Figure 12a shows that the share of Africa's exports going to China increased dramatically over this period going from around 2 percent of total exports in 1998 to a little over 25 percent of total exports in 2015. The share of Africa's imports coming from China also increased rapidly over this same period going from around 4 percent in 1998 to around 26 percent in 2015. The drops in African exports and imports in 2015 are partially explained by the drops in world commodity prices and partially explained by the slowdown in the world economy; we saw a similar pattern in Figure 3 for Chinese exports and imports.

Foreign Direct Investment

Figures 13a and 13b show that like trade, there was a rapid increase in FDI to Africa between 2004 and 2015 both from the world and from China. The bars in figure 13a show that total FDI flows to Africa nearly quadrupled in a 10-year period rising from \$13 billion in 2004 to \$48 billion in 2015. In this period, excluding 2008 due to the one-off transaction with Standard Bank in South Africa, we see that the share of Chinese FDI in Africa's total inward FDI flows rises from around 2 percent in 2004 and 2005 to 6-7 percent in recent years. In terms of FDI stocks, the bars in Figure 13b show that over this same period, FDI stocks in Africa went from around \$200 billion to almost \$530 billion; and China's share in Africa's FDI stocks increases from less than 1 percent in 2004 and 2005 to 6 percent in 2015. In both Figures 13a and 13b, the part of the bars that is shaded in red show the value of FDI from China to Africa. Unlike China's important role in Africa's total exports and imports, it is evident from both Figures 13a and 13b that China still accounts for a tiny share of total FDI in Africa, although it has been steadily increasing since 2004. These numbers are consistent with our discussion in the data section indicating that the actual as opposed to planned projects in Africa are still very few.

When we break down the FDI data by the amount received by five largest recipients- DRC, Nigeria, South Africa, Sudan and Zambia - versus the rest of Africa, a more interesting pattern emerges. We established using Figures 6a and 6b that Africa's top five recipients of global FDI also attract a significant share of Chinese FDI. Figures 14a and 14b actually show that as shares of these five top countries' total FDI, China is not that different from its shares in the rest of Africa in the early years of this 12-year period. This seems to tell us that the large African countries that received more of China's FDI inflows in these early years are also the countries that receive more FDI from the rest of the world. Thus, the argument that China's patterns of investment in Africa differ significantly from the rest of world's investments in Africa does not appear to be supported by the data in the early years. However, we can also see that although China's share in FDI to all of Africa has been relatively modest, the share of Chinese FDI going to countries outside the top five recipients has become more important in recent years. This can be most easily seen by staring at the red bars that represent the Chinese share of FDI stock in the rest of Africa in Figure 14b. In 2004, China's share of FDI stocks in countries outside the top five amounted to only 1 percent. By 2014 and 2015, China's share of FDI stocks in countries outside the top five was 8-9 percent. The implication is that China is diversifying its pattern of FDI away from the top five and into other African countries. It also indicates that Chinese FDI is diversifying more rapidly, at least in terms of destination, than FDI from other countries.

Loans and Construction

When we examined Africa's share in total Chinese lending and construction, we were able to use official statistics compiled by the Chinese government. It is close to impossible to do the reverse since there is no comprehensive database of construction projects in Africa. Getting a handle on this would almost certainly require fieldwork. Similarly, there is no comprehensive public database which shows borrowing by African countries by origin of lender. To the extent possible, we discuss this issue on a country by country basis in the next section of this paper where we consider the relative importance of Chinese investment in African countries' total gross fixed capital formation.

Summarizing, Africa appears to be much more dependent on China for trade than for foreign direct investment. By 2015, roughly 25 percent of Africa's global trade was with China. By contrast, China only accounted for around 5 percent of global FDI into Africa in 2015. The investment figures are consistent with the work showing that planned investments by China in Africa far outstrip actual investments. Finally, the aggregate statistics on Chinese FDI into Africa reveal some interesting heterogeneity. In particular, once one excludes the top five recipients of FDI - DRC, DRC, Nigeria, South Africa, Sudan and Zambia - a pattern of the increasing importance of Chinese FDI emerges.

V. Chinese Investment in Africa's Fastest Growing Economies

African countries have experienced an extraordinary period of economic growth over the last couple of decades. The recent downturn in the global economy has cast a dark shadow on the future of growth worldwide, but growth in Africa has been resilient and remains high (Diao et al 2017). Before turning to the literature, we pursue one more line of inquiry that might help shed light on the role of Chinese investment in Africa. In this section, we examine the role that investment (not just Chinese investment) has played in Africa's fastest growing economies. Our logic is as follows: if growth has been accompanied by rapid investment in these economies, then there is a chance that Chinese investment could have played a role in spurring this growth. On the other hand, if growth is primarily led by consumption, then it would be hard to argue that Chinese investment had played a direct role in stimulating growth.

As we discussed in our introduction, the average annual growth rate of GDP for Africa as a whole was 4.9 percent over the period 2000-2015. Of the 17 countries with above-average growth, seven are resource rich and their growth likely corresponds to the recent global commodity price boom that has now dissipated. These countries are Angola, Chad, DRC, Namibia, Nigeria, Sierra Leone and Zambia. However, many of these high-growth countries are resource poor including Burkina Faso, Ethiopia, Kenya, Rwanda and Uganda. And it is clear that in other countries such as Mozambique and Tanzania, natural resources do not explain the bulk of the recent performance. Overall, more than 70 percent of the increase in Africa's

total GDP (measured in constant USD) between 2000 and 2015 can be explained by the growth in these 16 countries; they accounted for 45.4 percent of African total GDP in 2000 and 58.6 percent in 2015⁹.

Figure 15 shows that in these high growth African countries, investments, measured as gross capital formation in national accounts, have grown rapidly between 2000 and 2015. Moreover, investment growth rates are consistently higher than GDP growth rates in most of these countries, ranging from 8.6 percent in Angola to 20 percent in Mozambique (Figure 15). We also distinguish between resource-rich and other high-growth countries using different colored dots in Figure 15. By doing this, we are able to show that the high growth rate of investment is not necessarily related to commodity booms that benefit resource-rich countries only. By contrast, the average annual growth rate of investment was 6 percent in the rest of Africa's economies (the red diamond dot in Figure 15). Thus, investment has clearly been at least a proximate driver of growth in Africa's fast growing economies.

What about consumption? We also find that final consumption growth rates are very close to GDP growth rates across the 16 high-growth countries; the correlation coefficient between consumption and GDP growth rates is 0.79. This seems to indicate that rapid investment growth did not come at the expense of consumption growth in most countries. For resource rich countries, high growth in investment can be financed by windfalls from commodity booms (which may be partly a result of Chinese demand) but for the rest of the African countries, high growth in investment requires external sources of financing including foreign aid, foreign loans and foreign direct investment. While Ethiopia has received substantial loans from China and the World Bank, it may be an exception in that it seems to have also financed much of its public investment through a combination of heterodox policies, including financial repression designed to channel private savings to public investment (Rodrik, 2016).

Against this background, we examine the relative importance of FDI in total investment in Africa's fast growing economies. From Section 4, we already know that for Africa as a whole, FDI increased rapidly. Here we compare the rapid growth in FDI with the rapid growth in overall investment in these 16 countries. We focus on the period of 2004-2015 the period in the acceleration of FDI to Africa. As shown in Figure 16, total FDI inflows to these 16 countries are equivalent to 12.4 percent of gross capital formation over 2004-2015, indicating that FDI is not a major source of financing. However, it could be that FDI was attracted to these countries primarily in recent years because of these countries' growth performance, which has expanded the size of the domestic market and has possibly increased the demand for investments in infrastructure.

Figure 16 also shows huge variation in the shares of FDI in capital formation in 2004-2015, which are represented by the purple bars, from high to low in the figure. The shares are as high as 60 percent in Sierra Leone and Mozambique and are negative (meaning net FDI outflows) in Angola. There are five countries where the shares are more than 25 percent, and another five with shares higher than the group average. Only four of these 10 countries are resource rich, which is consistent with our finding that a significant share of FDI takes place outside of the mining sector. The two green bars in Figure 16 represent breakdowns of FDI flows in two sub-periods, 2004-2011, and 2012-2015. The results show that for most countries, FDI shares increase between the two sub-periods.

We highlight the recent increase in FDI in Figure 17. In this figure, the red diamonds represent the ratio of the most recent four years' FDI total flows (2012-2015) over the previous eight years' (2004-2011). There are 8 countries where aggregate FDI in 2012-2015 is more than in 2004-2011 (over 8 years), and again, most of these countries are not resource rich. While the absolute level of FDI inflows is still low in some of these non-resource rich countries (e.g., Burkina Faso, Ethiopia and Kenya, where shares of FDI inflows are equivalent to less than 10 percent of gross capital formation), growth in FDI inflows has been rapid in the most recent period. On the other hand, FDI flows to Nigeria fell sharply between 2012-2015 and 2004-2011. This may be an indication that natural resource seeking FDI will be difficult to sustain over the long term. On the other hand, it may be that Nigeria is unique.

⁹We exclude Niger from the high growth African countries on the ground of the country's low per capita GDP growth rate in 2000-2015.

We have established that investment has played a key role in the growth of Africa's fastest growing economies. We turn now to the role that Chinese FDI has played in these fast growing economies. In Figure 18, we compare FDI inflows from China to total FDI inflows for each country. We can see that Chinese FDI increases faster than total FDI in all but two countries, Zambia and Rwanda. And only in Nigeria and Rwanda is China's FDI in 2012-2015 less than its FDI in 2004-2011. There are 7 countries in which China's share of FDI doubles between 2004-2011 and 2012-2015. Of these 7 countries, only Chad is resource rich. In-depth studies are required for better understanding Chinese FDI in these countries, which will be done in Section 6.

Although Chinese FDI has grown rapidly, its share in Africa's total FDI is still small (Figures 13a and 13b). In 2012-2015, China's share in total FDI inflows remains modest in most high growth countries, except for Kenya and Chad where it accounts for more than 25 percent of total inflows (Figure 19). From Figure 18, we already know that Chinese FDI to Kenya and Sierra Leone is 2.7 times and 68 percent greater, respectively, in 2012-2015 than in 2004-2011. Still, the absolute amount of Chinese FDI inflows in these two countries is modest. Besides these two countries, the shares of Chinese FDI in the 16 high growth countries' total FDI are still low and is only greater than the average share for Africa in five of these countries.

The Role of Chinese Contracted Construction Projects in Investment

We do not have data on the total value of fulfilled contracted construction projects in Africa; instead we only have access to estimates of commitments to construction projects in African countries in addition to the value of fulfilled projects reported by China. According to the Infrastructure Consortium for Africa, China accounted for nearly \$21 billion of the \$83.4 billion committed to African infrastructure in 2015, which includes commitments by African governments and the private sector (ICA 2016). Turning our focus to the data on fulfilled Chinese projects, we have already shown that Africa is a major destination for Chinese engineering firms (see Figure 10). Figure 20 emphasizes that China's role in construction projects in Africa has increased in recent years. We show this by comparing the value of construction projects to total capital formation for the two sub-periods defined in the previous subsection. As shown in Figure 20, the share of Chinese contracted construction projects in gross capital formation increased in 15 of the 16 high-growth countries from 2004-2011 to 2012-2015. The average share of Chinese construction projects in gross capital formation rises from 7.7 percent to 12.9 percent between these two periods, although it is as high as 40 percent in Chad in 2012-2015. Growth in demand for construction projects in African countries is expected to be rapid in the countries where investment grows rapidly. It also seems that in the countries with more growth in investment in recent years, the share of Chinese contracted construction value in the countries' gross capital formation is high. In Ethiopia, for example, Chinese contracted construction value is equivalent to 24.5 percent of gross capital formation in 2012-2015, compared to 15.2 percent over the previous 8 years.

Summarizing, we find that investment has played a key role in Africa's fastest growing economies. The evidence presented here also indicates that investment in the majority of Africa's fastest growing economies is not limited to natural resources, since the majority of Africa's fastest growing economies are not resource rich. Instead this investment was financed the old fashioned way: by loans, foreign aid or FDI - or in the case of Ethiopia - financed at least in part by domestic savings. Finally, we find that although Chinese FDI did not account for a large share of investment in most of these countries, its role in financing investment increased more rapidly in Africa's fastest growing economies in the period 2012-2015 than in the rest of Africa.

