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Foreign Direct Investment by Emerging Market Multinationals in Africa: Impact on Domestic Capital Formation

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Abstract

Foreign direct investment (FDI) flows within developing countries are rising. This article investigates whether FDI from emerging markets (EM) contributed to the domestic capital formation in Africa and how this compares to flows from developed countries. Fixed-effect estimates, based on panel data drawn from African countries covering the 2001–2012 period, suggest that total FDI and FDI from developed countries exerted favourable short-run and cumulative effects on total gross fixed capital formation (GFCF). We find that the effect of FDI from BRICS is significantly positive at least in the short run, while the average effect of FDI from other developing and transition economies is neutral. The indirect evidence of the crowding-in effect on private domestic investment by local enterprises is mixed. The results point to the relevance of the quality of institutions and extractive-sector activity in host economies as mediating factors between FDI and GFCF.
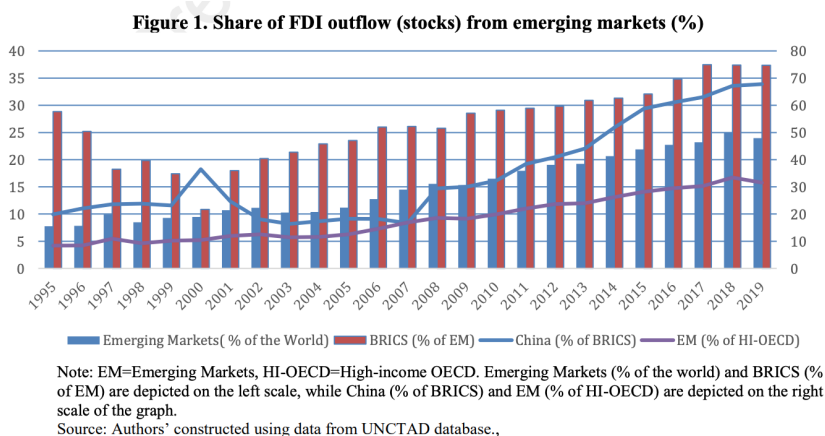
1. Introduction

Foreign Direct Investment is widely considered an important factor of growth for the development of countries suffering from the lack of investable capital. Most of these countries are actively seeking to expand their economies by attracting FDI. Although the large majority of FDI originate from developed areas, EM FDI has become a growing phenomenon in the last couple of decades and it forms today a significant proportion of FDI in developing countries (Adams and Opoku, 2015; Koku and Farha, 2019).

Historically, developing countries and more specifically emerging economies like Brazil, Russia,India, China and South Africa (BRICS) have hosted Western multinational enterprises (MNEs)

to have their products developed in the West, produced inexpensively in these and other countries, and then sold under their Western multinational brand names throughout the world. Large firms from emerging economies, on the contrary, were traditionally lacking quality products, well-known global brands and the competences to develop these important international assets. As a result, Western MNEs were not particularly worried about EM firms creating well-recognized global brands and becoming important global players. Over the years, EM firms have been increasingly making progress in this regard, and some have become significant threats to the Western MNEs (Ramamurti and Williamson, 2019; Kotabe and Kothari, 2016).

As shown in Figure 1, the stock of FDI outflows from EM has been on the rise with the share of the world total hovering above 35 per cent over the last three years of the period covered (Figure 1, left scale). [1]

The growing relative importance of EM FDI outflows is more evident if viewed in relation to the outflows from high-income OECD countries (Figure 1, right scale). The ratio of EM to high-income OECD outflows has been trending upward and reached roughly 30 per cent in the second half of the previous decade, representing a three-fold increase over a span of two decades.

