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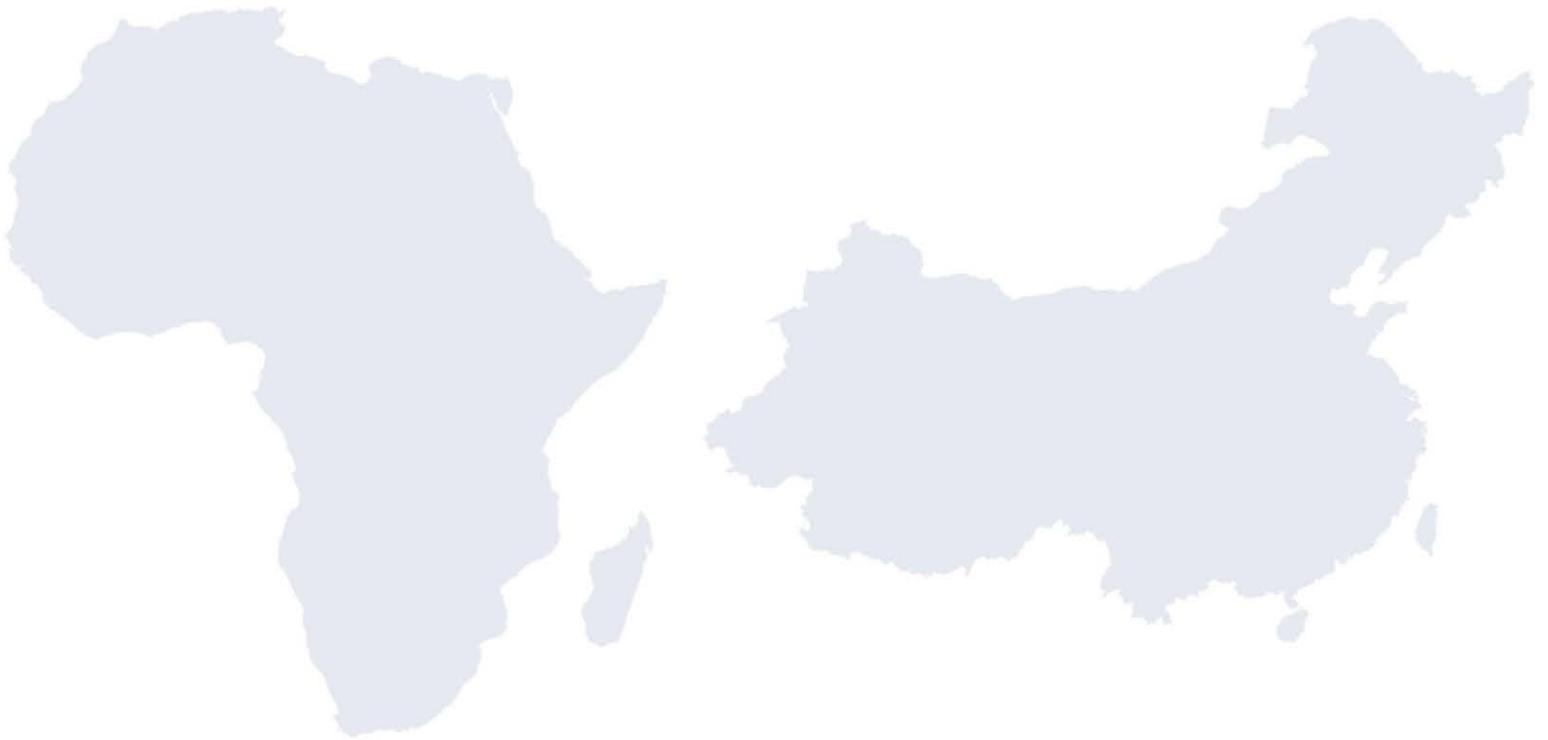
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Learning from China? Manufacturing, Investment, and Technology Transfer in Nigeria



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Abstract

As China's economic boom has boosted domestic growth and income, higher wage costs are moving an increasing number of Chinese firms overseas. This presents a favorable opportunity for less developed countries in Africa and Asia to boost their export and manufacturing sectors, as well as opportunities to absorb Chinese industries seeking to reduce costs offshore. This paper examines new trends of Chinese foreign direct investment and technology transfer in Nigeria's manufacturing sector, and evaluates their potential to catalyze further industrialization in Nigeria. Fieldwork investigations of both Chinese and Nigerian firms in three regions of Nigeria show some evidence of positive, if limited, technology transfer, although they also reveal negative perceptions towards Chinese investment. While Nigerian economic policies have served to promote Chinese investment and skills promotion in Nigeria, a more coherent strategy is needed to leverage this new, growing source of capital and the potential resources it brings.

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1. Introduction

It has long been the case that industrial production moves from higher to lower cost countries.¹ After a long period of tremendous economic growth, production and operating costs are now rising in China. As such, many firms have been encouraged to migrate to lower-cost locales. China's accession to the World Trade Organization (WTO) in the early 2000s coincided with a steadily growing wave of Chinese outward investment, helped by government policies encouraging firms to “Go Global” (zou chuqu). Larger state-owned enterprises (SOEs) are perhaps more visible, but there is also a large and growing number of small- and medium-sized Chinese firms, public and privately-owned, investing across the developing world. Africa is an increasingly attractive destination for these firms. According to the United Nations Commission on Trade and Development (UNCTAD), Asian foreign direct investment in sub-Saharan African nations has grown significantly—especially in the case of China—since the Asian economic liberalizations of the 1980s.² Yet little systematic data exist on Chinese private enterprises, and the topic has not been researched as much as the larger investments of SOEs.³

This study forms part of a wider program of research that examines how such investment linkages can contribute to processes of technology transfer in developing countries, and to the catalysis of structural transformation of these economies. This study surveys a sample of Chinese firms and Sino-Nigerian technical partnerships operating in Nigeria, examining firms and industrial clusters in four regions: the states of Lagos and Ogun in the Southwest; Calabar in Cross Rivers State; and two cities in Anambra state. Based on field research carried out in 2014 and 2015, we collected data on a total of 20 Chinese and 21 Nigerian firms, gathering information on company histories, the extent of Sino-Nigerian linkages, and relationships with other manufacturers and suppliers, in order to assess how micro-level mechanisms of technology transfer might contribute to these broader processes of economic transformation.

Our findings indicate some limited, but significant cases of technology transfer between Chinese and Nigerian partners, particularly in the automobile assembly and other light manufacturing industries where government policies have served to encourage Chinese investment through import substitution. The transfer of technology through “technical partnerships” that often involve extended relationships, equipment sales, and technical training schemes, is also an important and growing component of Sino-Nigerian business partnerships. While the Chinese government and two Nigerian state governments have sponsored economic cooperation and trade zones, there appears to be no government recognition or strategy on either side to expand or nurture these instances of technology transfer. Some Nigerian firms have also expressed concern over illicit or unethical practices by Chinese businesses, indicating the need for greater cultural integration and awareness of reputational impacts. It is clear that while Chinese manufacturing investment and machinery exports are affording substantial resources and opportunities for local Nigerian enterprises and workers, more needs to be done by private sector firms and both governments to enhance the positive development impact of this engagement. There is also a greater role for policy in facilitating the participation of local Nigerian industry through strategic Chinese

partnerships, to leverage these relationships to foster and accelerate processes of technology transfer.

2. Background

Manufacturing and Industrial Development in Nigeria

Nigeria's industrial development has been largely stagnant for much of its post-independence history. As a resource-rich country, the oil sector has been a fundamental driver of the Nigerian economy since its first boom in the 1970s, constituting the majority of both exports and government revenue. The effect of this resource dependence has been the crowding out of the non-oil sector, particularly in agriculture, which saw its share of GDP fall from 41 percent to 17 percent over the period from 1970-2004, as the overall contribution of the non-oil sector to GDP dropped from 94 percent to 52 percent in the same period.⁴ The dominance of oil exports has been a large contributing factor to the underdevelopment of the manufacturing industry. Despite consecutive industrial development plans from 1960-80, policies of import-substitution industrialization were unsuccessful in spurring manufacturing development. Key obstacles included the lack of human capital and technical and managerial skills for industrial projects.⁵ The growth of East Asia as a global manufacturing hub in the 1990s also further squeezed sectors of Nigerian manufacturing, particularly in textiles and clothing, as cheap imports from China and Asia flooded Nigerian markets.⁶

However, this trend is shifting. Nigeria's annual real GDP has been increasing by around 7 percent for the last decade, and this has been driven primarily by the non-oil sector, with services (e.g., telecommunications, retail) constituting 57 percent of this GDP growth, and manufacturing and agriculture contributing 9 percent and 21 percent, respectively, to these trends.⁷ Nigeria's dependence on resource commodities has rendered it vulnerable to global price fluctuations and other shocks, and 2013 was a particularly difficult year for the oil sector, which saw a decline in revenues due to unrest in the Niger delta region. As such, the Nigerian government has recognized that the development of the manufacturing sector is an important strategy for promoting economic diversification and adding value to commodities, and can, in the process, create employment, achieve growth, and reduce poverty.

