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Deal or No Deal

Strictly Business for China in Kenya?

Apurva Sanghi
Dylan Johnson

Abstract

Existing work on China's economic influence in Africa refers to Africa in broad terms, thereby generalizing the results to an extent that is unhelpful for policy-makers in a specific country. Moreover, the emphasis is on oil exporters. This paper remedies this by focusing on a single, oil-importing country: Kenya. The paper examines China's economic presence in Kenya and some of the popular myths surrounding Chinese economic activity. The first myth is that Chinese companies do not employ local workers. In fact, 78 percent of full-time and 95 percent of part-time employees in Chinese companies are locals. Second, although China represents a large potential market for local exporters, the study finds that China has a better chance of expanding its exports to Kenya than Kenya does to China based on existing specializations. This may change with recent oil discoveries in Kenya, increasing the space for Kenyan exports to China, as well as from China's shift to a consumption-driven economy which will increase demand for services, a growing strength of Kenya's economy (World Bank Country Economic Memorandum 2016). The paper emphasizes that Kenyan policy makers should be less concerned about bilateral trade imbalances and worry about Kenya's overall trade balance. However, the Standard Gauge Railway and Thika superhighway experiences suggest that Chinese firms offer relatively few technology transfer or supplier opportunities for local firms and academia. Third, the popular focus of Chinese competition is on the impact on well-organized Kenyan producers and not on consumers, thereby underestimating the benefits Kenyan consumer derive from the availability of more affordable Chinese goods. The paper concludes with policy directions for improving export competitiveness and transparency in infrastructure projects, and local content.

Deal or No Deal: Strictly Business for China in Kenya?

Apurva Sanghi[*]   Dylan Johnson[†‡]

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1 Introduction

In recent years, China's economic presence in Sub-Saharan Africa has risen rapidly. China's growth in the region is driven in part by its strong demand for raw materials, and resource rich countries that manage the boom well may also translate the gains to the broader economy, working to pay down high public debt or alleviate poverty. But the countries that benefit from the boom are also more vulnerable to China's economic slowdown. Oil-importing countries such as Kenya will be shielded from China's slowdown and should even see an increase in their exports. Kenyan exporters of services such as tourism will fare well as China transitions to a consumption-based economy by 2030. Greater Chinese consumption may also benefit Kenyan producers in the horticultural sector that are taking advantage of the trend of selling directly to large supermarkets in Asia. Supermarkets in China can also recieve Kenyan flowers if Kenya succeeds in negotiating duty-free access for cut flowers as part of the 404 duty free products from African countries.

Exporters of flowers are performing well, but producers of manufactured goods face more competition from China in both domestic and foreign markets. Many fear that local producers will be hurt by Chinese imports; cheap plastic shoes and clothes from China, and second-hand clothes in general, are much more popular than local products. In addition, Kenyan exports of clothing to the United States, for example, lost market share to China between 2004 and 2006, and have only recently begun to recover. The manufacturing sector grew slowly at only 3.4 percent in 2014, down from 5.6 percent in 2013, and some worry that slower growth could be a sign of a premature decline of industry (Chen, Geiger, Fui 2015). Without a turnaround in manufacturing, the growth potential of the economy is limited. But Kenya can enhance its growth in manufacturing if it continues to attract foreign direct investment from China.

A large share of foreign direct investment (FDI) already comes from China, allowing Kenya to diversify its sources of FDI and increase investment in manufacturing. Lagging behind countries such as Ghana, Nigeria and South Africa, Kenya performs poorly in attracting manufacturing FDI. To increase the low investment, Kenya wants to market opportunities to China because Chinese firms are attracted to the low cost of labor in Kenya. The lower wages, however, come with lower productivity, raising the unit cost of labor; at the moment, the unit cost of local labor is higher than in China, making Kenyan workers more expensive than Chinese ones. If Kenya reduces the unit cost of local labor, it will attract more Chinese investment in labor-intensive industries, providing jobs and helping reduce poverty. There is strong potential for poverty reduction in the textile and garments industry because it mainly employs women, who tend to increase the household savings rate.

China also offers critical financing in sectors that traditional investors overlook: infrastructure and construction. China's loans compete with loans from traditional donors that attach conditions of good governance and transparency. Uninterested in the politics of the country, China funds major infrastructure projects in Kenya. One such project is the Standard Gauge Railway linking Nairobi and Mombasa by the China Road and Bridge Corporation, and other Chinese construction companies are taking advantage of the real estate boom in Nairobi. Following the slowdown in China, marketing for construction services should increase globally, and even more Chinese companies may come to Kenya to undertake major infrastructure and construction projects. The

improvement in insfrastructure will help lower the cost of doing business, attract more investment, and enhance productivity.

We contribute to the literature by investigating China's impact on single, oil-importing country, Kenya. Oil-importers receive little attention in the existing literature, and researchers and journalists usually highlight Chinese demand for land and natural resources in Africa, ignoring the useful role China plays as an infrastructure provider and source of cheap goods for consumers and retailers. In Kenya, Chinese firms invest in more than just natural resources. They also invest large amounts in the communications and automotive original equipment manufacturing sectors.

Previous work on China in Africa refers to Sub-Saharan Africa in broad terms and fails to provide specific examples and guidance for individual countries navigating relations with China.[1] We avoid overgeneralizing by examining the trade, aid, and foreign direct investment between China and Kenya. Chinese investment is more than just state-owned companies negotiating directly with the government. Many are private companies looking for access to the domestic market or to produce goods for export to Europe or North America (Bräutigam 2013; SACE 2014). The manufacturing and service sectors attract a number of small and medium enterprises, and construction draws larger companies. Some bid for tenders from the Ministry of Commerce and receive support based on performance; others raise capital from family and friends in China; state-owned firms can access subsidized credit from the China export-import (EXIM) bank. But the size, operations, and financing of Chinese firms is quite diverse, a diversity that is often overlooked when discussing Chinese investment in Kenya.

We also find that businesses employ a majority of local workers in full-time and part-time roles; the majority of surveyed firms also report having a policy to localize its workforce, challenging the stereotype that Chinese firms only use Chinese labor. Workers also receive basic skills, safety and hygiene training (SACE 2014). Chinese firms can offer even more training if Kenya promotes local capacity building and technology transfer —The WTO's trade related investment measures (TRIM) forbids local content requirements. Mega-infrastructure projects undertaken by Chinese companies are valuable learning opportunities for local industry and training institutes; they allow well-organized firms to upgrade equipment and supply materials for both current and future projects. Experience from the Standard Gauge Railway (SGR) linking Mombasa to Nairobi has shown that without a strategy for knowledge sharing, local firms will miss out on the spillover effects from investment, a crucial part of increasing competitiveness of the domestic economy.

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[1]Similiar works include Onjala (2008), Chege (2008), Subramanian (2008) and Fiott (2006) that address Kenya specifically and provide a detailed account of China's involvement in Kenya from 1960 to 2006. Kaplinsky (2006, 2007) explains China's impact on clothing and textile exports from Lesotho, South Africa, and Kenya after the expiry of the MultiFibre Arrangement (MFA). Zafar (2006) sheds light on the effects of China's global macroeconomic presence on Sub-Saharan Africa, where he identifies winners (mainly oil exporting economies) and losers (mainly oil importers such as Kenya).

2 Kenya and China's Trade Relationship

2.1 The common belief: Exports from poorer countries are commodity-dependent

Many African economies have benefitted from China's strong demand for energy and metals. One expects Kenya to mostly export commodities to China, and China to export a greater variety of manufactured goods to Kenya. China is a richer middle income country and has greater opportunities to expand its exports in different sectors; as a lower middle income country, Kenya relies more on agricultural and commodity exports. But Kenya's exports are relatively more diverse: it exports metals and plastics, but also vegetable textile fibers and leather rawhide skins, presenting an opportunity to meet the demand for finished and crust leather in the EU and China (Hansen, Moon, Mogollon 2015). China mostly exports rubbers and plastic products to Kenya, suggesting an overspecialization in manufacturing. Its focus on manufacturing has come at the expense of domestic consumption and services. As China's economy changes to emphasize consumption, Kenya may take advantage of the opportunity to export financial, tourism, and business services to China. For instance, Kenya has the opportunity to export the MPESA system to China and other countries, especially those with poorly developed financial services. Exporting more services to China and to other countries will help upgrade the services industry and strengthen the overall balance of trade.

2.1.1 Kenya should pay more attention to the overall trade balance

When talking about trade, many officials in both China and Kenya are primarily concerned with the bilateral trade deficit, but it is a meaningless statistic; a country can have simultaneous surpluses and deficits with many different trading partners and still have a positive balance overall. For policy makers, the overall trade deficit in Kenya is more relevant and a bigger reason for concern.

A brief overview of Kenya's weak exports The current account deficit, or imports minus exports, reached 10.4 percent of GDP in 2014. The deficit was badly hit in 2011 when high oil and food prices and a weak shilling increased Kenya's import bill so much that Kenya's top four exports were insufficient to cover the cost. To finance the gap, Kenya had to rely on both short and long-term debt. Even with lower oil prices, the deficit remains high at 9.8 percent of GDP because imports of capital and equipment increased more than 25 percent. But as imports soar, exports continue to dip. In 2015, Kenya's manufactured exports fell 20.3 percent, its horticulture exports declined 5.5 percent, and its chemical exports fell 7.9 percent (Kenya Economic Update 2015). Even one of the major earners, tea, fell 1.1 percent. Tea and coffee still account for most of the growth, and Kenya must improve the competitiveness of manufacturing to diversify exports. It must also diversify export markets because the majority of growth is in traditional destinations, neglecting new opportunities for expansion.

Why are Kenya's exports performing so terribly? One can trace Kenya's weak exports to an underperforming manufacturing sector. For over a decade, manufacturing has remained at only 10 percent of GDP. Manufacturing receives little investment because investors want to avoid the underdeveloped infrastructure and high cost of doing business, and have diverted funds to non-tradable sectors such as real estate and construction. The budding tradable sector has watched its

competitiveness erode through poor government policies and inefficiency. Price controls and mis-managed marketing boards, for example, have discouraged coffee farmers from exporting, and the sector is barely recovering from the damage (Kenya Economic Update 2010). The goverment must shift resources to production of tradable goods or risk getting into more debt, debt that will lead to slower future growth.

Figure 1 shows Kenya's overall trade balance between 2000 and 2014. Kenya's net exports have fallen 14.74 percent per year over the period, reaching a low of negative US $12.2 billion in 2014. The trade balance reflects a larger need of preparing exports for competitive markets. Rather than focusing on exports to the Chinese market, Kenya should seek global markets and improve export competitiveness: curbing inflation and real exchange rate appreciation, reducing high tar-iffs on manufacturing inputs, and attracting more FDI into manufacturing. A key component to acheiving export competitiveness is the port of Mombasa. Greater efficiency at the port will cut the time for goods to reach Nairobi and help Kenya's regional exports. To improve the export cli-mate, Farole and Mukim (2013) recommend enforcing competition law especially in the transport sector, creating an automated risk management system to speed up risk-free cargo through cus-toms, and creating a trade information portal on general tariff rates, preferential rates, and quality standards.
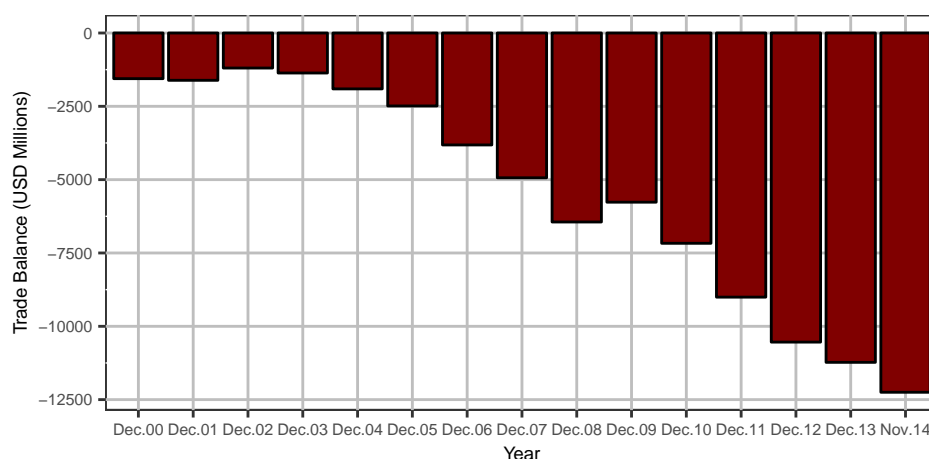
Figure 1: Kenya's overall trade balance is a bigger concern

Source: Central Bank of Kenya 2015

2.2 China is a large source of imports for Kenya

Figure 2 shows Kenya's imports from China between 2012 and 2014. China's share of Kenya's total imports has increased significantly. In 2012, Kenya's imports from China were 12 percent of total imports, but by 2014, they rose to 23 percent.

Kenyan consumers benefit thanks to a larger quantity of cheap Chinese products in the market. From 2012 to 2014, consumers enjoyed a ten percent lower unit price on manufactured goods and a seven percent lower unit price on chemicals. Consumers are gaining, but policy makers fear

that local producers are suffering from cheap Chinese goods. Some even argue that imports are hurting Kenya's prospects of industrialization.
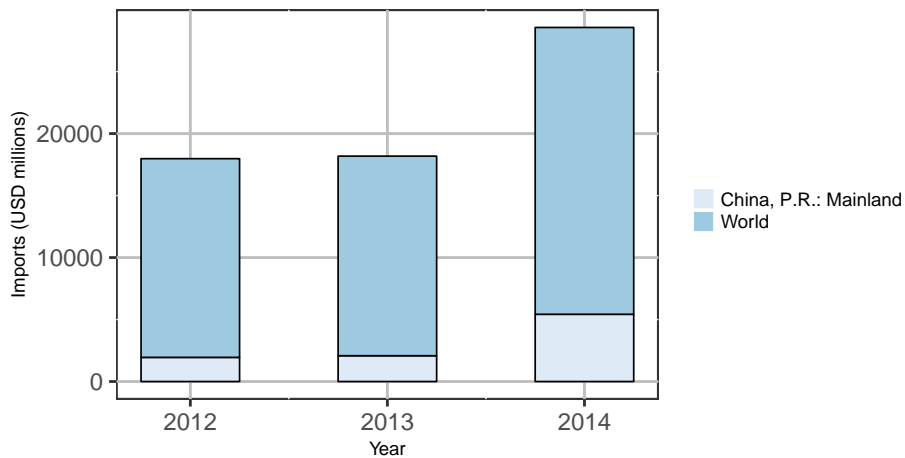
Figure 2: China takes a sizeable share of total Kenyan imports (2012-2014)

Source: IMF World Economic Outlook Database 2014
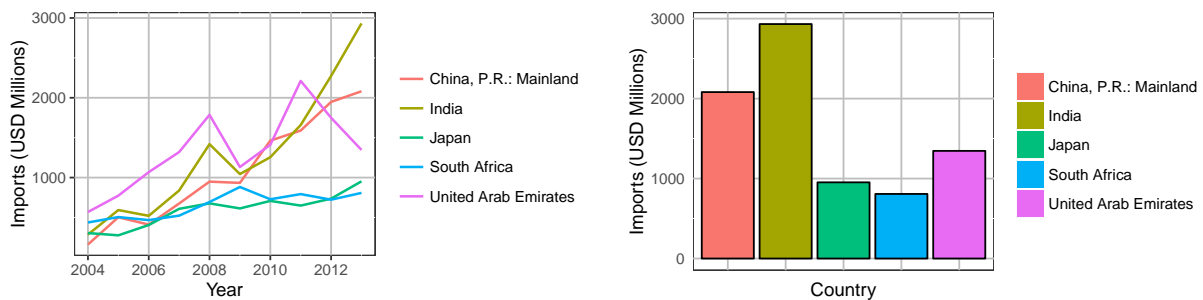
(a) China and India are a major source of imports (2004-2013)

(b) China and India were top two sources of imports (2013)

Figure 3: China and India are major sources of imports (2004-2013)

Figure 3a shows trends in Kenya's top import partners between 2004 and 2013. With strong growth since 2004, China and India have become major sources of imports to Kenya. China ranks second to India in number of exports to Kenya, and its low production costs and better positioning in global value chains may help it become the top source of imports for Kenya (figure 3b). Chinese imports grew at an annual rate of 33 percent, and Indian imports also grew quickly at 30 percent per year.

Kenya likely imports even more from China and India because many imports from the UAE are re-exported manufactured products such as phones, computer monitors, or jewelry originally from China or India. It is is difficult to find the exact amount of re-exports from China, but the UAE re-exported US $384.5 million worth of goods to Kenya in 2014, a large fraction of those

goods originating from China (UN Comtrade 2015).[2]

2.2.1 Kenya imports rubber manufactures from China

As in other Sub-Saharan African countries, Kenya mainly imports manufactured products from China. Figure 4 shows the top four import categories from China: manufactured goods classified chiefly by material made up 35 percent, machinery and transport equipment were 31 percent, miscellaneous manufactured articles were 24 percent, and chemical and related products were 8 percent of total imports from China. In 2012, the top goods from China were rubber products, footwear with outer soles of rubber or plastic and woven fabrics of synthetic filament (5).[3]
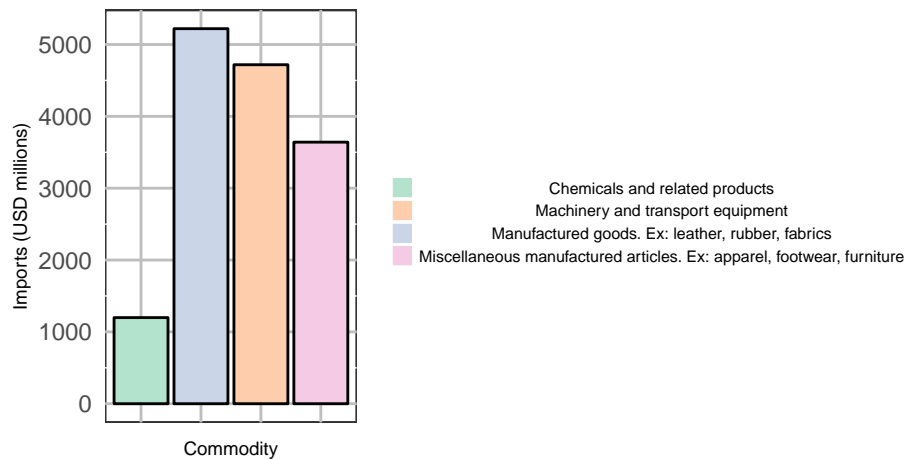
Figure 4: Kenya imports rubber manufactures from China (2010-2014)

Source: UN Comtrade database 2015

Kenya imports a large amount of rubber products because China has a comparative advantage in cheap manufactured goods; its manufacturing sector and infrastructure is also much more integrated in global value chains. The special economic zones for manufacturing in Kenya have poor infrastructure and a weak rule of law, inhibiting its sales and growth. The barriers to production will prevent local producers from competing with Chinese goods.