Figure 1. Share of FDI outflow (stocks) from emerging markets (%)

Note: EM=Emerging Markets, HI-OECD=High-income OECD. Emerging Markets (% of the world) and BRICS (% of EM) are depicted on the left scale, while China (% of BRICS) and EM (% of HI-OECD) are depicted on the right scale of the graph.
Source: Authors' constructed using data from UNCTAD database.,

An increasingly significant proportion of EM FDI outflows is sourced from BRICS. These five countries generated more than 45 per cent of these FDI in the second half of the preceding decade compared to less than 10 per cent two decades before. China, in particular, has become the main driver of FDI, accounting for more than 60 per cent of the stock of FDI originating from BRICS (Figure 1, Right scale). Figures 2 and 3 exhibits the flows of FDI to African countries by the origin of investors broadly categorized.[2] As depicted in Figure 2, the magnitude of FDI as a share of GDP (averaged over the 2001–2012 period) is two per cent or less for a number of them. In fact, the mean value for some countries indicates a net outflow during the years considered. For the majority of the receiving countries, the predominant source of FDI has been developed countries. A temporal profile of FDI flows also indicates that the FDI from developed countries dominated that from other countries, although the flows from developing countries have been trending upward (Figure 3).

This surge in EM FDI has been attributed to closer economic integration and increased South–South cooperation, as promoted by the G77 and the related Marrakech Declaration of 2003 (UNDP, 2010). Another set of reasons could be the familiarity of the EM MNEs with the investment climate of developing countries and the propensity to deliver products tailored to low-income consumers (Battat and Aykut, 2005). These arguments suggest that differences in endowments, proportions

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1. The EM and high-income OECD designations are as per UNCTAD classifications.
2. In the forthcoming figures and tables, the group "Developing+" refers to developing countries and transition economies as per UNDP classification of countries and economies.

and relative prices of resources are not the only factors influencing capital movements and EM FDI trends as posited by the standard neoclassical theory (Cleeve, 2008). Theoretical explanations adduced alongside the traditional theory of comparative advantage include economies of scale, imperfect competition, product life cycle and product differentiation (Dunning, 1998; Ramamurti and Williamson, 2019).
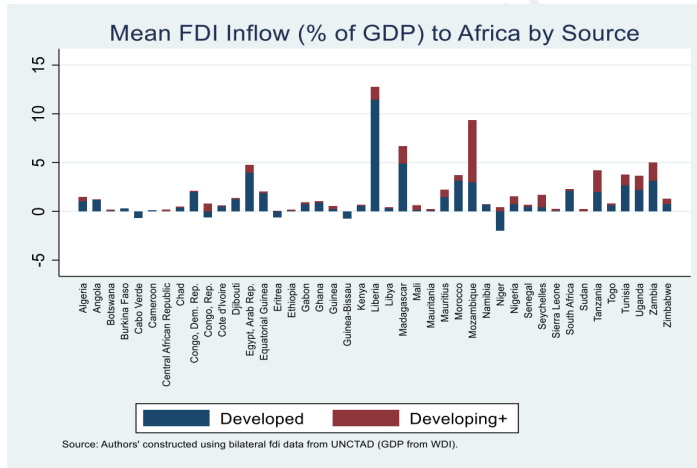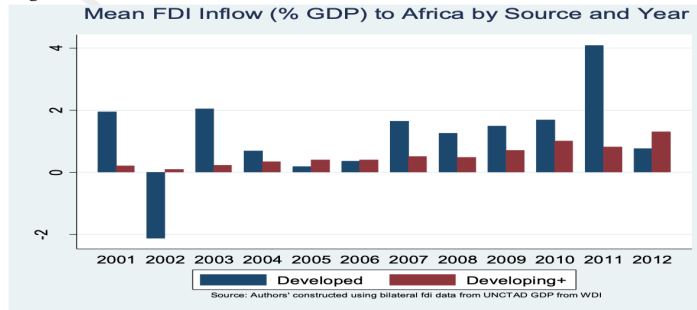
Figure 2

Source: Authors' constructed using bilateral fdi data from UNCTAD (GDP from WDI).