According to the World Bank, in recent years, manufacturing has comprised a growing share of Nigeria's GDP: in 2013 it was the largest single sector of non-oil based GDP growth, while the oil sector's contribution to GDP has continued to fall.* The food and beverage sector constituted 4.4 percent of annual GDP growth in 2013, and the small plastic and rubber industry is also growing.⁸ Consumer electronics and automobiles are projected to be two sectors with significant potential for expansion, and according to Lin and Treichel (2011),

* According to the World Bank (2014), where previously agriculture, oil and trade accounted for 84 percent of Nigeria's GDP, this now accounts for only 54 percent, due in part to growth in manufacturing, retail, and services sectors.

rubber and leather are both abundant resources that Nigeria can develop into promising sectors for manufacturing. The Nigerian Industrial Revolution Plan, released by Goodluck Jonathan's government in January 2014, aims to foster Nigeria as a regional manufacturing hub in West Africa, with plans to increase the manufacturing sector from 4 percent to 10 percent of GDP by 2017.⁹ This plan appears to have carried through under the new Buhari administration.

Policy trends also present favorable conditions for the development of Nigerian industry: the African Growth and Opportunity Act (AGOA) has been a boon for many African exporters, particularly as the act opened up U.S. markets to exports from textiles and light industry. Nigeria has been a top exporter under AGOA through the expansion of oil exports, yet it has not benefitted in other sectors, such as textiles, compared to other countries like South Africa or Kenya.¹⁰ Thus, while GDP growth has been high, employment generation outside of the oil sector is still lackluster.

Domestically, Nigeria has also instituted a policy of import substitution for certain goods, intended to encourage the localization of manufacturing production. Current policies enact different customs duties for finished versus unfinished goods, which is intended to incentivize domestic manufacturing in key areas. Many household consumer products are prohibited from import, including furniture, used automobiles, tires, cardboard, a number of finished pharmaceuticals, and common processed foods such as noodles. Local content policies such as the Nigerian Content Bill have also been applied to the oil and gas sector, with the aim of building capacity and human capital in this sector. To date, the policy created over 30,000 jobs from 2010-2012, according to the Nigerian Content Development and Monitoring Board (NCDMB).

One policy that may have a significant impact is Nigeria's Automotive Policy, enacted in November 2014, which could provide a huge boost to Nigeria's domestic auto industry. Nigeria experimented with import substitution policies in the 1960-80s, as well as a program of indigenization of foreign industries in the 1970s. However, lack of foreign exchange and lack of domestic capacity in manpower and skills hindered the development of domestic industry, and manufacturing exports—which were never high—further declined over this period.¹¹ The current policy will raise import duties on fully assembled cars from 10 percent to 35 percent, and is intended to incentivize domestic production and assembly. This in turn could boost foreign investment, auto exports, job creation, and industrial development in Nigeria. Although there are concerns about the impact of this on transport costs, the policy has shown some tentative success: a number of international auto manufacturers have begun to open (or reopen) assembly plants in Nigeria, including Toyota and Peugeot, and our scoping study also saw growing Chinese participation in this sector.¹²

Overall, despite positive growth trends, the majority of manufactured consumer goods in Nigeria are still imported from the EU and the U.S., followed by China.¹³ Nigeria's imports from China primarily consist of manufactured goods, chemicals, and machinery and transport

equipment. One study suggests that these imports might have a powerful impact: it estimates that a percentage point increase in imports from China correlates to a 0.2 percent rise in Nigeria's GDP.¹⁴ Unreliable supply chains and poor infrastructure, particularly access to power, are ongoing impediments to the development of Nigeria's manufacturing sector. Though unit labor costs are lower, labor productivity is also much lower compared to East Asia, and competition from cheap Chinese imports has put pressure on domestic industry, particularly in the footwear and textile industries. However, as demographic factors in China continue to push up its labor costs, there are increasing incentives for firms to "go out" to countries like Nigeria.

Sino-Nigeria Economic Cooperation

Nigeria's economic relations with China have evolved from limited diplomatic relations and engagement in the post-independence era to Nigeria becoming one of the largest destinations for Chinese FDI in Africa. At independence in 1960, Nigeria recognized the Republic of China (Taiwan) as "China." In the 1960s, a number of Hong Kong Chinese firms invested in Nigeria, helping shape the textile manufacturing sector in Kano and elsewhere in the north of the country.¹⁵ Many of these Chinese family firms had relocated to Hong Kong from Shanghai and Ningbo after the Communist takeover of mainland China in the 1940s. Of the four "big families," two are still present in Nigeria today: the Lee Group (controlled by the Lee family), which includes businesses in shoes, bread, plastic bags, steel and ceramics; and WEMPCO (controlled by the Tung family), another diversified conglomerate across the ceramics, building materials, and hospitality sectors, which opened the largest cold-rolled steel mill in Africa last year. Nigeria broke ties with Taiwan in 1971, and established diplomatic relations with the People's Republic of China. Trade with China grew slowly until the 1990s, when China became a net importer of crude.

Trade and investment between the two countries accelerated particularly under the presidency of Olusegun Obasanjo, yet much of this was concentrated in the oil sector and large state-led projects.¹⁶ The current influx of Chinese manufacturing investment in Nigeria represents a second wave, after the first wave of Hong Kong Chinese investment described above. Many of these are private investors or single entrepreneurs without state support, most of who have relocated directly from the coastal regions of the mainland such as Zhejiang, Shandong and Jiangsu.¹⁷ Chinese official sources estimate that 45 percent of China's official FDI in Africa is now from private sector sources, although this likely underestimates the reality of the number of small and medium enterprises (SMEs) on the ground, since China's Ministry of Commerce (MOFCOM) certification only tracks investments of projects above US\$10 million, and many smaller firms are put off by bureaucratic approval procedures.¹⁸ In Nigeria, Shen (2013) finds that Chinese FDI to the country has grown quickly within just the last few years. In fact, China is the fastest-growing and largest single source of FDI in Nigeria: Chinese FDI comprised 2.1 percent of contributions in the eight years leading up to 2008, but by 2011, its contribution had jumped to 24 percent of total FDI.¹⁹ Many firms have cited Nigeria as an attractive

investment destination because of its large domestic market and growing middle class, as well as because of its access to neighboring North and West African economies.

In 2006, the Chinese government pledged to finance up to five Economic Cooperation and Trade Zones (ECTZs) in Africa. Led by Chinese companies, these zones were designed to help attract Chinese investment, allowing host governments the opportunity to learn from China's own domestic Special Economic Zones (SEZs) that were integral to the economic success of its export-led growth strategy, and the growth of its coastal provinces.²⁰ Two of these zones came to be located in Nigeria, in Lekki and in Ogun state.

Beyond state-sponsored SEZs, some private companies have expressed interest in setting up their own industrial parks in Nigeria.²¹ A World Bank report on Chinese manufacturing by Shen (2013) reported that several Chinese companies had set up Private Industrial Estates (PIEs). However, our visits to the two Nigerian examples cited in this study—"Hazan Shoe Park," said to have been in development near Ogun state, and "Yuemei Fabric Industrial Zone" (YFIZ) in Calabar—highlighted some of the challenges for private firms. Hazan Shoes had been operating their factory inside the Chinese state-sponsored ECTZ in Ogun state, and went out of business before they were able to build their own industrial park. The Yuemei "zone" was only a cluster of empty factories located in Nigeria's Calabar Free Trade Zone, which was itself a Nigerian government project, opened in 1999.

Technology Transfer and Structural Transformation

In the same way that foreign direct investment (FDI) in China's economy was an important stimulus to growth and industrial upgrading, this trend of Chinese investment overseas has similar potential for fostering this process in developing countries in Africa and elsewhere. China's potential as a development model for Africa and as an alternative source of trade and finance from Africa's traditional development partners has spawned a growing literature, yet the localized impacts of China's African engagement and the mechanisms by which technology transfer can occur remain underexplored.

Research has shown that foreign firms can be catalysts for manufacturing development.²² There is extensive evidence for the potential for poor countries to catch up with rich countries through the manufacturing sector. Rodrik (2011) finds that since 1960, manufacturing industries have shown unconditional convergence in labor productivity, regardless of country or regional-level factors. This suggests that less developed countries can eventually catch up with the productivity levels of developed countries, and that the manufacturing sector's role in this is key.

Others have shown the impact of FDI spillovers by measuring the effect of foreign investment on domestic firm productivity growth; in the case of China, backward linkages have been a particularly potent channel for this spillover effect.²³ The transfer of innovations and ideas between countries has often prompted firms to adopt new practices and technologies. This

may occur through a number of mechanisms, including imitation of foreign firms, the “poaching” of skilled workers, subcontracting, and backward and forward linkages. However, foreign firms can also operate as enclaves, with little connection to the local economy and competing with local firms for market share and supplies.