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[2]UAE exports almost 60 percent of products originally from China according to the United Arab Emirates Information Guide http://alluae.ae/uae-imports-exports-re-exports/

[3]We use the 6 digit Harmonized System (HS) classification from the United Nations
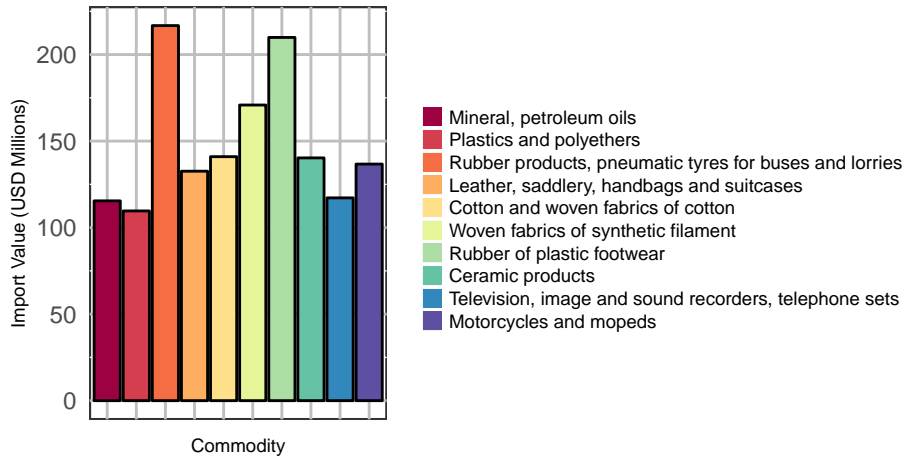
Figure 5: Kenya imports rubber footwear, tires, and fabrics from China (2012-2014)

Source: UN Comtrade database 2015

2.3   China is still a small export market for Kenya

As shown in Figure 6, Kenya only sends one percent of its exports to China, exporting US $63 million in 2012, US $48 in 2013, and US $70 million in 2014. Kenya exports little to China because it is an oil importer and relatively resource-scarce. With fewer natural resources, Kenya has been unable to take advantage of the commodity boom from China's growth (Zafar 2007). What's more, the growth does nothing for Kenya's agricultural sector because it lacks a comparative advantage in China's main food imports (wheat, corn, beef, soybeans), making it difficult for Kenya to increase its exports of agricultural products.
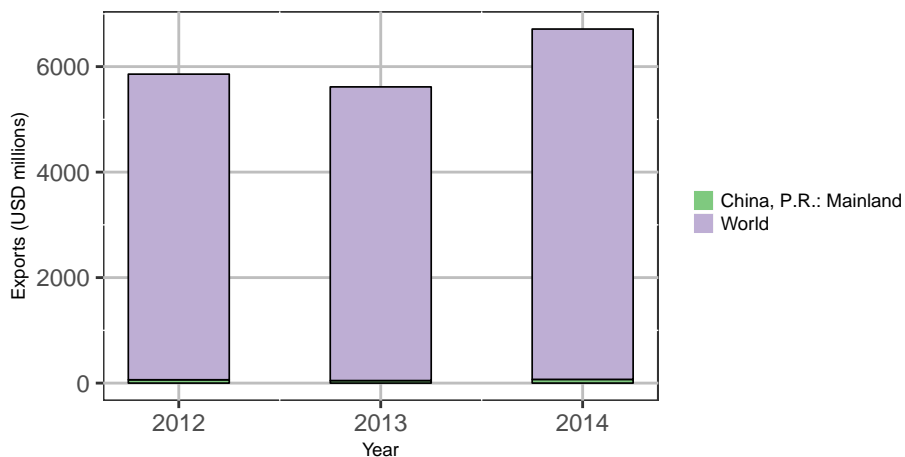
Figure 6: Kenyan exports to China small relative to total exports (2012-2014)

Source: IMF World Economic Outlook Database 2014

2.3.1 Kenya exports raw goods and metals to China

Crude materials such as raw hides and skins are the major exports to China (figure 7). Between 2010 and 2014, exports of crude materials were 55 percent, manufactured goods were 21 percent, food and live animals made up 15 percent, and chemicals and related products were 9 percent of exports to China. In the crude materials category, major exports to China include hides and skins, scrap metals, and sisal; coffee and tea were major exports in the food and live animals category.[4] In general, tea, coffee, sugar and flowers are sources of major foreign exchange earnings for Kenya, but it has managed some diversity in earnings (UNCTAD 2013). Value-added products such as chemicals and plastics have also reached China, a shift from the more common story of oil and resource exports.
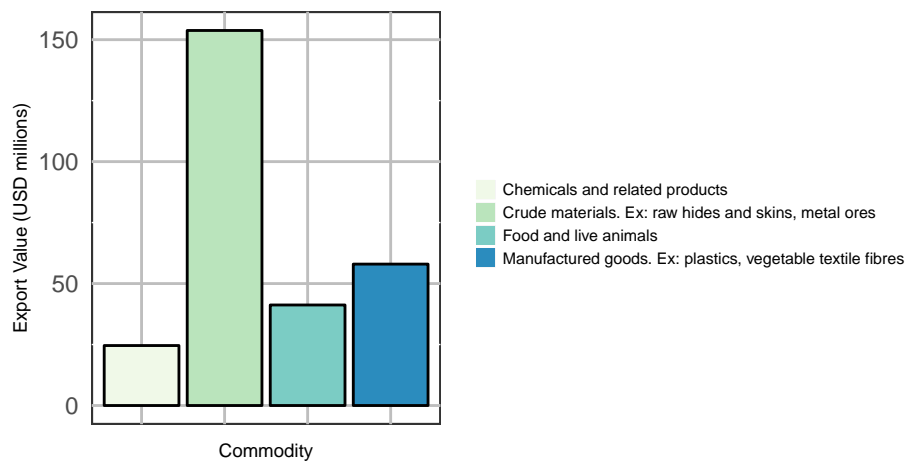
Figure 7: Kenya exports metals and hides and skins to China (2010-2014)

Source: UN Comtrade database 2015

In figure 8, we show the top products in the crude materials and manufactured goods categories. For crude materials, titanium ores and concentrates exports were the highest, followed by copper, vegetable textile fibers such as cotton, hemp, or sisal, and plastics.[5] Kenya's exports feature minimal value addition, and the prices of Kenya's major exports to China are low on international markets. Between January 2010 and January 2015, copper prices dropped 4.62 percent annually, and iron ore prices declined 11.57 percent per year (figure 9). A further 11 percent decline in the price of metals was forecasted by the World Bank Commodities Outlook (2015) because of weak import demand from China and new supplies of metal globally. Titanium and iron ores and copper are important exports to China, and with falling metals prices, Kenya will likely gain little from its current export pattern to China.

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[4]Here we use the Standard International Trade Classification (SITC) Rev.4 from the UN Statistics Division
[5]6 digit HS classification
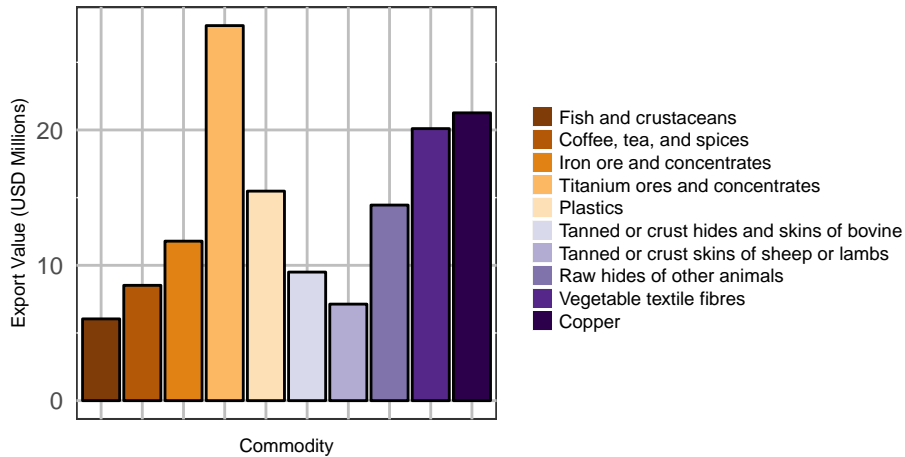
Figure 8: Kenya exports titanium ores and copper to China (2012-2014)

Source: UN Comtrade database 2015
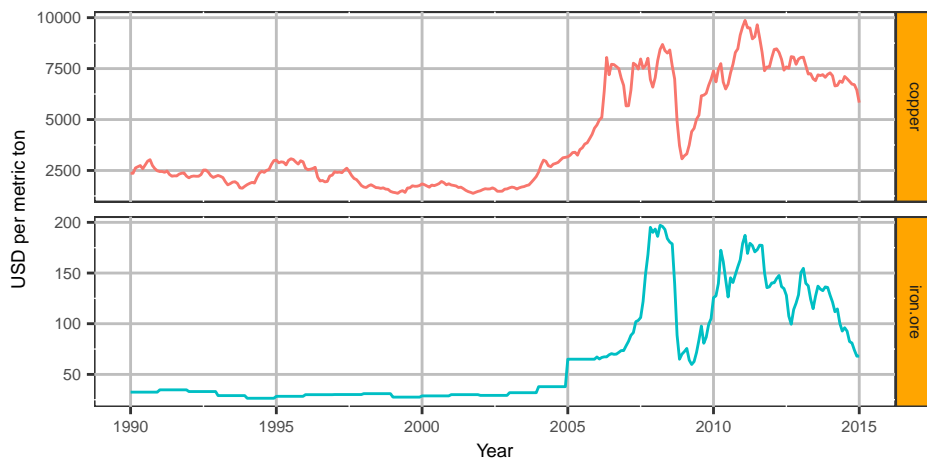
Figure 9: Metals prices have been falling since January 2010 (1990-2015)

Source: World Bank Commodity Price Data (The Pink Sheet)

Finished leather has a window of opportunity in the Chinese market   Because of economies of scale and low input costs, China is a much more competitive producer of leather products. Kenya, however, has room to export finished leather products to China. China has a limited presence in the high end leather market, giving Kenya a chance to supply more value-added leather products. (Hansen, Moon, Mogollon 2015). At the moment, Kenya exports raw hides and semi-processed leather, products that are in high demand in China. Just as Ethiopia attracted Chinese investment in the leather sector to meet demand, so may Kenya work to bring more investment to footwear manufacturing, lifting exports. Domestic leather demand is also higher than supply; local producers may use the new technology from Chinese firms to meet the growing domestic demand for finished leather (Hansen, Moon, Mogollon 2015).

2.4   Winners and Losers from Kenya's current trade patterns

2.4.1   The net benefit to the economy is positive

Cheaper Chinese finished and intermediate goods provide an overall benefit to the economy. Chinese competition forces uncompetitive firms out of the market and eliminates the deadweight loss in the domestic economy. Firms that remain are able to improve efficiency and upgrade standards to supply inputs to Chinese companies. During the Standard Gauge Railway construction, local cement producers upgraded their production to meet international standards and supply part of the railway. Firms that use Chinese goods as intermediate inputs improve their efficiency, and informal sector firms that use intermediates increase their retail margins and create more employment. Some well-organized producers may lose out, but economic theory tells us that the overall gain is positive.

2.4.2   Consumers and retailers gain

Consumers benefit from a greater variety of cheap consumer electronics and plastic and rubber products. Medicine, footwear, clothing, textiles and office supplies are now available to consumers at much lower prices, prompting side businesses reselling consumer products to enter the market. Between 2013 and 2014, the wholesale and retail trade sector grew at 6.9 percent, and shopkeepers in western Kenya had an average annualized return of 33 percent, although the median firm in the study's sample had an annualized return close to zero (Kremer *et al* 2011). Chinese goods only seem to help small retailers. Feinberg (2010) finds that small retailers in the United States are generally unaffected by currency appreciation, an indicator of higher imports; small retailers can cope with greater imports and other economic shocks. Although the context is different, the study agrees with anecdotal evidence of more Kenyan retailers selling goods from China. Chinese goods help small kiosks and shops earn greater profits, and since small shops make up 70 percent of shopping, Chinese goods appear to have benefitted retailers on a large scale.

China dominates the second-hand clothing and shoe market in Kenya   Most consumers buy leather shoes and clothes from the mitumba, or second-hand markets. Mitumbas offer consumers quality brands from North America, Europe, and Asia at lower prices than local clothes. But China is still a major player in the mitumbas: 60 percent of second hand shoes come from China and Hong Kong, and 60 percent of global leather footwear production and 40 percent of world exports of leather footwear are also from China and Hong Kong (Hansen, Moon, Mogollon 2015). The prices of Chinese products are often significantly cheaper. A bale from China is half the price of a bale from Germany, but the shoes are of different qualities. 80 percent of shoes in a bale from Europe are leather, but only ten percent of shoes in a Chinese bale are leather, the rest being rubber or plastic. The rubber and plastic shoes sell better in urban mitumbas; leather shoes sell better in rural areas because people often walk long distances and need something durable (Hansen, Moon, Mogollon 2015).

2.4.3   Producers are worse off; some benefit from Chinese intermediate goods

The literature generally concludes that existing and potential local producers in Sub-Saharan Africa are displaced by Chinese imports. Chinese imports have hurt textile and clothing pro-

duction, a sector that is 20 percent of all formal manufacturing employment in Kenya. Clothing enterprises employ mainly women, so a weaker industry worsens gender equality.

Some producers benefit from using Chinese intermediate goods in production When local producers use intermediate goods, they can access goods unavailable locally to increase their productivity. Between 1990 and 2014, imports of intermediate and capital goods have grown 12.6 percent annually (figure 10). Over time, many domestic businesses have switched to cheaper Chinese goods. Figure 11 shows imports from top trading partners: since 1990, Kenya's imports from China have increased 26.7 percent per year, and are now 21.9 percent of imports, replacing goods from other major sources. In 2014, only 6.9 percent of imports came from India and 4.5 percent came from South Africa, two former major sources of intermediate inputs.[6]
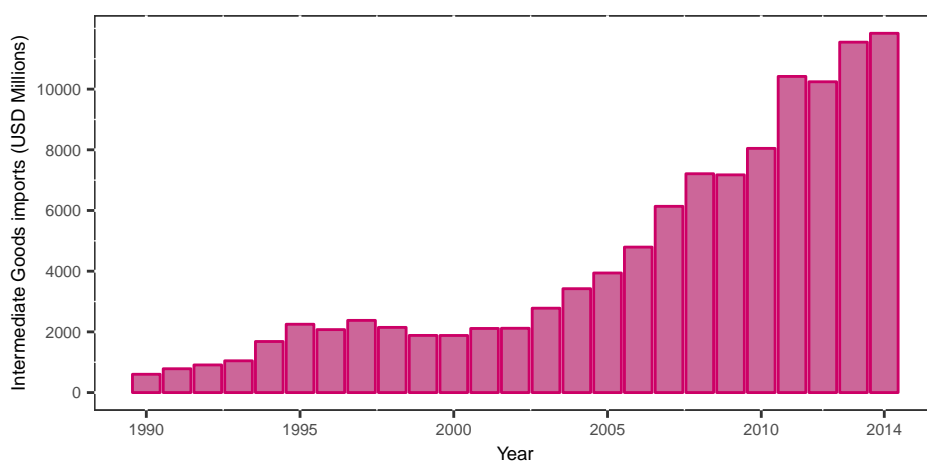
Figure 10: Kenya's imports of intermediate goods is rising quickly

Source: UN Comtrade 2015

The top categories from China were processed industrial supplies, parts and accessories for transport equipment, capital goods, primary industrial supplies, and food and beverages for industry. Industry supplies were 77 percent, and transport equipment and capital goods were each ten percent of imports of intermediate goods. Imports of industrial supplies and transport equipment are high because of strong demand from the Standard Gauge Railway construction. In general, transport equipment contributes a large share to import growth, and the switch to Chinese imports cuts the cost of production.

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[6]We use the Broad Economic Categories (BEC) classification for intermediate goods
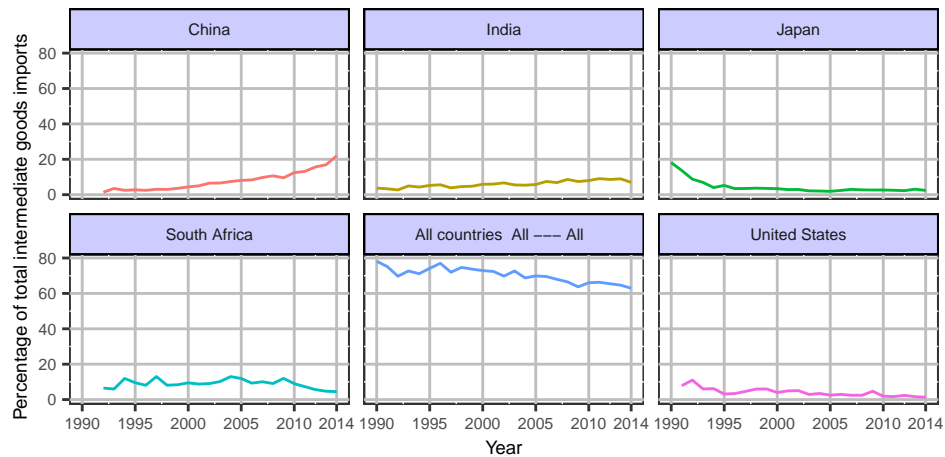
Figure 11: China's share of Kenya's intermediate goods imports is growing

Source: UN Comtrade 2015

Kenyan apparel exports to the US fell initially but are now improving Under the African Growth and Opportunity Act (AGOA) and the MultiFibre Agreement (MFA), the US received over over 90 percent of Kenya's clothing exports; exports increased 292 percent from US $78 million to US $306 million (Kaplinsky 2008). After removal of the MFA, Chinese competition decreased Kenyan exports, and threatened to erode gains Kenya made in the US market. Between 2004 and 2006, the value of Kenyan clothing exports to the US dropped 5.1 percent after the first two years of quota removal and dropped 4.6 percent between 2005 and 2011 (Kaplinsky 2008; Onjala 2008). Five factories closed in 2004-2005 with 4,603 job losses —though much fewer than the predicted 25,000 job losses.

After the renewal of AGOA in 2008, Kenyan apparel exports rebounded and are steadily growing (figure 12). Between 2010 and 2014, exports grew at a rate of 13.4 percent per year, faster than the Sub-Saharan Africa growth rate of 5.3 percent. By 2014, Kenya was 37.1 percent of Sub-Saharan Africa's apparel exports to the US, up from 29.4 percent in 2012. But even with the help of AGOA, Kenya's exports are still much smaller than China's. In 2014, Chinese exports were 81 times as much as Kenya's. Chinese exports grew at a slower rate of 1.2 percent from US $28.8 billion in 2010 to US $30.5 billion in 2014, but they are still 36.7 percent of total US apparel imports. China is becoming a supplier of choice for most US importers because it can meet the large volumes required by large US retailers and apparel companies. China also has lower labor costs, better technology, and better connections in global value chains. If China can manage its market share even with AGOA, if AGOA is removed, Kenyan exports may experience a major loss of their US market share.
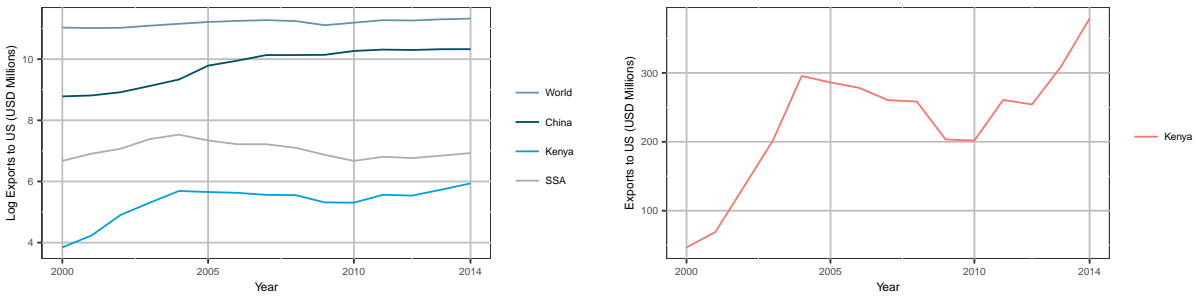
(a) China's apparel exports strong even with AGOA

(b) Kenya's apparel exports hit hard in 2004, but rebounded from 2010

Figure 12: Kenya's apparel exports to the US (2000-2014)

Source: UN Comtrade 2015

Kenya's exports to Uganda and Tanzania are falling   Chinese goods may have also hurt Kenya's exports to its neighbors. Exports to Tanzania and Uganda are quite similar to China's, compared to both countries' exports to the United States or the UK. The greater overlap in East Africa suggests that Chinese goods will likely displace Kenyan exports. Between 2008 and 2014, manufacturing exports to Tanzania fell 36.1 percent; exports to Uganda increased slightly by 4.5 percent, but compared to previous years, the growth was slow. [7]

Some fear that Chinese imports could lead to deindustrialization   Because Kenya produces and trades few intermediate goods, researchers have concluded that Chinese imports could lead to a de-industrialization. Many suspect a premature decline of industry because manufacturing growth was only 3.4 percent in 2014, down from 5.6 percent in 2013 (Chen *et al* 2015). The manufacturing sector is ten percent of GDP, but the government wants it to be 20 percent of GDP as part of its Vision 2030 program (KNBS 2015). Kenya will need to promote more FDI into manufacturing, improve labor productivity and infrastructure, lower transport costs, and lighten the regulatory burden of trade it if hopes to boost exports and the share of manufacturing in GDP (Farole 2011).

But Ethiopia is building a strong manufacturing industry   Ethiopia does a much better job of attracting FDI in manufacturing. Between 2010 and 2013, the FDI to GDP ratio in Ethiopia was 1.39 compared to only 0.67 in Kenya, and the FDI to Export ratio was 0.1 in Ethiopia and 0.03 in Kenya; it also has a lower cost of doing business, offering lower taxes, electricity, and labor costs

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[7]We calculate the export similarity of Kenya and China in Tanzania to be .0247 and in Uganda to be .164; in contrast, the export similarity in the United States is only 0.06. Let X_{ij} be the share of product i in country j's exports and X_{ik} be the share of product i in country k's exports. The export similarity is

$$XS_{jk} = \sum_{i=1}^{n} \min\{X_{ij}, X_{ik}\}$$

than Kenya (Chen, Geiger, Fui 2015). Ethiopia's manufacturing received 76 percent of total FDI for projects in operation, and China is the second largest investor in manufacturing, investing US $545 million between 2008 and 2013; it also has 196 projects in operation, the greatest number of projects among all investors (Chen, Geiger, Fui 2015).

Within manufacturing, Ethiopia's textiles, clothing, and leather sub-sector attracted US $2.5 billion in investment. FDI in the textiles and clothing sub-sector is crucial for employment growth. In Ethiopia, 40,000 permanent jobs came from manufacturing FDI between 2008 and 2014, with 22,000 manufacturing jobs originating from the textiles, clothing, leather and shoemaking sub-sectors (Chen, Geiger, Fui 2015). But many jobs in textiles and clothing come from two major investors, China and India. Between 2008 and 2014, China created 24 percent and India created six percent of total jobs. If Kenya wishes to attract more manufacturing FDI from China and India, it will have to work towards lowering the cost of doing business to compete with Ethiopia's more favorable investment climate (Chen, Geiger, Fui 2015). Kenya has preferential access to the US market under AGOA, and may attract more manufacturing FDI in textiles to create permanent jobs and boost exports to the US market.

2.5 What drives Kenya's exports?

2.5.1 Estimation

We estimate a gravity equation to explain what influences Kenya's exports, and if Kenya under or over exports to China relative to comparable countries. The model is analogous to the physical equation of gravity; just as the gravity is proportional to the mass of two planets and inversely proportional to the distance between them, so are exports positively related to the sizes of the two economies and negatively related to the distance between the two economies. The detailed model is in appendix A.1. Using a full set of bilateral trade flows between all pairs of countries as described in appendix B, we estimate a Poisson Quasi Maximum Likelihood regression model described in appendix A.

Kenya exports less to China than to economies of similar size Under the Poisson model in table 1, the coefficients on importer GDP per capita and distance are significant and have the expected signs: distance reduces trade and a higher GDP per capita of the importer increases trade. Distance deflects Kenya's exports by a factor of 0.18. Kenya's exports increase by a factor of 10.02 to countries that share a common border with Kenya. The China dummy coefficient is -1.74, so Kenya exports less to China by a factor of 0.18 compared to economies of similar size. If Kenya exports one million USD worth of goods to a country similar to China, it only exports 820,000 USD worth of goods to China. Kenya may export less to China after controlling for other independent variables, but the effect is constant over time —none of the China-year dummy coefficients are significan (table C8).