Figure 3

Source: Authors' constructed using bilateral fdi data from UNCTAD GDP from WDI

As mentioned above, EM FDI flows to developing countries, including Africa, have been on the rise. However, the empirical evidence on the effects of these flows on domestic capital formation in host countries is mixed, and there is little evidence on whether the origin of FDI matters, especially in the context of Africa. The nature and durability of FDI's effect will partly depend on its impacts on domestic firms and the contributions of the latter to gross fixed capital formation (GFCF). It is, therefore, worth investigating whether FDI flows spurred domestic capital formation in the host countries and whether the flows from EM exerted a different impact compared to the flows from developed countries. However, the effects of FDI flows from EM versus developed countries on domestic investment are yet to be sufficiently explored. This paper seeks to contribute to the body of empirical evidence on the issue by taking stock of the experiences of African countries. More specifically, the study seeks to address the following questions:

  i. Has FDI influenced domestic investment in African countries?
 ii. Is the source of FDI relevant in characterizing the effect of FDI on GFCF?
iii. What was the role of natural resource endowment and institutions as mediating factors in between

FDI and GFCF?

The objective of this paper is to address these questions using disaggregated FDI data available for the 2001–2012 period. The selection of study countries and periods has been dictated by the availability of data, especially, on FDI disaggregated by the origin of investors. The relationship between FDI and gross fixed capital formation is investigated using the fixed–effects estimation procedure, within an empirical framework that distinguishes between short–run and cumulative effects. The structure of the paper is as follows. Section 2 provides a brief review of the relevant literature. Section 3 describes the estimating model and data, followed by Section 4 where we present and discuss the results. Section 5 summarizes and offers concluding remarks.

2.   Literature Review

Economic theory posits that foreign direct investment can play a significant role in the growth dynamics of recipient economies. The relevant literature proposes that FDI can fill three development gaps. These are an investment/savings gap by providing much–needed capital to supplement domestic saving and investment; a foreign exchange gap by the provision of foreign currency through initial investment and subsequent export earnings; and a tax revenue gap by generating tax revenues through the creation of additional taxable economic activities (Anyanwu 2011; Quazi 2007).

Foreign direct investment could also crowd in domestically financed capital formation through a number of mechanisms including the following.[3] Facilitating the transfer of managerial skills and technological knowhow; heightening competition in the domestic market; creating modern job opportunities; expanding global market access for locally produced export commodities; attracting new local investors; improving human capital and total factor productivity; and increasing the availability and efficiency of infrastructure (Agosin and Mayer, 2000; Berthélemy and Démurger, 2000; Grossman and Helpman, 1988; Markusen and Venables, 1999; Moran, 2011). Conversely, the superior technological, managerial and financial know-how enjoyed by MNEs could allow them to create monopolies in the product market. Moreover, their scale of operation could cause the prices of resources to increase because of heightened competition in the domestic factor markets. These would hamper the growth of, or destroy, competing local businesses (Aitken and Harrison, 1999; Agosin and Mayer, 2000; Markusen and Venables, 1999).

The forgoing suggests that whether FDI crowds in or crowds out GFCF in developing countries is theoretically ambiguous. The nature of FDI's effect depends, among others, on the kind of FDI received (greenfield or mergers and acquisitions), the underlying motives for the flow (whether market–seeking, resource–seeking, etc.), whether MNEs' activities create backwards and forward linkages in the host economy, and on the strength of domestic firms to withstand the induced competition. A review of the empirical literature for evidence on the effects of FDI on GFCF reveals that the cross-country evidence on the effect of FDI on gross fixed capital formation is inconclusive. One of the earlier studies is that of Agosin and Mayer (2000) who, applying the Seemingly Unrelated Regression methods with fixed effects in a dynamic setting, find that the effect of FDI on domestic investment depends on the region and the period considered in their study sample. They report a crowding–in effect in Asian and a crowding–out effect in Latin American countries both over the whole period (1970–96) and the two sub–samples constructed. A crowding–in effect is observed in the African sub–sample, inclusive of 12 countries, for each of the two sub–periods. On the other hand, an estimation spanning the whole period reveals that the average long–run effect is neutral.