The role of foreign firms as catalysts in manufacturing development can occur through employment, technology transfer and backward and forward linkages. The role of Japanese factories as “Schumpeterian innovators” in Korea has been noted during the phase of Japanese colonialism, which in turn fostered a ‘cluster’ of Korean imitators.²⁴ In turn, Korean companies in Bangladesh have brought Bangladeshi workers to Korea for training. These workers then later left to set up their own companies, sometimes as sub-contractors.²⁵ Brautigam (2003) documented how Nigerian traders learned about manufacturing processes through site visits to Asian factories, while Mauritians formed joint ventures with firms from Hong Kong and then set up their own firms. Over time, skills spread through personnel shifts: smaller firms hire workers trained by a new investor, and skilled personnel can leave to set up their own firms. The current trend of Chinese investment in Nigerian manufacturing can potentially play a similar catalytic role.

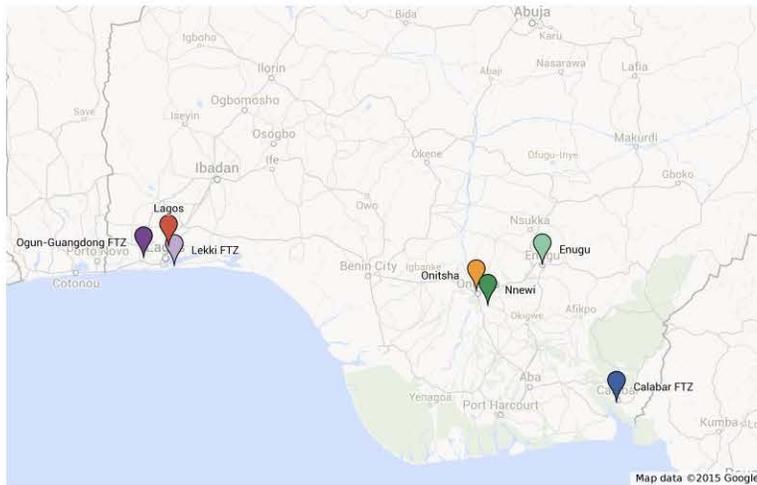
3. Chinese Manufacturing Investment in Nigeria

Study Scope and Methods

This study examines Chinese foreign investment in manufacturing as well as other direct linkages through which Chinese technology and skills might affect Nigerian manufacturers. Our goal was to examine the potential of these investments and other forms of Chinese engagement for technology and skills transfer. Our field study covered primarily Nigeria’s southeastern and southwestern states with major sites of Chinese manufacturing involvement: Lagos and Ogun states in the southwest; Calabar in Cross River State in the southeast; and finally Nnewi and Onitsha, both in Anambra State (Figure 1).

We started our study by collecting data on firms’ Nigerian investment proposals approved by China’s Ministry of Commerce and by the Nigerian Investment Promotion Commission (NIPC). MOFCOM’s registration list identified 297 Chinese firms whose investments (in all sectors) have been approved in Nigeria, while the NIPC shows 221 Chinese firms (Appendix II). Of these, we determined that 141 proposals on the MOFCOM list pertained to manufacturing, while the NIPC had 92 manufacturing projects registered in its database. The latter only includes firms the NIPC has assisted, while the former contains only firms that have received official approval from the Chinese government. In both cases, not every firm will actually go through with the investment. A manual matching analysis showed an overlap of only around 21 to 30 firms between the two lists. However, Chinese firms often establish a new local subsidiary with a different name when they invest abroad, and this is likely to explain much of the variation. These official lists provided one of several starting points to find firms for visits during our field study. Nonetheless, given our past experience in tracking down Chinese

Figure 1: Site visits to Chinese industrial investments and technical partnerships



investment and our knowledge of the difficulties of investment in Nigeria, we expected to find far fewer than the 91 to 123 registered firms.

Because MOFCOM does not include contact information, we conducted a web search to find contacts, but results were limited. The NIPC list did include contact information, and while this proved to be useful in some cases, in other cases we reached a dead end. More helpful was asking the

Chinese commercial office in Lagos, the Lagos Chamber of Commerce, the Manufacturer's Association of Nigeria, and other Chinese entrepreneurs for their contacts with other Chinese businesses. In some instances, we also attempted to "cold-call" Chinese firms; not surprisingly, the firms to whom we received an introduction were more likely to agree to an interview. Finally, we also worked with management of the Calabar, Lekki, and Ogun-Guangdong special economic zones to contact Chinese firms within their zones.

Initial fieldwork was conducted in July 2014 in Lagos, Ogun, and Calabar with twenty Chinese manufacturing firms, as well as four Nigerian firms with Chinese technical partnerships. Our research sites included the Chinese-built Ogun-Guangdong free trade zone (FTZ) (Ogun State) and the Lekki FTZ (Lagos State). We also spoke with current and former government officials and representatives from industry associations.

A second round of interviews took place in December 2014 and January 2015 in Anambra state, primarily in Nnewi and Onitsha. This second round focused on Nigerian industries, many of which had affiliations with China. Using semi-structured questionnaires and interviews of a sample of Chinese firms and Nigerian firms with Chinese partnerships, we gathered information on firm size, firm history and origins, revenue, and employment data. In order to evaluate the degree of potential technology transfer, we assessed the extent of horizontal and vertical linkages between domestic and foreign firms, hiring of local labor, and the nature of technical skills and practices disseminated between Chinese and Nigerian firms. We also assessed how government policy—for example, new incentives for the automotive sector—has affected incentives for this technology transfer process.

Lagos/Ogun State

The coastal regions around Lagos and Ogun state has a number of Chinese firms and investments ranging from small SMEs to larger investments of around US\$40 million, in the case of one Goodwill ceramics firm. Many of these operate in industrial or free trade zones, including the Chinese government-supported Ogun-Guangdong and Lekki zones.

- The **Ogun-Guangdong FTZ** is one of the fastest growing industrial zones, focusing on light industry, including ceramics. Chinese enterprises here are primarily in light industry, with a number of furniture firms, such as Wingham Furniture, as well as paper and other light industry for local markets, such as Vindax Tissue and Hewang Cardboard, which manufactures packaging. We also found two Chinese-owned steel and construction firms: Far East Steel and Flying Horse Aluminum. In recent years, more investors have been moving to Ogun due to its relatively low taxes compared to Lagos state.
- The **Lekki FTZ** was one of the first overseas economic cooperation and trade zones set up under the Chinese government's 2006 pledge.²⁶ Currently it holds primarily Nigerian enterprises, but also has four or five Chinese manufacturers including Sunday Lightbulbs. Representatives of the zone were seeking to attract more Chinese investors, although problems with land ownership around the zone appeared to be an ongoing issue that has yet to be resolved by the Lagos government.
- In the wider **Lagos and Lagos state** area, we identified a large number of operating Chinese industries. These include Hongxing Federated Steel, which has a number of subsidiaries around the Lagos and Ogun areas; more furniture/homewares firms, including Lifemate; and smaller firms like Mark Sino.

Calabar, Cross Rivers State

- The **Calabar FTZ**, situated in Cross Rivers State, was established in 2001 (although construction started as early as 1994) as the first and currently largest—by volume and revenue—free trade zone in Nigeria. It is home to a large number of manufacturing enterprises, which comprised 27 of the 74 operating businesses on site as of 2014. Of these, nine were Chinese. These include Bao Yao Group, operating since 1999, which produces iron rods and billets. Other enterprises include textiles and electronics, with some assembly firms producing appliances and automobiles, such as FAW's (originally First Automotive Works in China) heavy-duty trucks. There is little sign of sectoral clustering between the Chinese firms: Bao Yao Steel has no other competitor in southeastern Nigeria, and the three other appliance and electronics firms operate as part of the same company, Skyrun International. Most of the Cross Rivers State is dominated by agriculture, and the FTZ forms part of the state strategy to expand into industry, manufacturing, and primary processing.

Nnewi/Onitsha, Anambra State

We also visited three primarily Nigerian manufacturing hubs concentrated in Nnewi and Onitsha (Anambra State), as well as a Nigerian partnership in Enugu, Enugu State. Information from the Nnewi Chamber of Commerce indicates that there are around 11 manufacturing firms in the region with some form of Chinese partnership or cooperation in Nnewi. We also interviewed six firms in Onitsha and one in Enugu. Again, using semi-structured interviews we obtained information regarding connections with Chinese firms and other manufacturers, in order to shed light on the impact of Chinese linkages in unlocking the potential of the manufacturing sector in Nigeria.

Nnewi and Onitsha are both large cities in Nigeria's Southeast, with manufacturing clusters that have developed despite minimal direct intervention or stimulation from the state. Nnewi has much stronger ties to Chinese industry than Onitsha, due in part to its historical ties with traders from Asia. However, Onitsha, with a river port and a large urban market, also has a favorable climate for attracting outside investment. Although most of the industries in Onitsha are relatively small, many have partnerships with other Asian countries, including Singapore, Malaysia, and Korea. While connections and technical partnerships with China appeared to be more prevalent in Nnewi, Indian and Lebanese firms were more common in Onitsha. Many interviewees believed that the Chinese are reluctant to settle in Onitsha and Nnewi compared to Indians and other Asians.