Table 1: Estimates of Kenya's Trade Flows (1948-2014). Dependent variable: Kenya's exports

	Poisson Quasi Maximum Likelihood
Constant	$-0.93\ (0.41)^{*}$
Kenya GDP per capita	$0.00\ (0.00)^{***}$

	Poisson Quasi Maximum Likelihood
Importer GDP per capita	0.00 $(0.00)^{***}$
Population Kenya	-0.01 (0.01)
Population Importer	0.00 $(0.00)^{***}$
Distance	-0.00 $(0.00)^{***}$
Regional Trade Agreement	1.16 $(0.10)^{***}$
Contiguous	2.30 $(0.09)^{***}$
Common Language	0.19 $(0.06)^{**}$
GATT Kenya	0.78 $(0.23)^{***}$
GATT importer	1.50 $(0.09)^{***}$
Colonial History	2.53 $(0.08)^{***}$
China dummy	-1.74 $(0.42)^{***}$
AIC	
BIC	
Log Likelihood	
Deviance	98819.06
Num. obs.	6118

$^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$. Standard errors in parentheses.

Kenya's exports falls with distance. China is far   Figure C36 presents the relationship between distance and trade. The farther Kenya is from its destination, the less it exports. Kenya may under export to China because they are 9,201.3 kilometers apart, nearly in the third quartile of distances in the sample.

Kenya exports more to richer countries   Figure C37 shows the relationship between the per capita GDP of the importing country and exports in 2014. We see that a higher importer GDP per capita is linked to higher trade. Given its already high per capita GDP, the UK stands out as a bigger trading partner, and it probably trades more with Kenya because of the former colonial link. Kenya's exports to China are still low as figure 6 shows, but the large per capita GDP of China presents a potential market for exports.

China's exports to Kenya are "normal"   We estimate a similar Poisson regression taking China as an exporter to the world. Table 2 presents estimates of China's exports from the Poisson model: the importer GDP per capita and distance are significant predictors of trade; the coefficient of distance is close to zero, meaning that a one kilometer increase in distance reduces China's exports by a factor close to 1. The effect of sharing a border with its trading parter is insignificant for China, but it benefits Kenya. China exports more to Kenya by a factor of 1.08, so if China exports goods worth one million USD to a country comparable to Kenya, it exports 1,080,000 to Kenya. The coefficient, however, is statistically insignificant. Since the results from Poisson are less biased than the ordinary least squares model, we observe that China's exports to Kenya are as expected when we hold the other explanatory variables fixed. Over time, China's exports to Kenya are

roughly the same as its exports to countries similar to Kenya; neither the year dummies nor the Kenya year dummies are significant (Table C7).

Table 2: Estimates of China's Trade Flows (1948-2014). Dependent variable: China's exports

	Poisson Quasi Maximum Likelihood
Constant	8.82 (15.22)
China GDP per capita	0.00 (0.00)
Importer GDP per capita	0.00 (0.00)***
Population China	−0.01 (0.03)
Population Importer	0.00 (0.00)***
Distance	−0.00 (0.00)***
Contiguous	0.09 (0.06)
Common Language	1.94 (0.06)***
GATT China	0.90 (18.60)
GATT importer	0.79 (0.08)***
Colonial History	−1.45 (0.91)
Kenya dummy	4.42 (32.00)
AIC	
BIC	
Log Likelihood	
Deviance	13045625.79
Num. obs.	8215

***$p < 0.001$, **$p < 0.01$, *$p < 0.05$. Standard errors in parentheses.

Gravity model suggests room for Kenyan export growth The results suggest that Chinese exports to Kenya are essentially normal, but Kenya under exports to China compared to other larger markets. Since China has specialized in manufacturing exports, it is simply a large exporter in global value chains; Kenya imports the same amount from China as countries at similar income levels do. Kenya, however, has some room for growth of exports. Leather products and cut-flowers have shown some promise, and Kenya could reap the benefits of reorganizing its leather sector and negotiating for duty free access of its cut-flowers in China.

2.6 Brighter prospects for services exports as China rebalances

Kenya is unlikely to expand exports to China at the moment, but it may look forward to real benefits towards 2030. A recent World Bank Africa's Pulse report (2015) shows that China will import more from Kenya once it rebalances its economy to a consumption-driven path. Focusing on domestic consumption, China's GDP growth will slow from 7 percent to 6 percent per year between 2016 and 2030, eventually reaching 4.6 percent per year in 2030. Initially, Kenya's GDP will fall by 1.3 percent compared to if China continued with seven percent yearly growth. Kenya's GDP will suffer from weak demand for commodity exports, lower world commodity and food prices, and

higher spread on its sovereign bonds, the spread being already 600 basis points (6 percent) over US Treasuries (World Bank Africa's Pulse 2015).

Kenya's GDP will rebound, however, when China decreases investment and allows consumption to take a larger share of its GDP. Greater consumption usually leads to more imports, and demand for tourism, travel and business services will increase relative to commodities, an increase that should help Kenya's service sector, an already strong sector (figure 13). From the boost from China's greater consumption, Kenya's GDP will 7.5 percent higher than it would have been if China stayed with seven percent growth. By 2030, the higher GDP should also bring higher wages and real exchange rate appreciation (World Bank 2015).
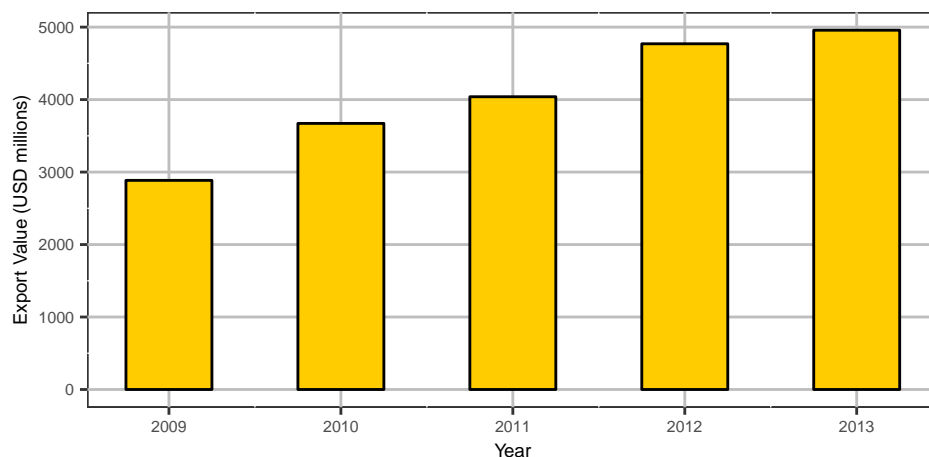
Figure 13: Kenya's services exports overall are strong

Source: UN Service Trade 2015

Threats to growth scenario: Strong Chinese downturn and terrorism Kenya may not realize the benefits it China's economy slows too much. A sharper downturn than expected will push down commodity prices even further, raising the cost of financing for Kenya; Kenya has a large current account deficit of ten percent of GDP (World Bank Africa's Pulse 2015). Slower Chinese growth may also mean less FDI in Kenya; Kenya performs poorly in attracting FDI and inflows are volatile (see sections 3 and 4.1.1). Less FDI in Kenya may stall growth plans, plans that would upgrade much need infrastructure. Because China's domestic consumption will shift toward final consumer goods, demand for natural resources and commodities will fall, and Kenya's recently discovered oil will face lower global prices.

2.6.1 China's rebalancing will help reduce poverty by 2030

Lakatos *et al* (2015) use a Global Income Distribution Dynamics (GIDD) model that incorporates micro and macro data for simulation of the effects of economy-wide changes in Sub-Saharan Africa. Changes in demographics, sectoral employment, per capita consumption growth, relative wages across sectors, and relative food to non-food prices are recorded by the model. It also uses

data from 130 countries and explicitly assesses the long-term behavior of income distributions, tracking demographic and educational changes over time.

Wealthier households in Sub-Saharan Africa benefit from demographic changes and wage changes across sectors The wealthiest 40 percent of households will have higher per capita income growth from demographic changes, but the poorest 40 percent of households will see no benefit. The poorest 20 percent of households will experience slower per capita income growth when demographic changes cause changes in relative wages across sectors. Upper middle income households —those between the 60th and 80th percentile of the income distribution —will gain the most from the wage changes, earning the fastest per capita income growth[8]

Poorer households are hurt by changes in food to non-food relative prices, but gain overall from Chinese slowdown and rebalancing Changes in food to non-food prices leave the poorest 40 percent of households worse off: per capita income growth is 2.9 percent compared to the 3.07 percent if China had continued to grow at seven percent. But thanks to greater Chinse consumption, the bottom 40 percent will increase their incomes; the number of people living in extreme poverty will fall by an additional 4.04 million people. The Chinese slowdown scenario increases poverty initially, but the rebalancing reduces poverty enough for an overall drop. More important, the bottom 40 percent in Kenya will see a per capita income increase of 2.7 percent, the highest in Sub-Saharan Africa (Lakatos *et al* 2015).

3 Foreign Direct Investment in Kenya

Kenya performs poorly in attracting foreign direct investment (FDI) given the size of its economy. Despite a larger economy, Kenya attracts even less FDI than Uganda and Tanzania. Figure 14 shows Kenya's net inflows of foreign direct investment (FDI) from 1980 to 2011. Kenya's investment levels dropped to less than 10 percent of GDP near 2000, but has since returned to levels experienced in the mid 1990s. Corruption, poor infrastructure, and poor investment climate have reduced foreign direct investment flows compared to pre 1980 levels; In 2007, Kenya received US $178 million in FDI, but post-election violence in 2008 cut down flows to only US $140 million. Kenya has since recovered, but it has been unable to reach its former 2007 peak. Figure 15 shows Kenya's FDI as a percentage of GDP. The average FDI to GDP ratio between 1980 and 2011 was 0.54. When compared with Kenya's domestic savings rates, Kenya's FDI signals a vulnerable current account because of weak domestic savings and investment. Figure 16 shows Kenya's gross domestic savings as a percent of GDP. From a peak of 22 in 1,994, Kenya's gross domestic savings rate dropped to only 4 percent in 2,014. Kenya's savings rate is much lower than the average in Sub-Saharan Africa of 20.4 percent. One reason for the low savings is Kenya's large scale infrastructure projects: the Standard Gauge Railway, Lamu berths, and Northern Corridor Integration Projects. Kenya's high fiscal debt puts it at a sovereign risk level of B1 (Moody's 2015; KPMG 2013).[9]

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[8]

[9]AAA is least risky and D is most risky.
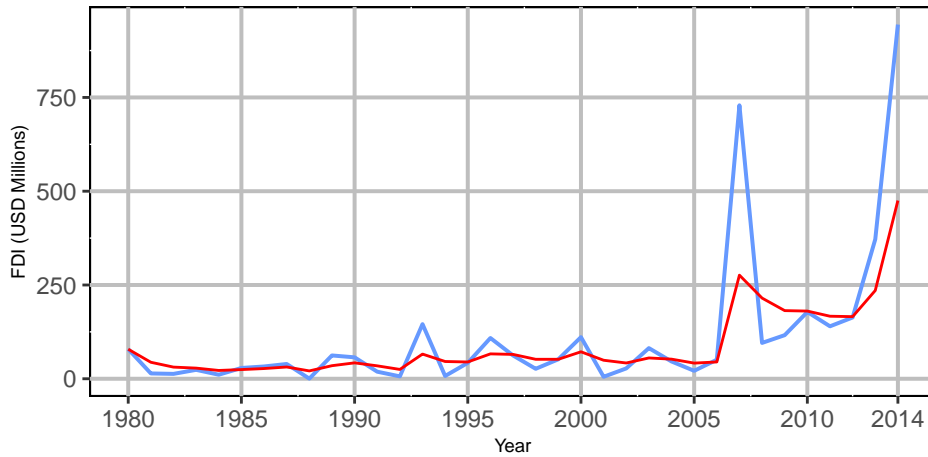
Figure 14: Kenya's FDI is low. Trend in red (1980-2011)

Source: World Development Indictors World Bank 2015
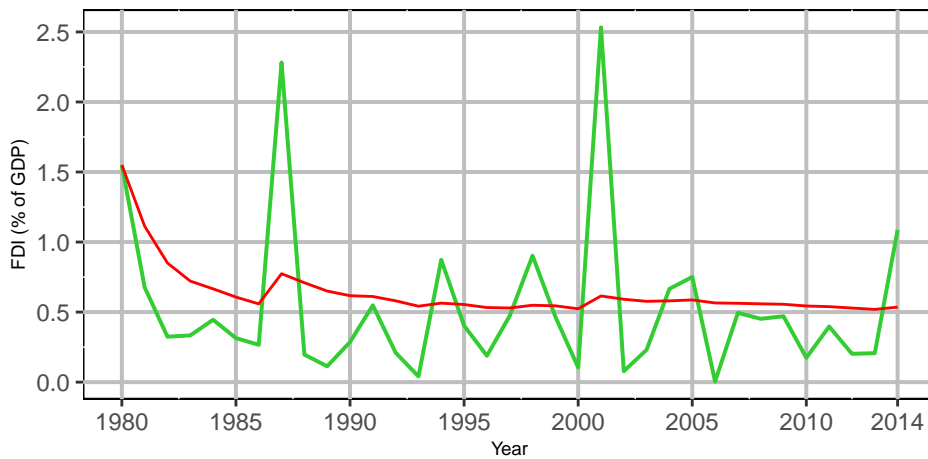
Figure 15: Kenya underperforms in attracting FDI relative to potential. Trend in red (1980-2011)

Source: World Development Indictors World Bank 2015
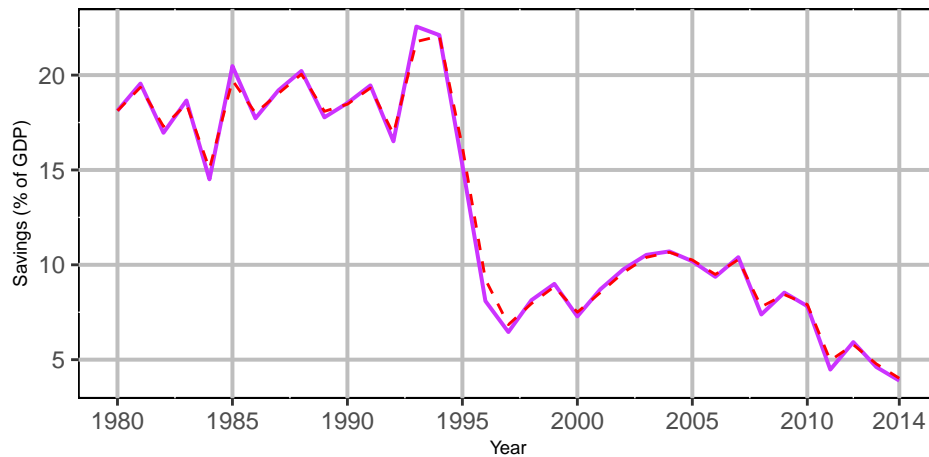
Figure 16: Kenya's Gross domestic savings has fallen sharply since 1993. Trend in red (1980-2013)

Source: World Development Indictors World Bank 2015

3.1 Chinese FDI in Sub-Saharan Africa

China's FDI consists of many medium to short-term loans with a focus on extractive industries such as oil, mining, gas, minerals and natural resources (Wang and Bio-Tchane 2007). Some loans are repaid with future exports from natural resources, especially in countries with poor credit ratings. Such resource-backed loans can be extended to Ghana, for example, for a hydropowered dam, and the loan is repaid with exports of cocoa beans (Bräutigam, Gallagher 2013). Other loans go to support multinational or state-owned companies in accessing markets, or to support foreign firms in buying Chinese goods. In 2004, the Chinese Development Bank loaned the major telecommunications firm Huawei US $10 billion for overseas expansion, and Nigeria took US $200 million in loans to buy Huawei equipment (Executive Research Associates 2009). In 2012, Huawei was awarded a tender to build a national fibre-optic network in Kenya worth US $60.1 million, a deal financed the China EXIM Bank (ICT Authority Kenya 2015). The China EXIM Bank also gives cheap capital to state-owned firms to bid for large infrastructure projects. Their state-owned status allows them to report profits at longer intervals, instead of quarterly as most firms are required. Other foreign firms with shorter time horizons and a higher profit requirement face a unique challenge when competing for contracts in Sub-Saharan Africa.

3.1.1 Chinese FDI in Sub-Sharan Africa is relatively small

In 2011, Chinese FDI stock in Sub-Saharan Africa was US $20.1 billion, or 3.2 percent of the total FDI stock of US $629 billion in Africa. China's relative focus on Sub-Saharan Africa is large —US $26 billion in Sub-Saharan Africa compared to US $22 billion in the United States in 2013 —but its share of investment is still small (Chen, Dollar, and Tang 2015). Unlike in oil-exporting countries, Chinese firms are interested in coffee and manufacturing in Kenya because the returns are higher than in oil exploration. In particular, the communications and automotive equipment manufacturing sectors (OEM) attract a large share of Chinese investment (figure 23a) (Financial Times Ltd 2015). Figure 17 shows the investment flows from China between 2003 and 2012. Its FDI has

grown rapidly, reaching US $23 million in 2,008 from just US $1 million in 2,003. Between 2,009 and 2,010, Chinese FDI increased 261 percent, the largest gain during the 2003-2012 period before returning to US $68 million in 2,011. China's FDI stock in Kenya has also grown 35.6 percent annually from US $26 million in 2,003 to US $403 million in 2,012. Figure 20 shows Kenya's top FDI inflow sources in 2011 (UNCTAD 2015). China comes in second to the United Kingdom, and its share of Kenya's FDI total inflows has also grown. Reaching a peak of US $101 million in 2,010, or 57 percent of Kenya's total FDI flows, it then fell to US $79 million in 2,012, representing 31 percent of total flows (figure 18). China's large FDI profile will lead to greater cooperation with Kenya, but Kenya must continue to lower the costs of business and investment and curb corruption to squeeze the most from foreign investment.

(a) Kenya's FDI inflow from China (2003-2012)   (b) Kenya's FDI instock from China (2003-2012)
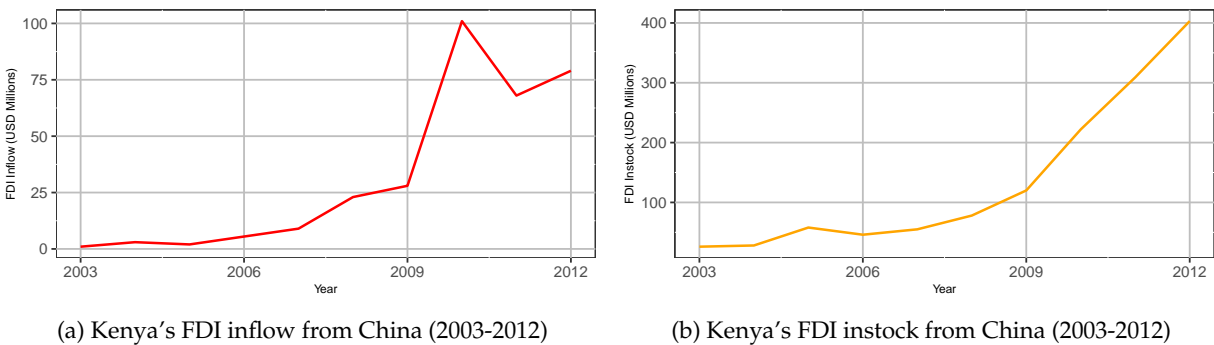
Figure 17: Chinese FDI in Kenya is growing quickly since 2009 (2003-2012)

Source: UNCTAD FDI/TNC database 2015
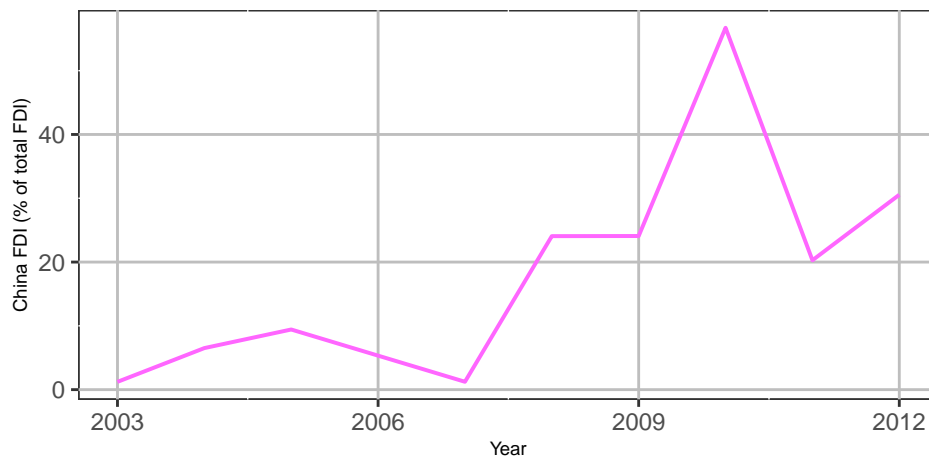
Figure 18: China's FDI represents large share of total FDI (2003-2012)