VI. The Literature on Chinese Investment in Africa

The stylized facts and growth analysis in the previous two sections have shown that China's involvement in Africa contrasts starkly with depictions of it as monolithically focused on resource extraction in a handful of countries. While Chinese investment in Africa has garnered significant and largely negative attention from politicians and media outlets, we now turn to the academic literature to see whether our findings are reflected. We pay attention to both the content of the arguments made and the data sources they draw

upon. The papers we review are summarized in Tables 1 and 2.

The literature on Chinese investment in Africa takes a more measured and fact-based approach than much of the publicized rhetoric, yet a number of papers fail to look beyond popular and convenient mythology. Some of the common myths that appear in the literature are a myopic focus on China's investment in natural resource extraction, its investments in undemocratic and politically unstable countries, and its use of Chinese labor and supplies in construction projects. Many of these papers fail to utilize sufficiently rigorous empirical approaches, either attempting regressions using minuscule sample sizes or using data that does not accurately capture the situation on the ground. There is more empirical substance in the literature on the effects of trade with China on African manufacturing, which presents a somewhat more nuanced picture.

Determinants of Chinese Investment in Africa

A large strand of the literature simply asks what the motivations and determinants of Chinese investment in Africa are. For example, Kolstad and Wiig (2011), using UNCTAD data run a cross-country regression with 29 observations and argue that the association of Chinese FDI with natural resource exports and poor governance implies that Chinese activities “can be highly detrimental to the development prospects of African countries.” Ramasamy et al (2012) using annual reports of top firms listed on the Shanghai and Shenzhen exchanges find a similar association between Chinese outward FDI (globally) and political risk, although they find that much of this is due to state-owned firms affiliated to Chinese local governments, while centrally affiliated and private firms tended to be more attracted to larger markets. Zhang et al (2013) using MOFCOM OFDI flow data find that the same holds true for Africa, although they only study the number of approved projects, not the value of projects or how many actually materialized. Ross (2015) using a panel of UNCTAD data for eight large African recipients of Chinese FDI over a short period, finds that investment is correlated with natural resource endowments, as well as infrastructure and fewer days required to import/export.

Other studies run somewhat more sophisticated analyses on the determinants of Chinese investments in Africa. Cheung et al (2012), using the MOFCOM OFDI flow data, find that natural resource endowments are one of many factors explaining Chinese investment along with GDP, real GDP growth and trade and financial ties with China. Chen et al (2016) using the MOFCOM OFDI project data make a similar point about the number not the value of Chinese investments, albeit using MOFCOM's project level database, which we have argued does not appear to track actual investment very well. They find that the majority of projects are in services and manufacturing rather than mining and construction and that Chinese investment follows typical profit-seeking motives in that it concentrates in skill-intensive sectors in skill-abundant countries and capital-intensive sectors in capital-scarce countries. It is important to recognize that this result is based on numbers of projects and not the value of projects; we have already shown the heavy concentration of Chinese FDI in mining and construction when the USD value of projects is used. They also find that China's attraction to resource rich countries is not significantly different than that of Western countries. Relatedly, they do not find that the incidence of Chinese investment is higher in weak governance countries, but that its share in total investment is, since Western countries tend to invest in countries with better governance. However, it should be reiterated that their data only includes the number of Chinese projects while the previous studies measure the value of investments. Using UNCTAD data, Sindzingre (2016) finds that patterns of Chinese economic engagement with Africa, including trade, investment and financing, have overall been converging with those of Western countries. At the country level, Seyoum and Lin (2015), using a World Bank survey of Chinese investors, find that the amount and location of Chinese FDI in Ethiopia is determined largely by firm-specific advantages (i.e. better technology and lower costs compared to competitors) and market access. However, many foreign investors in Ethiopia have little control over where they end up investing since location is often designated by the government (Abebe et al. 2017).

Although some studies do identify Chinese investment as growth-seeking and profit-oriented, few of them delve much further into the nature and impacts of these investments. There is some case study work on the effects of Chinese investment, particularly private manufacturing investment, in a handful of mostly high-growth African countries. For example, Gu (2009) finds from a small survey of Chinese firms in Ghana,

Nigeria and Madagascar that most of Chinese enterprises are small manufacturing firms coming to seek opportunity although the survey is not very detailed. More comprehensive is a series of country scoping studies carried out by the China-Africa Research Initiative at Johns Hopkins University. These are discussed in greater depth in the following section.

Bundling of Chinese Investment and Financing

There is a second major strand of the literature that considers the political economy and macroeconomic aspects of China's engagement in Africa. Our stylized facts also show that China's engagement in Africa involves interconnected flows of trade, investment, loans and infrastructure projects. This is reflected in the literature by an abundance of discussion of China "bundling" its economic cooperation with African countries, which has been referred to as the "Angola model" (Kaplinsky and Morris 2009). According to Kaplinsky and Morris (2009), this involves a line of credit made by China Exim Bank, which they characterize as concessional, that finances infrastructure projects usually tendered to Chinese companies, who use significant amounts of Chinese labor and inputs. The loans are typically backed by commodities, ranging from oil to cocoa, and repaid as a drawdown on exports to China. Importantly, the cost of Chinese-financed projects is typically 20-30% lower than those of other counterparts (Kaplinsky and Morris 2009). An example of this in Angolan construction projects is provided by Corkin (2012), who also notes that smaller private Chinese companies also enter the supply chains created by these projects and diversify into other business, giving an example of a businessman who came to supply air conditioners to construction offices and then diversified into other consumer goods.

However, these studies are largely conceptual and at best anecdotal. There seems to be little evidence of Chinese projects bringing permanent labor into African countries en masse, and the number of Chinese workers per project value has been decreasing (as shown in Figure 11). Additionally, Tang (2010) finds that Chinese projects in Angola and DRC tended to hire an increasing share of local labor over time. Moreover, case studies of private Chinese FDI, mostly smaller scale manufacturing, show that Chinese firms are hiring significant amounts of labor from the host country (Brautigam and Tang 2012, country case studies). While there is no available data regarding procurement by Chinese construction projects to our knowledge, Corkin (2012) acknowledges that Chinese construction managers found the costs of hiring skilled Angolan workers to be higher than those of hiring expatriates and that the only raw materials available are basic, low-value and often low quality. Moreover, she notes that Chinese companies have invested in factories making construction materials in Angola, especially since 2008 (Corkin 2012). As mentioned above, manufacturing FDI does seem to create substantial local employment. The positive spillovers from China's infrastructure investment are also recognized by Sindzige (2016). So not only do Chinese projects exhibit little evidence of crowding out local labor and content, which are often unavailable, they seem to crowd-in FDI and its associated employment.

Moreover, much of the literature surrounding China's use of low-interest resource backed loans overlooks two important points: (1) these loans do not meet the OECD definition of official development assistance (ODA) and (2) the use of resource backed loans is not a predominantly Chinese phenomenon. The vast majority of Chinese lending is not concessional; while it may be cheaper than finance from other sources, it is almost always made above market interest rates. For example, one \$2 bn line of credit for Angola was made at LIBOR plus 1.5 percent with a grace period while a consortium led by Standard Chartered group offered to provide the financing at LIBOR plus 2.5 percent. While these are likely better terms than Angola would have been able to access from other financial institutions, they involved no government subsidy and are thus not concessional from China's point of view. In fact, Angola has received a total of 48 oil-backed loans since 1979, including over \$ 3.5 billion from Western banks in 2000 and 2001 and what was reported as "the largest oil-backed transaction in the entire history of the structured trade finance market" from Barclays and RBS shortly after the Chinese infrastructure loan was made (Brautigam 2009). While the sustainability of commodity-backed loans, especially given the recent downturn in oil prices, deserves scrutiny, China appears to only be a small part of a larger trend in the country most cited as an example of China's economic imperialism and is doing so with more attractive terms than Western financial institutions.

Another important strand of the literature relates to the impact of rising trade with China on African manufacturing. As shown in Sections 3 and 4, Africa and China are playing increasingly important roles in each other's trade flows (Figures 4a & 4b and Figures 12a & 12b). While manufacturing in Africa overall has grown sporadically in recent years, the increasing penetration of Chinese imports in Africa, particularly textiles and low-value consumer goods, has raised the question of whether African manufacturers are being crowded out as a result.

The evidence available is mixed. Certainly, there has been tremendous pressure on African manufacturers, coupled by anecdotes of firm closures due to the Chinese competition. Kaplinsky (2008) postulates that Chinese competition bodes poorly for both domestic and export-oriented manufacturing in Africa and also limits the incentive for global firms to invest in African firms' supply chain upgrading. Some econometric work suggests that some of these predictions have come true to a limited extent; Edwards and Jenkins (2014 & 2015) find that increased Chinese import penetration into African markets significantly reduced South Africa's regional exports by 20%, manufacturing output by 5% and manufacturing employment by 8%. Moreover, 60% of the crowding-out impact was found to have occurred in medium-technology products (Edwards and Jenkins 2014). However, regional exports are much less important to most other African countries. Moreover, Kholsa (2015) finds that the distortionary effects of Chinese imports on intra-African trade have recently been decreasing over time, potentially due to increased FDI and infrastructure investment from China.

This potential finding ties into the concept of "creative destruction" that Chinese trade and investment may be inducing in parts of Africa. One example has been the Ethiopian leather industry, in which the entry of Chinese shoes into the market forced out the less efficient producers while forcing others to innovate and invest in order to survive (Sonobe, Akoten and Otsuka (2009)). This has been coupled by the entry of large Chinese firms into the sector that appear to have made their domestic counterparts more productive through technology transfer (Abebe et al 2017). Preferential market access, both to China through government incentives and the USA/Europe through AGOA and EBA, has also incentivized Chinese firms to manufacture in Africa (Brautigam and Tang 2014). Given the rising cost of labor and increasing competition in China, this trend of flying geese can be expected to accelerate. Overall, while the increasing economic engagement with China can be expected to change the structure of African manufacturing, its effects will likely be more nuanced than simply crowding out African firms.

In short, we find that the literature either focuses on the negative associations with Chinese investment in Africa, which do not appear unique to China, or acknowledges that investment is growth and market seeking but does not delve much further. This causes the literature to overlook the positive potential of Chinese FDI that is widely acknowledged in discussion of FDI in general- in terms of employment generation, tax revenue, and fostering local linkages, although such benefits are not likely to be universal. While our data suggests that critiques of China's use of local labor and content may be overblown, the economic potential of Chinese FDI does not negate the concerns some have raised about corruption at local and national levels, non-transparency of financial flows, and keeping authoritarian regimes in power. However, if these harmful effects do exist, then they are certainly not unique to Chinese investment. Given the discrepancy between our findings from available data and the tone of the research conducted to date, more research is required to fill the gap in understanding the mechanisms through which Chinese FDI contributes to growth and how African governments can best leverage its potential. Criticism of investment practices and their geopolitical effects should be applied even-handedly.

VII. An in-Depth Look at Chinese Investment in African Manufacturing

The potential for manufacturing to create jobs and stimulate economic growth through structural change is well documented (McMillan and Rodrik 2011). It is also well known that countries in East Asia, most recently China and Vietnam, achieved rapid growth in part due to the expansion of labor intensive manufacturing for export. The share of manufacturing in output and employment in most African countries is very low

(Diao et al 2017). Growing wages in China and the governments 'go out' policy have lead some observers to speculate that China could export up to 60 million manufacturing jobs to Africa (Lin 2011). Such a boom in manufacturing in Africa has the potential to be transformational. We have seen however that China still accounts for a relatively small share of global FDI in African manufacturing. Nevertheless, China's share of investment in African manufacturing has been growing and there are reasons to believe that the trend upward will continue.