The Nigerian firms in this area included similar industries to those found in the coastal free trade zones: primarily light industries, such as cables and electrical materials firms (Cutix Cables), plastics and paper, aluminum and metals. Several firms specialized in household products, processed food, and beverages. Nnewi is also famous for motor vehicle assembly and the manufacture of auto parts.

Sectors of Investment

Our initial findings show a growing trend of Chinese investment in manufacturing, as well as some evidence of technology transfer through Chinese and Nigerian technical partnerships. However, we do not see much evidence of geographic clustering in any particular sector. The investments reflect typical entry-level industries: furniture, building materials, plastics and food processing, and vehicle assembly, but they are not geographically concentrated.

- **Furniture:** the furniture industry in Nigeria is highly fragmented, with the largest firms purportedly holding a market share of around 5 percent. However, two of the largest Lagos firms are Chinese: Bedmate and Lifemate. The two firms have overlapping ownership, but are run independently. Smaller Chinese firms, such as Winghan in Ogun state, produce sofas and more specialized furniture.
- **Steel and construction materials:** Five Chinese steel manufacturers are registered with the NIPC as operating in Ogun, Edo, and Lagos states. We also came across a number of

Chinese steel manufacturers who were not registered on the NIPC list, including the Federated Steel Group in Ogun state and Baoyao Steel in Calabar FTZ. The Hong Kong-owned Lee Group and WEMPCO also own steel factories. On the Nigerian side, a number of small firms have relationships with Chinese suppliers, including Cutix, which specializes in telecoms cables and other electrical materials, Jocalis Aluminium, and Peter Ventures Industries.

- **Food and beverage:** The food and beverage industry was consistently identified as a fast-growing area of Chinese manufacturing investment, although many Chinese firms we identified were not registered with the NIPC. The Hong Kong-owned firm Lee Group also has divisions in the food industry. Nigerian firms Kotec Group and Stine Industries, market competitors in Anambra for processed foods such as noodles and bottled water, have both sought technical partnerships with Chinese machinery firms, which provide training and support in the production process, but no equity.
- **Automotive assembly:** In our fieldwork, we found two Chinese firms that are involved in the assembly of heavy-duty trucks: FAW in Calabar, and Jinan in Lekki. This is considered to be a promising area for future Chinese investment given Nigeria's automotive policy, which applies a 70 percent tariff on imported vehicles, thus creating strong incentives to move automotive assembly to the domestic market. Technology linkages between Chinese and Nigerian firms are also quite visible here. In Nnewi, which enjoys a reputation as Nigeria's auto manufacturing and trading hub, several firms we spoke to have entered into partnerships with Chinese firms: Innoson Vehicle Manufacturing and URU industries both have technical partnerships with Chinese firms; and Shacman Motors, which produces heavy-duty trucks, has partnered with Weichai Group from Shaanxi province to move toward manufacturing their vehicles domestically.

Our research also identified two sectors that have seen significant attrition: textiles and plastics. Although decades ago Chinese—particularly Hong Kong—investment in textile manufacturing was quite high (and provided local competition for Nigerian firms), the sector is now declining for both Chinese and Nigerian firms. Somewhat ironically, this can be attributed once again to Chinese competition, but this time from Chinese imports, and Chinese and Nigerian traders who bring back fabric and clothing. According to the manager of Shifa Plastics, profits in the plastics sector have also declined due to increased competition and smuggling. Yet, others report that business in plastic construction materials (Mark Sino) and plastic household products has been healthy.

Clustering and SEZs

The sites we visited along the coastal and inland states in Nigeria do not exhibit strong tendencies of sectoral clustering, despite the Chinese funding for two zones and the strong Chinese presence in the Calabar FTZ. None of the enterprises in the Ogun-Guangdong Free Trade Zone produce the same type of product, and the two firms producing furniture—one producing office chairs and the other one sofas—can hardly be called a cluster. Similarly, although the aluminum-molding firm, the iron rod firm, and the ceramic tile firm are all

involved in construction materials, there are no economic linkages between them, such as joint distribution. All of the manufacturers in the Lekki Free Trade Zone are in different industries.

Chinese manufacturers in Nigeria do not necessarily operate in the same sector that they operated in at home in China; instead, they often manufacture a completely new product. The decision to shift products seems to be based on their analysis of market potential rather than their own past experience. According to the manager of Goodwill ceramics, since ceramics are heavy to ship “there must be a domestic market in developing countries.” Similarly, the CEO of Vindax chose to produce tissue paper despite having no previous experience of the product.

These tendencies might explain the pattern of “anti-clustering,” where we saw few apparent linkages between the different Chinese firms operating in these zones. Indeed, some firms see the lack of clustering as a benefit: the manager of Baoyao Steel spoke positively about his firm’s competitive advantage as the only steel firm in the Calabar FTZ, meaning he could sell at higher prices than he could in Lagos.

Rather than clustering by industry, it appears that regional affiliations in China mattered more for Chinese entrepreneurs’ decisions to invest in Nigeria. Many, including Mr. Wang of Vindax, were introduced to Nigeria through personal connections to existing firms there. In the Calabar FTZ, a number of Chinese firms all originate from Jilin Province in China’s northeast. Mr. Kassim, the general manager of the FTZ, expects more investment from Jilin in the future. The Changchun Chamber of Commerce from Jilin’s capital city has organized a trade fair to attract Chinese business to Calabar. Likewise, Mr. Kassim’s team has been to Jilin twice to attract new investment.

The only intentional experiment of industrial clustering appears to have been the so-called Yuemei Fabric Industrial Zone (YFIZ), which Shen (2013) discusses as a successful case of a private industrial estate. Shen reported that twenty firms had invested in the zone, which was said to have been built by a Zhejiang company, Yuemei. We visited the Yuemei cluster, which was actually renting space in the Calabar Free Trade Zone. According to our interviews with a Chinese plant manager from the Yuemei cluster of factories, the original vision was indeed to establish a textile cluster where different specialist textile production firms could co-locate. However, despite interest from Chinese textiles firms, only two firms ever came to invest in this cluster: Mawa, which specialized in textile dyeing and printing, and Jinmei, which specialized in embroidery. Even these investments were short-lived. Although Jinmei was operational from 2010 to 2011, according to Mr. Zhang, operations ceased soon after when demand for embroidered cloth plummeted. Mawa also ceased production in early 2014 due to short supplies of dyes. Some Nigerians associated with the Calabar zone raised concerns that the Yuemei investors were more interested in transshipping products from China without paying appropriate duties than in local production. In February 2014, these two firms were evicted, and at the time of our visit their assets were in the process of being sold to new, non-Chinese buyers.

Motivations for Investment

Chinese firms decide to invest in Nigeria for a variety of reasons, including lower costs, lower competition, and the country's large domestic market. Many firms cited rising labor costs within China. As the founder of Goodwill Ceramics commented, "Chinese labor is so expensive now, so you have to walk out the door [zouchuqu]." Hence, despite the higher cost of some inputs in Nigeria, such as power, Chinese manufacturers still perceive the country to be a profitable destination. The manager of Skyrun commented, "The trend of global manufacturing sites is to shift. First it was Europe, then East Asia, and now it's shifting to other countries." Taking advantage of lower tariffs was another major factor in many firms' decision to relocate—while tariffs on imports of finished goods were 40 percent, they were only 5 percent on locally assembled products, incentivizing many formerly trading-only firms like Skyrun to move from importing goods to manufacturing them domestically.

When asked why they chose to invest in Nigeria, many firms described how they had considered multiple destinations. The founder of Goodwill Ceramics had considered destinations as diverse as Bangladesh, Saudi Arabia, and Mexico before settling on Nigeria. Many Chinese entrepreneurs cited Nigeria's large domestic market and large population for consumer goods as a draw for investment. Others came to Nigeria from other foreign destinations: Lifemate started out in Tanzania before expanding to Nigeria. Nigeria's growing middle-class and wealthy subset of the population also attract investors in firms such as interiors and furnishing as consumers' ability-to-pay is an important factor for manufacturers of higher-end goods. Many firms also cited the lack of intra-industry competition for many product types as another factor that influenced their decision to invest in Nigeria. The founder of Shifa Plastics reminisced about the previously high profit margins enjoyed in the plastics industry, where "a single plastic cup could generate 2 RMB of profit."

Despite these strong advantages, respondents consistently identified a number of challenges to investing in Nigeria. Many entrepreneurs cited safety and security as the primary factor driving their choice of investment location within Nigeria. As a manager in Sunday Lightbulbs, which operates in Lekki SEZ, put it, "Our factory would be cheaper in Lagos, but safety is worth paying for." Many firms in Calabar identified the safety and relative predictability of government services as motivating factors for them to invest in Calabar rather than in the Lagos/Ogun area, noting that the zone is planned and predictable with generally functional management and infrastructure.