Source: Authors' own calculation based on World Development Indictors World Bank 2015
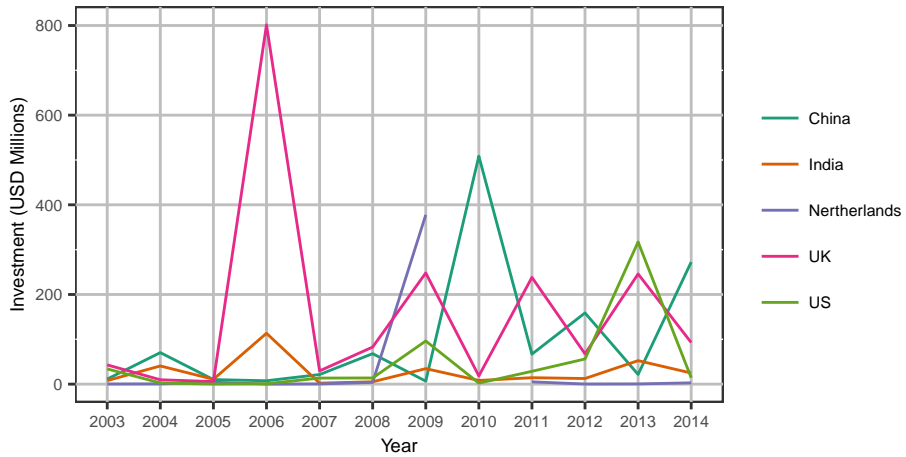
Figure 19: Investment from China rising; investment from UK and US falling

Source: KenInvest 2015
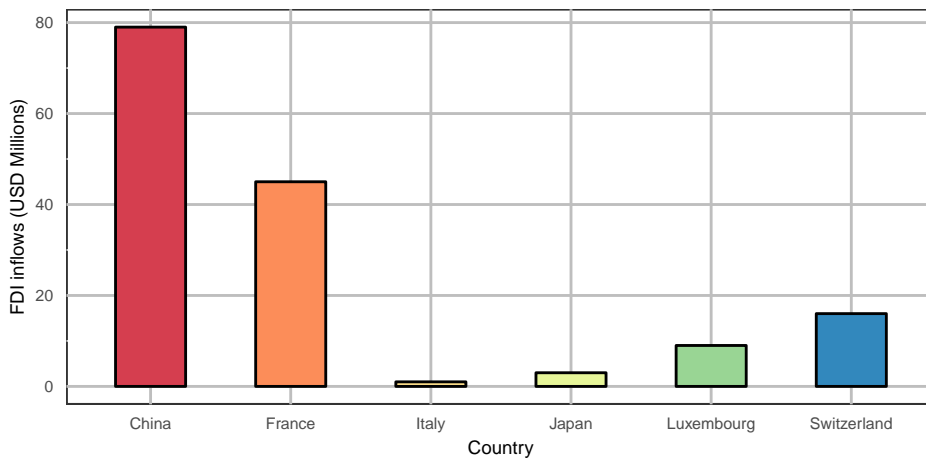
Figure 20: China and France top sources of FDI inflows for Kenya (2012)

Source: UNCTAD FDI/TNC database 2015
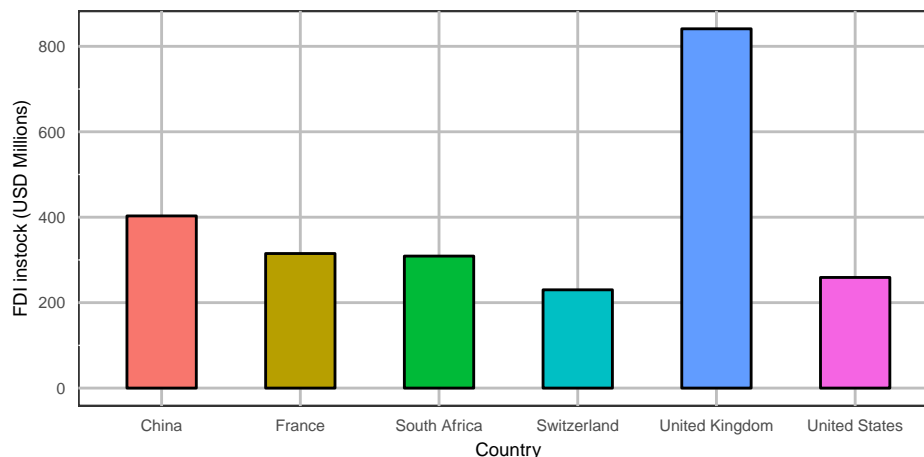
Figure 21: China and UK hold the most FDI stock in Kenya (2012)

Source: UNCTAD FDI/TNC database 2015

Chinese firms are well-represented in large-scale infrastructure projects China constructed 905.5 km of road in 2006 and invested €200 million (US $227.6 million) to rehabilitate the Nairobi-Mombasa road (Fiott 2006). In 2012, three kilometeters of road at the KWS Gate/Bomas Junction have been built for KES 2.67 billion (US $27.1 million) by the China Wu Yi Co., and many Chinese firms have been pre-qualified by the government to develop 2,000 km of road in various counties (Kenya Urban Roads Authority 2015). For the mega-projects, the China Road and Bridge Corporation is building a 609 km section of the Standard Gauge Railway (SGR) linking Nairobi and Mombasa for US $3.6 billion, and the China Communication Construction company is building three berths at the port on Lamu island for US $467 million (Financial Times 2014). With the slowdown of the Chinese economy, China's low cost infrastructure providers will seek to market their services outside of China, including in Africa, so Chinese infrastructure projects in Kenya will likely continue.

But the bulk of Chinese work in infrastructure is not investment, but contracting The SGR and the berths at Lamu are not investments, but projects financed by China's EXIM bank: the bank will finance 90 percent of the SGR, making SGR a Kenyan investment. Kenya has taken on debt for many major construction projects, and Chinese companies typically have no equity stake in the particular building, road, or port. The EXIM bank is responsible for promoting exports and investments of Chinese firms abroad, offering international guarantees, export buyers credit, and export sellers credit (Center for Global Development 2006). The bank meets demand for infrastructure in Kenya and Sub-Saharan Africa, a sector that traditional donors and investors have neglected because of fears of corruption and high risk. The EXIM bank, for example, provided US $95.4 million for drilling of 26 wells in Olkaria, Nakuru for geothermal energy in 2014 (Geothermal development company 2014). Once one accounts for large, debt-financed projects, medium sized private Chinese firms are a sizeable share of investment, and they tend to operate in the manufacturing sectors, creating many low-skilled manufacturing jobs. Futhermore, Chinese firms face the same problems that any firm faces in Kenya: poor electricity, roads, security and corruption.

3.2 Chinese companies in Kenya: From large state companies to small private ones

Kenya currently hosts around 400 Chinese firms spread across every sector. In February 2014, the Sino-African Centre of Excellence (SACE) foundation launched the Business Perception Index (BPI) survey to learn the views and experiences of Chinese companies in Kenya. The BPI surveyed 75 companies: 25 state owned and 50 privately owned enterprises. Many firms in the sample are in the manufacturing, construction, and resources sectors; Chinese firms are also involved in trade, tourism, hotels, and restaurants. Chinese electrical companies are working with Kenya Power, the government-owned power company, to establish 33 power lines in five Kenyan towns: Kitale, Awendo, Konza and Kutus (Business Daily 2015). Oil companies are sure to be attracted to Kenya's new oil discoveries in Turkana and the northwest part of the Rift Valley, but the UK based Tullow Oil Plc has rights for drilling.

3.2.1 Chinese invest the most in metals, communications, and automotive original equipment manufacturing (OEM)

Figure 23a below gives the amount of Chinese investment by sector between 2003 and 2015. Chinese companies invested US $178.9 million in metals, US $150.9 in communications, and US $68 million in automotive original equipment manufacturing (OEM). Investment in metals fits with Kenya's high exports of titanium ores and copper to China. Companies also want to take advantage of the growing telecommunications market in Kenya: the number of mobile telephone has grown significantly in the last five years, reaching over 33 million subscribers in 2014; Chinese firms such as Huawei and ZTE wish to compete with other major companies such as Nokia or Ericsson (see figure 22). Figure 23b shows the overall distribution of Kenya's FDI. The top sectors are communications at US $2.51 billion, alternative and renewable energy at US $2.36 billion, and coal, oil and natural gas at US $1.35 billion. In total, Chinese companies contributed US $464.75 million in capital investment with an average investment of US $35.75 million per project; other foreign companies in Kenya had a similar project size of US $35.5 million.
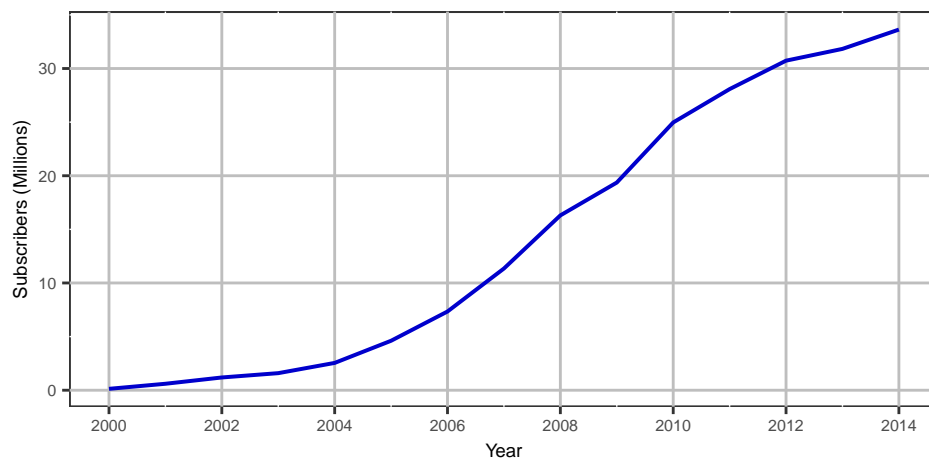
Figure 22: Kenya's mobile telephone subscriptions grew quickly over last decade

Source: International Telecommunications Union 2016
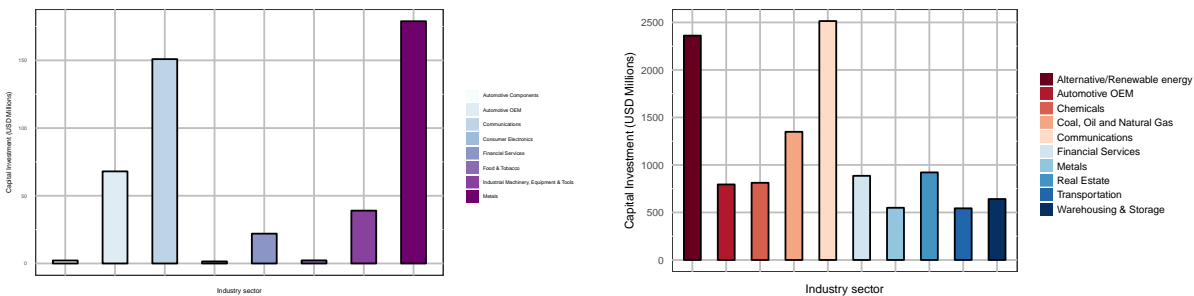
(a) Chinese FDI in Kenya by sector   (b) FDI by sector

Figure 23: China invests most in metals and communications in Kenya (2003-2015)

Source: fDi Intelligence from The Financial Times Ltd 2015

Chinese companies invest the most in manufacturing activities   Chinese firms focus on manufacturing in Kenya, investing US $296.17 million between 2003 and 2015. Manufacturing was 64 percent of total investment for Chinese companies compared to only 24 percent of total investment among all companies. The average capital investment of China's manufacturing projects was US $49.36 million with a total of six projects; the overall average project size of manufacturing projects was slightly larger at US $58.31 million with 59 projects. Compared to overall trends, Chinese FDI is absent in major sectors: electricity, construction, ICT and internet infrastructure, and logistics, distribution, and transportation. Even though companies have worked on high profile projects, Chinese investment in construction is tiny. The EXIM bank only provides loans: Chinese firms worked on the Standard Gauge Railway and the Thika Superhighway, but the government of Kenya must pay back the debt. Overall, construction had an average project size of US $215.4 million, with five projects in total.
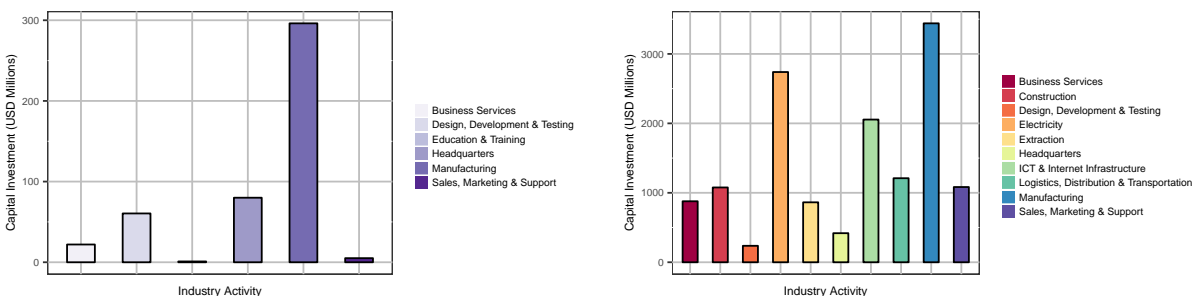
(a) Chinese FDI by industry activity   (b) FDI by industry activity

Figure 24: Chinese companies invest most in manufacturing (2003-2015)

Source: fDi Intelligence from The Financial Times Ltd 2015
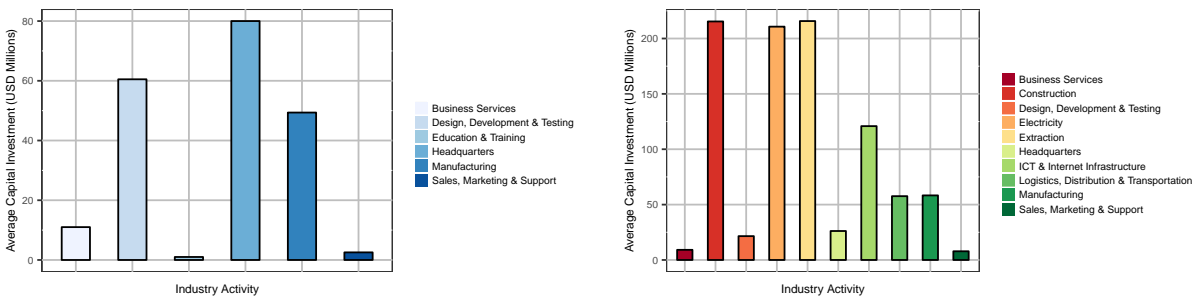
(a) Average Chinese FDI by industry activity   (b) Average FDI by industry activity

Figure 25: Chinese investment per project highest in headquarters creation and manufacturing (2003-2015)

Source: fDi Intelligence from The Financial Times Ltd 2015

3.2.2 Corruption is the biggest obstacle for Chinese firms

Chinese companies identified corruption as the most significant obstacle to doing business in Kenya: 53 percent of respondents said corruption was a "very significant obstacle" and 15 percent mentioned corruption as a "significant obstacle" (SACE 2014). Crime, theft, and personal safety was the second most significant obstacle: 37 percent said it was "very significant" and 25 percent responded "significant" (SACE 2014). 32.3 percent of foreign companies in the World Bank Enterprise Survey (2013) said corruption was a major constraint. According to a Kenya National Bureau of Statistics (KNBS) survey, 76.4 percent of respondents said corruption hurt their business. The negative perception of corruption was consistent across all sectors: manufacturing, transportation, financial services, and wholesale and retail trade (KNBS 2013).

The BPI also finds that the Kenya Revenue Authority (KRA) is more likely to visit Chinese companies. The KRA visited Chinese companies 3.1 times on average during 2013 compared to only 2.2 times for all companies (SACE 2014). In addition, 60 percent of Chinese companies report that KRA officials asked for informal payments and gifts during their visit. Because of KRA corruption, Chinese companies see the tax system as a burden; 85 percent of Chinese companies surveyed have at least one Kenyan accountant to handle external audits and authorities, and 63 percent of companies have a Chinese accountant for internal audits (SACE 2014). 59.2 percent of foreign companies view the corporate tax, value-added tax (VAT), and the custom and excise duty as obstacles to business (KNBS 2013).

3.2.3 Chinese firms source most materials from China

Chinese companies import 59 percent of goods from China and an additional seven percent indirectly from Kenyan suppliers. Chinese goods are much cheaper than the local equivalents, and firms simply find it more profitable to import inputs from China. Companies in the sample target the domestic market with 96 percent of sales occurring in Kenya during 2013; the other four percent of sales were for Tanzania and Uganda (SACE 2014). Chinese companies also report a shorter time for customs clearance than other companies. The majority, however, report having a professional clearance agent, where corruption is rampant (SACE 2014).

3.2.4   Chinese firms employ a large share of local workers

Contrary to the popular belief that Chinese companies only hire Chinese workers, 93 percent of companies report hiring Kenyan employees; private enterprises are more likely to hire locals than state enterprises. In addition, larger firms are more likely to hire Kenyans than smaller firms: 40 percent of micro enterprises and all small, medium and large enterprises hire Kenyans (SACE 2014). Of the companies surveyed, Kenyans represent 78 percent of full-time and 95 percent of part-time employees. The companies had an average of 360 local employees: 252 were part-time (70 percent) and 108 were full-time (30 percent) (SACE 2014). All foreign manufacturing companies in Kenya had 127.8 full time workers and 19.3 part-time workers on average. Manufacturing and construction companies are larger employers, hiring 762 employees on average compared to 45 in the services sector; all foreign manufacturing firms hire 158.3 full-time workers and 47.3 part-time workers on average (World Bank Enterprise Survey 2013). Chinese companies in the services sector hire 71 percent full-time employees, but the manfacturing and construction sectors hire only three percent full-time employees. 90 percent of manufacturing employees are local, and 82 percent of service sector employees are local. Chinese companies also hire more Kenyans over time: they had 102 full-time local employees upon establishment, and by the time of the BPI survey, they had hired 214 full-time local employees. 63 percent of Chinese companies said they had a policy of replacing Chinese employees with locals (SACE 2014). Larger firms were more willing to replace Chinese workers than smaller firms, and private enterprises were more willing to replace Chinese workers than state enterprises. A local technician is much cheaper than a Chinese technician because a work permit costs US $4,597. Local employees also receive basic insurance from Chinese companies: 44 of 68 companies noted that they offer basic insurance for all employees. Again, larger companies are more likely to provide basic insurance than smaller employers. 84 percent of manufacturing and construction companies offer insurance for Kenyans, and 72 percent of service sector companies offer insurance for locals. Overall, there are 663 foreign and 20,790 local workers in managerial positions, 781 foreign and 87,589 local employees in skilled positions, and 633 foreign and 131,618 workers in unskilled positions. The average number of unskilled workers in foreign manufacturing companies is 49, or 37.3 percent of the workforce; detailed information about the workforce of Chinese companies is unavailable (KNBS 2013).

