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Inclusive Growth in Africa: Are Chinese Investment and Local Industry Participation Compatible?

Emmanuel T. Kodzi

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Emmanuel T. Kodzi Jr, Rollins College, USA

ABSTRACT

Purpose - This study set out to explore whether increasing Chinese FDI is associated with rising contributions of local industry in African countries connected to the Belt and Road Initiative (BRI). The existence of cooperative industry linkages between Chinese investments and local businesses is a necessary condition for achieving the mutual benefits asserted by the BRI.

Design/methodology/approach - Under growing FDI, we framed increasing local industry contribution as indicative of existing industry linkages. Using principal component analysis and multiple regression on collated country-level data, we examined relationships between key industry output variables and several independent variables representing Chinese investment and economic activity in a contiguous 3-country region, over two investment periods.

Findings - Increasing Chinese FDI was associated with positive economic outcomes including decreasing unemployment; however, it did not appear to support local industry participation. We identified a "China Effect" that hampered industry contribution to GDP. We found that attempting to counterbalance this effect through direct exports to China was not strategically sound. Similarly, export-focused clusters in special zones may not foster industry linkages if they result in isolationism. Rather, host countries have an opportunity to enhance local industry contribution through leveraging interconnectivity factors under increasing FDI.

Research limitations - Our small sample size has implications for the predictive power of the model, and for our complete explanation all the emerging findings. However, we presented compelling arguments for selecting the specific East African countries. By conducting robustness checks on a separate West African region, our findings were substantially corroborated.

Practical Implications: Instead of exporting directly to China as a way to mitigate local industry contraction, host countries need to thoughtfully pursue opportunities that present the greatest value-added export advantages. Proposed Chinese-funded infrastructure projects must be negotiated with a goal to strategically reduce interconnectivity barriers and achieve broader logistics improvements in the host countries.

Social Implications: The study provides a tool for proponents of local industry growth to present clearer frameworks in their advocacy. The social tensions around Chinese dominance in the host countries can be reduced by understanding and pursuing levers that enhance industry contribution in those contexts.

Originality/value: This study takes a different approach to examining the professed win-win proposition of the BRI in Africa. It uncovers important effects of increasing Chinese FDI, and addresses viable host country responses, including a clear pathway for forging the cooperative industry linkages needed for inclusive growth and sustainable development.

Introduction

Chinese investments intensified in Africa following the 2013 launch of the Belt and Road Initiative (BRI). Such Foreign Direct Investment (FDI) is generally assumed to positively affect the economic outcomes of host countries (Hallin and Lind, 2012) through technology transfers to, and productivity increases in industry. However, these positive spillover effects are unattainable without value-adding linkages between foreign investors and local businesses (Görg and Strobl, 2005; Scott-Kennel, 2007; Santangelo, 2009). Foreign investors may pursue linkages to the extent that these linkages support their investment goals (Chen, Chen & Ku, 2004). But investor goals may diverge from those of the host country such that expected technology and knowledge transfers to the latter may be constrained; especially if foreign investors only focus on extracting value efficiently in the short term rather than developing local partners in the long term. Investor goals often dominate the FDI discourse when significant power asymmetries exist. Thus, when the competitive strength of the foreign investor outweighs that of potential local partners there are fewer opportunities for value-adding linkages between foreign and local businesses (Görg & Strobl, 2005). Given the strength of Chinese investors relative to businesses in several African countries, the BRI may only achieve win-win benefits if there is *intentional* nurturing of backward and forward linkages to enable local African businesses to participate in global supply chains. Such partnerships improve the economic performance of both foreign and local business, shrinking the disparities between them over time. For example, if investors are unable to fully exploit firm-specific advantages in a foreign context, the resulting gaps may be furnished by connected local companies as they build capacity (Blomström and Kokko, 2001; Dunning and Lundan, 2008). The converse of creating such value-adding linkages is the aggressive competitive

expansion of foreign investors, without consideration for the outcomes of existing or emerging local businesses. This paper conceptualizes industry linkages in terms of cooperative partnerships between foreign and local businesses. In the taxonomy of exchange relations (Chen, Chen & Ku, 2004), these cooperative partnerships would comprise local supplier sourcing, local subcontracting, and product design through local alliances. Our main question is whether there is evidence of durable backward and forward industry linkages in African countries directly connected to the BRI. This focus is needed to understand the implications of the BRI for African industries, and to explore host country responses that will allow African industries to participate equitably in global value chains.

Given the overcapacity in China following the 2008 financial crisis, and the subsequent push for outward foreign investment, it is not unexpected that Chinese investors would channel foreign market access into an opportunity for suppliers in China, rather than for local suppliers in the host nation (Corkin and Burke 2006; Chia and Sussangkarn 2006; van der Lugt et al., 2011; Swaine 2015). There is a perceived lack of linkages between Chinese investors and local businesses in diverse regions, as evidenced by the investors: (a) importing most of their production and construction inputs (Corkin, 2007; Amendolagine et al., 2013), (b) importing Chinese labor for construction (Cheru and Obi 2011), and (c) practicing sourcing activities that restrict local specialization to low value-added outputs (Jenkins, 2010; Flynn, 2013). Zhang, Alon, and Cheng (2014)'s conclusion that Chinese FDI does not significantly affect economic growth in Africa suggests low levels of linkages. Similarly, You, Salmi and Kuappi (2018) found that while Chinese firms run large infrastructure projects, African firms typically play only minor roles. In contrast,

some Chinese foreign investments demonstrate substantial technology- and knowledge-transfers that have resulted in win-win outcomes. For example, the Geely and Volvo brands have both gained stronger market positions following Geely's acquisition and subsequent commitment to avoid micromanaging Volvo (Ambler, 2018). This positive FDI outcome begs an analysis of Chinese FDI strategy in African countries - to what extent are such positive outcomes replicated in Africa? This question complements our main question regarding evidence of durable backward and forward industry linkages. Specifically, we investigate the existence of cooperative linkages between Chinese investments and local industry in three African countries with port and other infrastructure critical to the BRI.