Local Employment

While criticism of Chinese firms in Africa has often centered on Chinese firms importing their own labor, it is clear that the industries surveyed have generated significant local employment (see Appendix 1). Some firms, such as Skyrun, have an explicit policy that demands the localization of its labor force, countering to the popular belief that Chinese firms largely employ Chinese. In reality, the high level of local employment we found appears to be driven

by business economics; bringing labor from China is significantly more costly than hiring locally, even after taking productivity into account. Many of the government officials we spoke to noted that Nigerian policies allow foreign investors to bring expatriate staff only if they possess skills unavailable locally, but Chinese firms continued to demand higher quotas for Chinese labor. On average, the Chinese firms we sampled employ over 80 percent of their workforce locally. However, most Nigerians in the firms we surveyed are primarily employed on the factory floor, with few in managerial roles. While some factories provide only basic assembly jobs, others, such as furniture manufacturing or welding firms, require far more specialized training for workers and thus entail higher wages.

4. Technology Transfer from China

Although we saw evidence of technology and skills transfer in some of the firms we observed, there was no systematic technology transfer. Due to the nature of the work at many of the enterprises, such as basic factory line processes, the potential for building technical skills was often low. However, we did observe a number of cases where firms explicitly promoted skills transfer through both formal and informal training; the transfer and usage of hardware and machinery for industrial upgrading was also a recurring theme. The Nigerian joint ventures we observed showed particularly positive trends of both Chinese-led training of local labor and Chinese assistance with industrial upgrading. We identified the automotive and construction sectors as sectors where firms showed significant practice of technology transfer. Yet, evidence of backward linkages between Chinese firms and the local economy was relatively low, which means this is not a promising mechanism for technology transfer.

Hardware and Machinery Transfer

The transfer of hard technology was also common theme. The Nigerian enterprises we interviewed were selected because of their prior technical linkages with Chinese firms: nearly all had procured machinery from China for their manufacturing needs, which entailed the transfer of Chinese technology and knowledge. These machines were set up and serviced by Chinese equipment suppliers or were sourced through maintenance deals, except for more technical manufacturing (such as automobiles) that required more expert input on the production process.

One primary advantage of Chinese technology is cost. The sales manager from Chartered Aluminum, Mr. Kingsley, noted the low cost of the step tiles machines imported from China, which ranged from US\$25,000 to US\$30,000, compared to US\$100,000 to US\$150,000 for European machines. Similarly, Mr. Okoli of Louis Carter Industries, which manufactures plastics, also noted the lower cost of Chinese technology. European machines that cost over US\$450,000 could be procured in China for around US\$23,000—one-twentieth of the cost—making it the only cost-viable option. Many firms also noted the advantage of having easily accessible support services to maintain the machines, and in many cases, they teach local staff basic maintenance skills. Mr. Okuwasa of Cutix Cables noted that his Chinese machinery

supplier offered one year's worth of support for machines procured from their company, even after-sales support, free of charge. He commented, "Although these products don't last as long as European machines would, it just helps us get by, in that we could break-even before the machine deteriorates. That's the advantage."

There is often a tradeoff between cost and quality for Chinese machinery. A number of Nigerian firm owners complained about the poor quality and unreliability of Chinese-made machinery. Mr. Kingsley (Chartered Aluminum) noted, "If you're lucky, you get a good one that would last. Sometimes you may end up with some that would even last the haul...This one here was brought over in 2012 and wasn't used for up till a year, and when we tried to use it, it packed up...the machines supplied may be looking all right physically, but technically...we may end up fabricating some missing components."

In the case of the steel industry, most firms can get away with older, lower-standard machinery. Most of the machinery from Baoyao steel in Calabar FTZ, for example, was from an old Shanghai steel mill that was closed because more stringent environmental regulations by the Shanghai government, a case of Chinese "sunset industries" being offshored. However, the large market potential and low competition allowed firms to invest in larger-scale factories. The Lee Group, for example, has one of the largest rubber thong sandal ("flip-flop") factories in the world in Northern Nigeria, and Goodwill Ceramics in Ogun runs production lines double that of any other ceramics manufacturer in Nigeria.

Education and Skills Training

In general, formal skills training is low in many of the Chinese firms. Most provide informal on-the-job training, which is relatively rudimentary and overlaps with a trial period during which a firm can let the worker go if s/he proves unsatisfactory in some way. A few Chinese firms have invested much more heavily in training workers, although not always as much in retaining these well-trained workers. In Calabar, for example, the Baoyao steel mill uses ship wreckages as raw material. This requires a higher level of technical ability; as such, its welders have become renowned for their skill and speed. "It's like we opened a school!" said Mr. Zhang, the plant manager at Baoyao, on the steady stream of workers showing up at his door seeking to learn the welding trade. Indeed, the Nigerian Maritime College sends their trainees to Baoyao for two months to get welding training. After learning on the job, many welders leave for better paying jobs, often being poached by other companies in the area. Rather than raise salaries, the plant manager seemed resigned to this state of affairs, even seeing it as a form of giving back to local society. Other firms, including Skyrun electronics, which explicitly aims to localize its labor force, similarly acknowledged that many of the workers they trained would be poached by other companies once they were fully trained. However, they noted that "it's expensive and hard to bring Chinese because of the immigration system. We aspire to be like American companies, which have almost no Americans here."

In the Lekki Zone in Lagos state, Jihua Furniture has invested in training its workers to produce products for household interiors: custom doors, patterned glass for storefronts, and special-order staircases, all of which require a high-level of customization. The company provides several months of training after taking on a worker, and works hard to retain those trained workers, paying N30,000 – 60,000 per month (around US\$150-300)—well above the Lagos state minimum wage of N18,000 (US\$90) per month. It even provided accommodations for workers that moved with the firm when it relocated last year. According to the head of the Jihua factory operations, due to the custom nature of the work and the long training period, “We don’t want them to leave. If they want to leave, we want them to really have to think about it.”

Language and cultural differences remain barriers for this form of interpersonal skills transfer between Chinese and Nigerian staff. Many firms expressed frustration with the low education level of Nigerian workers, which made training a slow process. Many of the Chinese firms we interviewed also cited cultural differences in attitudes toward work as a challenge, namely the stark contrast between Chinese work culture and the relaxed attitude and time-management among local Nigerians. Lack of trust of Nigerian staff, and fear of losing sensitive business knowledge were also noted as obstacles to skills transfer.

Joint Ventures and Partnerships

Our study found relatively few examples of joint ventures (JVs) within the manufacturing sector, and the overall sense from interviewees is that equity JVs between Chinese and Nigerian firms are rare. There are many cases of Chinese firms providing a small minority share to local government officials (presumably as a quid pro quo for political protection and/or favorable land rates), but few true partnerships with equitable sharing of investment, responsibilities, and profits exist.

One exception is Techno Oil, a local producer of lubricants that is actively exploring a joint venture agreement with a Chinese firm. Their interest in partnering with Chinese firms was sparked when two other Nigerian firms in the downstream oil sector entered into JVs with Chinese partners. Techno Oil’s JV is still under discussion, but the proposed ownership structure would be 55 percent Chinese and 45 percent Nigerian. The Chinese party would supply technology and equipment, and Techno Oil would supply capital and land. According to the business development manager at Techno Oil, the company is attempting to build an explicit technology transfer process into the agreement whereby after 20 to 30 years Techno Oil will gradually take over all of the equity and own the rights to the technology, illustrating the importance of negotiation and initiative on the part of Nigerian firms. In contrast, the Nigerian mining firm, Multiverse, has only a 25 percent stake in its joint investment partnership with a Chinese firm, and no explicit agreement for technology transfer, which leaves them open to risk. As the owner noted, “If they’re suddenly recalled to China, we need a backup for operating the mine and the quarry.”

Innoson Vehicle Manufacturing, part of a diversified manufacturing group in Anambra and Enugu States, was another case. The company's CEO described how he had been looking to diversify his investments with Chinese enterprises. Currently, he holds a 55 percent stake of a tire and tube company located in Wuxi, China. However, he described how his attempts to open a tire factory with Chinese joint venture partners in Nigeria were halted by the Nigerian Environmental Standards Regulations and Enforcement Agency (NESREA), leading to the factory closure and job losses. Although the reasons for NESREA's objections were not clear, sources at Innoson implied that regulators may have been angling for payments that their firm refused to provide. Undaunted, Innoson was planning to diversify into the furniture and wood business through a joint venture with a Chinese company based in Zhejiang. The firm had already signed a memorandum of understanding (MoU) with the Nigerian partner owning 40 percent and the Chinese 60 percent. The factory would be established in Enugu.

Franklin Marble, a smaller enterprise producing marble and granite, also stated plans to partner with a Wuhan firm to set up a vertically integrated quarry-to-retail operation. Currently, its MoU is at an early stage and would require funding from the Nigerian Bank of Industry. The Chinese partners would manage the hardware part of the scheme—technology provision of all machinery and production equipment—while providing technical assistance.