Chinese companies create the most jobs in communications   Figure 26a presents the number of jobs that Chinese companies have created in each sector. Chinese companies have created 2,170 jobs, 5.3 percent of the total 40,646 jobs created through FDI. The greatest number of jobs came from the communications sector at 931 jobs, followed by 500 jobs in the automotive original equipment manufacturing (OEM), and 342 jobs in the metals industry. Chinese companies have focused more on Automotive OEM than other countries. It makes up 23 percent of China's overall jobs created compared to only 11.4 percent of total overall jobs. As figures 27 and 28 highlight, manufacturing takes the largest share of employment for both Chinese FDI and total FDI. Chinese manufacturing FDI created 1,600 jobs with 266.7 jobs on average, and manufacturing in total created 21,119 jobs with 357.9 jobs per project. Other major employers were customer contact centres, creating 2,218 jobs and 443.6 jobs per project.
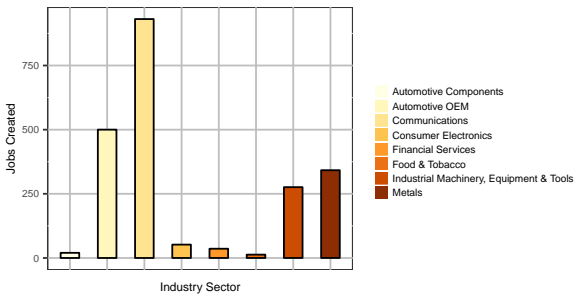
(a) Chinese FDI job creation by sector
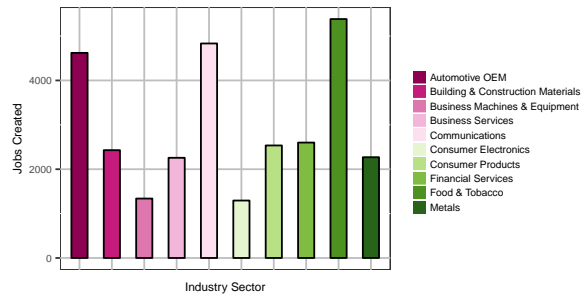
(b) Total FDI job creation by sector

Figure 26: Chinese companies create most jobs in the communications sector (2003-2015)

Source: fDi Intelligence from The Financial Times Ltd 2015
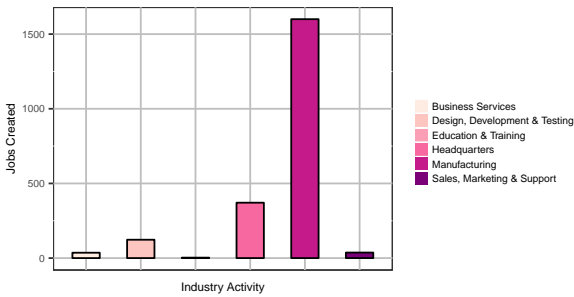
(a) Chinese FDI job creation by Industry Activity
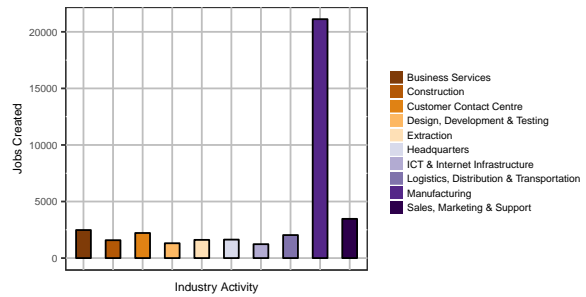
(b) Total FDI job creation by Industry Activity

Figure 27: Chinese companies in manufacturing sector create the most jobs (2003-2015)

Source: fDi Intelligence from The Financial Times Ltd 2015
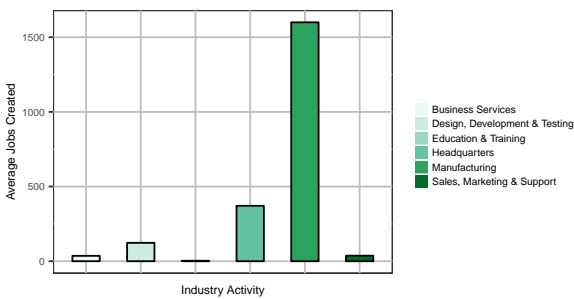
(a) Average Chinese FDI job creation per project by Industry Activity
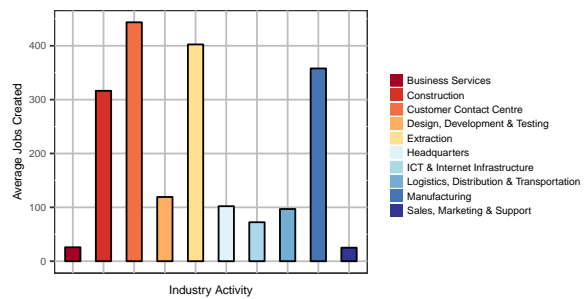
(b) Average total FDI job creation per project by Industry Activity

Figure 28: Chinese companies in manufacturing sector create the most jobs per project (2003-2015)

Source: fDi Intelligence from The Financial Times Ltd 2015

China is also a major employer for Kenya. Figure 29 shows the number of jobs that each country creates through FDI. China ranks fifth overall with 2,170 jobs, and India is number one with 7,422 jobs. Hence, China and India are not only important sources of trade and investment,

but new jobs as well. Chinese companies have a higher number of jobs per project because they have fewer projects than other countries. Between 2003 and 2015, FDI from China created 166.92 jobs on average; total FDI generated 100 jobs per project[10] FDI has a strong ability to create jobs, and table 3 shows some of the progress.
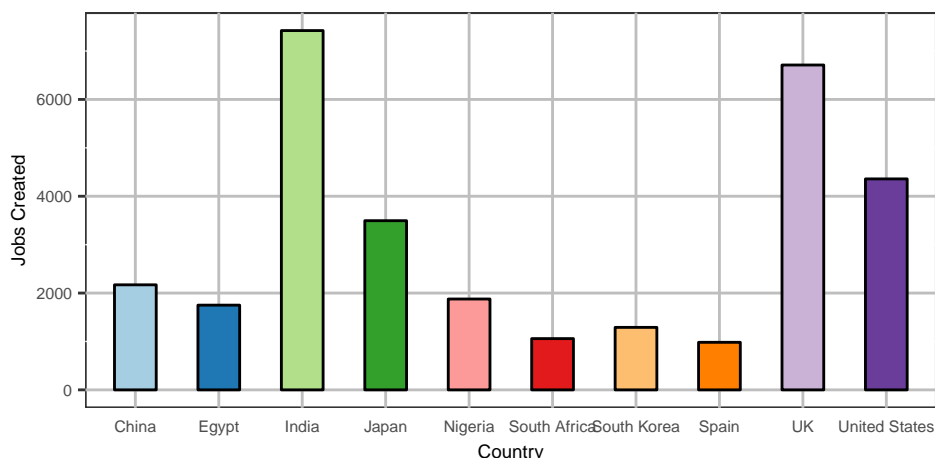
Figure 29: China is fifth largest creator of jobs. India creates the most jobs (2003-2015)

Source: fDi Intelligence from The Financial Times Ltd 2015

Table 3: FDI Projects and related employment (2007-2011)

Year	Number of Projects	Employment	Employees per project
2007	55	2,847	51.8
2008	73	4,341	59.5
2009	121	37,045	306.2
2010	129	15,753	122.1
2011	145	13,289	91.6

Source: Adapted from UNCTAD/DIAE/PCB/2012/6

Chinese firms already offer basic skills training   60 percent of Chinese companies offer formal training programs on skills, safety, and hygiene for local staff; 64 percent of all foreign firms in Kenya offer formal training (SACE 2014; World Bank Enterprise Survey 2013). Companies in the manufacturing sector and state enterprises are more likely to offer formal training than private companies and the service sector. A few Chinese projects aim specifically to provide skills training for Kenyans, but businesses report that high turnover harms efforts for skills training and promoting Kenyans to higher level management because the high staff turnover raises the cost of training employees (SACE 2014). The BPI suggests that companies engage local employees in formal contracts, regardless of skill level, to build more trust and reduce the incentive to switch jobs and vandalize property. The language barrier also presents a challenge in training, but the growing interest in Chinese langauge study among Kenyans should slowly improve communication

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[10]Kenya gained 40,646 jobs and 406 projects from FDI in total between 2003 and 2015.

(section 4.2.2).

Chinese companies hire fewer female employees   Chinese companies hire few female employees: women only represent five percent of total employees for Chinese companies on average versus 29 percent for all companies in Kenya. Chinese companies in the services sector have 19 percent female employees compared to 31.8 percent female employees in the services sector overall. In manufacturing, women are only three percent of employees in Chinese companies, but they are 22.7 percent of full-time employees overall (SACE 2014; World Bank Enterprise Survey 2013). 15 percent of the workforce in private companies is female, but only two percent of the workforce is female in state-owned enterprises. Hiring more female employees has a direct impact on poverty because women spend more on health, education, and household durables. When women work, they also tend to increase household savings (Lawson *et al* 2009).

3.2.5   Chinese firms face some competition from the informal sector

93 percent of Chinese companies in the sample have registered their business. 24 percent of companies reported competition from the informal sector, and informal competition was more likely in services (35 percent) than in manufacturing (13 percent) (SACE 2014).

3.2.6   Chinese companies less likely to take credit line

Chinese firms are less likely to obtain a loan or credit line. Only 26 percent of Chinese companies obtained a loan; 36 percent of all companies in Kenya had a loan. (World Bank Enterprise Survey 2013). Potential borrowers are dissuaded by unfavorable interest rates and complex application procedures. 51 percent of Chinese companies reported not needing a loan because they had sufficient capital (SACE 2014). State owned enterprises had financing from headquarters in China, and private companies accumulated savings and loans from family and friends. Manufacturing and construction companies take as much credit as other companies in Kenya, but only 16 percent of companies in the services sector have taken a loan or credit line. Larger companies tend to have better access to loans and credit. 95 percent of Chinese companies, however, have a local bank account and can access basic banking services.

4   Official Development Assistance from China

4.1   Chinese aid is small compared to commercial activities

Chinese aid to Sub-Saharan Africa was US $3.2 billion in 2013, and is quite small relative to its investment stock of US $32.35 billion in Africa; the small amount of aid supports China's no handout policy (China Africa Research Initiative 2013). China is more of a business partner than a donor, but it does provide grants and other forms of aid (Wang and Bio-Tchane 2007). Chinese aid only started to become significant after 2002, and it became 1.23 percent of total loans and grants to Kenya in 2003 (Mwega 2009; Onjala 2008). China also accounted for 10 percent of loans and 20 percent of physical infrastructure assistance to Kenya in 2005 (UNDP 2005; Onjala 2008). Unfortunately, we do not have access to quality aid data, as we discuss in section 4.3

4.1.1   Kenya may rely more on Chinese aid because of volatile aid flows

Chinese aid may continue to play a bigger role over time because Kenya's foreign aid flows are volatile. The coefficient of variation of Kenya's aid is 74.19 between 1960 to 2013; the coefficient of variation for Sub-Saharan Africa is 64.71 over the same period.[11] Chinese official development assistance is a small fraction of Kenya's total aid flows. Figure 30 shows Kenya's top sources of official development assistance in 2013.
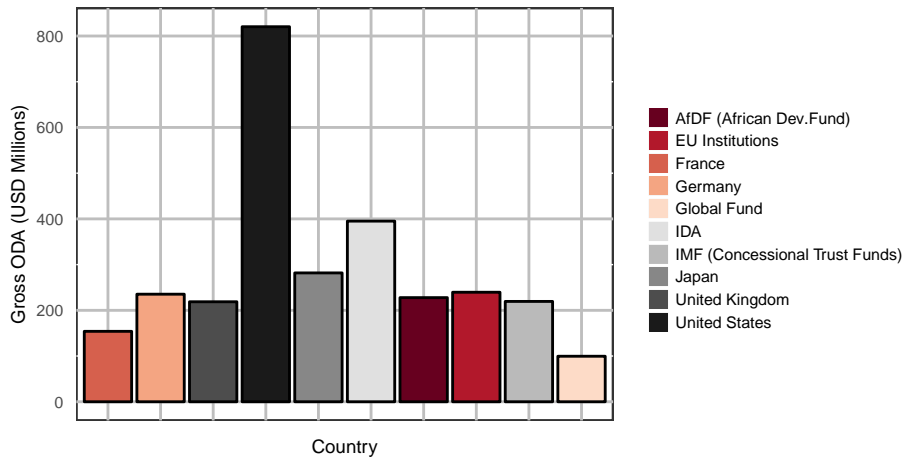
Figure 30: US is a top donor for Kenya. Chinese finance does not meet OECD/DAC aid criteria (2013)

Source: OECD DAC aid database 2015

China is not a member of OECD donors   China is absent from the top ten donors because it is not a member of the OECD, so little of Chinese financing qualifies as official development assistance under the standard OECD definition (Bräutigam 2011). Figure 31 gives a sectoral distribution of aid to Kenya. Overall, aid to the health and population sector is the highest at US $574.3 million (31 percent) followed by economic infrastructure and services at US $407.5 million (22 percent).

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[11]The coefficient of variation is the ratio of the standard deviation to the mean:

$$C_v = \frac{\sigma}{|\mu|}$$

where μ is the average and σ is the standard deviation.
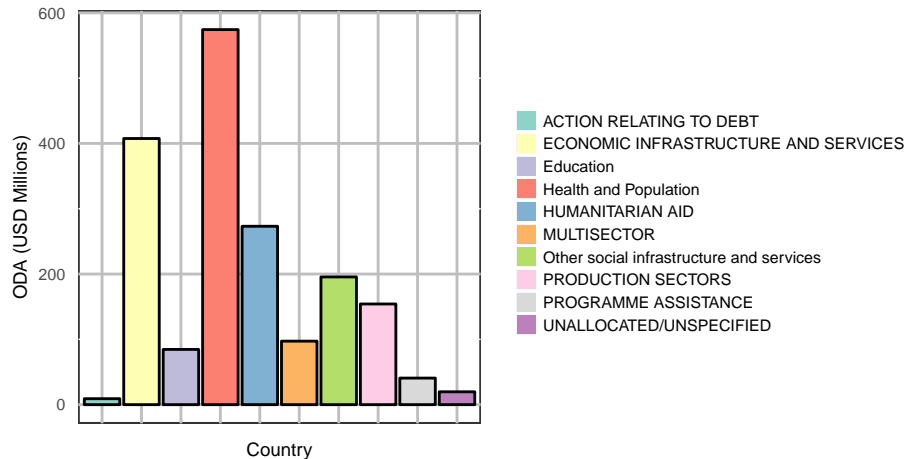
Figure 31: Kenya receives the most aid in health and populations services (China excluded) (2013)

Source: OECD DAC aid database 2015

4.2 Most Chinese financing does not qualify as ODA

The OECD Development Assistance Committee (DAC) calls export credits and loans with a less than 25 percent grant element other official flows (OOF); much of China's financing overseas would fall under this category. The Chinese development bank, for example, created an China Africa development fund which provides equity investment capital. The ministry of finance also subsidizes the Exim bank's preferential export credits and foreign aid loans, paying the difference between the interest rate and the actual cost of the loan. 97 percent of Chinese Exim Bank financing is in suppliers' credits and other official flows, and the remaining three percent is in foreign aid (Bräutigam 2011). China gives most of its official financing at competitive commercial rates with a maturity of 12 to 15 years and a grace period of two to five years (Bräutigam 2011).

4.2.1 China loans the most to ministries of energy and petroleum and transport and infrastructure

China's aid to Kenya is almost entirely loans. The government of China gave a total of KSH 20.6 billion (US $200.6 million) in loans for development expenditure for the fiscal year ending in 2015, and figure 32 shows their destinations (Ministry of Finance 2014). China gave KSH 12 billion (US $120 million) to the ministry of energy and petroleum, KSH 5.6 billion (US $56 million) to the ministry of transport and infrastructure, and KSH 2.5 billion (US $25 million) to the ministry of information, communications and technology (ICT). The ministry of energy and petroleum amount includes the large geothermal loans from China EXIM bank. China's loan breakdown matches its focus on natural resource extraction and infrastructure upgrading in many countries in Sub-Saharan Africa. Loans to the information, communication and technology sector go together with its investments in the communications sector (figure 23) and its strategy of using Kenya for access to the regional market. The small amount given to support devolution —the decentralization of roles and resources to the lowest levels of government —supports China's non-interference foreign policy.
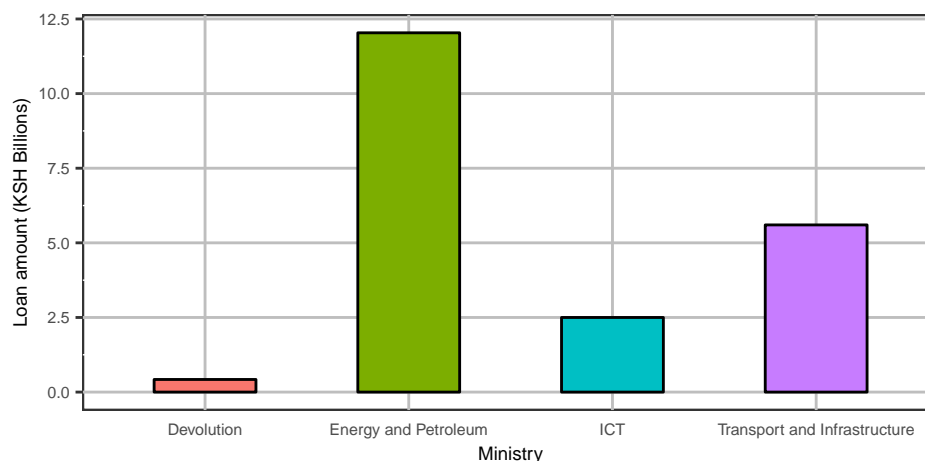
Figure 32: Ministry of Energy and Petroleum receives most loans from China (2014)

Source: Estimates of Development Expenditure Government of Kenya (2014)

4.2.2   Chinese stands out in education aid

China is quite active in the education sector in Kenya and provides a number of training programs, university scholarships and language programs. Recent data is hard to gather, but China spent roughly US \$120,000 on volunteers and US \$1.2 million on trainings in 2010 (UNESCO 2015). Education aid is a small percentage of China's bilateral loans and aid, but education is also a small part of the overall aid budget for traditional donors (figure 31). In 2011, China built St. Francis Sivo Primary School and four other primary schools in 2012 at an estimated cost of US \$400,000, supported in part by China Youth Development Foundation (UNESCO 2015).

China focuses on scholarships, vocational and professional programs, less on the formal education sector   China's Nanjing Agricultural University (NAU) and Egerton University began a partnership in 1994 that created fellowships for Egerton students to study and work in Nanjing. The program has trained 200 agricultural technicians to date from ten countries in East Africa (UNESCO 2015). From 2004 to 2008, China trained 697 Kenyans in short courses, focusing on agricultural technology. China offers more than 50 short courses on topics such as hydropower technology, malaria control, and hybrid rice technology (King 2010). Since 1984, China provided ten annual scholarhips to Kenyans and 40 annual scholarships in 2007. By 2013, China had more than 300 Kenyans studying in China. China offered 34 scholarships in 2015 (Ministry of Education Kenya 2015).

Growing interest in Chinese language study in Kenya   China also offers language scholarships: in 2009, the Confucious Institute at the University of Nairobi offered 49 language scholarships and the China information and culture communication center sent 40 self-sponsored students to China for language study (King 2010). China is becoming a more popular educational destination for Kenyans. Even without financial assistance, Kenyans find the competitve cost of Chinese universities attractive. As China's influence in Kenya grows, the popularity of languages studies will likely rise. The Kenya Institute of Curriculum Design and Kenyatta University, for instance,

are developing plans to offer Chinese language classes in primary and secondary schools (KICD 2014).

4.3   Lack of quality Chinese aid data

Since OECD and other official sources do not track China's aid, researchers at AidData have created their own database of Chinese aid to Africa.[12] The database uses media reports, government investment websites, and other official sources to calculate the total amount of Chinese development finance to various African countries by project. The data collection occurs in two stages. First, researchers look through Factiva, a Dow-Jones owned media search engine, to identify media reports about aid projects in various countries. The team also uses donor and recipient country government websites to search for projects that they may have missed in the initial Factiva search (Strange *et al* 2013). After selecting the first group of projects, AidData re-searches using Google and other country search engines such as Baidu to retrieve the date, location, project cost, financial details, and status of the project. AidData then uses other staff members to review project details and information sources to correct mistakes.

4.3.1   Drawbacks of existing Chinese aid data: Media based data collection is problematic

Compiling data from various sources to create something usable for analysis is commendable and brings more transparency to the debate on Chinese aid. Since the database is open source, anyone can suggest improvements and make corrections, allowing the database to improve with time. Relying on media reports, however, is problematic. Newspapers often report inaccurate information on the size and type of financial flows, or cover projects that are later cancelled. 6 of 20 Chinese deals cited in an AidData paper, for example, never actually happened, and China only financed 38 percent of the Merowe hydropower project in South Sudan. The authors, as a result, find that the total of the 20 Chinese deals was US $38 billion when the actual total is only US $9 billion (Bräutigam 2013).

Data entry from media reports is also error-prone and classifying aid flows is hardly straightforward. Selection bias is also a problem with media-based data collection: only projects that journalists write about make it to the aid figures. Although AidData includes English and Chinese language media reports, researchers may also overlook other resources such as local newspapers in other languages or those only published in print. Given the issues with media data collection, we decide not to report aid numbers from these databases, and we will wait for a time when the open source community and researchers have had more time to correct errors.

5   Review and future directions

FDI is usually beneficial for small countries when they have the capacity to absorb the investment. Chinese investment can become more transparent if Kenya can reduce corruption and promote good governance. Reforms in the rule of law and the regulatory environment will also help companies run more efficiently. Just as Jamaica promoted itself as an entry point to markets in the Caribbean, so too can Kenya continue to encourage Chinese companies to use Kenya as an entry

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[12]See china.aiddata.org

point to markets in Eastern and Southern Africa, particularly the East African community (EAC) and the Common Market for Eastern and Southern Africa (COMESA) (UNCTAD 2010). More sophisticated Chinese companies in Kenya may enhance spillover effects and improve technology transfer.

5.1 Consider the long term growth of local industry

While there are certainly benefits to more competition, policy makers must also consider the long-term growth of labor-intensive local industries. One of the major failings of the SGR project is the near-exclusion of local suppliers. Local manufacturers were only able to supply cement and a neglibible amount of steel to SGR; contracters imported the rest of the materials from China. Local manufacturers missed a valuable opportunity for capacity building, knowledge sharing and long-term job creation. A positive outcome of SGR however, was that Chinese competition forced some local cement manufacturers to upgrade their standards. Policy makers can design policies to help form linkages between small Kenyan firms, technical institutes, and Chinese contracters, treating the SGR project as a learning experience. With greater linkages, future infrastructure projects can draw from a larger pool of skilled labor and cut its costs. Inefficient Kenyan firms will close; firms that upgrade technology can enter the market, produce efficiently, and improve consumer welfare (UNCTAD 2010).

5.1.1 SGR spotlight: Non-existent capacity building

On 19 September 2015, the president chaired a Cabinet Steering committee meeting with the China Road and Bridge Corporation (CRBC) on the progress of the SGR construction from Mombasa to Nairobi.

Nearly half of civil work construction is complete   As of 31 August 2015, 49 percent of the construction of civil work such as bridges, culverts and sub-grade is complete.

Employment

- 25000 skilled and unskilled local laborers
- 17000 directly employed
- 7000 indirectly employed
- 2000 Chinese expatriates

Local content: dropping the ball on Phase 1, Mombasa to Nairobi   The panel said that purchases of local content was 30 billion KSH (US $304.6 million) by 31 August 2015. The involvement of local suppliers, however, was low. Prior to private sector engagement, CRBC imported 6000 tons of cement; afterwards, cement companies managed to supply the remainder. Construction used negligible local steel and imported all other materials (Private sector, SGR consortium 2015). Since they do not have VAT exemption, local traders and suppliers

cannot compete with Chinese contractors; they also pay many other taxes and fees that Chinese firm bypass. Local traders and suppliers are still waiting for VAT reimbursements to date; without VAT reimburesments, local private sector cannot supply goods on time and are essentially shut out.

Industrial parks along SGR The ministry of industrialization wants to place industrial zones along the SGR route and has already targeted land in Mariakani, Emali, Voi, Naivasha, and Athi River. At the moment, the ministry is seeking funding and commercial contracts are awaiting approval.