The analysis in this paper covers the period between the BRI launch (2013) and the second Forum on China-Africa Cooperation (FOCAC) summit in Johannesburg (2015) where China-Africa relations were upgraded to "comprehensive strategic and *cooperative partnership* status"; and the following period between 2016 and 2018, when the third FOCAC summit was held in Beijing. These periods are informative for our analysis because "cooperative partnership" suggests that attention would be given to creating industry linkages. Our analysis uncovered an association between increases in Chinese FDI and reductions in industry contribution to Gross Domestic Product (GDP). These reductions contradict the assumption that cooperative industry linkages have been created over the period of analysis. Rather, they signal a shift toward consumption, with the known implications for productive capacity and sustainable development. Our paper contributes to the literature by delineating a "China Effect" on industry contribution, and clarifying that increasing exports to China *per se* (as a recommended response to FDI), does not

counterbalance this effect. Instead, we find that industrial contribution is boosted by country-level logistics performance. Our findings lead to specific recommendations for host country governments about reducing interconnectivity barriers and facilitating joint planning for FDI implementation. The rest of the paper is structured as follows: a brief review of the background to industry linkages and spillovers leading to our hypotheses; a description of the data and method; a discussion of analysis and findings, a summary to highlight implications and a conclusion of the study.

Theoretical Background

The predominant view of FDI is from the perspective of investor benefits, even though FDI has a principle of long-term relationships at its core (UNCTAD, 2019). But countries attracting FDI do so expecting enhancements in productivity and economic growth (Meniago and Asongu, 2019). Thus, consistent with Sustainable Development Goals (SDGs) it is important to consider industry growth in ways that do not widen the achievement gap and force the exit of local value chain participants in regions receiving FDI. This "inclusive growth" perspective underscores the importance of creating value-adding linkages that support shared economic development (Henderson et al., 2002; Coe et al., 2004). Chen, Chen and Ku (2004) treat linkages as an investment in local relations in the host country. This view puts the responsibility on the host country to create conditions under which economic exchanges through FDI will be beneficial. However, our findings illustrate investors and hosts acting in their separate interests, instead of adopting a cooperative approach that creates shared value. The focus on industry linkages in this paper allows for FDI benefits to be considered for both foreign investors and local industries.

Previous studies have shown that linkages between foreign and local firms are critical for achieving the expected positive spillovers from FDI (Pavlínek and Žížalová 2016; Crespo and Fontoura 2007; Havranek and Irsova, 2011). These spillovers may be horizontal, occurring unintentionally among firms in the same industry; or vertical, mostly depending on the nature of backward and forward linkages between foreign investors and local businesses (Giroud and Scott-Kennel 2009; Hansen et al., 2009; Hallin and Lind, 2012). The vertical spillovers may occur through sourcing relationships, and may provide technology, skill, and knowledge benefits to local businesses, as well as performance improvements for the foreign investor (Blomström and Kokko, 2001; Giroud and Scott-Kennel, 2009). Partnerships that adopt a long-term view of cooperative business exchanges can facilitate learning (Hillman et al., 2009), and encourage local businesses to invest in R&D capabilities (Liang, 2017), thereby minimizing potentially negative impacts of FDI. For example, local firms that become suppliers to foreign investors may pursue process and productivity improvements (Pavlínek and Žížalová, 2016) to meet the requirements of foreign businesses, thereby become more efficient. Thus, intentionally-structured cooperative linkages may result in technology improvements that boost the competitiveness of local suppliers. In that respect, supplier development may be an important consequence of linkages between foreign investors and local suppliers (Adu-Gyamfi, 2017).

Given the role of learning in cooperative industry linkages, the orientation of the foreign investor in terms of motivations for entry, and desired length of stay in the host country (Kim et al., 2019) become essential in determining how intentional they would be about promoting value-adding linkages. In parallel, local businesses must possess sufficient absorptive capacity. Kubny and Voss

(2014) revealed weak linkages between Chinese firms in Vietnam and local suppliers, expressed through limited, arms-length exchanges. However, their study indicated that this situation is driven, not by poor local absorptive capacity, but by the investor's reluctance to recognize, engage or develop local capabilities. This reticence is incongruous with the FDI principle of long-term relationships (UNCTAD, 2019). Longer term investment intentions may lead to entry modes involving shared foreign-local ownership, which will improve linkages and lead to positive spillovers (Smarzynska Javorcik, 2004). Since economically powerful foreign investors play a critical role in how their supply chains are coordinated, this paper takes the view that the creation of value-adding linkages is not a function only of the preparedness of the local businesses, but also the intentionality of the foreign investor. This position is especially relevant, given the BRI context of declared cooperative partnership with Africa; we expect to see a positive impact of Chinese FDI in terms of industrial growth because both Chinese investors and the host countries have a declared interest in making the partnership mutually beneficial. Our first hypothesis is as follows:

H1: Increased Chinese FDI is associated with local industrial participation in the host countries.

Zhang, Cheng and He (2019) focus on the lag effect in the mechanism of FDI spillovers in developing countries and refer to systematic biases in this line of research. They point to studies like Demena and van Bergeijk (2017) whose review indicated negative or non-existent spillover effects. So, they propose much longer (6 years) timeframes for assessing the effect of Chinese FDI on industrial production in the host countries; and Chinese investors could be more measured

in the extent of integration in host operating environments. We have discussed the *intentional* nurturing of linkages as a basic premise of any win-win proposition. Given the referenced cooperative partnership position, it is conceivable that the foreign investor would recognize the benefits of broader-based growth even though their initial preference might be to use familiar suppliers from the home country. Concerted efforts by investors and hosts should produce quick, tangible results. Thus, this paper also takes the view that if Chinese FDI considers industry linkages as part of the investment package, then increasing FDI should directly impact local production systems, not by squeezing them out, but by increasing their economic contribution. Our second hypothesis is as follows:

H2: The change of partnership status during the two periods of analysis is sufficient to indicate a positive change in industrial contribution.