Kasuga (2007) estimates the investment–rate equation based on a reduced form relationship inclusive, among others, of saving and foreign aid as control variables. A panel data analysis of 64 developing countries over the period 1980–1999 using 5–year moving averages suggests that FDI

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3. See, for example, Amighini, McMillan, and Sanfilippo (2017) for a more detailed review of the mechanisms through which FDI is expected to influence GFCF.

positively affects fixed investment. A crowding-in effect is also reported by Ndikumana and Verick (2008) who apply a fixed-effects procedure to panel data drawn from 38 SSA countries over the period 1970-2005.

Wang (2010), analysing data from 50 developed and developing countries spanning the 1970-2004 period, finds FDI to have a negative contemporaneous and a positive cumulative effect for the whole sample and a neutral contemporaneous and positive cumulative effect for a sub-sample of less developed countries. Distinguishing between initial and lagged effects and using the fixed-effects method, Adams (2009) documents that FDI exerts a contemporaneous negative, and a lagged positive, effect on domestic investment for a panel of 42 African countries over 1990-2003. Spanning the same period, Mutenyo, Asmah and Kalio (2010) find a crowding-out effect for a smaller sample of 34 SSA countries. They estimate a modified accelerator investment model of domestic private investment using a standard panel and 2SLS procedures based on three-year averaged data. On the other hand, Ndikumana and Blankson (2015), applying a dynamic panel-data estimation method to a larger sample of 50 African countries over a longer period (1971-2012), provide evidence that FDI crowds in domestic investment.

Employing a panel-cointegration estimation technique to panel data from the economic community of West African states from 1970-2008, Eregha (2012 reports that FDI substitutes for domestic investment in the region. Similarly, Fahinde, et al. (2015), in their study of the economies of WAEMU for the period 1996-2011, report that FDI crowds out domestic investment in the said bloc of countries. More recently, Yiheyis and Cleeve (2018), in their analysis of the experiences of 41 African countries over nearly two decades using dynamic panel-data estimation methods, report that FDI generally exerts a negative effect on locally financed domestic capital formation. In a rare study that compares the GFCF effect of FDI from developed and developing countries using industry-level data, Amighini, McMillan, and Sanfilippo (2017) find that FDI exerts a positive impact on GFCF where MNEs engage in manufacturing production and that the impact of FDI from advanced economies is stronger than that from developing countries.

It is clear from the foregoing brief review of relevant empirical studies the impact of total FDI on domestic capital formation in developing countries has been a subject of investigation for various groups of countries. However, the evidence is inconclusive, with reports of crowding-in, crowding-out, or neutral effects of FDI on domestic investment in host countries. Cross-study differences in results may be attributed to differences, among others, in modelling, study sample composition, estimating methods, and whether the total domestic investment or locally financed domestic investment is used as the response variable. What is also clear from the review is the dearth of comparative analyses of the GFCF effect of FDI disaggregated by the origin of investors.

As noted above, the motives of FDI flows, such as market-seeking, resource-seeking, or other motives, the extent of backward and forward linkages created in the host economy, and the impact of the induced competition on local businesses are some of the factors that could characterize the nature and duration of FDI's effects on GFCF. Most of these factors could well be specific to each investor; and as Meyer and Siani (2009) suggest there exist characteristics of MNEs that are associated with beneficial or adverse spillover effects. Cataloguing observed key differences and commonalities of characteristics among foreign firms point to the relevance of MNEs' origin broadly categorized, heterogeneity within each group notwithstanding. Distinguishing between OECD FDI and EM FDI is a clear case in point. EM MNEs are observed to have different characteristics and face a disparate set of constraints along with historical, cultural, technological, and institutional differences, which may impel them to pursue different strategies than firms from the OECD countries (Guillén and Garcia-Canal, 2009; Luo and Tung, 2007; Ramamurti and Singh, 2009; Li et al., 2018). A survey of the operation of domestic and foreign firms in Africa by UNIDO finds differences in self-reported motives of entry, technology transfers, the propensity to generate linkages with local suppliers, and labour-market outcomes (employment opportunity, relative wage premium, and demand for skilled

workers, among others). The survey finds that these factors broadly align with whether the investors are from the OECD or BRICS countries (Amendolagine and Coniglio, 2016; UNIDO, 2011).