Construction of Phase 2 from Nairobi to Malaba: Local content still an afterthought The president requested for skills building and local content manufacturing on the next portion of the railway between Nairobi and Malaba. Attendees discussed including a specific requirement for local provision, but the extension of Phase 1 to Naivasha has already started. CRBC claims to have a capacity building program in place and mentioned a plan to rebuild the railway technical institute near Nairobi's Wilson airport. No concrete plans for the program or the institute, though, are in place. Without a formal plan, capacity building will be forgotten. During phase one from Mombasa to Nairobi, CRBC also said they would consider local content and skills, but they did not have any obligation to buy from local private sector or build local capacity: they ended up importing the bulk of the materials from China. A repeat of Phase 1 will deny the next generation of local industry a valuable opportunity to learn, upgrade technologies, and gain efficiency.

New developments: Engagement with private sector The private sector has established the Kenya Industry Sector Board Working Group and Linkage of Industry with Academia (LIWA) to promote dialogue and action across private sector, academia, and government. LIWA is working to help vocational institutes tailor curriculums that match the skills that industries demand. Cross-cutting groups can work around barriers to improving skills and standards; they also ensure that stakeholders voice concerns before the start of large infrastructure projects. An agreement among all stakeholders will result in a conscious effort on creating jobs and advancing training and research (Private Sector, SGR consortium 2015).

5.2 Diversify FDI sources to avoid overreliance on China

China is a rapidly rising source of FDI, but Kenya must continue to attract FDI from other sources to avoid a dependency on Chinese FDI. Kenya performs poorly in attracting FDI relative to its potential, and it must improve its efforts at marketing investment opportunities to Chinese as well as other Asian firms to increase FDI inflows. Kenya can attract FDI sources for much needed infrastructure investment that will lead to more FDI in other sectors, lessening the dependence on China. In other words, improving infrastructure, reforming taxes, and cutting labor costs should help Kenya attract more FDI in general; diverse FDI sources can serve as insurance against financial shocks and China's future slowed growth (UNCTAD 2010).

5.3   Monitor debt levels from China

Kenya still has a heavy debt burden and China's loans can bring debt to unsustainable levels. Some of China's loans are nonconcessional, which can raise debt to GDP levels quickly. As of 30 June 2015, Kenya's gross public debt to GDP ratio was 49.7 percent, and external loans contributed to the KSH 420.9 billion (US $4.3 billion) increase in public debt from June 2014 (National Treasury 2015). China is already Kenya's top source of external financing. Figure 34 shows Kenya's top external creditors as of June 2015. China holds the largest amount of debt at US $2.6 billion, 57 percent of Kenya's total debt of US $4.51 billion. China's large proportion of public debt may be part of the trend of partnerships between developing countries.

5.3.1   Debt to China is growing quickly

China's loans for energy and infrastructure investments such as SGR and geothermal power are accumulating quickly. Figure 33 shows Kenya's external debt to China from 2010 to 2014[13]. Debt grew at an annual rate of 54 percent between 2010 and 2014, reaching US $821 million in 2014 from just US $146 million in 2010. Figure 35 shows the growth of debt to China from the third quarter of 2014 to the second quarter of 2015. China's stock of Kenyan debt rate grew at 16.5 percent per quarter from US $ 753.3 million to US $2.56 billion; Kenya's other top sources of debt stagnated or even declined. Kenya's debt to Japan fell 2.98 percent per quarter and France declined 0.58 percent per quarter. Traditional donors must coordinate efforts with China to avoid undermining governance and debt sustainability programs.
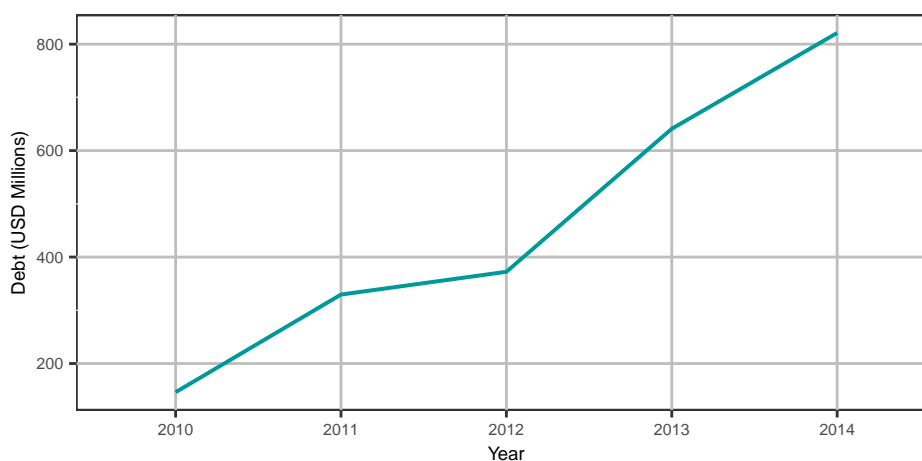
Figure 33: Kenya's debt to China is growing quickly (2010-2014)

Source: Kenya National Bureau of Statistics Economic Survey 2015

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[13]Here 1 USD = 98.48 KSH. We take this from the UN Operational Rates of Exchange Effective date 30 Jun 2015
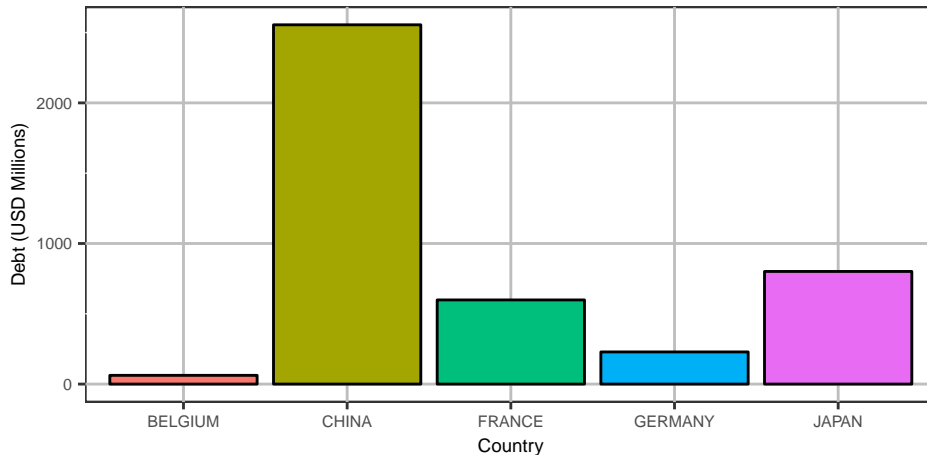
Figure 34: Kenya owes most debt to China (2015)

Source: The National Treasury of Kenya (2015)
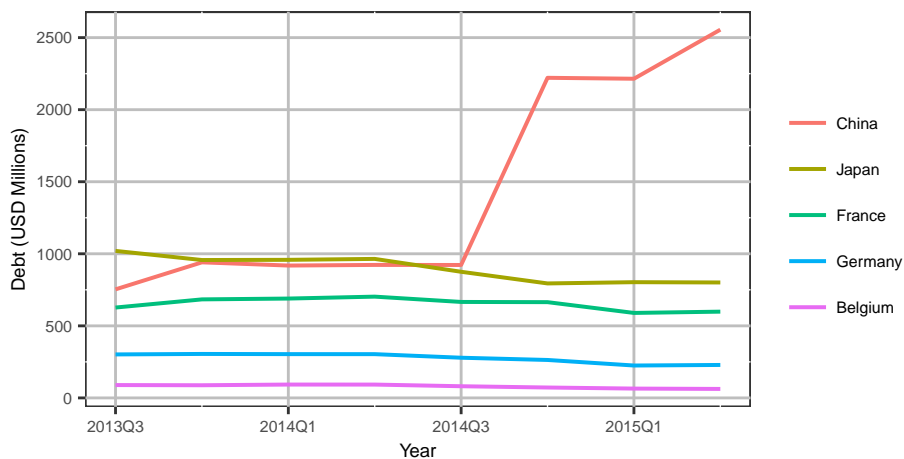
Figure 35: Kenya's debt to China outpaces the rest (2015)

Source: The National Treasury of Kenya (2015)

5.4   Supply-side Shortages: Reducing labor costs

Chinese firms may see Kenya's lower labor cost as an advantage, but the unit labor cost is still quite high. The unit cost of labor in Kenya is 25 percent of the value added, but is only 15 percent of value added in China. The combination of low wages and high productivity results in a low unit cost of production for Chinese workers; low productivity, however, raises the unit labor cost of Kenyan labor. Reducing the unit cost of labor —wages increases should at most match productivity increases —through employment subsidies or reduction of formal sector wages can attract more Chinese firms aiming to take advantage of the low cost Kenyan labor force, especially firms that are developing export businesses to the United States after the renewal of AGOA. It may also help export competitiveness generally and help to reduce the overall trade deficit.

5.4.1 Encourage technology transfer and capacity building with infrastructure projects

Chinese firms involved in labor-intensive activities identified the lack of a skilled workforce as a constraint to doing business in Kenya (SACE 2014). The language barrier is a constraint for skills transfer, but Kenya may continue to promote Chinese language training. Many Kenyans are already learning Chinese and the government of China offered 34 full scholarships to study in China in 2015; greater numbers of Kenyans learning Chinese will lower language barriers on both sides. Policy makers can also help initiatives such as LIWA to create links between Chinese firms and Kenyan universities and training institutes to address key skills gaps. At the China-Africa summit in Johannesburg on 4 December 2015, China pledged to support capacity building in Africa and build five "Jiao Tong", or transportation universities that train scientists, engineers, and technicians; leaders should negotiate for a "Jiao Tong" in Kenya, a step that will ensure more technology transfer and skills development. The literature suggests that FDI creates an opportunity for domestic firms to enter and supply inputs to foreign firms, increasing labor demand. Since requiring local content is prohibited under the WTO Trade Related Investment Measures (TRIM) agreement, Kenya can seek alternatives to promote local content. For example, Estonia offered funds to large companies to develop linkages with local suppliers, and Jamaica took a "cluster" approach that attracted FDI to sectors that could exploit synergies (UNCTAD 2010). Similarly, Kenya can build capacity in small and medium entreprises (SME) to supply Chinese businesses by connecting local suppliers to large Chinese companies.

But Kenya should not push too hard for domestic content   Though many countries have local content laws, Kenya should be careful to avoid overpushing for domestic content. Grossman (1981) finds that requiring local content is equivalent to taxing the foreign firm, hurting efforts to increase and diversify FDI, and in some cases even lowering domestic value added. In fact, firms will fail to meet the local content requirement if the cost of the foreign intermediate good is less than the cost of buying enough of the domestic intermediate good to meet the content requirement. Chinese companies import 59 percent of inputs from China because they are cheaper than local goods; restricting foreign inputs may be unprofitable for Chinese firms. When promoting local content, Kenya can also look to improve the competitiveness of local industry so firms naturally move towards local products. It can also offer support to companies that develop linkages with local firms.

5.4.2 Bring more transparency to loans and infrastructure projects

China's loans come with attractive interest rates and without strings attached for good governance. Though Kenya faces few conditions on its aid, other countries in Sub-Saharan Africa leverage China's financing to gain bargaining power with traditional donors.[14] The loans, however, could harm Kenya in the long-run because of their lack of transparency and failure to tie aid to key governance reforms. Traditional donors can work to help China follow the environmental protection standards, and civil society groups can demand increased transparency in aid and finance, pushing Chinese and non-Chinese firms in the natural resources sector to involve themselves in the Extractive Industries Transparency Initiative (EITI) and report payments made to the government.

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[14]Angola turned down financing from the IMF that required measures to improve transparency in the oil sector, and accepted US $2 billion in loans from the Chinese EXIM bank (Davies 2007)

5.4.3 Special Economic Zones

Kenya's export processing zones have acheived some diversification in manufacturing FDI, but garment manufacturing is still the majority of employment and investment. Table 4 provides the distribution of FDI by sector in the export processing zones (EPZ). The garment sector is the largest within the EPZ: it is 79.7 percent of employment, 53.1 percent of exports, 48.9 percent of total sales, 26.9 percent of firms, and attracts 27.9 percent of investment. Notably, Kenya has managed some diversification in the EPZs; the agro-processing sector contributes 11 percent of employment, 15.9 percent of export sales, 14.7 percent of total sales, and 16.1 percent of investment. Services FDI has also increased within the EPZ. Farole (2011) finds that horticultural and food-processing, call centers, and human and veterinary pharmaceuticals have entered the zones. Despite the diversification, Kenya's EPZs have remained stagnant at just over US $400 million in exports since its inception during the 1990s. In addition, the EPZ program's exports relative to national levels are still small (Farole 2011). Firms operating inside the EPZ cannot sell products to the domestic market. Kenya can open sales to the domestic and regional market to stimulate Chinese and other foreign investment in the SEZs. The positive effects from the higher investment and improved infrastructure may help sales performance and employment growth in the SEZs (Farole 2011).

Table 4: Export Processing Zones sector contribution in 2012 (%)

Sector	Number of Firms	Employment	Exports	Total Sales	Investment
Agro processing	22	11	15.9	14.7	16.1
Beverages	4	0.5	0.9	0.8	0.6
Chemicals	1	0.2	0.1	0.1	2.9
Dartboard	1	0.7	1.5	1.4	1.8
Electricals	3.7	0.1	6.9	6.3	1.2
Food Processing	3.7	0.9	1.0	1.5	5.6
Garments	26.9	79.7	53.1	48.9	27.9
Garment supported services	6.1	0.1	0	0.1	0.2
Minerals, Metals, and Gemstones	4.9	1.2	8.2	7.5	20.3
Medicine and medical services	2.4	0.8	1	1.4	2.7
Plastics	6.1	1.3	1	1.3	3
Printing	1.2	0.7	1.5	7.5	6.2
Relief supplies	2.4	0.3	2.5	2.5	1.4
Services	12.2	2.5	6.4	6.0	10
Other	2.4	0.02	0.01	0.01	0.01
Total	100	100	100	100	100

Source: Adapted from Export Processing Zones Annual Report 2012

5.4.4 Conclusion

Greater competition from imports lowers consumer prices and gives some producers access to cheaper inputs and capital goods. Chinese imports do not necessarily displace domestic production, as they may replace imports from other countries, lowering the cost of imports. The imports could also boost labor productivity within certain sectors and increase employment in services. But Kenya must still work to improve its manufacturing sector to compete with China's low cost manufacturing; Kenyan producers have to upgrade their skills or specialize in areas where they have a comparative advantage. To improve exports, Kenya could negotiate for duty free access for cut flowers as part of the 404 primary products that China already allows to enter duty free. Exports to China, especially of services, may increase once China transitions to a consumption-driven economy closer to 2030. When focusing on trade, policy makers should shift attention to improving export competitiveness and the overall balance of trade. Kenya's exports need to improve overall, not just to China.

Chinese companies create a large number of local jobs, and they are the fifth largest employer from foreign direct investment in Kenya. Unlike in other places in Sub-Saharan Africa, China invests in more than natural resources in Kenya. Although metals investment is large, Chinese companies have also invested US$150.9 million in the communications sector, the second highest amount. China has also provided considerable financing for infrastructure, infrastructure that will help growth by lowering the cost of doing business. For future infrastructure projects, decision makers can create programs to encourage technology transfer with local firms and vocational institutes. Local industry will grow as more firms meet the standards to supply inputs for mega infrastructure projects, providing much needed jobs and skills. China is a business partner and is uninterested in the internal affairs of other countries. When considering opportunities, Kenya must remember local capacity development to absorb the most from investment and infrastructure projects. Our paper is not the final word, but the start of a discussion on China's economic influence in Kenya. We hope that future research will address data limitations in aid flows and investment, and examine what Chinese involvement means for growth and poverty reduction.

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Appendix A Gravity model of trade

Anderson (1979) provides the first attempt at a model of gravity under the assumptions that consumers have a desire for foreign goods and each country produces a unique good that it exports to the rest of the world. In the model, all consumers purchase at least some goods from all countries (UNCTAD/WTO 2012). Let X_{ij} be the bilateral trade flows between country i and country j, G be a constant term, Y_i and Y_j be country i and country j's GDPs, and D_{ij} be the distance between i and j. Then the simplified version of the gravity model is

$$X_{ij} = G \frac{Y_i Y_j}{D_{ij}} \tag{1}$$

.

Here bilateral trade increases with country i and j's GDPs and decreases with the distance between i and j. In general, a gravity equation can take the form of

$$X_{ij} = e^{\alpha} Y_i^{\beta_1} Y_j^{\beta_2} D_{ij}^{\beta_3} \tag{2}$$

where β_1 and β_2 equal one and β_3 is close to -1 which gives us (1). We can take advantage of the multiplicative form and express (2) in log form with an unobservable term u_{ij}, which gives

$$\ln X_{ij} = \alpha + \beta_1 \ln Y_i + \beta_2 \ln Y_j + \beta_3 \ln D_{ij} + u_{ij} \tag{3}$$

which allows us to estimate trade flows between i and j using a least squares approach with an easy interpretation of the coefficients as elasticities. Here we have added the unobservable term u_{ij}. Although (1) resembles the gravity equation from physics, it also has a grounding in economic theory. In fact, a wide range of trade theories can produce a gravity equation. Bergstrand (1985 and 1989) show that one can derive gravity from a monopolistic competition model from Paul Krugman (1980) (UNCTAD/WTO 2012). The monopolistic competition model does not assume that location of production matters for good differentation, and countries and firms specialize in the production of goods. Gravity can even arise in a perfect competition model. Eaton and Kortum (2002) show in the perfect competition model that the lowest cost producer across countries that produce a good will supply that particular good (Arkolakis 2012).

One typically estimates trade flows between i and j using a least squares approach with a simple interpretation of the coefficients as elasticities, but the OLS model is biased because it fails to account for zero reported trade; the Poisson model is better suited to handle a large number of observations with zero trade (Santos Silva and Tenreyo 2006). Let the exporter i be Kenya for all time t. Let X_{ijt} be the export volume, β_0 be a constant term, Y_{it} be the GDP of the exporter, Y_{jt} be the importer GDP, N_{it} be the exporter population, N_{jt} be the importer population, D_{ijt} be the bilateral distance between i and j, and Z_{ijt} be a vector of characteristics that include information on colonial histories, regional trade agreements, year dummies, a China dummy variable and China×year interaction dummies.

$$X_{ijt} = \exp(\beta_0 + \beta_1 Y_{it} + \beta_2 Y_{jt} + \beta_3 N_{it} + \beta_4 N_{jt} + \delta D_{ijt} + \mathbf{Z}_{ijt}\gamma) + u_{ijt} \tag{4}$$

A.1 Model

Anderson (2003) develop a theoretical model for gravity equations. Let w_i be the unit price of a good produced in country i and τ_{ij} be the transport cost from country i to j. Let N be the number of countries. Here we follow the convention that costs are "iceberg" meaning that some fraction of the goods shipped from i to j will not arrive. Let $w_i\tau_{ij}$ be the price the importer in country j pays at the port. The constant elasticity of substitution (CES) price index is given by

$$P_j^{1-\sigma} = \sum_{i=1}^{N}(w_i\tau_{ij})^{1-\sigma} \tag{5}$$

where $P_j^{1-\sigma}$ is the price index for country j and σ is the elasticity of substitution, or the measure of substitutability between goods. The representative consumer utility in country j is

$$U_j = \left(\sum_{i=1}^{N} \alpha_i^{\frac{1-\sigma}{\sigma}} c_{ij}^{\frac{\sigma-1}{\sigma}} \right)^{\frac{\sigma}{1-\sigma}} \tag{6}$$

subject to the budget constraint $y_j = \sum_{i=1}^{N} w_i\tau_{ij}c_{ij}$. Here $0 < \alpha < \infty$ is a given preference parameter and c_{ij} is the consumption level of good i in country j. Then from the CES utility function, we can get the demand function of

$$x_{ij} = \left(\frac{\alpha_i w_i \tau_{ij}}{P_j} \right)^{1-\sigma} y_j. \tag{7}$$

Now let the value of aggregate production be $y_i = \sum_{j=1}^{N} x_{ij}$, meaning that output matches the total demand of good i. Substituting (7) we get

$$y_i = (\alpha_i w_i)^{1-\sigma} \sum_{j=1}^{N} \left(\frac{\tau_{ij}}{P_j} \right)^{1-\sigma} y_j, \quad (i = 1, \ldots, N). \tag{8}$$

Now let $y_w = \sum_{j=1}^{N} y_j$ be world income. If we solve (8) for $(\alpha_i w_i)^{1-\sigma}$ and then substitute into (7) we obtain

$$x_{ij} = \frac{y_i y_j \tau_{ij}^{1-\sigma}}{\sum_{j=1}^{N} \left(\frac{\tau_{ij}}{P_j} \right)^{1-\sigma} y_j P_j^{1-\sigma}} = \frac{y_i y_j \tau_{ij}^{1-\sigma}}{y_w \sum_{j=1}^{N} \left(\frac{\tau_{ij}}{P_j} \right)^{1-\sigma} \frac{y_j}{y_w} P_j^{1-\sigma}}. \tag{9}$$

Let

$$\Pi_i = \left(\sum_{j=1}^{N} \left(\frac{\tau_{ij}}{P_j} \right)^{1-\sigma} \frac{y_j}{y_w} \right)^{\frac{1}{1-\sigma}} \tag{10}$$

be the exporter ease of access from country i to j. Similarly, we can define the importer ease of access by substituting (8) solved for $\alpha_i w_i^{1-\sigma}$ into (5) to get

$$P_j^{1-\sigma} = \sum_{i=1}^{N} \left(\frac{y_i \tau_{ij}}{\sum_{j=1}^{N} \left(\frac{\tau_{ij}}{P_j} \right)^{1-\sigma} y_j} \right)^{1-\sigma}$$

$$= \sum_{i=1}^{N} \left(\frac{y_i \tau_{ij}}{y_w \sum_{j=1}^{N} \left(\frac{\tau_{ij}}{P_j} \right)^{1-\sigma} \frac{y_j}{y_w}} \right)^{1-\sigma} \tag{11}$$

$$= \sum_{i=1}^{N} \frac{y_i}{y_w} \left(\frac{\tau_{ij}}{\Pi_i} \right)^{1-\sigma}.$$

A key simplifiying assumption of symmetric trade costs or $\tau_{ij} = \tau_{ji}$ allows us to write $\Pi_i = P_i$. So we now have

$$P_j^{1-\sigma} = \sum_{i=1}^{N} \left(\frac{\tau_{ij}}{P_i} \right)^{1-\sigma} \frac{y_i}{y_w} \tag{12}$$

and we can recover a familiar form of the gravity equation

$$x_{ij} = \frac{y_i y_j}{y_w} \left(\frac{\tau_{ij}}{P_i P_j} \right)^{1-\sigma}. \tag{13}$$

Appendix B   Gravity Data

We conduct our analysis using a data set covering bilateral trade between all pairs of countries from 1948 to 2014 used in Head *et al* (2010)[15]; we extend the data to include bilateral trade up to 2014 with information from UN Comtrade. A detailed explanation and codebook of the data are found in the appendix of Head *et al* (2010). However, one key aspect of the data is the treatment of missing trade flows. A trade flow of zero will cause problems for the log transformations. The authors therefore include only non-zero trade flows in the data. While this leads to selection bias, other forms of dealing zero flows are also unsatisfactory. For example, a common practice is to add one to zero trade flows which yields incorrect estimates because it does not truly reflect the underlying values (UNCTAD/WTO 2012). Another common technique is to use a Poisson maximum likelihood estimator that deals directly with zeros. However estimates will be biased if there is a large number of zeros in the data. Tobit estimation, which can also handle zero trade, imposes assumptions of the unobservable term u_{ijt} that are too strong, namely log normality and homoskedasticity. Choosing a left censor or lower bound also presents problems because estimates are highly sensitive to the choice of left censor value, or the value assigned to zero trade. Hence, in using this data set we have also dropped zero trade flows.