Nandonde et al (2019) discuss the role of policy in helping to generate FDI-related benefits to the host country. Tanzania encouraged local supplier development by requiring local input sourcing minimums for goods processed by foreign investors. This policy was in response to a South African retailer importing about 80 percent of its food items from the home country. So, consistent with our earlier position about intentionality, when foreign investors are unable to perceive the benefits of nurturing cooperative linkages in the host country, some institutional frameworks can shepherd them in that direction. This is where the call for joint industry and government cooperation is crucial (Kodzi, 2018). Industry clusters can structure a broad range of opportunities to develop linkages by applying institutional leverage to negotiate terms of

engagement with prospective users of Special Economic Zones (SEZs) in the host country. By co-locating similar and dissimilar businesses in appropriate geographic areas under suitable terms of engagement, both horizontal and vertical linkages can develop and result in positive spillovers (McCormick, 1999; Forni and Paba, 2002). These cluster contexts encourage larger investors to collaborate with teams of smaller businesses and generate mutual benefits in terms of entrepreneurial (often localized) ideas for foreign investors, while local businesses reap reputational and resource access benefits (Prashantham, Kumar and Bhattacharyya, 2019). Some authors view such a geographic concentration of firms as indicative of larger regional infrastructure inadequacies (Ikiara and Ndirangu, 2003). However, these clusters may provide a pragmatic solution to infrastructure inadequacies by pooling administrative and other resources (Tsai and Goshal, 1988; UNCTAD, 2019). SEZs are a known tool for attracting investment and spurring industrial development, because they signal the host country's preparedness for international exchanges. Counter-intuitively, enclave operators have a much lower potential for positive spillovers, compared with collaborators (Scott-Kennel, 2007). However, this paper views the structuring of industry clusters as an opportunity for developing linkages and achieving positive spillovers; notwithstanding the drawbacks, the presence of SEZs should spur industrial growth. Our third hypothesis is as follows:

H3: The use of clusters to organize FDI activity supports local industrial participation.

Methodology

This study explores evidence of cooperative industry linkages in African countries directly connected to the BRI. Our larger objective is to examine if the expected positive outcomes from Chinese FDI are replicated in Africa. We pursue this objective by adopting a quantitative approach in researching a contiguous 3-country region.

Country Selection

The selection of a contiguous region strategically located on the BRI route is purposeful for understanding implications of the BRI for Africa. Kenya, Ethiopia and Djibouti are within the fastest growing economic region in Africa and were selected for their port and associated infrastructure that are significantly important to the BRI. This contiguous regional block is served by two main Indian Ocean ports currently integrated into the BRI - Kenya's Mombasa Port and Djibouti's Port of Djibouti. The Standard Gauge Railway terminating in Mombasa serves as a gateway for trade in the largest East African economy, with planned extensions to Uganda and Rwanda. Kenya and Ethiopia are also seeking to establish a common cross-border Free Trade Zone to accelerate development in the Moyale border area (UNCTAD, 2019). Kenya has attracted a broad range of Chinese FDI including infrastructure, ICT, and the extractive industries, and is critical in this analysis as the leading East African economy.

Similarly, despite Djibouti's smaller land area and population, it has significant port infrastructure on one of the world's busiest shipping routes and a railway connection to Ethiopia. During the period of analysis, the scope and intensity of Chinese investment in Djibouti was highlighted by the opening of a Chinese-funded SilkRoad International Bank, and a Chinese military base.

Djibouti's role as a gateway for Chinese-driven Ethiopian exports presents an opportunity for mutually beneficial economic exchanges through linkages with local transportation and logistics providers (Kodzi, 2018). Ethiopia has also emerged as an important manufacturing hub, with global access primarily through the Port of Djibouti. It is a significant FDI recipient, attracting investments in manufacturing, energy, real estate, horticulture, and the extractive industries.

An important limitation of this 3-country selection is the small sample size for analysis. However, Scott-Kennel (2007) notes that large samples do not necessarily reduce the complexity of evaluating linkages, because of the tendency to focus on quantity of foreign-local connections rather than the essence of beneficial spillovers. So, even though one might potentially include all African countries connected with the BRI to generalize the results, or analyze similar countries not associated with the BRI separately as counterfactual, that is beyond our current scope. The selected countries have typically received a broader range of investments in areas that directly impact local industries, and their selection presents analytical advantages despite the limitations.

Data Sources

Our analysis required comparable indicators of investment, labor input, and economic growth across the selected countries, relative to Chinese FDI. Data were sourced from the World Bank, The Heritage Foundation, and the SAIS China-Africa Research Initiative at Johns Hopkins University. We combined various SAIS datasets that had been collated from UNComtrade, National Bureau of Statistics of China, China Statistical Yearbook, China Annual Bulletin of Statistics of Contracted Projects, Labor Cooperation with Foreign Countries, Almanac of China's

foreign economic relations and trade, and China's trade and external economic statistical yearbook. We then extracted the relevant variables over the period of analysis.

Variables

We assigned industry contribution to GDP as our dependent variable, measured in terms of manufacturing value-added (MVA) as a percentage of GDP. This decision was informed by our view that if cooperative linkages have been nurtured over the investment period, then with the increased investment, there would also be growth in the contribution of local industry to economic outcomes. The SDG Framework supports this approach by clarifying that increasing financing for economic infrastructure (such as the prioritized infrastructure development in BRI target countries) is insufficient to meet SDG targets *if* the infrastructure does not facilitate growth in industrial production (SDG, 2019). MVA is a core aspect of indicator 9.21 of SDG Goal 9. We also considered services value-added (SVA). However, the manufacturing function has an integrated service component such that MVA could be directly impacted when service activities are outsourced (OECD, 2018). We chose to adopt a simpler model using MVA. Our analysis focused on variation in MVA over a period of increasing Chinese investment.

We examined the association between MVA and a range of predictor variables collated from the referenced datasets and shown in Table 1. We used per capita and percentage conversions to standardize the variables across the focal countries. We also used the Logistics Performance Index (LPI) from the World Bank to proxy enablers of commerce in our analysis of industry linkages. The LPI is a composite measure comprising customs, infrastructure, ease of arranging

shipments, quality of logistics services, timeliness, and tracking and tracing; thereby reflecting the facilitation of domestic and international trade (Arvis et al, 2018).