With respect to technological transfers, Hu, You and Esiyok (2021) report evidence suggesting that FDI from developing countries generates stronger technological benefits compared to that from developed countries. At the same time, technologies adopted by EM MNEs, which are more adapted to the host economy, would make MNEs more vulnerable to domestic competition to the extent of discouraging MNEs' propensity to invest (Amighini, et al. 2017). This would mitigate the adverse effect of unfavourable competition stemming from the technological superiority previously mentioned. There is also some evidence, albeit mixed, that MNEs from emerging markets positively respond to institutional weakness in host countries (e.g. Holburn and Zelner, 2010; Tang and Buckley, 2022). This suggests that developing countries with weak institutions would attract FDI from EM EMNs, bearing implications for the effectiveness of FDI from EM EMEs in promoting domestic investment. For example, terms of negotiations with foreign firms and decisions made by local authorities regarding FDI would likely be more favourable to host economies in the presence of sound institutions than otherwise. Furthermore, poor institutions, in view of their adverse growth effect, could undermine the potential contribution of FDI projects once implemented. The contribution of FDI from EM MNEs with less home–host institutional distance could hamper institutional development in host economies, generating adverse long–run effects.

The above–noted and other differences, such as in perceptions of political and economic risks, location choices and corporate social responsibility, between the aforementioned groups of foreign investors could bear implications for their respective impacts on the operations of domestic firms in the host economies and by extension on total and locally financed domestic capital formation. In light of the paucity of empirical evidence on the matter, this paper seeks to assess the extent to which EM FDI flows affected GFCF in Africa and how these effects compare to those of FDI from developed countries. In doing so, the paper explores the role of natural resource endowments and the quality of institutions in host economies as mediating factors between FDI and GFCF.

3.   Method and Data

The role of FDI and the implication of its origin in the process of domestic capital formation is assessed using an empirical model that controls for other key observable determinants of GFKF. In view of the multiplicity of channels through which FDI is expected to influence domestic investment, the empirical model used in this article is eclectic, rather than being derived from a single theoretical framework. The estimating equation specified controls for GDP growth, domestic saving rate, trade openness, macroeconomic instability, fiscal policy, natural resource endowment and exploitation, and quality of institutions. Theoretical and empirical considerations guided the selection of these control variables most of which appear in investment equations in the related literature with varying compositions and representations (for example, Agosin and Machado, 2005; Agosin and Mayer, 2000; Al-Sadig, 2013; Ndikumana and Blankson, 2015; Yiheyis and Cleeve, 2018).

Motivated by the accelerator principle, GDP growth is included as a proxy for the expected increase in aggregate demand and, thus, higher profits, boosting GFCF. The domestic saving rate enters the model to represent the availability of savings from domestic sources, a key factor in domestic capital formation, especially where capital mobility is imperfect (Ndikumana and Blankson, 2015). A measure of trade openness has been included for two main reasons. First, a decrease in trade barriers, to the extent that it is accompanied by and leads to greater access to global markets, could create additional investment incentives in the export sector. Second, increased access to imported inputs resulting from liberalization could spur investment activity both in the export and in the other sectors of the economy. Trade openness is represented by the sum of exports and imports as a share of GDP.

Macroeconomic instability, the other control considered, is expected to adversely affect invest–

ment activity due to uncertainty and associated risks. The inflation rate is used as a proxy for macroeconomic instability as a rise in it shows the government's overall inability to manage the economy (Fischer, 1993). In addition, fluctuations in prices may reflect macroeconomic instability to the extent that it represents distorted decisions made by producers and consumers (Satyanath et al, 2008). However, inflation may also signal higher profitability where nominal wages and prices of inputs are sticky, in which case inflation could positively affect GFCF in the short run. [4]