In this section, we present results from recently completed (or ongoing) - mostly unpublished - research that takes an in-depth look at Chinese investment in manufacturing in four of Africa's fastest growing economies: Ethiopia, Ghana, Nigeria and Tanzania. All of this evidence is based on firm level interviews with the exception of Ethiopia, where we have some evidence based on Ethiopia's manufacturing census. We examine the types of manufacturing investments made by Chinese investors in these countries and the extent to which these investments are linked with local economies. Since Special Economic Zones (SEZ) have been closely associated with China's strategy for investing in African manufacturing, we begin with a review of what we know about SEZs set up by China in Africa.

China's Special Economic Zones in Africa

The establishment of Special Economic Zones has been a major component of China's domestic growth that has also featured in their outward economic strategy. Of 19 overseas zone proposals that were approved in 2007, five are in Sub-Saharan Africa. These include a mining-focused zone in Zambia, a textile-focused zone in Mauritius, and zones hosting various manufacturing sectors in Ethiopia and two Nigerian states. Most of these zones, with the exception of the Mauritian one, have attracted a few tenant companies but are not yet at capacity nor have they realized their committed levels of investment. Although employment data are tentative, it appears that these companies have generated substantial employment, much of which has been local; in the three zones for which data are available (Zambia, Ethiopia and Ogun, Nigeria), there were reportedly 1,849 Chinese employees compared to 11,192 African employees. However, substantial local linkage and technology transfer benefits do not appear to be occurring outside of Nigeria, where there has been some degree of local contracting, as companies have not been willing or able to tap into local input supply for various reasons and few local firms have joined the zones (Brautigam and Tang 2014). Similar issues are reflected in the evidence from cases studies below. Nevertheless, the potential for technology transfer and local linkages exist if local firms can upgrade their production and/or enter the zones (Brautigam and Tang 2014). Firm level evidence from case studies

Researchers conducted scoping studies on actual Chinese manufacturing investment in selected entry-level sectors (leather processing, textiles, shoes, plastic goods, agro-processing, etc.) in four African countries (Brautigam, Tang and Xia 2017). To select these firms, they obtained and coded official data (in Chinese) from the Chinese Ministry of Commerce on investment approvals. They then selected four countries with significant Chinese interest in the sectors mentioned above: Ethiopia, Ghana, Nigeria and Tanzania. In each of these countries they attempted to match the data from MOFCOM with official data on registered firms from the relevant investment approval authorities.

In each country, they conducted a subsector census by tracking down and interviewing as many of the existing Chinese firms in the selected sectors as they could reach. Consistent with research by Shen (2015) the work revealed many more projects on the books than were operational. This exercise also revealed that nearly twice as many firms were registered with local authorities in these four countries than with MOFCOM, although these firms were typically much smaller than those registered with MOFCOM. Moreover, manufacturing firms made up a much higher share (82%) of locally registered projects than they did in MOFCOM-registered projects (39%). The researchers also interviewed African firms and institutions in these subsectors: suppliers, subcontractors, government promotion offices, industry associations, etc. Using semi-structured interviews, they focused on linkages and learning opportunities.

To the best of our knowledge, this research is the first to focus solely on Chinese manufacturing investment in Africa. The researchers interviewed over 90 Chinese firms, some with multiple factory investments in entry-

level manufacturing and agro-processing in the four countries. These firms had hired over 20,000 African workers and also employed over 1,300 Chinese staff. The average value of these investments was slightly above \$10 million. A significant percentage (at least 28%) of Chinese firms had originally come to Africa as traders and later decided to invest in production. The motivations for these investments varied by country, though local market access tended to play a major role while access to resources was minor. However, Chinese manufacturing firms in Ethiopia's leather and textile sectors were much more export oriented, given the nature of these sectors.

A large majority of firms sold their output primarily in local markets. Yet Chinese factories reported that their main competitors were other foreign firms in Africa or imports, not local African firms. In many cases, firms were pursuing import substitution and taking advantage of protectionist policies imposed by host governments, while exporters often sought to take advantage of the African Growth and Opportunity Act (AGOA) and the Everything But Arms (EBA) deal to gain preferential access to American and European markets.

With regard to local training, skill diffusion, and technology transfer, they found this occurring mainly through local worker training. There were almost no significant joint ventures between African and Chinese investors. A small number of Chinese firms had sent local staff to China for training, but at least 70% reported onsite training of local workers. Several had employed local technical school students as interns. There were also a number of African as well as non-Chinese foreign firms that had "technical partnerships" with Chinese companies that supplied expertise and temporary technical assistance on a contract basis.

However, they found few examples of technology transfer through backward linkages so far, except in Nigeria, where a number of local firms have contracted with Chinese suppliers. Although Chinese firms obtain significant inputs locally, only a handful work with these suppliers to improve quality. Still, by establishing quality standards and insisting that local firms figure out how to meet them, Chinese factories have pushed some local companies to invest in new machinery and methods. In other cases (plastic recycling in Ghana and Tanzania), they saw a segmentation of the market, where local firms now dominate in collection and initial processing, and Chinese firms dominate in the manufacture of plastic products from recycled plastics. The African government statistics and the MOFCOM OFDI project data both indicate considerable interest on the part of Chinese firms in manufacturing investment. Yet there remain significant challenges to investors: as we saw in the case of Ethiopia, only 5% of planned projects materialized (EIC, 2016). In addition, the small size of the projects not captured by the MOFCOM OFDI project data suggests that the investment figures reported in the MOFCOM OFDI flow data are likely to be somewhat accurate. However, the MOFCOM OFDI project data does not capture the full number of Chinese firms and their distribution across locations and sectors. Nevertheless, the takeaways from this research and the official data remain similar: although the Chinese may be investing in manufacturing in Africa, their share of manufacturing investment and employment in Africa is still rather modest.

However, the researchers report that they expect Chinese investment in manufacturing to grow. In general, Chinese firms were optimistic about the opportunities for production in Africa. For example, one large firm invested heavily in Ghana's two paper mills. Back in China, the company was operating steel plants, cement factories, wood processing plant and other business. With rising production costs, overcapacity, and a saturated market in China, the owner reported that he planned to close these factories down in the next few years and relocate them to Africa. This sentiment is common among Chinese investors in Africa's manufacturing sector. The discrepancy between planned projects and operational projects also reveals an unmet demand for OFDI in African manufacturing by Chinese investors. Finally, the Chinese government is very supportive of OFDI to Africa. For example, at the December 2015 Forum on China Africa Cooperation (FOCAC) in Johannesburg, South Africa, the Chinese government officially committed to assisting in African industrialization (Eom, Hwang, Xia, and Brautigam, 2016).

Evidence based on Ethiopia's manufacturing census

Abebe et al (2017) use Ethiopian manufacturing establishment data from 1997 to 2013 combined with

a technology transfer survey module designed by them in cooperation with Ethiopia's Central Statistical Agency to assess the nature of linkages between foreign and domestic firms in Ethiopia's manufacturing sector. The identification problems associated with this type of work are well known (Harrison and Rodriguez-Clare, 2009). Abebe et al (2017) establish causality by using an event study design that exploits the exogenous placement and timing of the opening of large greenfield FDI plants. This event study design allows them to examine trends in the outcomes of domestic plants both pre and post the opening of the large FDI plant. The relatively small number of Chinese firms in the census - 19 in total - combined with the nature of the research design does not allow for an explicit test of the impact of Chinese FDI on domestic plants.

Nevertheless, the survey data does allow us to say something about which sectors Chinese firms invest in, how many domestic and foreign workers they employ and the wage rates paid by Chinese firms relative to domestic firms. In total, Chinese firms in Ethiopia's manufacturing sector employed a little over 5,000 workers, the vast majority of whom were Ethiopian. Entry by Chinese firms into Ethiopia's manufacturing sector came 4-5 years later than other foreign investors and only started to pick up around 2009. Thus, the Chinese firms are still smaller on average than other foreign firms in terms of employment size. A regression of the log of real wages on an indicator variable for Foreign_other and Foreign_Chinese indicates that like other foreign firms, Chinese firms pay a wage premium relative to domestic firms. Also, like other foreign firms, Chinese firms source roughly 70 percent of their inputs locally. Chinese firms export slightly more of their total output than other foreign firms. Finally, the Chinese firms in the sample are primarily invested in textiles, leather products and plastics.

As noted, there are not enough Chinese firms in the sample to make conclusions about linkages between Chinese firms and domestic firms. However, since the Chinese firms look similar to the rest of the foreign firms along many dimensions, it may be reasonable to think that the conclusions reached for foreign firms in general would also hold for Chinese firms. Abebe et al (2017) first show evidence from the technology transfer module clearly indicating the existence of knowledge transfers via labor flows from FDI to domestic plants, communication externalities, and (to a lesser extent) backward and forward linkages in the supply chain. They then evaluate the changes in total factor productivity (TFP) and the rate of entry of domestic plants when a large FDI plant is opened in a locality. Their empirical strategy exploits the government designation of locations for large greenfield FDI plants, in combination with an event study research design. Their estimates suggest that in the three years starting with the year of the event, domestic plants have on average around 16 percent higher total factor productivity. They also find that the number of local domestic plants is around 25 percent higher after the opening of the large FDI plant. These results demonstrate that attracting quality FDI can generate spillovers to the domestic economy and may therefore be viewed as an important component of a developmental strategy of industrialization. Their work may also be viewed as a validation of a cornerstone in the Ethiopian government's industrial policy, which has prioritized attracting foreign direct investment to its manufacturing sector.

VIII. Concluding Remarks

An analysis of the available data surrounding Chinese FDI and overall economic engagement in Africa yields a few stylized facts, which are not well reflected in the China-Africa popular discussion and academic literature to date. An important caveat is that the available data does not paint a complete picture of Chinese investment in Africa, mainly due to investment going through offshore financial centers, differences between committed and realized investments, and small investments unregistered with China's Ministry of Commerce. However, similar constraints apply to FDI data in general. Nevertheless, the official Chinese investment data - MOFCOM OFDI flow - which is also used by UNCTAD, provides a useful foundation for our analysis.

We find that Chinese investment is smaller, more diverse and more growth-oriented than is often believed. Despite the increasing notoriety of the Chinese presence in Africa, it still accounts for a small but increasing share of Africa's inward FDI stocks and a stagnant share of China's outward FDI stocks. Contrary to perceptions that Chinese investment exclusively targets natural resources, we find that construction and

manufacturing also play significant roles; China's mining and manufacturing investment in Africa are comparable to its investment in those sectors in other regions. Similarly, Chinese investment is not limited to resource-rich countries; it certainly has a large presence in some of them but China is also invested in some of Africa's most promising, high-growth, and economically diverse nations. These patterns do not appear unique to China however; investment from Western countries has long targeted a similar array of sectors and states and patterns of Chinese and Western investment in Africa appear to be converging.

We also contextualize Chinese investment in Africa within its broader patterns of economic engagement, including trade, loans and construction projects. China has become a major source of Africa's imports and destination for its exports and has committed a large proportion of Africa's infrastructure funding. Improving the continent's infrastructure appears essential for unlocking further investment potential, both from China and other countries, and leads to both direct and indirect job creation, the majority of which is for local workers.

These stylized facts stand in contrast to much of the literature on the subject, which largely focuses on cross-country regressions to explain what determines Chinese investment and anecdotal case studies describing Chinese investment practices in a particular country. However, a handful of case studies show that Chinese investors are employing many African workers, although there are as yet few signs of local linkages developing. Expanding on the case studies that have been done would permit a more rigorous firm-level assessment of Chinese investment throughout Africa. However, collecting such data is difficult and time-consuming.

Future research with the available data should focus on Chinese investment in the African countries with sustained economic growth not related to resource booms. This research should also examine the relative importance of investments by smaller Chinese firms where the linkages with locals may be stronger. Such analysis would help contribute to the understanding of Africa's economic potential, both in manufacturing and other modern sectors, such as IT and finance, which have been burgeoning in a few countries. As Romer (1994) argues, FDI may have the potential for a larger effect on growth than trade in goods, due to the diffusion of knowledge from the entering firms. Therefore, it is important to develop a further understanding of the role that FDI, from China and elsewhere, can play in boosting productivity growth in Africa.