Appendix C   Results

Table C5: Estimates of Kenya's Trade Flows (1948-2014). Dependent variable: Kenya's exports

	Pooled OLS	Fixed Effects	Random Effects
Constant	5.26 (0.61)***		5.26 (0.61)***
Kenya GDP per capita (Log)	0.95 (0.13)***		0.95 (0.13)***
Importer GDP per capita (Log)	0.64 (0.02)***	0.69 (0.03)***	0.64 (0.02)***
Population Kenya (Log)	−1.47 (0.14)***		−1.47 (0.14)***
Importer Population (Log)	0.42 (0.01)***	0.64 (0.03)***	0.42 (0.01)***
Distance (log)	−1.25 (0.05)***	−1.31 (0.10)***	−1.25 (0.05)***
Regional Trade Agreement	1.73 (0.13)***	1.80 (0.15)***	1.73 (0.13)***
Contiguous	1.14 (0.14)***	0.77 (0.17)***	1.14 (0.14)***
Common Language	0.67 (0.06)***	0.92 (0.08)***	0.67 (0.06)***
GATT Kenya	−1.36 (0.12)***	−1.33 (0.11)***	−1.36 (0.12)***
GATT importer	0.09 (0.06)	−0.05 (0.05)	0.09 (0.06)
Colonial History	2.88 (0.14)***	2.16 (0.11)***	2.88 (0.14)***
China dummy	1.11 (0.19)***		1.11 (0.19)***
Year dummies			
Year1949	−0.04 (0.37)	0.04 (0.40)	−0.04 (0.37)
Year1950	0.01 (0.37)	0.03 (0.38)	0.01 (0.37)
Year1951	−0.25 (0.37)	−0.25 (0.35)	−0.25 (0.37)
Year1952	0.39 (0.40)	0.46 (0.40)	0.39 (0.40)
Year1953	0.68 (0.35)	0.81 (0.39)*	0.68 (0.35)
Year1954	0.14 (0.34)	0.31 (0.30)	0.14 (0.34)
Year1955	−0.02 (0.35)	0.13 (0.34)	−0.02 (0.35)
Year1956	−0.43 (0.37)	−0.34 (0.36)	−0.43 (0.37)
Year1957	−0.32 (0.38)	−0.24 (0.38)	−0.32 (0.38)
Year1958	0.01 (0.34)	0.20 (0.36)	0.01 (0.34)
Year1959	−0.49 (0.35)	−0.37 (0.34)	−0.49 (0.35)
Year1960	0.21 (0.34)	0.36 (0.34)	0.21 (0.34)
Year1961	0.08 (0.33)	0.30 (0.29)	0.08 (0.33)
Year1962	0.29 (0.31)	0.41 (0.30)	0.29 (0.31)
Year1963	0.11 (0.33)	0.22 (0.31)	0.11 (0.33)
Year1964	0.11 (0.36)	0.14 (0.29)	0.11 (0.36)
Year1965	0.01 (0.34)	0.04 (0.33)	0.01 (0.34)
Year1966	0.19 (0.35)	0.16 (0.35)	0.19 (0.35)
Year1967	−0.16 (0.33)	−0.14 (0.30)	−0.16 (0.33)
Year1968	0.40 (0.32)	0.54 (0.32)	0.40 (0.32)
Year1969	0.18 (0.32)	0.27 (0.29)	0.18 (0.32)
Year1970	−0.12 (0.33)	−0.05 (0.35)	−0.12 (0.33)
Year1971	0.16 (0.34)	0.18 (0.31)	0.16 (0.34)
Year1972	0.41 (0.32)	0.47 (0.34)	0.41 (0.32)
Year1973	0.08 (0.33)	0.19 (0.30)	0.08 (0.33)
Year1974	−0.13 (0.34)	−0.04 (0.35)	−0.13 (0.34)
Year1975	0.08 (0.32)	0.15 (0.30)	0.08 (0.32)
Year1976	0.03 (0.34)	0.05 (0.32)	0.03 (0.34)

	Pooled OLS	Fixed Effects	Random Effects
Year1977	0.41 (0.32)	0.46 (0.32)	0.41 (0.32)
Year1978	−0.04 (0.34)	0.06 (0.34)	−0.04 (0.34)
Year1979	−0.01 (0.33)	0.03 (0.34)	−0.01 (0.33)
Year1980	0.15 (0.33)	0.16 (0.31)	0.15 (0.33)
Year1981	−0.09 (0.33)	0.06 (0.32)	−0.09 (0.33)
Year1982	0.37 (0.33)	0.42 (0.29)	0.37 (0.33)
Year1983	0.18 (0.34)	0.19 (0.37)	0.18 (0.34)
Year1984	−0.22 (0.33)	−0.11 (0.31)	−0.22 (0.33)
Year1985	0.03 (0.34)	0.03 (0.29)	0.03 (0.34)
Year1986	−0.19 (0.33)	−0.24 (0.32)	−0.19 (0.33)
Year1987	0.33 (0.33)	0.31 (0.29)	0.33 (0.33)
Year1988	−0.02 (0.34)	0.11 (0.33)	−0.02 (0.34)
Year1989	0.34 (0.31)	0.38 (0.29)	0.34 (0.31)
Year1990	0.01 (0.31)	0.07 (0.29)	0.01 (0.31)
Year1991	−0.16 (0.35)	−0.18 (0.35)	−0.16 (0.35)
Year1992	0.24 (0.31)	0.26 (0.30)	0.24 (0.31)
Year1993	0.14 (0.31)	0.15 (0.31)	0.14 (0.31)
Year1994	−0.03 (0.33)	−0.03 (0.31)	−0.03 (0.33)
Year1995	0.14 (0.33)	0.16 (0.33)	0.14 (0.33)
Year1996	0.12 (0.32)	0.18 (0.32)	0.12 (0.32)
Year1997	0.17 (0.32)	0.22 (0.32)	0.17 (0.32)
Year1998	−0.09 (0.32)	−0.09 (0.26)	−0.09 (0.32)
Year1999	0.03 (0.31)	0.04 (0.31)	0.03 (0.31)
Year2000	0.11 (0.31)	0.12 (0.27)	0.11 (0.31)
Year2001	0.27 (0.31)	0.31 (0.31)	0.27 (0.31)
Year2002	0.11 (0.31)	0.15 (0.28)	0.11 (0.31)
Year2003	−0.01 (0.32)	−0.02 (0.34)	−0.01 (0.32)
Year2004	0.21 (0.31)	0.33 (0.32)	0.21 (0.31)
Year2005	0.24 (0.30)	0.32 (0.30)	0.24 (0.30)
Year2006	0.03 (0.31)	0.11 (0.29)	0.03 (0.31)
Year2007	−0.10 (0.33)	0.06 (0.32)	−0.10 (0.33)
Year2008	0.07 (0.36)	0.11 (0.36)	0.07 (0.36)
Year2009	0.10 (0.34)	0.19 (0.31)	0.10 (0.34)
Year2010	−0.13 (0.34)	−0.05 (0.35)	−0.13 (0.34)
Year2011	0.28 (0.34)	0.24 (0.33)	0.28 (0.34)
Year2012	0.03 (0.32)	0.10 (0.32)	0.03 (0.32)
Year2013	0.25 (0.33)	0.32 (0.31)	0.25 (0.33)
Year2014	0.18 (0.34)	0.16 (0.33)	0.18 (0.34)
Year China dummies			
China Year 1948		−0.45 (0.26)	
China Year 1956		0.62 (0.26)*	
China Year 1957		−0.34 (0.24)	
China Year 1959		0.55 (0.25)*	

	Pooled OLS	Fixed Effects	Random Effects
China Year 1960		$-0.75\ (0.25)^{**}$	
China Year 1961		$0.68\ (0.24)^{**}$	
China Year 1962		$0.58\ (0.17)^{***}$	
China Year 1964		$2.09\ (0.25)^{***}$	
China Year 1966		$-1.91\ (0.26)^{***}$	
China Year 1967		$0.93\ (0.19)^{***}$	
China Year 1968		$-4.49\ (0.22)^{***}$	
China Year 1969		$0.71\ (0.19)^{***}$	
China Year 1970		$-0.31\ (0.20)$	
China Year 1971		$-0.59\ (0.22)^{**}$	
China Year 1972		$-1.93\ (0.24)^{***}$	
China Year 1973		$2.03\ (0.23)^{***}$	
China Year 1974		$1.04\ (0.26)^{***}$	
China Year 1975		$-0.62\ (0.20)^{**}$	
China Year 1976		$1.67\ (0.22)^{***}$	
China Year 1977		$-1.53\ (0.19)^{***}$	
China Year 1978		$0.08\ (0.20)$	
China Year 1979		$2.19\ (0.22)^{***}$	
China Year 1981		$-1.07\ (0.23)^{***}$	
China Year 1982		$-2.46\ (0.24)^{***}$	
China Year 1983		$-1.60\ (0.26)^{***}$	
China Year 1984		$0.00\ (0.22)$	
China Year 1985		$1.14\ (0.17)^{***}$	
China Year 1986		$0.87\ (0.19)^{***}$	
China Year 1987		$1.84\ (0.21)^{***}$	
China Year 1988		$-1.02\ (0.28)^{***}$	
China Year 1989		$0.23\ (0.19)$	
China Year 1990		$-0.96\ (0.18)^{***}$	
China Year 1991		$0.75\ (0.24)^{**}$	
China Year 1992		$1.41\ (0.19)^{***}$	
China Year 1993		$-0.63\ (0.17)^{***}$	
China Year 1994		$1.02\ (0.20)^{***}$	
China Year 1995		$0.51\ (0.20)^{**}$	
China Year 1996		$-0.87\ (0.19)^{***}$	
China Year 1997		$-3.65\ (0.29)^{***}$	
China Year 1998		$-3.28\ (0.29)^{***}$	
China Year 1999		$1.14\ (0.17)^{***}$	
China Year 2000		$-0.02\ (0.18)$	
China Year 2001		$0.00\ (0.18)$	
China Year 2003		$-0.35\ (0.19)$	
China Year 2004		$-0.70\ (0.21)^{**}$	
China Year 2005		$-2.23\ (0.21)^{***}$	
China Year 2006		$-1.40\ (0.19)^{***}$	

	Pooled OLS	Fixed Effects	Random Effects
China Year 2009		$-2.73\ (0.20)^{***}$	
China Year 2010		$-0.07\ (0.27)$	
China Year 2011		$-0.28\ (0.19)$	
China Year 2012		$0.01\ (0.23)$	
China Year 2013		$-0.41\ (0.18)^{*}$	
China Year 2014		$1.42\ (0.19)^{***}$	
R^2	0.63	0.40	0.63
Adj. R^2	0.62	0.39	0.62
Num. obs.	6917	6917	6917

$^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$. Standard errors in parentheses.

Table C6: Estimates of China's Trade Flows (1948-2014). Dependent variable: China's exports

	Pooled OLS	Fixed Effects	Random Effects
Constant	$-7.78\ (1.31)^{***}$		$-7.78\ (1.31)^{***}$
China GDP per capita (Log)	$0.90\ (0.06)^{***}$		$0.90\ (0.06)^{***}$
Importer GDP per capita (Log)	$0.75\ (0.01)^{***}$	$0.74\ (0.01)^{***}$	$0.75\ (0.01)^{***}$
Population China (Log)	$0.40\ (0.23)$		$0.40\ (0.23)$
Importer Population (Log)	$0.80\ (0.01)^{***}$	$0.79\ (0.01)^{***}$	$0.80\ (0.01)^{***}$
Distance (log)	$-0.42\ (0.04)^{***}$	$-0.42\ (0.04)^{***}$	$-0.42\ (0.04)^{***}$
Regional Trade Agreement	$0.76\ (0.20)^{***}$	$0.81\ (0.21)^{***}$	$0.76\ (0.20)^{***}$
Contiguous	$0.31\ (0.10)^{**}$	$0.29\ (0.08)^{***}$	$0.31\ (0.10)^{**}$
Common Language	$1.40\ (0.10)^{***}$	$1.40\ (0.09)^{***}$	$1.40\ (0.10)^{***}$
GATT China	$0.44\ (0.06)^{***}$	$-0.47\ (0.28)$	$0.44\ (0.06)^{***}$
GATT importer	$0.14\ (0.04)^{***}$	$0.15\ (0.04)^{***}$	$0.14\ (0.04)^{***}$
Colonial History	$0.22\ (0.19)$	$0.19\ (0.27)$	$0.22\ (0.19)$
Kenya dummy	$0.26\ (0.10)^{**}$	$0.26\ (0.21)$	$0.26\ (0.10)^{**}$
Year dummies			
Year1949	$-0.30\ (0.25)$	$-0.29\ (0.26)$	$-0.30\ (0.25)$
Year1950	$-0.13\ (0.25)$	$-0.12\ (0.25)$	$-0.13\ (0.25)$
Year1951	$-0.15\ (0.23)$	$-0.15\ (0.25)$	$-0.15\ (0.23)$
Year1952	$-0.37\ (0.24)$	$-0.37\ (0.25)$	$-0.37\ (0.24)$
Year1953	$-0.28\ (0.26)$	$-0.27\ (0.25)$	$-0.28\ (0.26)$
Year1954	$-0.24\ (0.23)$	$-0.24\ (0.25)$	$-0.24\ (0.23)$
Year1955	$-0.27\ (0.22)$	$-0.27\ (0.24)$	$-0.27\ (0.22)$
Year1956	$-0.46\ (0.25)$	$-0.45\ (0.24)$	$-0.46\ (0.25)$
Year1957	$-0.19\ (0.20)$	$-0.19\ (0.24)$	$-0.19\ (0.20)$
Year1958	$-0.37\ (0.25)$	$-0.36\ (0.25)$	$-0.37\ (0.25)$
Year1959	$-0.30\ (0.23)$	$-0.28\ (0.24)$	$-0.30\ (0.23)$
Year1960	$-0.35\ (0.22)$	$-0.35\ (0.24)$	$-0.35\ (0.22)$
Year1961	$-0.33\ (0.23)$	$-0.29\ (0.24)$	$-0.33\ (0.23)$

	Pooled OLS	Fixed Effects	Random Effects
Year1962	$-0.45\ (0.22)^{*}$	$-0.43\ (0.23)$	$-0.45\ (0.22)^{*}$
Year1963	$-0.74\ (0.24)^{**}$	$-0.72\ (0.23)^{**}$	$-0.74\ (0.24)^{**}$
Year1964	$-0.29\ (0.22)$	$-0.28\ (0.23)$	$-0.29\ (0.22)$
Year1965	$-0.26\ (0.22)$	$-0.19\ (0.23)$	$-0.26\ (0.22)$
Year1966	$-0.35\ (0.21)$	$-0.32\ (0.23)$	$-0.35\ (0.21)$
Year1967	$-0.63\ (0.22)^{**}$	$-0.60\ (0.23)^{**}$	$-0.63\ (0.22)^{**}$
Year1968	$-0.26\ (0.21)$	$-0.22\ (0.22)$	$-0.26\ (0.21)$
Year1969	$-0.34\ (0.20)$	$-0.31\ (0.23)$	$-0.34\ (0.20)$
Year1970	$-0.37\ (0.21)$	$-0.35\ (0.22)$	$-0.37\ (0.21)$
Year1971	$-0.28\ (0.22)$	$-0.27\ (0.23)$	$-0.28\ (0.22)$
Year1972	$-0.29\ (0.20)$	$-0.29\ (0.22)$	$-0.29\ (0.20)$
Year1973	$-0.36\ (0.20)$	$-0.35\ (0.22)$	$-0.36\ (0.20)$
Year1974	$-0.41\ (0.22)$	$-0.41\ (0.22)$	$-0.41\ (0.22)$
Year1975	$-0.30\ (0.21)$	$-0.28\ (0.22)$	$-0.30\ (0.21)$
Year1976	$-0.25\ (0.20)$	$-0.25\ (0.22)$	$-0.25\ (0.20)$
Year1977	$-0.44\ (0.21)^{*}$	$-0.42\ (0.22)$	$-0.44\ (0.21)^{*}$
Year1978	$-0.35\ (0.20)$	$-0.34\ (0.22)$	$-0.35\ (0.20)$
Year1979	$-0.48\ (0.21)^{*}$	$-0.45\ (0.22)^{*}$	$-0.48\ (0.21)^{*}$
Year1980	$-0.15\ (0.21)$	$-0.11\ (0.22)$	$-0.15\ (0.21)$
Year1981	$-0.36\ (0.21)$	$-0.36\ (0.22)$	$-0.36\ (0.21)$
Year1982	$-0.08\ (0.20)$	$-0.09\ (0.22)$	$-0.08\ (0.20)$
Year1983	$-0.41\ (0.20)^{*}$	$-0.43\ (0.22)^{*}$	$-0.41\ (0.20)^{*}$
Year1984	$-0.55\ (0.21)^{**}$	$-0.55\ (0.22)^{*}$	$-0.55\ (0.21)^{**}$
Year1985	$-0.53\ (0.20)^{**}$	$-0.55\ (0.22)^{*}$	$-0.53\ (0.20)^{**}$
Year1986	$-0.33\ (0.20)$	$-0.33\ (0.22)$	$-0.33\ (0.20)$
Year1987	$-0.54\ (0.19)^{**}$	$-0.53\ (0.22)^{*}$	$-0.54\ (0.19)^{**}$
Year1988	$-0.23\ (0.19)$	$-0.17\ (0.22)$	$-0.23\ (0.19)$
Year1989	$-0.39\ (0.20)^{*}$	$-0.38\ (0.21)$	$-0.39\ (0.20)^{*}$
Year1990	$-0.42\ (0.20)^{*}$	$-0.41\ (0.22)$	$-0.42\ (0.20)^{*}$
Year1991	$-0.30\ (0.19)$	$-0.30\ (0.21)$	$-0.30\ (0.19)$
Year1992	$-0.47\ (0.20)^{*}$	$-0.46\ (0.21)^{*}$	$-0.47\ (0.20)^{*}$
Year1993	$-0.61\ (0.20)^{**}$	$-0.60\ (0.21)^{**}$	$-0.61\ (0.20)^{**}$
Year1994	$-0.60\ (0.20)^{**}$	$-0.59\ (0.21)^{**}$	$-0.60\ (0.20)^{**}$
Year1995	$-0.39\ (0.19)^{*}$	$-0.38\ (0.21)$	$-0.39\ (0.19)^{*}$
Year1996	$-0.33\ (0.20)$	$-0.32\ (0.21)$	$-0.33\ (0.20)$
Year1997	$-0.32\ (0.20)$	$-0.34\ (0.21)$	$-0.32\ (0.20)$
Year1998	$-0.22\ (0.19)$	$-0.24\ (0.21)$	$-0.22\ (0.19)$
Year1999	$-0.55\ (0.19)^{**}$	$-0.56\ (0.21)^{**}$	$-0.55\ (0.19)^{**}$
Year2000	$-0.33\ (0.19)$	$-0.34\ (0.21)$	$-0.33\ (0.19)$
Year2001	$-0.45\ (0.21)^{*}$	$-0.46\ (0.21)^{*}$	$-0.45\ (0.21)^{*}$
Year2002	$-0.56\ (0.20)^{**}$	$-0.55\ (0.21)^{**}$	$-0.56\ (0.20)^{**}$
Year2003	$-0.48\ (0.19)^{*}$	$-0.47\ (0.21)^{*}$	$-0.48\ (0.19)^{*}$
Year2004	$-0.48\ (0.19)^{*}$	$-0.51\ (0.21)^{*}$	$-0.48\ (0.19)^{*}$