Table 1

Description and Summary Statistics of variables

Variable	Description and (measures)	Mean	Std Dev	Median	IQR	MIN	MAX	N
MVA	Dependent Variable, Manufacturing Value Added (% GDP)	5.96	3.22	4.15	5.74	2.34	11.75	24
FDI	Total FDI Flows to host country (% GDP)	4.66	4.72	3.28	6.23	0.45	21.59	24
CFDI	Stock of Chinese FDI in host country ($mn/capita)	33.15	53.20	18.43	20.45	4.20	246.65	24
ExpTCh	Value of exports from host country to China ($mn/capita)	2.00	1.43	1.76	2.47	0.02	4.99	24
ImpFCh	Value of imports from China to host country ($mn/capita)	512.31	772.27	102.92	898.68	9.82	2312.31	24
RevChCntr	Revenues of Chinese Construction Companies in host country (Smn/capita)	157.73	292.42	45.25	48.73	17.70	1172.70	24
PctChLbr	Chinese workers in-country (percentage of host country population)	0.03	0.04	0.01	0.01	0.00	0.16	24
LPI	Logistics Performance Index for host country (units)	2.47	0.35	2.42	0.33	1.80	3.33	24

A control variable was included in the analysis for the period before and including 2015 (0) compared with the period after 2015 (1). We expected the level of Chinese FDI in the selected countries to increase over the 2016-2018 period compared with the earlier period. Another control variable for country was added, using Djibouti as the reference. The data for 2018 were not complete for all three countries so we limited the data range to 2017, but started in 2010 to increase the sample size, since investments in 2010-2013 and 2013-2015 were not significantly different in value.

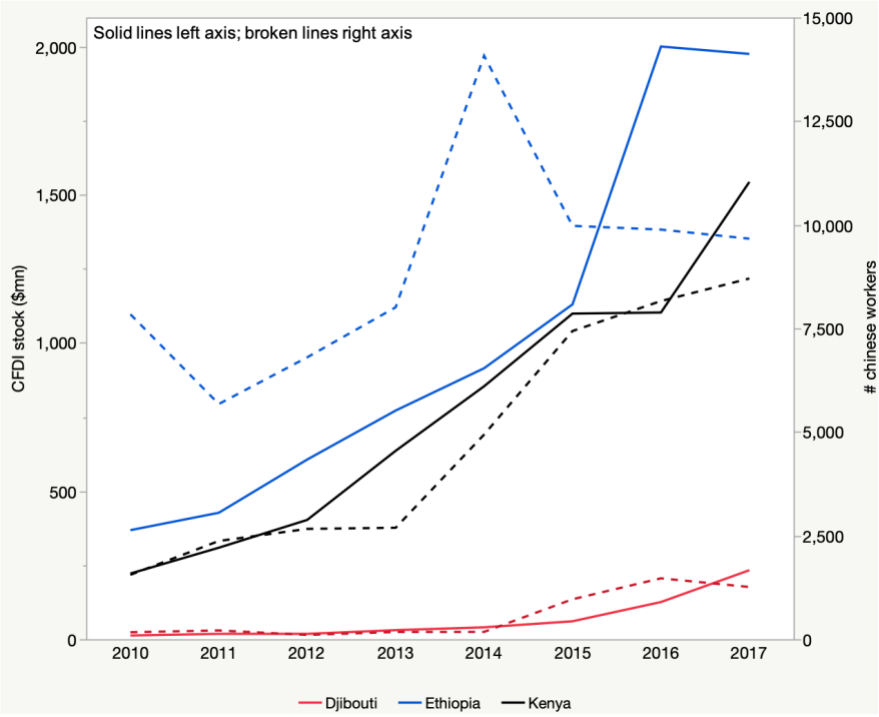
To test our hypotheses, we explore the relationship between various indicators of Chinese investment, and industry contribution to GDP (*H1*). We examine the relative effects on industry contribution between two investment periods to proxy the intensified Chinese FDI following the declaration of strategic and cooperative partnership status in 2015 (*H2*). We also examine whether investment in SEZs influences the forgoing analysis (*H3*).

Analysis and Findings

This section comprises descriptive analyses of the relationships between some variable pairs, followed by principal component analysis to model the effect of the variables related to Chinese FDI, then regression analysis of industry contribution on the independent variables. Figure 1 shows that as expected, Chinese FDI stock increased in all three countries over the period of analysis as did the number of Chinese workers, with a greater rate of increase after the BRI launch in 2013.

Figure 1

Chinese FDI stock and number of Chinese workers



With 9 times as many Chinese workers in Kenya than in Djibouti in 2010, and 7 times as many in 2017 (with higher numbers in Ethiopia), there was a higher concentration in Djibouti relative to its population size. Djibouti's population remained relatively flat (up by about 104,000) while Ethiopia's population increased by over 18 million over the same 8-year period. Consequently,

the number of Chinese workers as a percentage of the population in Djibouti was 13.3 percent compared with 1.7 percent in Kenya and 0.9 percent in Ethiopia. These increases may not support evidence of labor linkages (Chen, Chen and Ku 2004), but rather the notion of importing Chinese labor for construction (Cheru and Obi 2011). This view is strengthened by the observation that revenues of Chinese construction companies showed a pattern similar to the percentage of Chinese workers, except for slight decreases between 2016 and 2017 (Figure 2). Taken together, it appears that revenues of construction companies were partly a function of their use of Chinese labor, and this may signal a reluctance to change the *status quo*. We also examined the association between investment activity and unemployment, expecting that new linkages would generate increased opportunities for employment in the host countries, all things being equal. Figure 2 reveals that unemployment generally decreased over the period; suggesting that locals were also employed in the construction projects, even though Chinese labor was imported. Kenya achieved lower unemployment than Djibouti, while Ethiopia achieved the lowest levels of unemployment.