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APPENDIX

Tables

Table 1: Summary of China's economic engagements in the world and in Africa under four categories

	Trade		Value of turnover fulfilled of contracted	Loans	FDI flows
	Exports to	Imports from	projects		
World	10,076.3	8,191.0	591.7		462.2
Africa	305.2	449.5	175.5	59.9	12.5
Summary for Africa					
	Total exports	Total imports			total FDI flows
	2,114.1	1,735.1			202.3

Note: 2010-2014 total (billion \$US).

Table 2: Cross-Country Studies on Chinese Investment in Africa

Author, Date	Research Question	Measure of Investment	Data Description	Main Result(s)
Kaplinsky, 2008	What does the rise of Chinese exports mean for African industry?	Trade	UNCTAD, Com-trade and various secondary sources	African firms are getting squeezed out of export markets due to rising Asian competition and the governance structure of global value chains is changing.
Kaplinsky and Morris, 2009	What are the characteristics of large scale state-owned Chinese FDI in SSA?	State-owned FDI	AERC scoping studies, 2005 UNIDO survey, other smaller case studies	Chinese state-owned FDI is integrated with Chinese government strategy, long-term oriented and bundled with aid, esp. in natural resource countries.
Brautigam, 2011	How much of China's finance to Africa qualifies as official development assistance?	Aid, concessional and non-concessional loans	Chinese foreign aid data, key interviews, review of official policies	Much of China's officially-supported financing to Africa does not meet the OECD criteria for foreign aid.
Kolstad and Wiig, 2011	What are the motives behind China's OFDI in Africa?	Outward FDI	UNCTAD (2003-2006)	The dominant motive for Chinese FDI in Africa is access to natural resources, particularly in poorly governed countries, but that this is not different from other countries' engagement.

Cheung et al, 2012	What are the determinants of Chinese ODI in Africa?	Outward FDI	MOFCOM OFDI flow	Chinese ODI correlates to market size and real GDP growth, trade and project ties with China, corruption and low law and order and presence of natural resources.
Ramasamy et al 2012	What are the determinants of FDI location by Chinese public and private countries	Public and private FDI	Annual reports of top firms listed on Shanghai and Shenzhen exchanges	State-owned enterprises affiliated with local governments invest more in less stable countries while central and especially private firms rather tend to be market seekers.
Zhang et al 2013	What are the determinants of private Chinese FDI in Africa?	Private FDI	MOFCOM OFDI flow	Private FDI is market seeking and tends to concentrate in manufacturing and agriculture.
Kholsa, 2015	Does Chinese involvement in Africa reduce intra-regional trade?	FDI	FDI is not directly included in the estimate, trade data from Comtrade	Trade relations with China reduce trade with other African countries though the effect has been much lower since 200, possibly due to infrastructural investment/FDI.
Shen, 2015	What are the trends of Chinese private FDI in Africa?	Private FDI	MOFCOM OFDI flow	Private trade is increasing in Africa's burgeoning manufacturing sector and is more than official estimates.
Chen, Dollar and Tang, 2016	What are the determinants of Chinese FDI in Africa?	Firm-level FDI data	MOFCOM OFDI flow	Abundance of skilled employment and natural resources are the main determinants of the sector of Chinese investments in a given country.
Sindzingre, 2016	What are patterns of convergence between Chinese and Western involvement in Africa?	Trade, FDI, aid	UNCTAD	There are increasingly convergent patterns of trade and investment with Africa between China and Western countries, in terms of primary commodity trade and related sectors of investment.

Note: UNCTAD and MOFCOM OFDI flow are the same since UNCTAD's source is the MOFCOM OFDI flow data.

Table 3: Country Studies on Chinese Investment in Africa

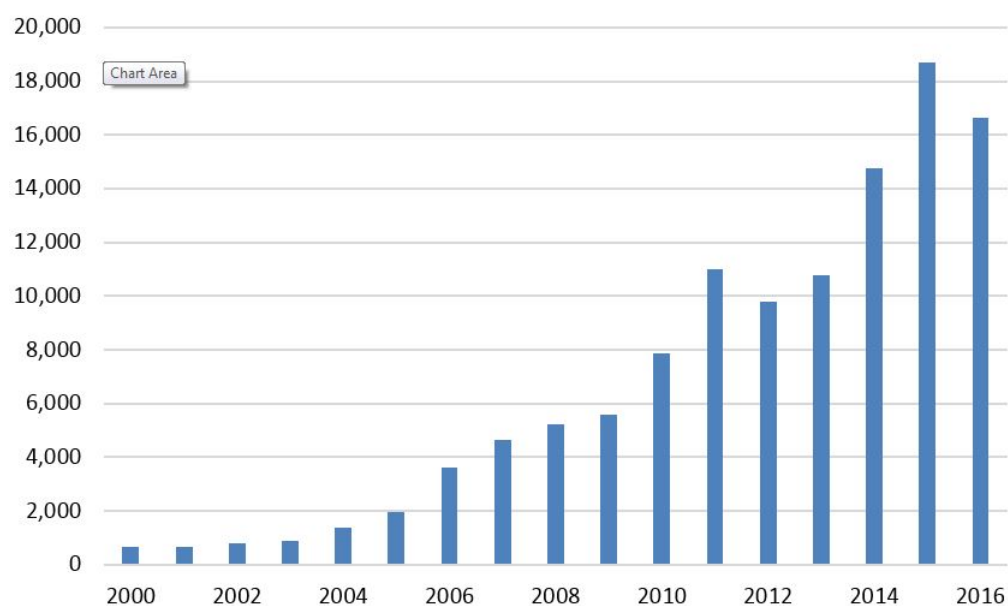
Author, Date	Country	Research Question	Measure of Investment	Data Description	Main Result(s)
<i>Econometric Studies</i>					
Edwards and Jenkins, 2015	South Africa	Is China crowding out South African exports of manufactures?	Manufacturing exports	Comtrade	South Africa has lost market share to China in its major export markets. Nonetheless the crowding out is relative as South African manufacturing exports grew rapidly between 2001 and 2010.
Edwards and Jenkins, 2015	South Africa	The Impact of Chinese Import Penetration on the South African Manufacturing Sector	Manufacturing production	Statistics South Africa Production Data Comtrade	Employment in labor intensive manufacturing was negatively impacted by Chinese mfg. imports. Price inflation was reduced by these imports.
Ross, 2015	NGA, ZAF, ZAM, GHA, KEN, ALG, EGY, SDN	What are the determinants of Chinese OFDI in African countries?	FDI	UNCTAD	FDI is driven by access to natural resources, infrastructural quality and regulatory environment.
Seyoum and Lin, 2015	Ethiopia	What determines Chinese FDI in Ethiopia and its location factors?	FDI	2012 World Bank survey of Chinese investors	Chinese FDI is determined by firm specific advantages (i.e. technology and lower costs) and market access.
<i>Case Studies</i>					
Gu, 2009	Ghana, Nigeria, Madagascar	What does Chinese private FDI look like in Africa?	Private FDI	Primary data collection from firms	Dominated by SMEs mostly in manufacturing.
Haglund, 2009	Zambia	Does Chinese state-owned FDI promote short or long term interests?	SOE	Primary data from mining industry and stakeholders	The nature of investments in the mining sector make them focused on short term profits rather than long term sustainability.

Tang, 2010	DRC & Angola	What is the impact of Chinese FDI on local employment?	FDI	Field Research	A lot of unskilled labor has been localized but less so skilled labor. Increasing localization among older enterprises.
Oyeranti, Babatunde and Ogunkola, 2011	Nigeria	What is the economic relationship between China and Nigeria in terms of FDI	FDI	Nigerian Investment Promotion Commission, qualitative surveys, key informant interviews	FDI is concentrated in a few sectors of strategic interest to China, largely extraction. Much is carried out by SOEs or JVs.
Corkin, 2012	Angola	What are the sourcing behaviors and local linkages of Chinese large construction projects in Africa?	Construction projects (not nec. FDI)	Qualitative interviews in Angola and China	Very little integration of Angolan labor and materials into Chinese construction, amid weak enforcement of government requirements.
Auffray and Fu, 2014	Ghana	Are there managerial knowledge spillovers from FDI?	Construction FDI	31 interviews in Accra	Few Chinese construction companies have integrated Ghanaians into their management structures.
Kernan and Lam, 2014	Ghana	What is the role of Chinese state in SOE FDI	Construction FDI	Field interviews in Ghana	Localization is driven by profit maximization and competition and follows patterns by Western companies.
Tang, 2014	COMESA	What is the impact of Asian countries on African textile industries?	Textile	Field interviews	Asian textiles have out-competed African textile companies but there is potential for flying geese to relocate production to Africa.
Barton, 2015	Zambia	What if any influence does the Chinese State have on terms of FDI in Zambia?	SEZs	Primary archival data, elite interviews	Finds that literature speculates on non-evident coercive investment practices and that investment arrangements are “calculated, consensual and symbiotic”.

Chen et al, 2015	Nigeria	Is there learning and technology transfer from Chinese mfg FDI in Nigeria?	Mfg FDI	Field interviews with Nigerian and Chinese firms in Nigeria	Evidence of limited but significant technology transfers, limited evidence of perceptions that Chinese firms don't hire local labor.
Karkkainen, 2015	Zimbabwe	Is Chinese engagement with Zimbabwe part of China's geoeconomic strategy?		Secondary sources only	Suggests that China's securing of resource backing for loans is part of its global geoeconomic strategy.
Brautigam, Weis and Tang, 2016	Ethiopia	What have been the effects of Ethiopia's industrial policy on its leather sector	Chinese FDI in leather sector	Semi-structured interviews	The policy framework centered around attracting Chinese investment has yet to translate latent comparative advantage into a full one due to policies, supply of hides, low scale and infrastructure.
Brautigam, Tang and Xia, 2017	Ethiopia, Ghana, Nigeria, Tanzania	What does Chinese manufacturing investment look like on the ground in these countries?	Mfg FDI	In-depth interviews	Chinese investment is largely local-market seeking with some exporting; high local employment but few linkages and little tech. transfer.
Tang (forthcoming)	Tanzania	Mapping the overall state of Chinese investments in Tanzania's manufacturing sector	Mfg FDI	21 in-depth interviews	Chinese mfg investments are in various subsectors, Chinese firms are somewhat clustered, there is technology transfer in terms of machinery and local management, varying use of local raw material.
Xia (forthcoming)	Kenya	Why are Chinese companies investing in Kenya, what are they investing in and what are their impacts?	Ag. & Mfg. FDI	KenInvest, field interviews	Construction FDI has flocked to Kenya partly due to increasing Chinese contracted projects, domestic and AGOA market access for mfg., ag. Investment is relatively new and local linkages are growing.