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	Pooled OLS	Fixed Effects	Random Effects
Year2005	−0.26 (0.19)	−0.27 (0.21)	−0.26 (0.19)
Year2006	−0.32 (0.19)	−0.32 (0.21)	−0.32 (0.19)
Year2007	−7.59 (0.25)***	−0.00 (0.20)	−7.59 (0.25)***
Year2008	−7.48 (0.23)***	0.09 (0.17)	−7.48 (0.23)***
Year2009	−7.47 (0.22)***	0.11 (0.17)	−7.47 (0.22)***
Year2010	−7.39 (0.23)***	0.15 (0.16)	−7.39 (0.23)***
Year2011	−7.28 (0.23)***	0.27 (0.16)	−7.28 (0.23)***
Year2012	−7.52 (0.23)***		−7.52 (0.23)***
Year2013	−7.55 (0.23)***		−7.55 (0.23)***
Year2014	−7.62 (0.22)***		−7.62 (0.22)***
Kenya Year dummies			
Kenya Year 1960		0.73 (1.49)	
Kenya Year 1961		−0.65 (1.49)	
Kenya Year 1962		0.66 (1.49)	
Kenya Year 1963		1.87 (1.49)	
Kenya Year 1964		2.00 (1.48)	
Kenya Year 1965		−3.16 (1.49)*	
Kenya Year 1966		−1.63 (1.48)	
Kenya Year 1967		1.40 (1.48)	
Kenya Year 1968		−0.94 (1.48)	
Kenya Year 1969		0.23 (1.48)	
Kenya Year 1970		−1.55 (1.48)	
Kenya Year 1971		0.06 (1.48)	
Kenya Year 1972		0.08 (1.48)	
Kenya Year 1973		−0.57 (1.48)	
Kenya Year 1974		1.63 (1.48)	
Kenya Year 1975		−0.30 (1.48)	
Kenya Year 1976		0.84 (1.48)	
Kenya Year 1977		−2.91 (1.48)*	
Kenya Year 1978		0.51 (1.48)	
Kenya Year 1979		−1.24 (1.48)	
Kenya Year 1980		−2.75 (1.48)	
Kenya Year 1981		1.18 (1.48)	
Kenya Year 1982		0.55 (1.48)	
Kenya Year 1983		1.34 (1.48)	
Kenya Year 1984		0.74 (1.48)	
Kenya Year 1985		1.52 (1.48)	
Kenya Year 1986		0.37 (1.48)	
Kenya Year 1987		0.58 (1.48)	
Kenya Year 1988		−5.31 (1.48)***	
Kenya Year 1989		0.75 (1.48)	
Kenya Year 1990		−1.04 (1.48)	
Kenya Year 1991		1.29 (1.48)	

	Pooled OLS	Fixed Effects	Random Effects
Kenya Year 1992		−0.19 (1.48)	
Kenya Year 1993		−1.07 (1.48)	
Kenya Year 1994		−0.54 (1.48)	
Kenya Year 1995		1.42 (1.48)	
Kenya Year 1996		0.12 (1.48)	
Kenya Year 1998		−0.48 (1.48)	
Kenya Year 1999		0.32 (1.48)	
Kenya Year 2000		−0.48 (1.48)	
Kenya Year 2002		−2.12 (1.48)	
Kenya Year 2004		2.70 (1.48)	
Kenya Year 2005		0.70 (1.48)	
Kenya Year 2008		1.27 (1.48)	
Kenya Year 2009		−0.05 (1.48)	
Kenya Year 2010		0.68 (1.48)	
Kenya Year 2013		1.04 (1.48)	
R^2	0.74	0.62	0.74
Adj. R^2	0.74	0.61	0.74
Num. obs.	8207	8207	8207

$^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$. Standard errors in parentheses.

Table C7: Estimates of China's Trade Flows (1948-2014). Dependent variable: China's exports

	Poisson Quasi Maximum Likelihood
Constant	8.82 (15.22)
China GDP per capita	0.00 (0.00)
Importer GDP per capita	0.00 (0.00)***
Population China	−0.01 (0.03)
Population Importer	0.00 (0.00)***
Distance	−0.00 (0.00)***
Contiguous	0.09 (0.06)
Common Language	1.94 (0.06)***
GATT China	0.90 (18.60)
GATT importer	0.79 (0.08)***
Colonial History	−1.45 (0.91)
Kenya dummy	4.42 (32.00)
Year dummies	
Year 1950	0.08 (4.29)
Year 1951	0.02 (4.44)
Year 1952	−0.39 (5.11)
Year 1953	0.11 (4.63)
Year 1954	0.06 (4.94)

	Poisson Quasi Maximum Likelihood
Year 1955	1.99 (3.68)
Year 1956	2.34 (3.73)
Year 1957	2.54 (3.91)
Year 1958	1.61 (4.56)
Year 1959	1.70 (4.73)
Year 1960	1.90 (4.47)
Year 1961	1.70 (4.45)
Year 1962	1.79 (4.51)
Year 1963	2.07 (4.70)
Year 1964	2.61 (4.87)
Year 1965	3.06 (5.11)
Year 1966	3.47 (5.47)
Year 1967	3.57 (5.90)
Year 1968	3.82 (6.35)
Year 1969	4.18 (6.80)
Year 1970	4.44 (7.28)
Year 1971	4.87 (7.79)
Year 1972	5.33 (8.25)
Year 1973	5.97 (8.64)
Year 1974	6.41 (9.08)
Year 1975	6.67 (9.42)
Year 1976	6.89 (9.82)
Year 1977	7.12 (10.08)
Year 1978	7.64 (10.47)
Year 1979	8.02 (10.72)
Year 1980	8.37 (10.99)
Year 1981	8.68 (11.30)
Year 1982	8.90 (11.66)
Year 1983	9.12 (11.97)
Year 1984	9.35 (12.24)
Year 1985	9.62 (12.48)
Year 1986	9.89 (12.92)
Year 1987	10.27 (13.45)
Year 1988	10.61 (13.81)
Year 1989	10.91 (14.17)
Year 1990	11.18 (14.58)
Year 1991	11.50 (14.94)
Year 1992	11.74 (15.21)
Year 1993	12.02 (15.52)
Year 1994	12.16 (15.58)
Year 1995	12.23 (15.53)
Year 1996	12.39 (15.57)
Year 1997	12.65 (15.68)

	Poisson Quasi Maximum Likelihood
Year 1998	12.87 (15.86)
Year 1999	13.05 (16.04)
Year 2000	13.27 (16.02)
Year 2001	12.50 (24.63)
Year 2002	12.59 (24.60)
Year 2003	12.60 (24.47)
Year 2004	12.52 (24.19)
Year 2005	12.39 (23.90)
Year 2006	12.32 (23.45)
Year 2007	3.92 (12.51)
Year 2008	2.86 (10.44)
Year 2009	3.46 (9.59)
Year 2010	2.86 (7.67)
Year 2011	1.39 (4.81)
Year 2012	1.27 (3.08)
Kenya Year dummies	
Kenya Year 1960	−8.04 (150.60)
Kenya Year 1961	−15.92 (4873.15)
Kenya Year 1962	−7.93 (150.60)
Kenya Year 1963	−6.89 (90.80)
Kenya Year 1964	−6.12 (45.92)
Kenya Year 1965	−6.06 (42.75)
Kenya Year 1966	−5.51 (37.77)
Kenya Year 1967	−6.12 (43.49)
Kenya Year 1968	−5.51 (38.81)
Kenya Year 1969	−5.93 (41.19)
Kenya Year 1970	−5.85 (40.78)
Kenya Year 1971	−5.81 (39.55)
Kenya Year 1972	−6.17 (40.77)
Kenya Year 1973	−6.32 (38.99)
Kenya Year 1974	−5.53 (34.77)
Kenya Year 1975	−6.76 (40.22)
Kenya Year 1976	−6.09 (36.34)
Kenya Year 1977	−5.51 (34.32)
Kenya Year 1978	−6.13 (35.06)
Kenya Year 1979	−6.17 (34.53)
Kenya Year 1980	−5.96 (33.70)
Kenya Year 1981	−6.18 (33.83)
Kenya Year 1982	−6.40 (34.22)
Kenya Year 1983	−6.85 (35.29)
Kenya Year 1984	−6.56 (34.30)
Kenya Year 1985	−6.58 (34.11)
Kenya Year 1986	−6.48 (33.81)

	Poisson Quasi Maximum Likelihood
Kenya Year 1987	−6.17 (33.18)
Kenya Year 1988	−6.51 (33.45)
Kenya Year 1989	−6.56 (33.38)
Kenya Year 1990	−6.65 (33.43)
Kenya Year 1991	−6.58 (33.18)
Kenya Year 1992	−6.53 (33.04)
Kenya Year 1993	−6.15 (32.64)
Kenya Year 1994	−5.89 (32.47)
Kenya Year 1995	−5.42 (32.29)
Kenya Year 1996	−5.62 (32.33)
Kenya Year 1997	−5.42 (32.23)
Kenya Year 1998	−5.63 (32.26)
Kenya Year 1999	−5.85 (32.30)
Kenya Year 2000	−5.74 (32.23)
Kenya Year 2001	−5.79 (32.22)
Kenya Year 2002	−5.57 (32.17)
Kenya Year 2003	−5.32 (32.13)
Kenya Year 2004	−4.94 (32.09)
Kenya Year 2005	−4.64 (32.07)
Kenya Year 2006	−4.42 (32.05)
Kenya Year 2008	−1.15 (57.87)
Kenya Year 2009	−1.92 (57.18)
Kenya Year 2010	−1.38 (49.47)
AIC	
BIC	
Log Likelihood	
Deviance	13045625.79
Num. obs.	8215

$^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$. Standard errors in parentheses.

Table C8: Estimates of Kenya's Trade Flows (1948-2014). Dependent variable: Kenya's exports

	Poisson Quasi Maximum Likelihood
Constant	−0.93 (0.41)*
Kenya GDP per capita	0.00 (0.00)***
Importer GDP per capita	0.00 (0.00)***
Population Kenya	−0.01 (0.01)
Population Importer	0.00 (0.00)***
Distance	−0.00 (0.00)***
Regional Trade Agreement	1.16 (0.10)***
Contiguous	2.30 (0.09)***

	Poisson Quasi Maximum Likelihood
Common Language	0.19 (0.06)**
GATT Kenya	0.78 (0.23)***
GATT importer	1.50 (0.09)***
Colonial History	2.53 (0.08)***
China dummy	−1.74 (0.42)***
Year dummies	
Year 1949	−0.24 (0.48)
Year 1950	0.51 (0.43)
Year 1951	0.05 (0.47)
Year 1952	−0.03 (0.49)
Year 1953	0.56 (0.40)
Year 1954	−0.06 (0.47)
Year 1955	−0.31 (0.44)
Year 1956	0.49 (0.40)
Year 1957	0.41 (0.41)
Year 1958	0.29 (0.41)
Year 1959	0.45 (0.38)
Year 1960	−0.21 (0.40)
Year 1961	0.13 (0.40)
Year 1962	0.38 (0.39)
Year 1963	0.36 (0.37)
Year 1964	0.17 (0.36)
Year 1965	0.88 (0.38)*
Year 1966	0.38 (0.38)
Year 1967	−0.34 (0.39)
Year 1968	0.17 (0.38)
Year 1969	0.30 (0.40)
Year 1970	0.35 (0.38)
Year 1971	0.51 (0.39)
Year 1972	0.41 (0.39)
Year 1973	0.29 (0.37)
Year 1974	0.43 (0.39)
Year 1975	0.39 (0.38)
Year 1976	0.54 (0.37)
Year 1977	0.05 (0.39)
Year 1978	0.26 (0.39)
Year 1979	−0.41 (0.43)
Year 1980	0.03 (0.38)
Year 1981	0.21 (0.39)
Year 1982	0.50 (0.37)
Year 1983	0.12 (0.38)
Year 1984	0.54 (0.37)
Year 1985	0.64 (0.36)

	Poisson Quasi Maximum Likelihood
Year 1986	0.38 (0.36)
Year 1987	0.39 (0.36)
Year 1988	−0.06 (0.41)
Year 1989	0.32 (0.39)
Year 1990	0.24 (0.39)
Year 1991	0.07 (0.38)
Year 1992	0.15 (0.40)
Year 1993	0.28 (0.36)
Year 1994	−0.31 (0.40)
Year 1995	0.29 (0.37)
Year 1996	0.51 (0.36)
Year 1997	0.30 (0.36)
Year 1998	0.25 (0.36)
Year 1999	0.15 (0.36)
Year 2000	0.09 (0.36)
Year 2001	0.36 (0.36)
Year 2002	0.30 (0.37)
Year 2003	0.37 (0.35)
Year 2004	0.33 (0.37)
Year 2005	0.24 (0.37)
Year 2006	0.54 (0.37)
Year 2007	−0.13 (0.44)
Year 2008	0.09 (0.41)
Year 2009	−0.10 (0.39)
Year 2010	0.47 (0.39)
Year 2011	0.86 (0.36)[*]
Year 2012	1.07 (0.36)[**]
Year 2013	0.38 (0.40)
Year 2014	0.36 (0.40)
China Year dummies	
China Year 1948	−13.71 (1603.39)
China Year 1955	−12.41 (1603.39)
China Year 1956	−13.42 (1603.39)
China Year 1957	−0.89 (8.50)
China Year 1960	−16.02 (1603.39)
China Year 1961	0.70 (4.61)
China Year 1962	−0.66 (7.97)
China Year 1963	−12.09 (1603.39)
China Year 1964	−1.99 (17.81)
China Year 1965	−14.40 (1603.39)
China Year 1967	−11.30 (1603.39)
China Year 1968	−13.54 (1603.39)
China Year 1969	−12.19 (1603.39)

	Poisson Quasi Maximum Likelihood
China Year 1970	−11.42 (1603.39)
China Year 1971	−13.86 (1603.39)
China Year 1972	−13.98 (1603.39)
China Year 1973	−12.07 (1603.39)
China Year 1974	0.52 (3.80)
China Year 1975	1.58 (2.79)
China Year 1976	−11.95 (1603.39)
China Year 1977	−1.00 (5.37)
China Year 1978	−0.45 (3.06)
China Year 1979	−1.85 (8.50)
China Year 1980	−13.56 (1603.39)
China Year 1981	−3.97 (17.81)
China Year 1982	0.23 (4.91)
China Year 1984	−0.00 (5.37)
China Year 1985	−1.41 (6.01)
China Year 1987	−0.94 (4.60)
China Year 1989	−11.57 (1603.39)
China Year 1990	−0.25 (3.43)
China Year 1991	−13.27 (1603.39)
China Year 1992	−13.60 (1603.39)
China Year 1993	−11.43 (1603.39)
China Year 1994	−11.52 (1603.39)
China Year 1995	1.76 (1.12)
China Year 1996	−1.24 (2.80)
China Year 1997	−11.76 (1603.39)
China Year 1998	−11.58 (1603.39)
China Year 1999	0.32 (2.66)
China Year 2000	−12.98 (1603.39)
China Year 2001	−0.79 (6.94)
China Year 2003	−0.09 (3.27)
China Year 2004	−11.94 (1603.39)
China Year 2006	−11.71 (1603.39)
China Year 2007	0.13 (0.88)
China Year 2008	−1.85 (16.99)
China Year 2009	−11.00 (1603.39)
China Year 2010	−11.54 (1603.39)
China Year 2011	−12.23 (1603.39)
China Year 2012	−2.53 (17.81)
China Year 2013	−2.22 (16.98)
AIC	
BIC	
Log Likelihood	
Deviance	98819.06

	Poisson Quasi Maximum Likelihood
Num. obs.	6118

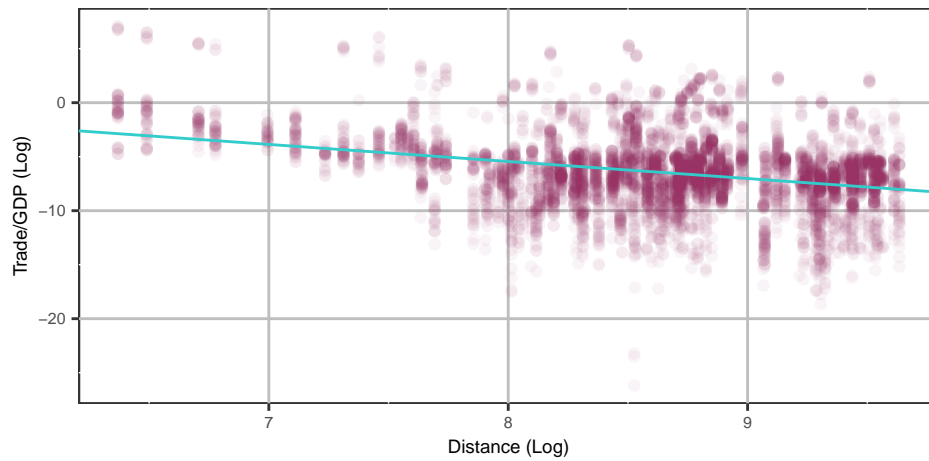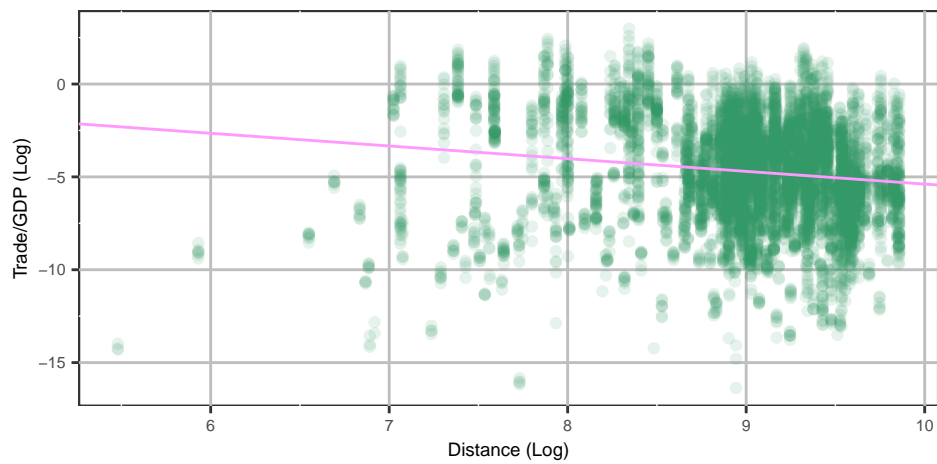$^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$. Standard errors in parentheses.

Figure C36: Trade and Distance Kenya and Rest of the World (1948-2014)

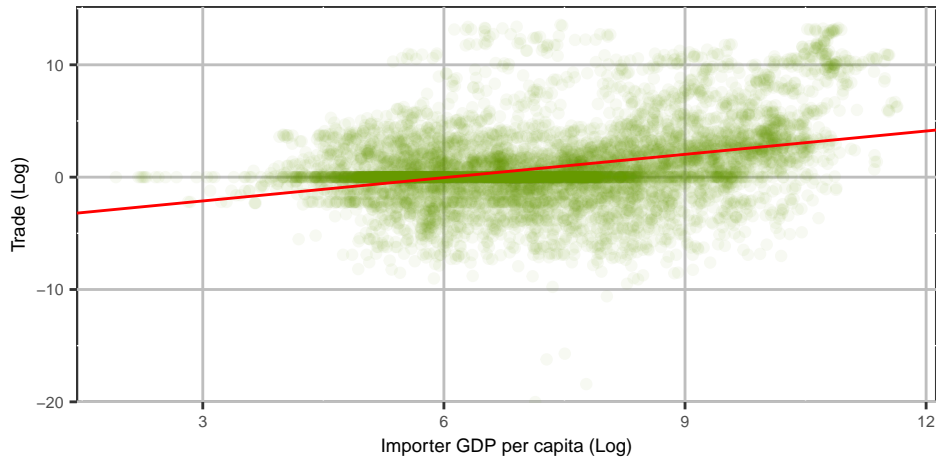Source: CEPII Gravity Database 2010 and UN Comtrade 2015

Figure C37: Trade and Importer GDP per capita Kenya and Rest of the World (1948-2014)

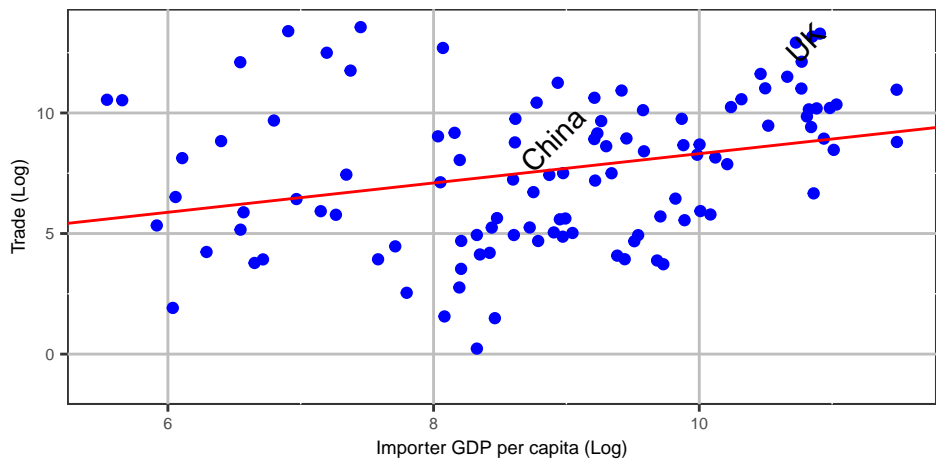Source: CEPII Gravity Database 2010 and UN Comtrade 2015

Figure C38: Trade and Importer GDP per capita Kenya and Rest of the World (2014)

Source: CEPII Gravity Database 2010 and UN Comtrade 2015