During the same period of analysis, GDP per capita increased in all three countries (Figure 3). Overlaying this pattern with GDP per person employed reveals that during the period, labor productivity also increased while the economies were growing. This is a positive result because it speaks to the efficient use of resources, and as Frazer (2005) observed, improved productivity is associated with survival in a competitive global context.

Figure 2

Revenues of Chinese Construction companies and Unemployment

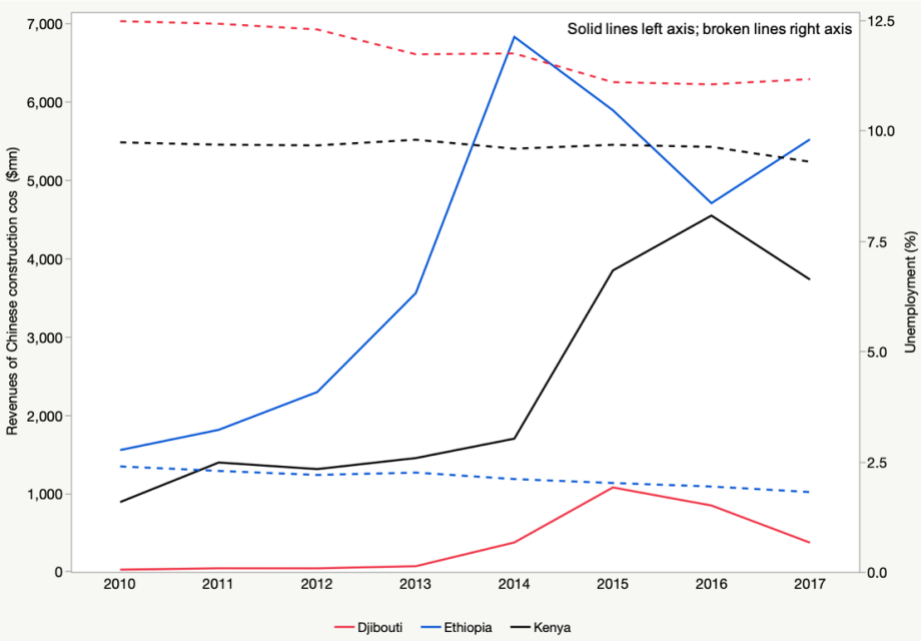


Figure 3

GDP per capita and GDP per person employed

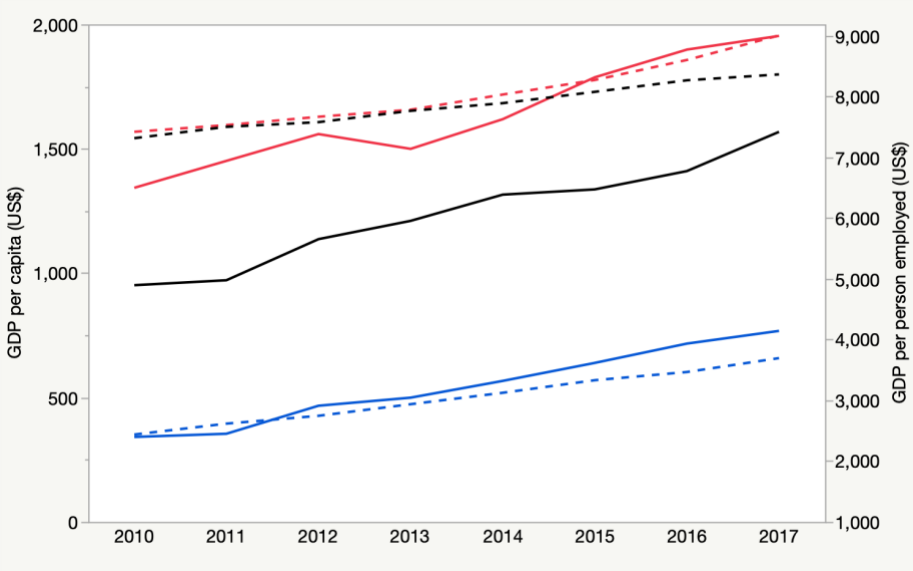
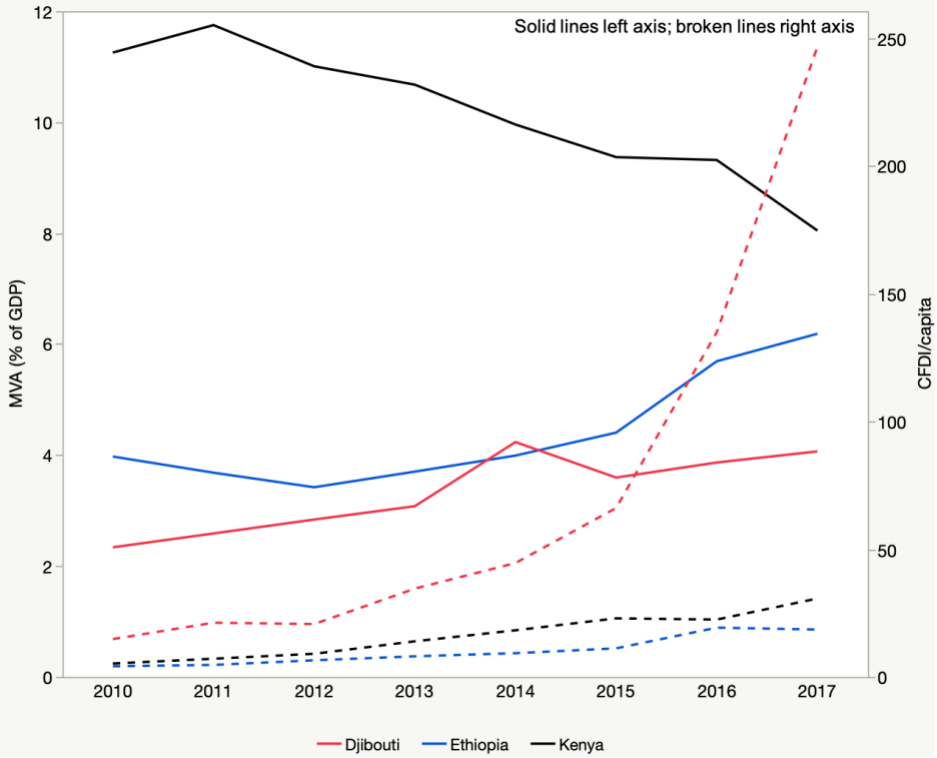