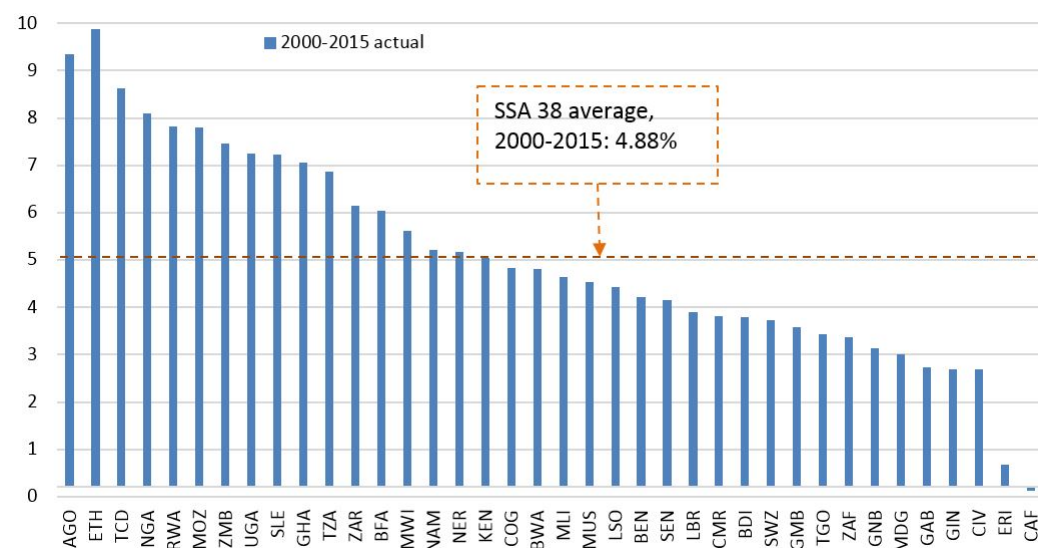
Figures

Figure 1: Mention of Chinese Investment in Africa in Major News Outlets 2000-2016



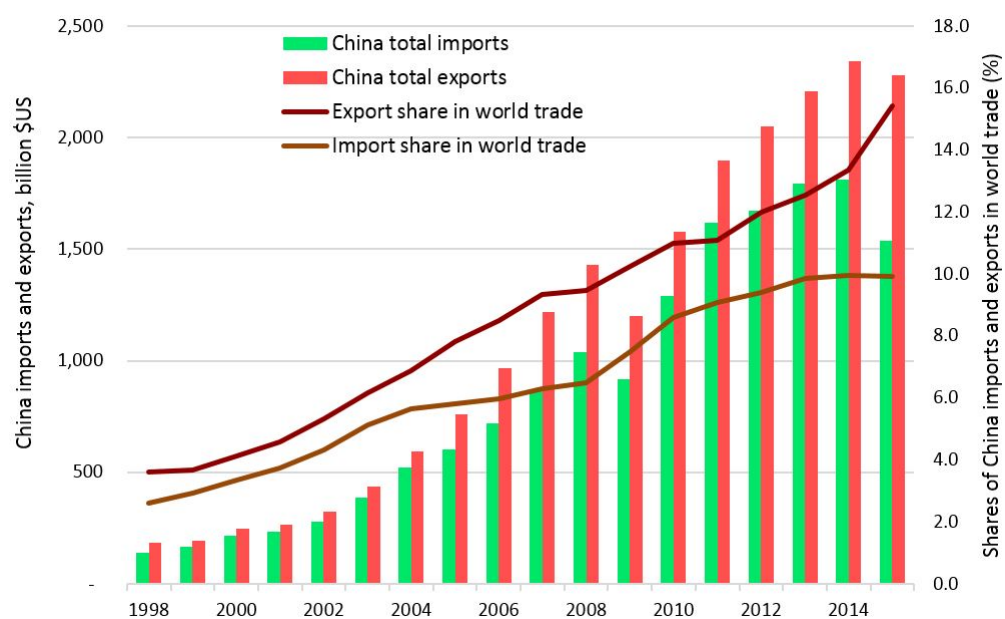
Source: Author's calculations using LexisNexis. *Note:* Number of mentions is equal to the number of newspaper and related articles in the LexisNexis database for the given year that mention China AND Investment AND Africa.

Figure 2: African Countries' Growth Performance - GDP Annual Growth Rate in 2000-2015 (Percentage)



Source: WDI (World Bank 2017).

Figure 3: China's Total Exports and Imports and Shares in World Trade

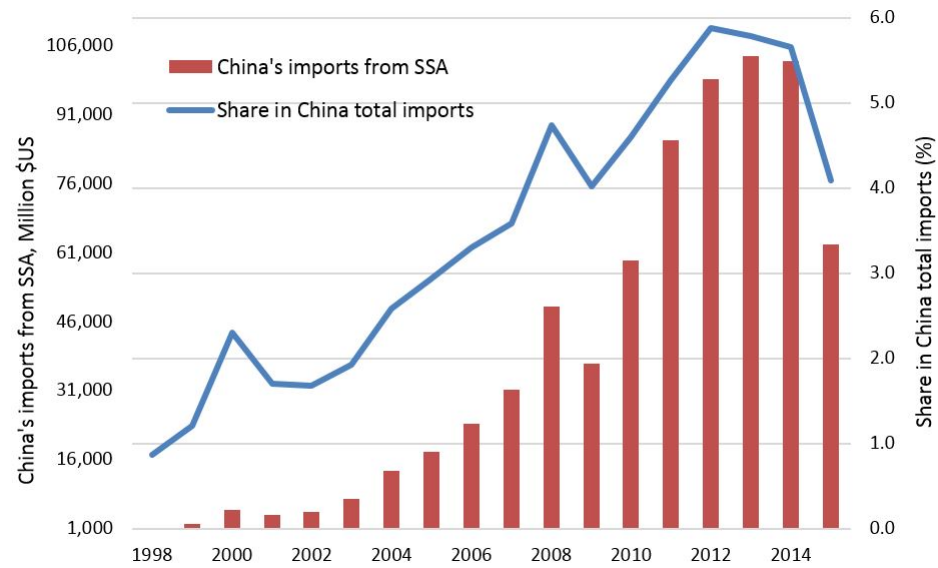


Source: UN COMTRADE (2017).

Figure 4a: China's Trade with Africa - Exports



Figure 4b: China's Trade with Africa - Imports



Source: UN COMTRADE (2017).

Figure 5a: China's FDI to Africa and the Rest of World - Flows

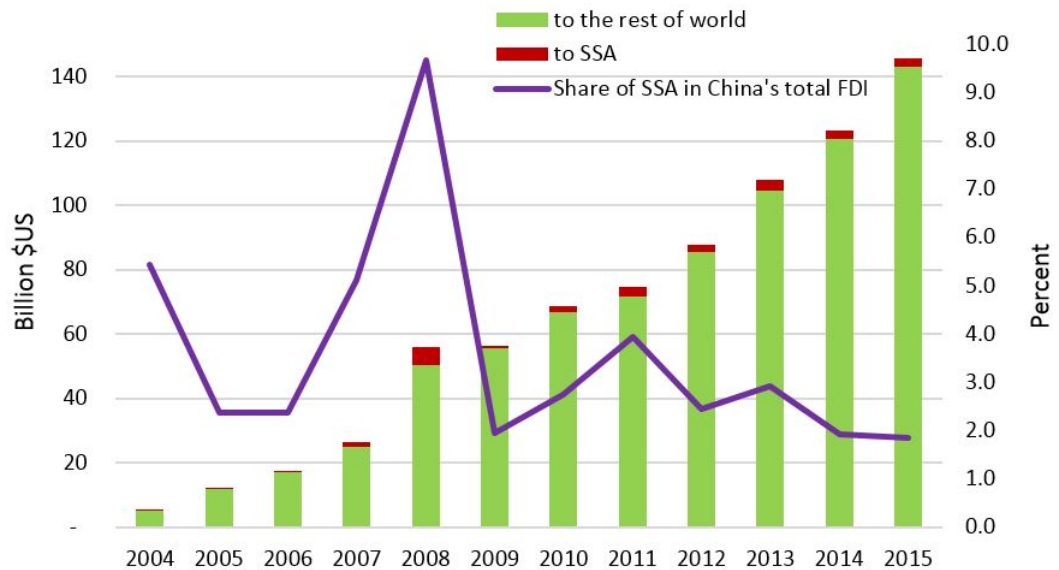
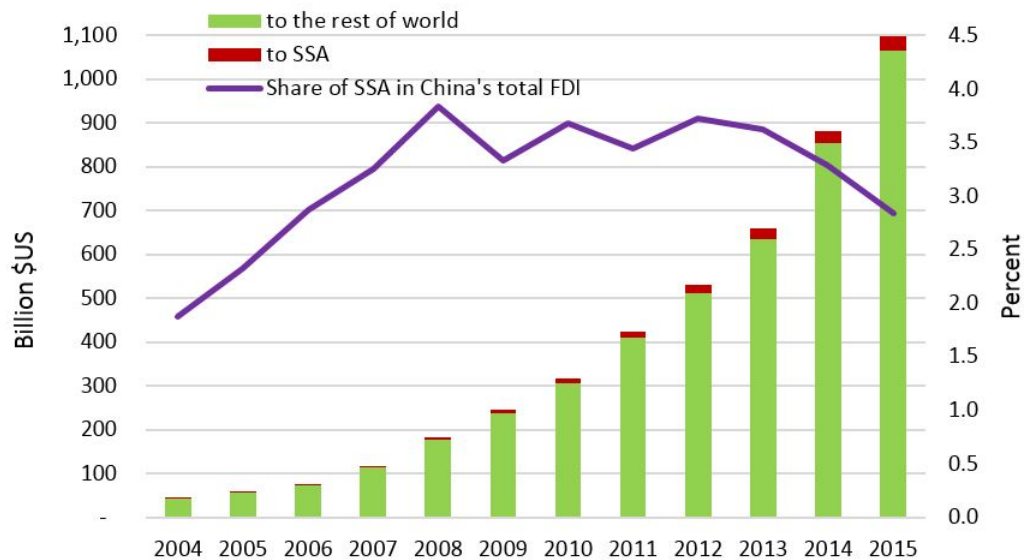


Figure 5b: China's FDI to Africa and the Rest of World - Stocks



Source: Authors' calculations using data from Table of "China's Outward FDI Flows by Country and Region" in *China Commerce Yearbook* (various years) published by Ministry of Commerce (MOFCOM) - click [here](#). The data is same as from China Statistical Yearbook: "Oversea Direct Investment by Countries or Regions." - click [here](#); and UNCTAD Bilateral FDI Statistics - click [here](#).

Figure 6a: China's FDI in Africa, Total Africa, Large Recipient Countries and the Rest of Africa - Flows

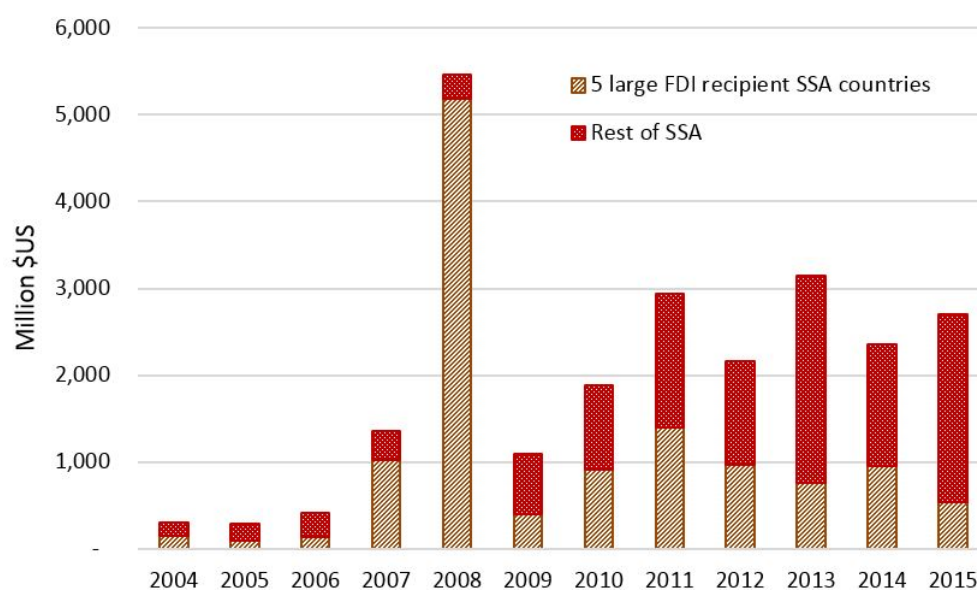
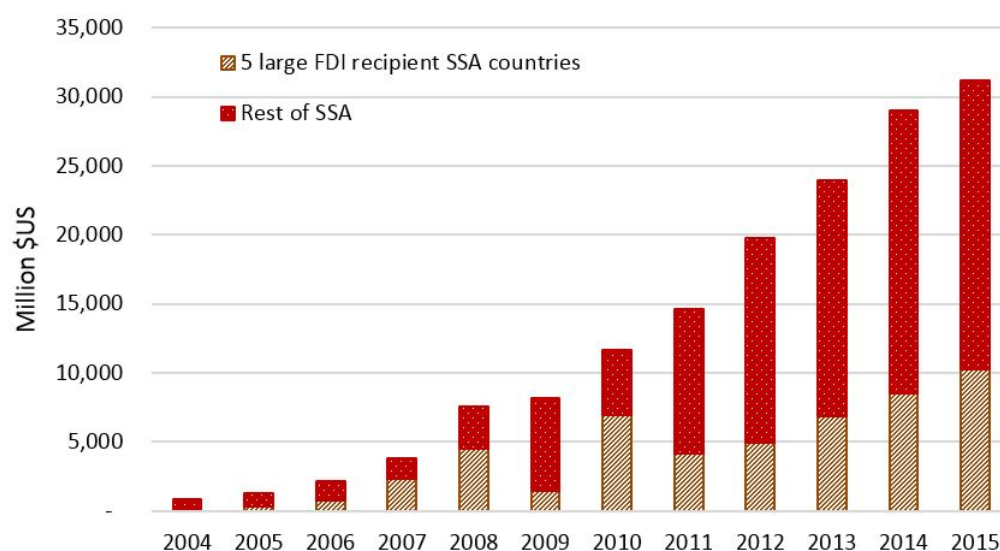


Figure 6b: China's FDI in Africa, Total Africa, Large Recipient Countries and the Rest of Africa - Stock



Source: Authors' calculations using data from Table of "China's Outward FDI Flows by Country and Region" in *China Commerce Yearbook* (various years) published by Ministry of Commerce (MOFCOM) - click [here](#). The data is same as from China Statistical Yearbook: "Oversea Direct Investment by Countries or Regions." - click [here](#); and UNCTAD Bilateral FDI Statistics - click [here](#).