In general, the Nigerian firms we spoke to that had imported manufacturing equipment and technology with technical assistance from Chinese firms were optimistic about technology transfer. These partnerships all generally incorporated some form of Chinese technical training in using machine equipment and the production process for Nigerian staff. Together, the 12 Nigerian firms we interviewed had a total of 54 Chinese (and 56 other foreigners) in the factories during our visits, compared with a total of 14,063 Nigerian employees. The CEO of Innoson Group, explained that “our people can do the work without any input from our Chinese partners. Now they are able to run the production line by themselves. The number of our Chinese technical partners is depreciating [sic] because our people are being taught to use the technology.” Similarly, the head of Shacman Motors, also an automotive company, stated that the Chinese were brought in to provide training to the former ANAMMCO staff on how to assemble Chinese trucks. “Now that the Chinese partners have taught them, they can do it all by themselves.” A number of firms saw the presence of Chinese in training roles as temporary, necessary for training Nigerian workers to take over in the running of production lines. This demonstrates that rather than simply playing a supervisory role, Chinese technicians do impart valuable technical skills to Nigerian workers, without entailing a continued need for, or dependence on, Chinese staff.

Similarly, the CEO of Ngobros and Co., which manufactures diapers, described the Chinese staff training positively, noting that they had started with 11 Chinese technicians but now had only six. “By the middle of this year, we may have no more need for them, especially after our people can...run the whole production line by themselves.”

Some Nigerian firms have also sent staff for training in China, including both the Chicason Group and Innoson Group. Chicason has sent staff for three months of training when it was necessary for specific projects such as the opening of a new product line. The Innoson Group hired a Chinese-speaking Nigerian to be a translator for their Chinese technicians in their vehicle assembly plant. They have also actively dealt with the language barriers by sending six of their staff to China to learn to read, write, and speak Mandarin, and they “are proposing to send a few more.”

Local Linkages and Supply Chains

Technological gains and spillovers from FDI may also occur through backward linkages, where domestic firms are suppliers for foreign firms: such backward linkages have been found to be positive mechanisms for technological gains. Our study of Chinese firms, however, did not find strong signs of such backward linkages. The anti-clustering tendencies of many Chinese firms meant there were few opportunities for cluster-based supply chain linkages to develop, and of the Nigerian firms we observed, their relationships with Chinese partners was primarily one of technical assistance and support, rather than in upstream or downstream production. In terms of local economic relations, Chinese firms were not very integrated: only three Chinese firms were members of the Lagos Chamber of Commerce.

In the special economic zones we visited, Chinese firms' decisions to relocate were based largely on concerns about reducing competition, leading to low industrial clustering: indeed, the only attempt at creating a textile cluster, Yuemei in Calabar FTZ, appears to have failed; we will return to this case below. The existing Chinese firms view other firms more as competitors than as potential subcontractors or collaborators (this also seems to be the case with Nigerian firms, as even the famous Nnewi auto parts cluster has few, if any, instances of subcontracting or joint ventures). Although our sample size is small, it appears that when there is a need or opportunity to reduce costs, firms tend to use vertical integration—absorbing upstream or downstream production into the firm—rather than trying to attract other firms to locate nearby to produce those services, according to value chain complementarity. One example of this is Hewang Cardboard Packaging Company, which, concerned about the high price of pulp, built an upstream pulp production plant themselves.

In the case of the furniture industry, furniture and sofa imports are banned in Nigeria, which has incentivized domestic production in the FTZs. Firms must have a minimum local content (or ‘value added’) of 35 percent to be able to sell products produced in the FTZ to the rest of Nigeria.²⁷ However, Chinese firms still import the majority of their raw materials from China; only low-value and bulky materials such as rock for ceramics, scrap metal, and wood for furniture are purchased locally, and many entrepreneurs complained about the poor quality of local materials. Wingham Furniture in Calabar, for example, purchases its wood and foam locally, but the leather material it uses for its sofas is still purchased from China. The company explained that the design and processing of Chinese leather is better quality. Even some Nigerian firms we interviewed, such as Cutix Cables in Nnewi, source some of their inputs and

accessories, as well as machinery, from a supplier in Shanghai, a surprising case of backward linkage from Nigeria to China.

Firms claimed to have met their local raw materials suppliers from either going to the relevant local market (e.g., going to the wood market in the case of furniture makers) or through having suppliers show up at their doorsteps (e.g., steelmakers found that scrap metal peddlers would come to their factories). Many tried several suppliers before settling on one that best fit their needs, but even so, many of the relationships seemed shallow. Although a few Chinese

The Impact of Nigeria's Automotive Policy

Import substitution policies are one area in which Nigerian government policy has had a major impact on Chinese enterprises. Furniture imports, for example, were banned in 2010, leading to an opportunity for Chinese furniture makers such as Bedmate and Lifemate to assemble products in Nigeria. Likewise, tariffs on imported cars doubled as of November 2014 to 70 percent, while tariffs on complete assembly (CKF) and partial assembly would be zero and 5 to 10 percent, respectively. In addition, companies will receive a 5-year tax holiday on vehicle assembly plants as well as other incentives for meeting 25 percent or greater local content. The Nigerian government's strategy, according to the director of the Investment Facilitation/Incentives Administration of the NIPC, is to "build up a crop of SMEs" to supply car components, after the model of Chennai in India. The policy has been a major boost to businesses seeking partnerships with China, especially in areas of heavy-duty machinery procurement.

There is already a nascent auto parts industry in areas like Newi and Onitsha, where a number of Nigerian firms have struck up successful technical partnerships with Chinese, and this appears to be rising. Auto firms we spoke to, such as FAW and GAC Motors, both Chinese, spoke of setting up a manufacturing plant in Nigeria as a matter of the firm's survival. FAW, a heavy truck brand, is completing an assembly plant in Calabar FTZ. According to Mr. Yang of FAW, there were five competing foreign vehicle firms setting up assembly plants in the Lagos area and one in Calabar. GAC Motors has recently sought distribution agents within Nigeria with a view to testing the market, with an eye towards eventually building assembly plants if sales are promising.

There has been significant dispute over how much the policy will benefit domestic Nigerian firms. Some respondents believed the largest beneficiaries may be the existing large auto manufacturers already operating in Nigeria, such as Toyota and Peugeot. The policies have already had spillover effects for Nigeria's neighbors. While the policy has taken its toll on Nigerian car imports, which dropped 63 percent between January 2014 and January 2015, Cotonou Port in Nigeria's neighbor Benin has seen its car imports increase 50 percent in the same period.²⁸ This suggests that some car importers may be circumventing the higher tariff by bringing vehicles across the porous border.

entrepreneurs commented that their local suppliers had become more consistent on quality and delivery times over the course of working together, no interviewed Chinese businessperson had actively invested in upgrading the technology or skills of their local suppliers.

In general, of the Chinese firms we observed, firms tended to have more downstream linkages with local firms than upstream ones. On the downstream side, nearly all Chinese firms relied on local distributors for their goods. According to Hong Kong businessmen with longtime investments in Nigeria, there is an “unwritten rule that Chinese business stops at the factory door,” at which point local distributors take over. This arrangement seems to suit recent Chinese immigrants well, given that most have limited English abilities and no local distribution network.

One interesting trend is the growing role of “agent suppliers,” an informal network that provides a link between Nigerian manufacturers and mainland China for the supply of basic needs and services. These are Chinese traders and businessmen living in Nigeria whose business it is to serve as middlemen between Nigerian manufacturing firms (generally in the south-east) and Chinese suppliers. They arrange contacts between factories in China that specialize in the required area and often earn commissions. They are mostly found in the large trade fair complexes and the Chinatown in Lagos. Some Nigerians also play the role of agents, securing contacts for Nigerian businesses needing some form of Chinese technical expertise or inputs.

5. Challenges Facing Firms and Investors

Power, safety, and security

Despite the many factors that make investment in Nigeria attractive, Chinese interviewees consistently identified poor power supply, corruption, and concerns about personal safety as major concerns when considering investing in Nigeria. Baoyao Steel, for example, identified power as its major challenge in doing business in Nigeria—the firm operates at 50-60 percent capacity due to power limitations. In addition, concerns about corruption and personal safety have been a significant factor in many Chinese businesses choosing to locate in special economic zones rather than leasing their own land. Entrepreneurs in Calabar also identified safety as a major concern for choosing that particular FTZ: the region was perceived as safer than the area around Lagos, making it more attractive despite the lower costs of operation in Lagos.

The establishment of Ogun FTZ was also motivated by security concerns. The original plans were to set up the FTZ in Imo state, near the Niger delta. However, it was eventually relocated to Igbessa, Ogun due to concerns of instability and high operating risks in the Niger Delta region. Political lobbying may have also played a part as former president Obasanjo is from Ogun state and put pressure for its relocation to Ogun. Instrumental actors such as the former

governor of Ogun State, Daniel Gbenga, a staunch advocate of Chinese investment in Nigeria, also played a role, telling one of the authors: “the Ogun-Guangdong FTZ is my baby.”