Figure 4 breaks with the pattern of improvements in the indicators – Chinese FDI per capita increased but Manufacturing Value-added (MVA) decreased sharply in Kenya, while increasing in Ethiopia and Djibouti, although not to the level of Kenya. This is an interesting finding that requires more investigation. Is Kenya becoming more consumer-oriented than production-

oriented? Are the type and intensity of Chinese investment in Kenya hampering manufacturing? Could the incidence of gated enclaves that usually serve as bases for Chinese projects (Mohan, 2013) limit industry linkages and reduce spillovers to the larger community? Is this MVA decline just a systemic failure within Kenya, since between 2007 and 2018 MVA decreased from 12.79 percent to 7.74 percent (World Bank, 2019); or is the decline related to the type and intensity of FDI?

Figure 4

MVA and CFDI/capita

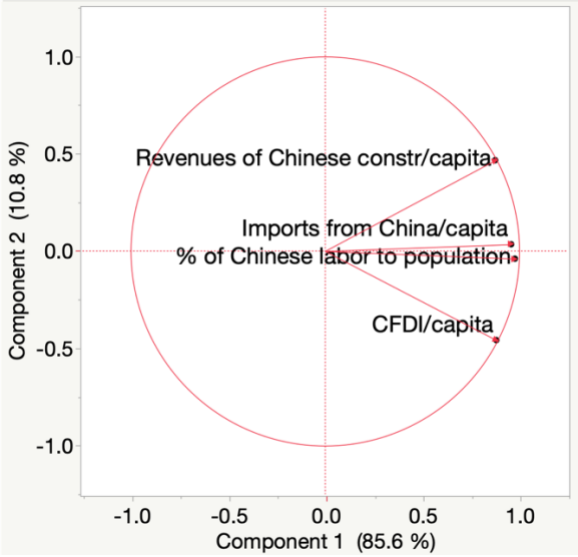


To be consistent with SDG targets, FDI should translate into greater contribution by local industry to economic outcomes *if* industry linkages had been nurtured over the investment period. So, the observation of increasing MVA with increasing CFDI in Ethiopia is in the right direction; but this contrasts sharply with the situation in Kenya. The increase of MVA in Djibouti is likely attributable to its lower level of development, resulting in a more immediate boost from FDI.

To understand this emerging situation with MVA we built a multiple regression model; first using a stepwise process with the lowest BIC value to determine which predictors to include in the model, then building the model using a standard least squares process. The logic of the model was to specify the relationship between MVA and overall FDI, relative to country-level enablers of commerce like LPI, and examine if there was a "China Effect" on the MVA outcomes. To account for data sparsity with the number of predictors, we conducted Principal Component Analysis (PCA) to estimate this China effect. The predictors from Table 1 included in the PCA were CFDI/cap, ImpFCh/cap, ExpTCh/cap, RevChCntr/cap, and PctChLbr. The first principal component accounted for 75.2 percent of the variation, and the Loading Matrix showed positive coefficients between (0.85 and 0.97) for all the variables except ExpTCh/cap, which had a negative coefficient. This contrary behavior is reasonable, since conceptually ExpTCh/cap is directionally opposite to the other variables. We isolated ExpTCh/cap as a separate independent variable in the model and rerun the PCA with the remaining 4 variables. The Loading Plot is shown in Figure 5.

Figure 5

Loading plot with 4 independent variables



Components 1 and 2 accounted for 85.6 percent and 10.8 percent of the variation respectively. The correlation matrix showed positive correlations among all 4 variables, with the highest between ImpFCh/cap and PctChLbr (0.8971) followed by CFDI/cap and PctChLbr (0.8769). Both the Loading Matrix and the Variable Cluster Analysis identified PctChLbr as the most representative variable, followed by ImpFCh/cap. Component 1 aggregates the effects of inbound Chinese-related commercial activity, according to the following relationship:

$$0.0525 * CFDI/cap + 0.9489 * ImpFCh/cap + 0.3111 * RevChCntr/cap + 0.000047 * PctChLbr - 536.9540$$

The PCA demonstrates that increased CFDI is associated with increased proportions of Chinese workers relative to local labor, increased imports from China, and increased revenues to Chinese Construction companies in the host countries. These associations may reflect a perceived need to protect Chinese interests in the host countries through substantial oversight, as well as preserve supplier relationships in China. As previously noted, this focus on oversight and home relationships does not facilitate positive spillovers (van der Lugt et al. 2011; Swaine 2015; Ambler 2018).

The 2 components we obtained from the PCA replaced the original 4 independent variables in a multiple regression model. The control variable for host country was very influential in the regression analysis and resulted in extremely high Adjusted R^2 values. This is because the MVA profiles for the countries were so different (Figure 4) that the between-country variation severely moderated the effect of the other independent variables. So, the country dummy was excluded from the model, recognizing that LPI values also represented country-specific infrastructure and flow characteristics.

Overall regression results

The overall FDI effect, though not significant, is not in the expected direction. The period variable is also not significant in the model notwithstanding our earlier observations (Figure 1) about increased Chinese FDI post-2015. The undetectable period effect is probably due to the small sample size, and the fact that we do not have many values after 2015 for a robust comparison. This observation may be indicating that the China Effect did not change dramatically after the 2015 FOCAC declaration, even though cross-border trade and investment activity increased. Perhaps, the declaration of strategic and collaborative partnership status was only a recognition of the growing reality on the ground, rather than signaling a large, combined increase of the factors accounting for the China Effect. Thus, H2 is not supported. We excluded the period variable in the next stepwise regression iteration (Table 2).