Figure 7a: China's Total FDI Flow by Sector Structure in 2004-2015 (Percentage)

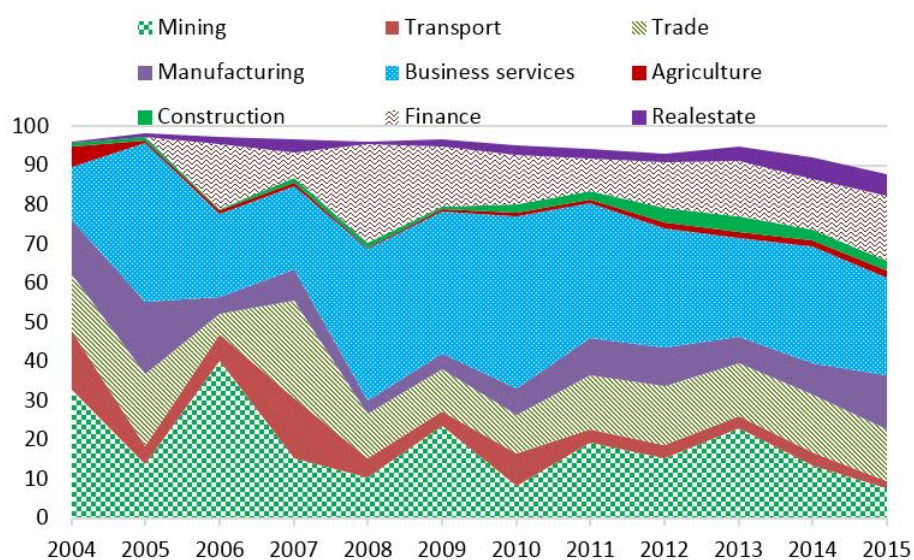
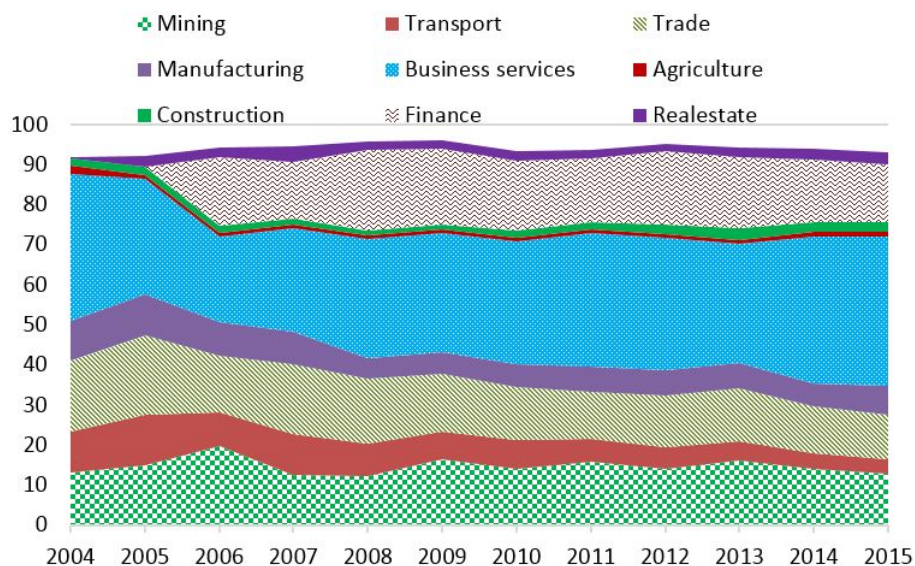
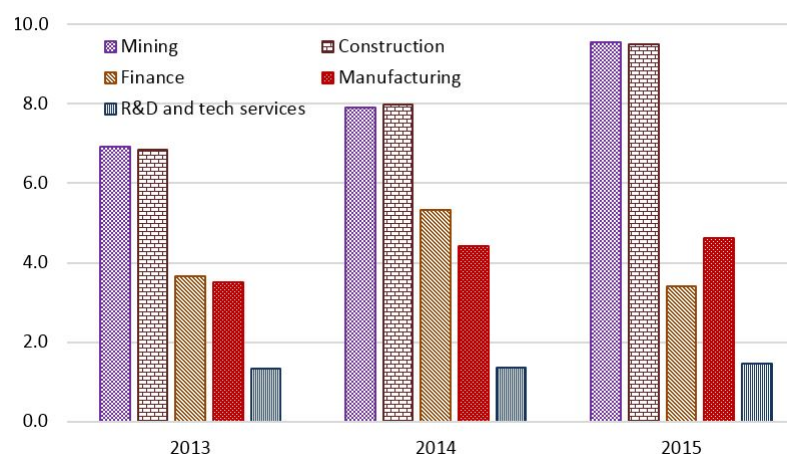


Figure 7b: China's Total FDI Stocks by Sector Structure in 2004-2015 (Percentage)



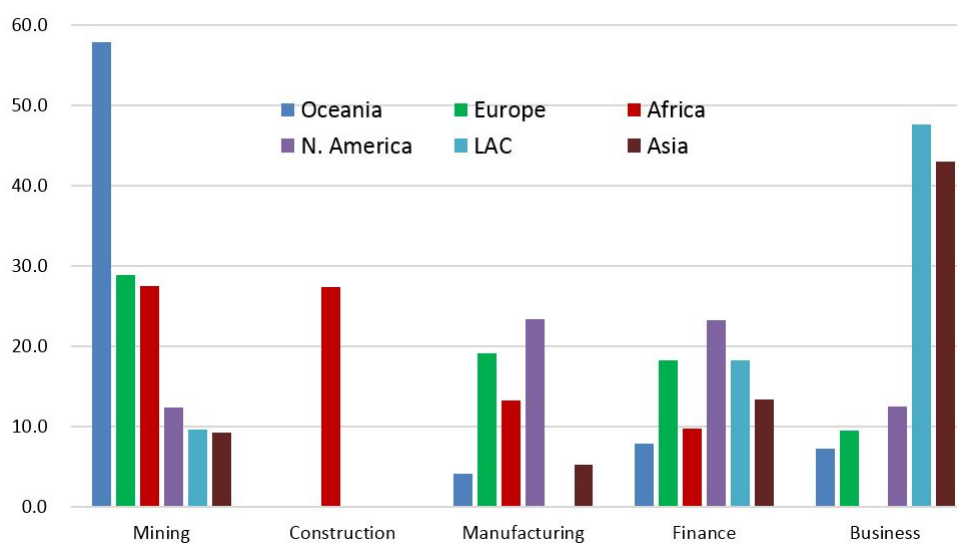
Source: National Bureau of Statistics of China (2017) - click [here](#).

Figure 8: Top Five Sectors in China's FDI Stocks in Africa (Billion \$US)



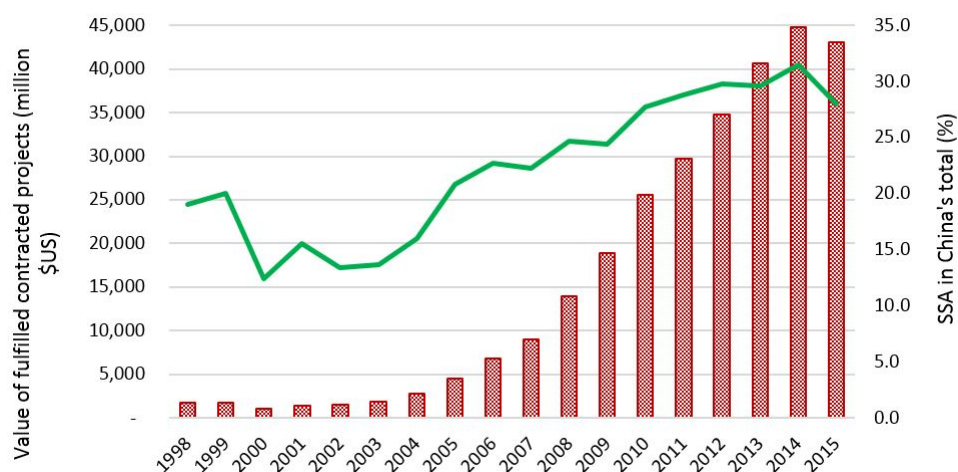
Source: Statistical Communique on China's Foreign Direct Investment (MOFCOM 2017) - click [here](#). *Note:* The data is for whole Africa including North Africa, as the data cannot be separated for SSA countries.

Figure 9: Structure of China FDI Stocks in Each Region in 2015 (Percentage)



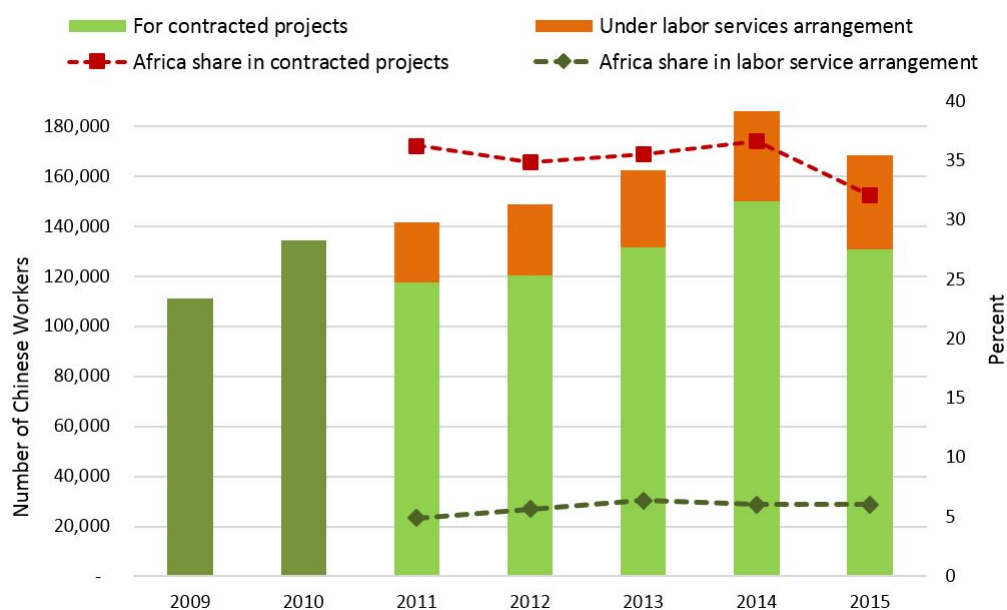
Source: Authors' calculations using data from Statistical Bulletin of China's Outward Foreign Direct Investment 2013-2015 downloaded from website of National Bureau of Statistics of China (2017b) - click [here](#). *Note:* The sector level of FDI stock data is available only for top five sectors in each region. The missing bar for a particular sector in a particular region implies that this sector does not belong to top five for this region. However, it does not imply that China did not have FDI for this sector in this region. For each region, the sum of reported sectors in the figure is around 70-80 percent of Chinese FDI stock in this region. We do not have FDI flow data similar as in this figure. It should be expected that structures of FDI flows have changed more rapidly than the stocks.