Negative impacts of Chinese investment

While many Nigerian respondents interviewed were generally positive about their economic and technical relationships with Chinese partners, some also expressed frustration at several instances of what they perceived to be abusive business practices, including corruption and illegal smuggling activities on the part of Chinese firms. In the case of the Yuemei “industrial cluster,” which was eventually closed down, Nigerians in Calabar noted that the factories on site did not appear to be operating, despite large numbers of containers coming into the local port. They worried that the factories might be fronts for a smuggling operation.

Some expressed anger at underhanded Chinese practices, including product imitation and duplication. The CEO of a Nnewi company described how the Chinese company he formed a technical partnership with had sold him products that were duplicates, using his company's own design specifications, as well as copies of German companies' goods. “They cheat us a lot! Most of the steel rims they sold to us...were either not enough as quoted in the bill of supply or of low quality,” he noted. “It's terrible. I lost a lot of money and decided never to partner with the Chinese again.”

In general, complaints about Chinese businesses often centered on the poor quality of competing Chinese products, which were not only cheap but crowded the markets and made for difficult competition for Nigerian firms. This also affected the image of Chinese equipment suppliers. Many Nigerian entrepreneurs noted the poor quality of Chinese products and equipment, which they attributed to the lack of standards in China and poor quality control. As one Anambra State entrepreneur noted, “there are no standards in China...you need to know what you want, or else you would be utterly disappointed.” From these interviews, it is apparent that the business practices of some Chinese firms seeking export profits in Nigeria have had a profoundly negative impact on the general reputation and image of Chinese firms, which also carries negative spillovers for other Chinese who seek business collaborations with Nigerians.

6. Conclusion

As China's domestic economy develops, the overseas expansion of its enterprises is an increasingly salient trend, adding another layer to an already complex China-Africa economic relationship. While Chinese development finance and large SOEs have made major contributions to African infrastructure and growth, private businesses and manufacturing firms from China could also have a significant impact on economic development, with implications for the structural transformation of African economies. Chinese manufacturing FDI not only offers employment generation, but it can also contribute to industrialization and the economic transformation of the country through promoting technology transfer and

spillovers, allowing developing countries to upgrade domestic production and create higher value goods over commodities; by providing opportunities for training, skills transfer, and human capital development; and through local forward and backward linkages that integrate domestic firms into manufacturing supply chains.

Our study of Chinese industrial investment in four Nigerian states and “technical partnerships” between Chinese suppliers and Nigerian firms explored the nature of these linkages in order to assess whether these mechanisms are present and the degree to which they present opportunities for technology diffusion and learning. We identified Chinese firms in three free trade zones, as well as in the cities of Lagos, Onitsha, and Nnewi, operating in a number of key sectors, including furniture, construction materials, and food and household products. We also foresee significant potential growth in the automobile sector, particularly in the wake of Nigeria’s automotive policy shifts, which have already shown successful signs of spurring greater investment in Nigeria’s auto and auto parts sector.

We found a number of cases of positive technology transfer in the firms surveyed, through means of skills transfer and training in production methods. However, this was not a systematic trend, and the level and formality of training varied substantially between different firms and product industries. While some industries, such as welding and steel production—which require significant training—have furnished local workers with valuable technical skills that have increased their income and their labor market value, other basic assembly jobs show less promise. On the whole, training is rudimentary and highly informal in most of the Chinese firms we observed. However, despite popular claims that Chinese firms import their own labor, Chinese manufacturing enterprises appear to have had a positive impact on employment creation: in the firms surveyed, local Nigerians constituted the majority of the workforce, with Chinese workers on average constituting only 20 percent of all labor employed. Chinese manufacturing firms also largely stayed out of downstream distribution, leaving room for Nigerians to take these opportunities. Chinese technology has also been a boon to Nigerian manufacturing enterprises, particularly in the industrial town of Nnewi, where a significant number of Nigerian firms utilize Chinese machinery and production methods in their plants. Some have fruitful technical partnerships with Chinese firms; these involve supervision and training of Nigerian labor, but no equity investment.

Despite the proliferation of free trade zones around Nigeria’s coastal states, however, these zones have not had the desired effect of encouraging sectoral clustering. Chinese firms in these zones all appear to be making disparate products, rather than grouping by sector to capture agglomeration economies. Backward linkages with local firms and suppliers are also weak and generally shallow, with little sign of significant technology or skills transfer through this avenue. Lack of quality raw materials and poor infrastructure are also ongoing problems in building up supply chains. As a catalyst for Nigeria’s industrialization, current patterns of Chinese manufacturing investment have had only limited impact. Moreover, while many Nigerian firms benefit from technical partnerships with Chinese firms, some interviewees raised concerns over unethical and illegal behavior on the part of some Chinese firms; these

reputational effects may create barriers to potential partnerships and integration between foreign and domestic firms.

Finally, the role of Chinese and Nigerian brokers and middlemen in connecting Nigerian and Chinese firms is an area for further research. Building long-term broker relationships with trusted suppliers is one way to overcome the fears of poor quality and reduce the risks that short-term profits from cutting corners will continue to place barriers in the way of technology transfer. These relationships can, over time, also be the foundation for joint ventures, as has been seen in the case of several firms in Nnewi.

Nigerian actors do have a fair amount of agency to shape the likely outcomes of Chinese manufacturing investment. The case of Techno Oil shows that private Nigerian firms are able to negotiate technology transfer into joint venture agreements if they deem it a priority. On the policy level, the Nigerian government's import substitution policy is a way of directing foreign direct investment into priority sectors, and although it is still early, it seems to already be having its intended effect of spurring automobile makers to invest in local assembly. This implies that purposeful and coordinated Nigerian private and public sector action can have a significant impact on the already robust Chinese manufacturing investment, shaping it to help achieve Nigerian goals of employment, skills development, and industrialization.

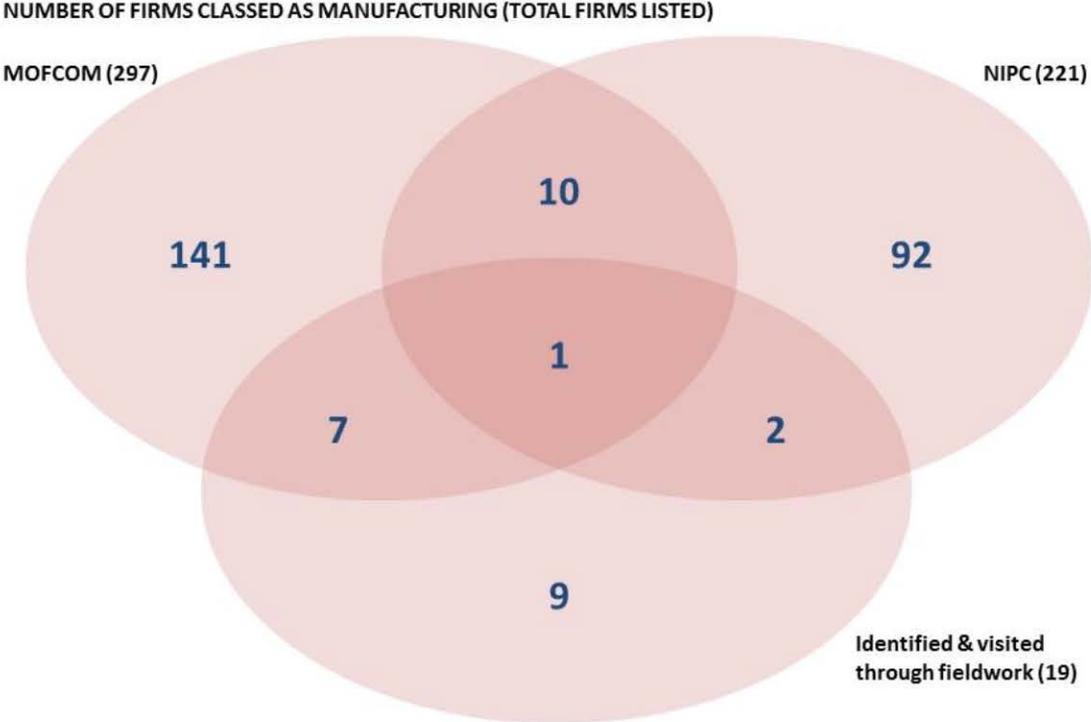
Appendix I: Chinese firms visited during fieldwork (2014)