Table 2
Regression output for MVA

Predictor	**Estimate**	**p-value**
Intercept	-6.1985	0.2214
FDI Flows Total (% GDP)	-0.0618	0.6770
Exports to China/capita	-1.1163	0.0129*
Logistics Performance Index	5.9516	0.0037*
China Effect (PCA1)	-0.7157	0.0382*
China Effect (PCA2)	0.4450	0.5561
Observations = 24		
F-ratio = 5.6898 (p-value, 0.0026*)		
Adjusted R^2 = 50.48%		

Counterbalancing Chinese Investments

The coefficient of the Exports to China variable is negative and significant, and this is a surprising result. ExpTCh/cap represents a country-level response to the presence of Chinese investments

in the host country; it is expected that this response would mitigate the MVA decline. However, the observed negative coefficient may be due to the dominance of primary over value-added products in exports from the host countries to China. This explanation is consistent with similar conclusions from Jenkins (2010) and Flynn (2013). Our finding of this negative effect of Exports to China on MVA is despite Mao, Liu, Zhang & Atif's (2019) assertion that exports to China from "node countries" was positively affected by the BRI. Even with export increases through access to Chinese markets, or through the sheer economics of not returning empty vessels to Chinese ports, the focus on primary products does not support MVA. Host countries should refrain from just exporting to China with the goal of reducing trade deficits; rather they should determine where the greatest value-added export advantages are and pursue those.

Furthermore, coordinated action needs to be taken to break the isolation of project enclaves. Consider export activities organized within SEZs; instead of this cluster concept enhancing horizontal and vertical linkages, the SEZs appear isolated in their setup. For example, textile products made for export in the Athi River (Kenya) Export Processing Zone do not necessarily have local industry linkages in supplier or retail partnerships; clothing and textiles produced in the zone do not have an allocation for local consumption (even while contentions remain about used-clothing imports). So, while imports crowd out local production, exports also constrain local industry participation through the isolation of SEZs, through the disproportionate allocation of production resources to SEZs relative to other locations, and through the focus on primary products. It is noteworthy that of the 237 SEZs in Africa, 61 are in Kenya (UNCTAD, 2019), raising the expectation for linkage development as previously discussed. However, Kenya had a very

sharp decline in MVA in spite of the fact that it has the largest number of SEZs in Africa. It is not unreasonable to view the gated-enclave setup in many Chinese projects (Mohan, 2013) as unsupportive of industry linkages and spillovers. SEZs by themselves will not solve the problem of linkages and industrial contribution to GDP. We do not find support for H3.

The China Effect

The coefficient of the China Effect (PCA1) is negative and significant, though small. The small effect may be due to the contribution of other countries to overall FDI. However, the negative effect implies that though increased Chinese investment is associated with lower unemployment and higher GDP per capita in the host countries, the investment does not appear to have bolstered MVA. This observation underlines our main question about whether cooperative industry linkages exist. We do not find evidence to support H1. Minimizing this negative effect will entail a proactive inclusive strategy involving institutional arrangements and industry initiatives (Kodzi, 2018; Rodrik, 1994).

The China Effect runs counter to the LPI effect, which is large, positive, and significant in the presence of the other variables. This is an important result because it indicates that developing infrastructure in ways that facilitate internal and external flows supports MVA growth. Chinese project financing in Africa is substantial and may be often channeled toward infrastructure development that helps secure access to resources (Garcia-Herrero and Xu 2019). However, if Chinese construction projects in the host countries are purposely targeted to increase LPI, some of the interconnectivity barriers constraining industry linkages may be removed. Therefore,

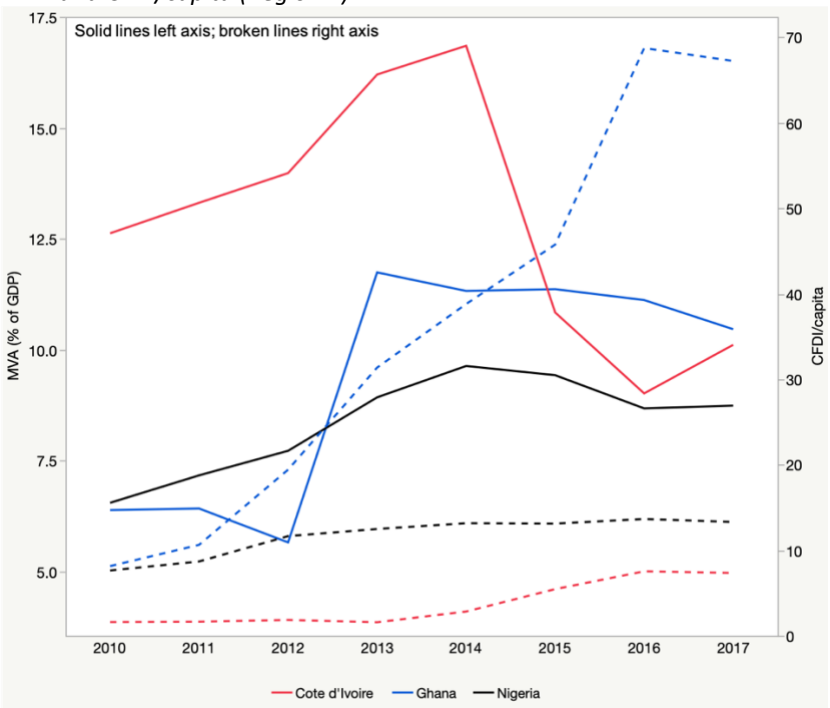
strategic government intervention to facilitate positive spillovers through local sourcing and joint ownership requirements must prioritize LPI-enhancing infrastructure investments.

Robustness Check

Given the small sample size and the purposive selection of the contiguous region for analysis, it was imperative to check the robustness of our findings. We selected another contiguous region in West Africa comprising Cote d'Ivoire, Ghana and Nigeria. This region is similarly connected to the BRI with significant port infrastructure. We assembled the same variables over the same period of analysis. Compared with Figure 4, this region showed more drastic declines in MVA while CFDI/capita increased (Figure 6).