Figure 10: Value of Turnover Fulfilled Contracted Projects in Africa and Share in China's Total



Source: Authors' calculations using data from Table of "China's International Contracted Projects and Labor Service Cooperation in 2015 by Host Country/Region" in *China Commerce Yearbook* (various years) published by Ministry of Commerce (MOFCOM 2017) - click [here](#). The data can also get access at National Bureau of Statistics of China - click [here](#). Note: China's overseas contracted projects refer to activities of contracting overseas construction projects by Chinese enterprises.

Figure 11: Number of Chinese Workers in Africa by End of Year

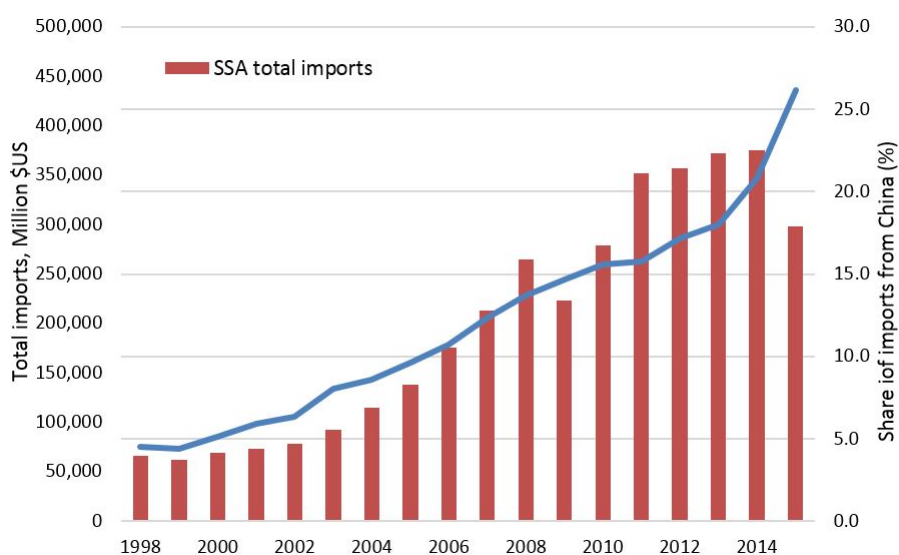


Source: Authors' calculations using data from Table of "China's International Contracted Projects and Labor Service Cooperation in 2015 by Host Country/Region" in *China Commerce Yearbook* (various years) published by Ministry of Commerce (MOFCOM 2017) - click [here](#). The data can also get access at National Bureau of Statistics of China - click [here](#). Note: Chinese workers in Africa refer to two types of workers: (1) Chinese workers going abroad under foreign contracted construction projects implemented by Chinese enterprises, which is red bars in the figure; (2) Workers organized by Chinese firms operating in China to provide services to enterprises or agencies abroad, including but not limited to Chinese firms, which is green bars in the figure. There is no separated data for the two types of workers in 2009 and 2010.

Figure 12a: Africa Total Exports and Share of Exports to China



Figure 12b: Africa Total Imports and Share of Imports from China



Source: UN COMTRADE (2017).

Figure 13a: Total FDI Flows in Africa from China and the Rest of the World and Share of China

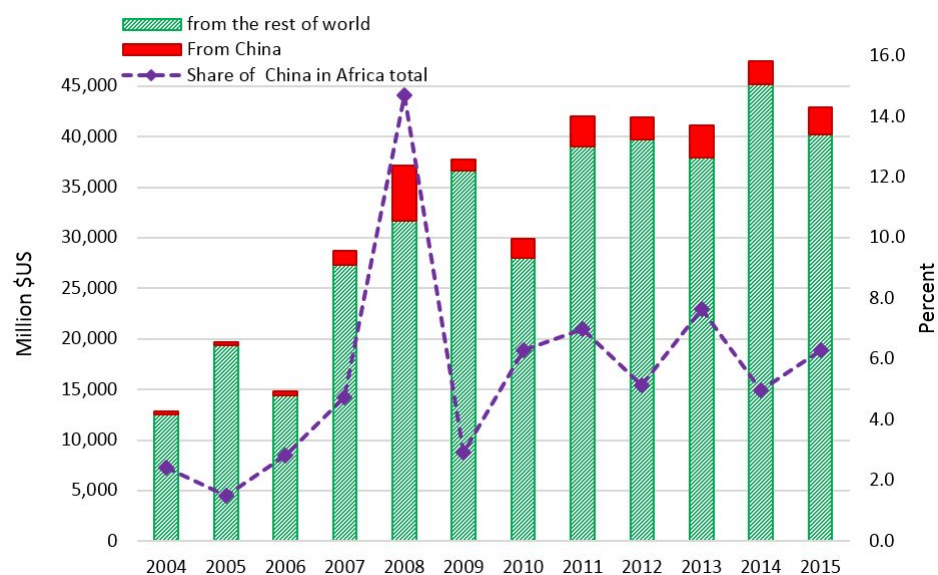
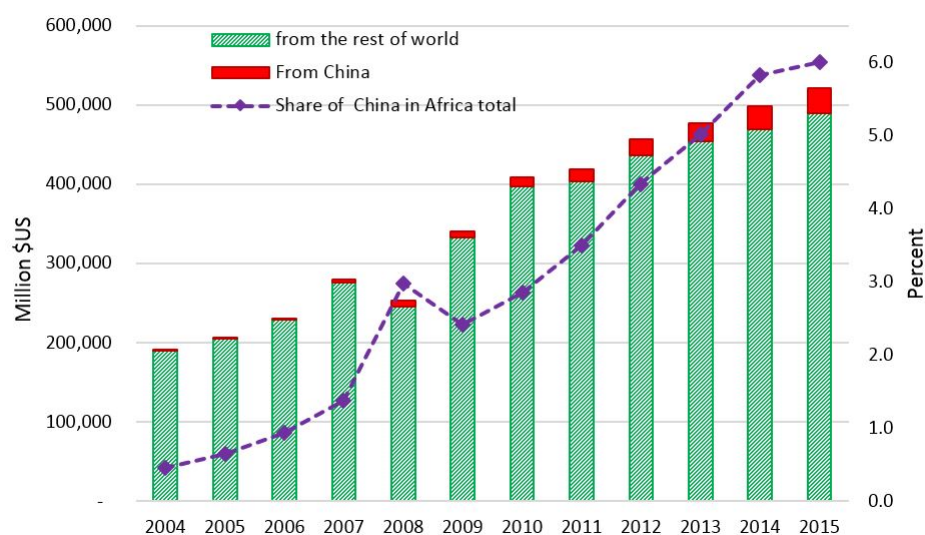


Figure 13b: Total FDI Stocks in Africa from China and the Rest of the World and Share of China



Source: UNCTAD (2017) - click [here](#).

Figure 14a: Share of China's FDI in Africa Total inward FDI Flows, Total Africa, Large Recipient Countries and the Rest of Africa (Percentage)

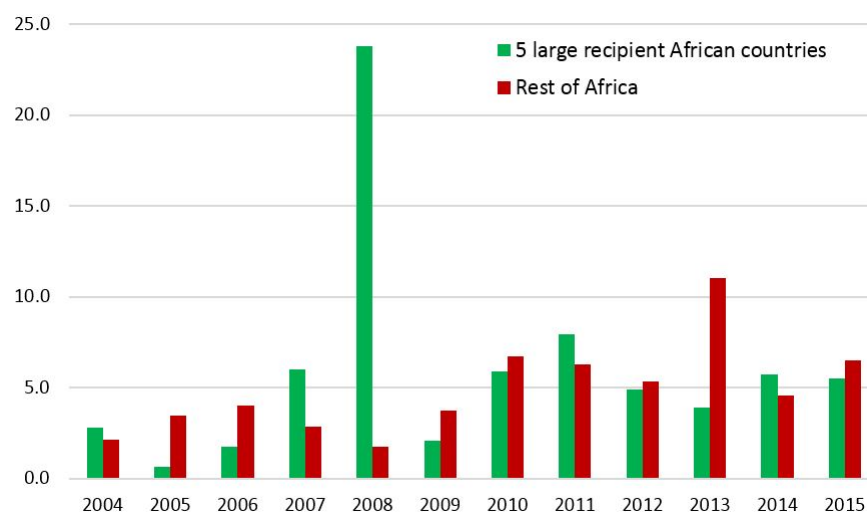
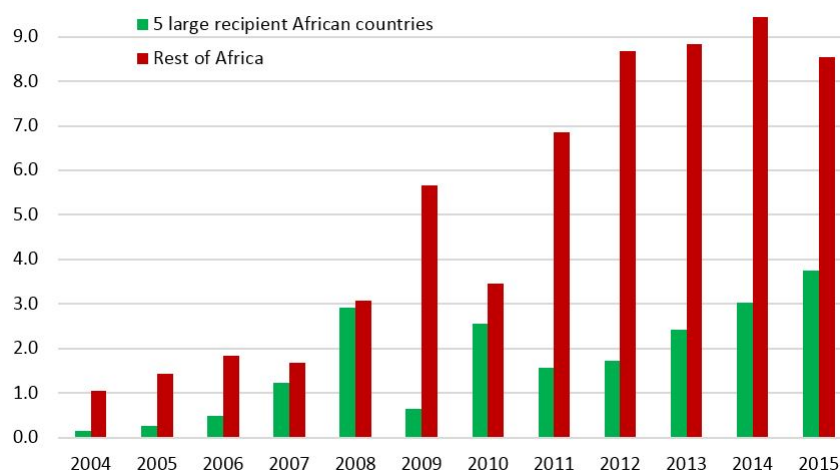
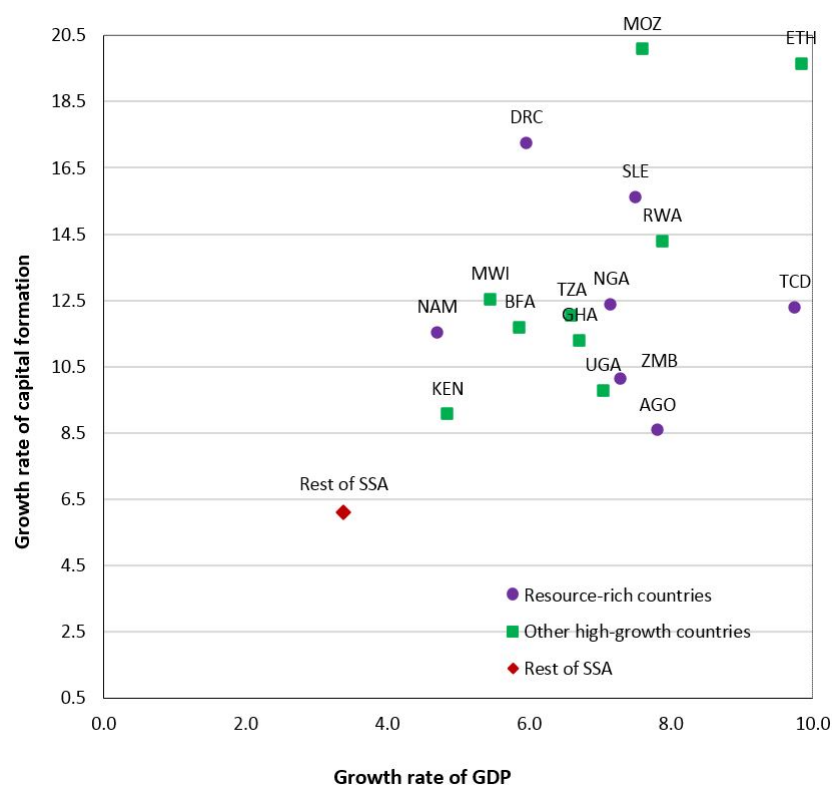


Figure 14b: Share of China's FDI in Africa Total Inward FDI Stocks, Total Africa, Large Recipient Countries and the Rest of Africa