Firm	Year est. in Nigeria	Location in Nigeria	Products	% capacity	Investment (RMB)	USD Equivalent (2014)	# Chinese	# Nigerians	% local workers
Baoyao Steel	1999	Calabar FTZ	Iron rods and billets	55.6%			65	350	84.3%
F.A.W.	unknown	Calabar FTZ	Heavy-duty trucks				30	85	73.9%
Federated Steel (4 subsidiaries)	1982	Ogun (2 firms); Lagos (2 firms)	Steel rods, bars, electrodes; brand name biscuits	100.0%			20	1200	98.4%
Flying Horse	unknown	Ogun-Guangdong FTZ	Aluminum piping		7,000,000	\$1,136,790	4	70	94.6%
Goodwill Ceramics	2011	Ogun-Guangdong FTZ	Ceramics	80.0%	250,000,000	\$40,599,600	85	1000	92.2%
Hewang Cardboard	2007	Ogun-Guangdong FTZ	Cardboard packaging		80,000,000	\$12,991,900	30	255	89.5%
Hongxing Steel	2008	Lagos; Edo state	Steel	100.0%			86	1600	94.9%
Jiuhua	2004	Ogun-Guangdong FTZ	Doors, windows, furniture				65	100	60.6%
Lifemate	2004	Ikeja, Lagos	Furniture, beds				100	400	80.0%
Longgan Furniture	2011	Lekki FTZ	Furniture, office chairs		325,733	\$52,899	4	21	84.0%
Mark Sino	2000	Calabar FTZ	PCV ceilings				6	25	80.6%

Shifa Plastics	unknown	Lagos island	Plastic household items				10	300	96.8%
Skyrun Holdings (3 subsidiaries)	2005	Calabar FTZ	Household appliances; electronics		977,199	\$158,695	20	200	90.9%
Sunday Lightbulbs	2013	Lekki FTZ	Lightbulbs	53.3%	3,000,000	\$487,195	3	30	90.9%
Vindax Tissue Paper	2004	Ogun-Guangdong FTZ	Tissue paper		10,000,000	\$1,623,980			
Winghan Furniture	2004	Ogun-Guangdong FTZ	Furniture, sofas	40.0%	10,000,000	\$1,623,980	12	20	62.5%
Average				71.5%	45,162,866	\$7,334,370	36	377	84.9%

Appendix II: Identification of Chinese firms

Matching analysis of manufacturing firms on MOFCOM list, NIPC list, and identified by fieldwork(2014)



Endnotes

¹ Raymond Vernon, “International Investment and International Trade in the Product Cycle,” *The Quarterly Journal of Economics* 80, no. 2 (May 1966): 190, doi:10.2307/1880689; Kaname Akamatsu, “A Historical Pattern of Economic Growth in Developing Countries” *The Developing Economies* 1 (March 6, 2007): 3–25, doi:10.1111/j.1746-1049.1962.tb01020.x.

² *Asian Foreign Direct Investment in Africa: Towards a New Era of Cooperation among Developing Countries*, United Nations Development Programme (New York: United Nations, 2007).

³ Raphael Kaplinsky and Mike Morris, “Chinese FDI in Sub-Saharan Africa: Engaging with Large Dragons,” *European Journal of Development Research* 21, no. 4 (2009): 551–69; Jing Gu, “China’s Private Enterprises in Africa and the Implications for African Development.” *European Journal of Development Research* 21, no. 4 (2009): 570–87, doi:10.1057/ejdr.2009.21; Xiaofang Shen, “Private Chinese Investment in Africa: Myths and Realities,” Policy Research Working Paper, The World Bank, 2013.

⁴ E. Olawale Ogunkola, Abiodun S. Bankole, and Adeolu Adewuyi, “China-Nigeria Economic Relations,” *AERC Scoping Studies on China-Africa Relations*, AERC, Nairobi, February, 2008, <http://dspace.africaportal.org/jspui/bitstream/123456789/32058/1/Nigeria.pdf>.

⁵ L.N. Chete, J.O. Adeoti, F.M. Adeyinka, and O. Ogundele, “Industrial Development and Growth in Nigeria: Lessons and Challenges,” WIDER Working Paper, 2014, <http://www.econstor.eu/handle/10419/96311>.

⁶ Ron Sandrey and Hannah Edinger, *China’s Manufacturing and Industrialization in Africa*, African Development Bank Group, 2011, <http://core.ac.uk/download/pdf/6429063.pdf>.

⁷ Barbara Barungi, Eric Ogunleye, and Colleen Zamba, “Nigeria 2015,” *African Economic Outlook*, African Development Bank, 2015.

⁸ World Bank Economic Report, 2014, <http://www.worldbank.org/content/dam/Worldbank/Feature%20Story/japan/pdf/event/2014/Africa-Business-Seminar-100314.pdf>.

⁹ “Nigeria Industrial Revolution Plan,” Nigerian Ministry of Industry, Trade and Investment, January 2014, www.nipc.gov.ng/NIRP.pdf.

¹⁰ Brock R. Williams, “African Growth and Opportunity Act (AGOA): Background and Reauthorization,” Congressional Research Service, May 27, 2014, <http://www.pennyhill.com/jmsfileseller/docs/R43173.pdf>; Heidi Scheller, Jack Smith, Phyllis Jones, and George Oligbo, “African Growth and Opportunity Act: Export Opportunities for Nigerian Manufacturing in Textile Based Sewn Products - Part I: The Assessment,” Task Order, African Growth and Opportunity Act, United States Agency for International Development (USAID), June 2002.

¹¹ *Exporting Africa: Technology, Trade, and Industrialization in Sub-Saharan Africa*, UNU-INTECH Studies in New Technology and Development 4, ed. S.M. Wangwe (London: Routledge, 1995).

¹² Elayne Wangalwa, “Impact of Nigeria’s New Automotive Policy,” *CNBC Africa*, December 2, 2015, <http://ncdmb.gov.ng/index.php/public-relations/fotos/1-ncdmbimg/detail/12-ncdmbimg29-copy-copy?tmpl=component>.

¹³ “Nigeria: Socio-Economic Overview,” presented at the Africa Business Seminar, World Bank, 2014, <http://www.worldbank.org/content/dam/Worldbank/Feature%20Story/japan/pdf/event/2014/Africa-Business-Seminar-100314.pdf>.

¹⁴ Idris Ademuyiwa, Chukwuka Onyekwena, Olumide Taiwo, and Eberechukwu Uneze, “Nigeria and the BRICS: Current and Potential Trade Relations and Their Implications for the Nigerian Economy,” Occasional Paper, Economic Diplomacy Programme, South African Institute of International Affairs, May 2014.

¹⁵ Pat Utomi, “China and Nigeria,” in *US and Chinese Engagement in Africa: Prospects for Improving US-China-Africa Cooperation*, ed. Jennifer G. Cooke (CSIS, 2008).

¹⁶ Ibid.

¹⁷ Kaplinsky and Morris, “Chinese FDI in Sub-Saharan Africa: Engaging with Large Dragons”; Shen, “Private Chinese Investment in Africa: Myths and Realities.”

¹⁸ Shen, “Private Chinese Investment in Africa: Myths and Realities,” 10.

¹⁹ Shen, “Private Chinese Investment in Africa: Myths and Realities,” 13.

²⁰ Deborah Bräutigam and Tang Xiaoyang, “‘Going Global in Groups’: Structural Transformation and China’s Special Economic Zones Overseas,” *World Development* 63 (November 2014): 78–91, doi:10.1016/j.worlddev.2013.10.010; Deborah Bräutigam and Tang Xiaoyang, “African Shenzhen: China’s Special Economic Zones in Africa,” *The Journal of Modern African Studies* 49, no. 01 (March 2011): 27–54, doi: 10.1017/S0022278X10000649.

²¹ “China’s Private Enterprises in Africa and the Implications for African Development”; Shen, “Private Chinese Investment in Africa: Myths and Realities.”

²² See, e.g., Deborah E. Winkler, “Potential and Actual FDI Spillovers in Global Value Chains: The Role of Foreign Investor Characteristics, Absorptive Capacity and Transmission Channels,” World Bank Policy Research Working Paper, no. 6424 (2013), http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2256299.

²³ Kui-yin Cheung and Ping Lin, “Spillover Effects of FDI on Innovation in China: Evidence from the Provincial Data,” *China Economic Review* 15, no. 1 (January 2004): 25–44, doi: 10.1016/S1043-951X(03)00027-0; Zhiqiang Liu, “Foreign Direct Investment and Technology Spillovers: Theory and Evidence,” *Journal of Development Economics* 85, no. 1-2 (February 2008): 176–93.

²⁴ Atul Kohli, “Where Do High Growth Political Economies Come From? The Japanese Lineage of Korea’s ‘Developmental State,’” *World Development* 22, no. 9 (1990): 1269–1293.

²⁵ Y.W. Rhee and T. Belot, “Export Catalysts in Low-Income Countries—A Review of Eleven Success Stories.” World Bank Discussion Papers, 1990, 72.

²⁶ “African Shenzhen: China’s Special Economic Zones in Africa.”

²⁷ Gbenga Kuye, “Investment Opportunities and Challenges in Free Trade Zones in Nigeria,” presented at the Oil & Gas Investment Forum, Onne, Rivers State, Nigeria, October 24, 2013, http://www.nigeriaoilandgasinvest.com/wp-content/uploads/2013/10/GBENGA-KUYE_Session21.pdf.

²⁸ “Nigeria’s Neighbors Profiting from Its New Automotive Policy,” *Leadership*, March 15, 2015, <http://leadership.ng/news/417740/nigerias-neighbours-profiting-from-its-new-automotive-policy>.

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