Figure 6

MVA and CFDI/capita (Region 2)



The earlier PCA process was adopted. This time, the most representative variable was ImpFCh/capita (with PctChLbr closely following); compared with PctChLbr first, followed closely by ImpFCh/capita in the original analysis. Table 3 presents the regression output using the same variables as in Table 2. Similar to Table 2, these results show a significant and negative China Effect on MVA. The effect size in Region 2 is larger than that observed in Region 1. This finding offers concrete support to our previous findings. H1 is not supported and leaves us without an affirmative response to our main question. The LPI effect is significant and supportive of MVA, buttressing the importance of developing infrastructure in ways that promote cooperative linkages as previously discussed.

Table 3
Regression output for MVA (Region 2)

Predictor	**Estimate**	**p-value**
Intercept	-31.21519	0.0106*
FDI Flows Total (% GDP)	0.3211	0.2202
Exports to China/capita	0.2873	0.0001*
Logistics Performance Index	13.4437	0.0039*
China Effect (PCA1)	-3.126262	0.0001*
China Effect (PCA2)	-0.970271	0.1890
Observations = 24		
F-ratio = 10.5679 (p-value, <.0001*)		
Adjusted R^2 = 67.53%		

The main point of divergence between the two regression outputs is with the sign of the ExpTCh coefficient. This variable is significant in both regressions, but the sign is positive in the case of Region 2, whereas it was negative in Region 1. A positive sign is what we initially expected – that exporting to China would mitigate the MVA decline. However, given that such exports may be counterproductive depending on their type and content, it was useful to compare the export profiles of the two regions. Table 4 shows that the East African countries generally have a higher

proportion of agricultural products, while the West African countries have higher proportions of gems, precious metals and mineral fuels. These observations buttress our earlier view that exports must include some value-addition to contribute to MVA.

Table 4

Relative Export Profiles

Country	Top 2 Exports	% of Total Exports
KENYA	Live trees, plants, cut flowers	40
	Coffee, tea, spices	
ETHIOPIA	Coffee, tea, spices	51
	Oil seeds	
GHANA	Gems, precious metals	66
	Mineral fuels including oil	
NIGERIA	Mineral fuels including oil	93
	Ships, boats	

Source: Author's compilation from worldatlas.com, listwand.com, and worldstopexports.com

Having described our analysis and findings, tested our hypotheses, and confirmed our results using a different region, we now conclude this study and offer some policy implications.

Conclusion

This study explored whether increasing Chinese FDI is associated with increasing local industry participation in African countries connected to the BRI. This potential compatibility was examined through relationships among FDI-related indicators and industry contribution to GDP. Our point of view was that during a period of intensifying FDI, where China-Africa relations were elevated to "strategic and collaborative partnership" status, there would also be increases in local industry contribution through existing industry linkages. We did not find support for the expected compatibility. Rather, we:

a) identified a "China Effect" that constrained local industry participation. To our knowledge, this China Effect on local industry participation has not been delineated in this fashion.

b) found that increasing direct exports to China in order to mitigate this effect is not strategically sound, because the nature of these direct exports could exacerbate rather than counterbalance the observed China Effect.

c) found that country-level logistics performance supports industry participation.

These findings have implications for academia and for policy.

Implications

Our delineation of the significant negative China Effect on industry participation in both regions is an important contribution to the literature. The implicit power asymmetries between investors and African industries imply that investors have a role to play in fostering inclusive growth. Thus, researchers need to re-examine FDI from the perspective of both investors and host countries and review the preconditions for generating positive spillovers from FDI.

Our second contribution about the unsoundness of counterbalancing this effect through direct exports to China implies that International Business scholars need to examine qualifiers to proposed response mechanisms under intensifying FDI. The fact that all 3 hypotheses were unsupported suggests the need to re-evaluate the frameworks from which they were developed.

There are several policy implications based on our insights from this study:

a) Since SEZs are supposed to be a positive development, and yet did not alter the local participation constraint, it suggests that SEZs should not be left to operate independently.

Through applying institutional leverage, terms of engagement within the SEZs may be negotiated in ways that present broad opportunities to develop cooperative industry linkages.

b) The ineffectiveness of direct exports as a response to FDI has implications for Export Development policy in the host countries. Country export profiles should be re-examined to increase value-addition. Developing regional markets for products with less value-addition may serve exporting countries better than relying on demand from distant locations.

c) Our finding that industrial contribution is boosted by country-level logistics performance has strategic implications for host country governments. Chinese financing for infrastructure projects can be negotiated with a view to reducing interconnectivity barriers within host countries and with their neighbors. Governments cannot passively expect Chinese investors to incorporate principles of inclusive growth, given that investors will generally pursue actions in their own self-interest. The joint action of industry, investors and institutions must be mobilized to chart a clear path of inclusive growth through prioritizing cooperative industry linkages and improving logistics performance.

d) This study has implications for dealing with social tensions around perceived cues of Chinese dominance. Understanding that the China Effect was strongly influenced by the percentage of Chinese workers and imports from China, host governments should consider policy constructs that will reinforce local sourcing and include local labor in supervisory and managerial roles. Proponents of local industry growth can now design a clearer framework for their advocacy, by identifying the levers that can enhance industry contribution under increasing FDI.

Limitations

Our small sample size was the main limitation in this study. However, the basic trade-off between including all BRI-connected countries and having clearer conclusions was resolved in favor of the simpler model. The predictive power of our model is affected by the sample size, even though the relationship between the response and predictor variables was amply demonstrated. The data do not allow for a full explanation of the emerging findings, such as the impact of concentrating manufacturing activity in SEZs; or the extent to which value-adding linkages are created through the intentionality of the investor, the preparedness of the local businesses, or the guidance of the institutional environment. However, the robustness check on a different region served to substantially corroborate our findings and increase confidence in our conclusions. It is hoped that a future replication of this study with more available data will provide added robustness. Further research may also include text-analyses of reported Chinese investment activity in the host countries to better understand the insights emerging from this quantitative analysis.

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