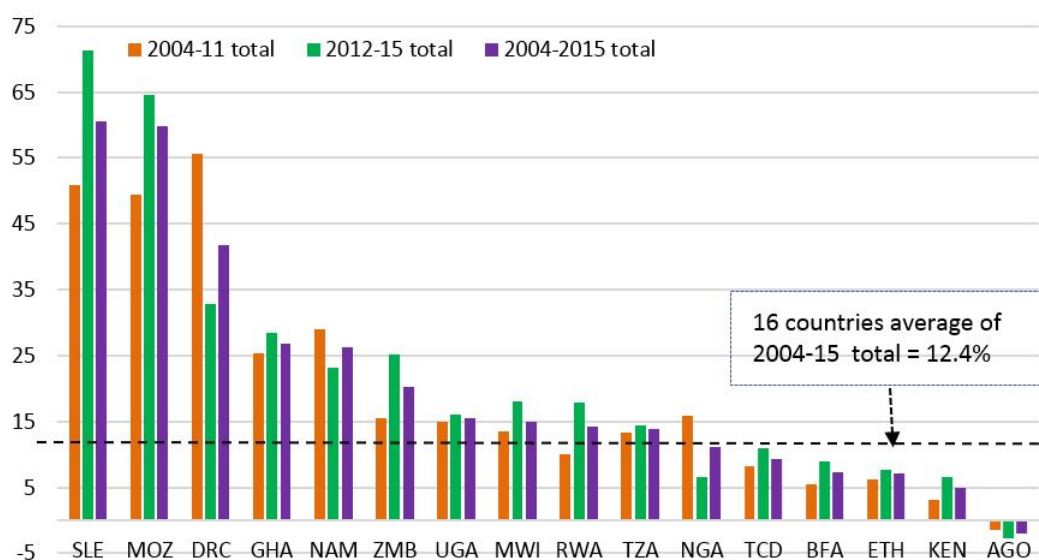
Source: Authors' calculations using data from Table of "China's Outward FDI Stocks by Country and Region" in *China Commerce Yearbook* (various years) published by Ministry of Commerce of the People's Republic of China. *Note:* The five large FDI recipient countries are DRC, Nigeria, South Africa, Sudan and Zambia.

Figure 15: Growth in GDP versus in Capital Formation, Annual Average in 2000-2015 (Percentage)



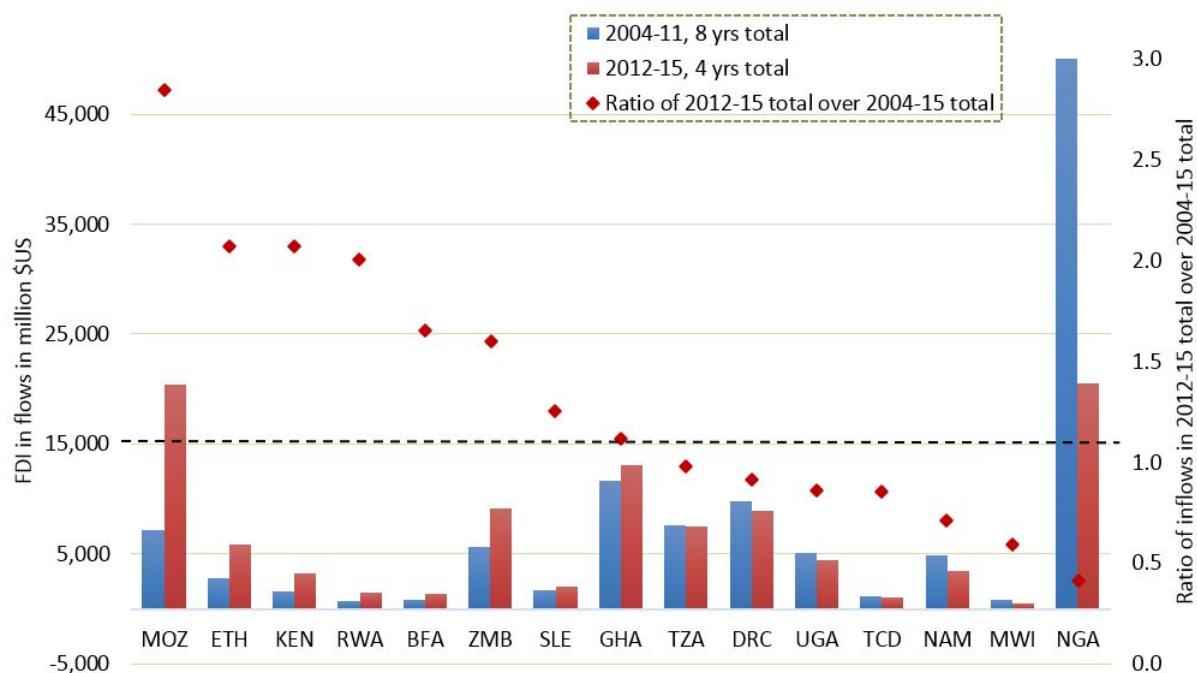
Source: Authors calculations using data United Nations Statistics Division (UNSD 2017) - National Accounts, click [here](#). *Note:* Resource-rich countries are Angola, Chad, DRC, Namibia, Nigeria, Sierra Leone and Zambia.

Figure 16: Equivalent Shares of FDI Flows in Gross Capital Formation for 16 High Growth Countries (Percentage)



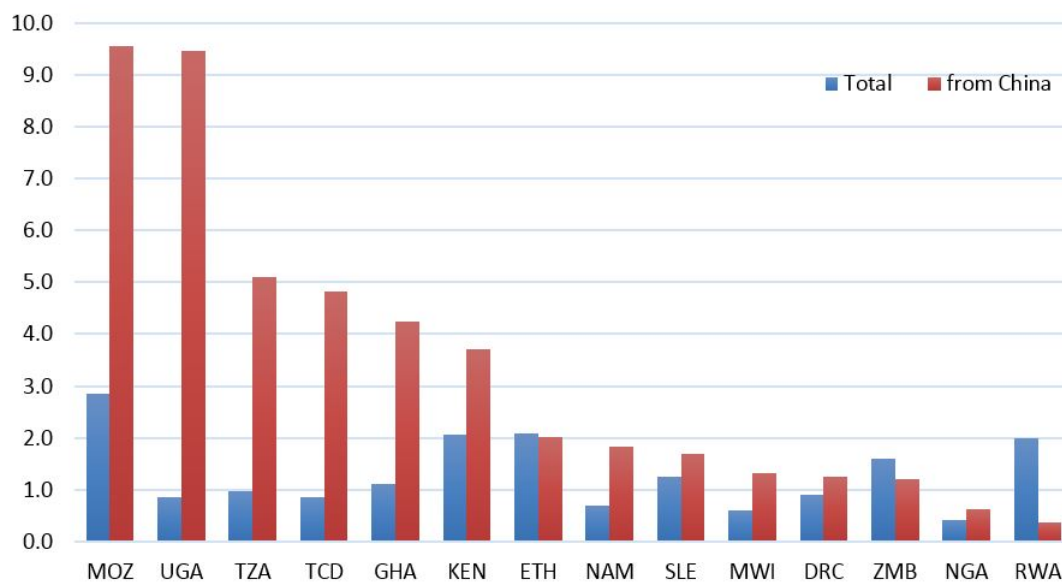
Source: Authors' calculations using data from UNSD (2017) for gross capital formation and UNCTAD (2017) for FDI flows.

Figure 17: FDI Inflows in 16 High Growth Countries in 2004-2011 and 2012-2015



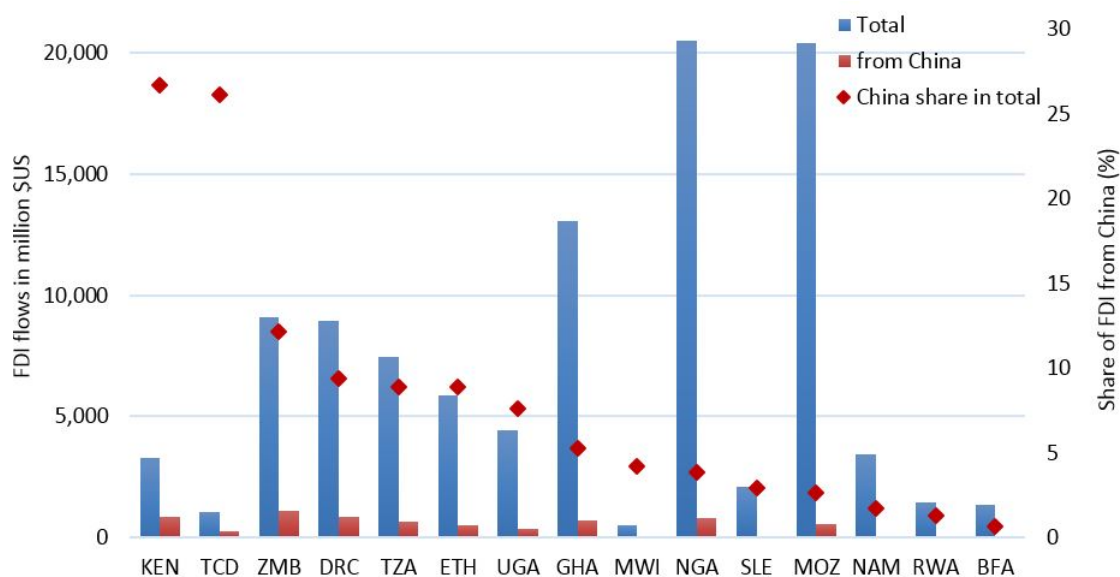
Source: Authors' calculations using data from UNCTAD (2017).

Figure 18: Ratios of FDI Flows in 2012-2015 Over 2004-2011, Total and from China (the Ratio =1.0 If the Amount of FDI Inflows in 2012-2015 Is Same As in 2004-2011)



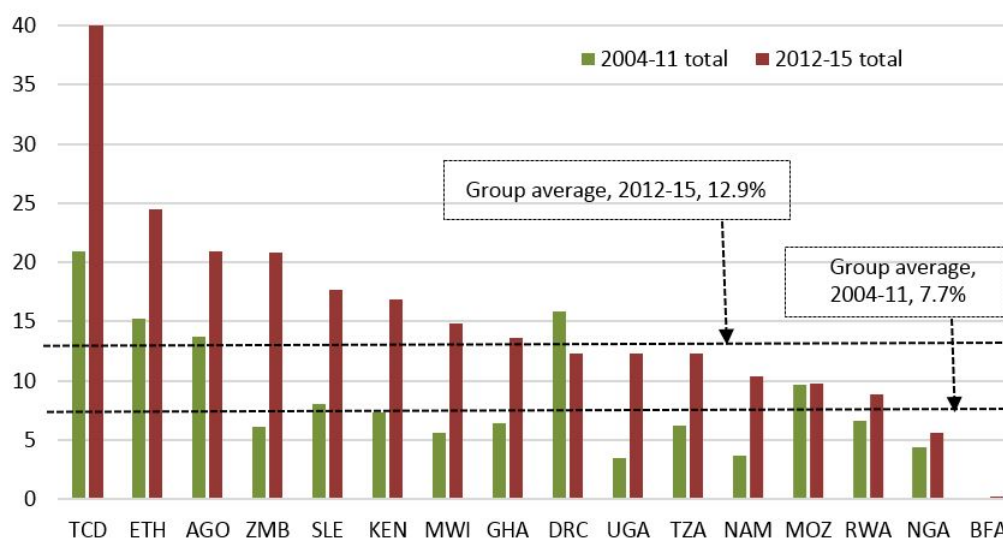
Source: Authors' calculations using data from UNCTAD (2017).

Figure 19: FDI Inflows in 16 High Growth Countries from the World and China, 2012-2015 Aggregation



Source: Authors' calculations using data from UNCTAD (2017).

Figure 20: Equivalent Shares of Construction Value Contracted by Chinese Enterprises in Gross Capital Formation in 16 High Growth African Countries in 2004-2011 and 2012-2015 (Percentage)



Source: Authors' calculations using data from UNSD (2017) for gross capital formation and UNCTAD for FDI flows.

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