The share of government consumption spending in GDP enters the model to represent the implications of fiscal policy for investment. Incorporated are also institutional factors, such as the quality of the system of governance with a view to account for the political, administrative and institutional environment in which businesses operate. The quality of institutions may influence GFCF not only directly but also interactively with FDI. A proxy for the quality of institutions is constructed as the first principal component of the six governance indicators estimates, namely, government effectiveness, control of corruption, regulatory quality, rule of law, voice and accountability, political stability and absence of violence/terrorism. We use the principal component to obviate the multicollinearity problem that would otherwise arise by including the aforementioned indicators in the model. We also control for natural resource endowment in cognizance of the importance of the resource-seeking type of FDI in Africa, which tends to be less responsive to risks, trade barriers and other attributes, as outlined later in the discussion of results. Natural resource endowment and exploitation is represented by total natural resources rents as a percentage of GDP. [5] The baseline regression model used to investigate the effect of FDI on GFCF takes the form:

$$gfcf_{it} = \alpha_0 + \alpha 1 fdi_{it} + \alpha 2 fdi_{it-1} + + \phi_J Z_{Jit} + \mu_i + \epsilon_{it} \qquad (1)$$

where: $gfcf$ is gross fixed capital formation; fdi is net foreign direct investment (aggregate or disaggregated by origin); Z is the vector of the control variables identified above: lagged real gdp growth rate ($gdpgrowth_{-1}$), gross domestic saving rate (gds), trade openness ($itrade$), natural resources rent ($nresources$), fiscal policy (gov), lagged inflation rate, ($inflation_{-1}$) and quality of institutions ($instt$). All variables except gdp growth rate, inflation, and institutions enter the regressions as percentages of GDP. μ is the unobserved country-specific effect; ϵ is the error term; and i and t denote the study country and period, respectively. The estimating procedure employed is the fixed-effects procedure, which controls for country-level fixed effects, recognizing that the study countries are otherwise heterogeneous. We have also incorporated period dummy variables to account for time-varying domestic and international events influencing GFCF that the included regressors may not fully be captured. Given the short period dimension of the unbalanced data utilized, the lag of the variable of interest is limited to one. When further lagged terms were included, their coefficient estimates turned either insignificant or alternated signs. Since multiple lags of the same variable will typically be highly collinear for economic time series that tend to change slowly, the estimating equation is rearranged as follows incorporating the first difference and lagged level of fdi, which are expected to be less correlated (Harvey, 1990: 113). The resulting equation takes the following form.

$$gfcf_{it} = \alpha_0 + \alpha_1 \Delta fdi_{it} + \alpha_2 * fdi_{it-1} + + \phi J Z_{Jit} + \mu_i + \epsilon_{it} \qquad (2)$$

where $\alpha_2 {}^* = \alpha_1 + \alpha_2$. ($\alpha_2$ in equation 1).

The additional advantage of this formulation is that α_2* can be interpreted as the cumulative or long-run response of $gfcf$ to changes in fdi.[6] We estimate equation (2) first separately for each group of FDI sources and then examine the effects of flows from a given source holding those from another.

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4. The inflation rate based on the GDP deflator is used because of missing observations for some countries on CPI inflation

5. As defined in the World Bank's WDI database, "total natural resources rent are the sum of oil rents, natural gas rents, coal rents (hard and soft), mineral rents, and forest rents." See e.g. Ndikumana (2019) for the use of this variable as an indicator for natural resources.

6. See Harvey, 1990:113 for details.

Three groups of sources of FDI are formed for the present investigation: developed countries, BRICS, and other developing and transition economies.[7] The study sample is drawn from African countries for which relevant data are available for the period 2001– 2012.[8] Data sources include UNCTAD (for total and disaggregated FDI data) and World Bank databases. [9]

4.   Results and Discussion

Equation (2) is estimated using the fixed–effects procedure on unbalanced data using alternately total GFCF and private GFCF as response variables, with a focus on the latter. This section presents and discusses the results.

Baseline Model Estimates:

Table 1 records fixed–effects estimation results of the baseline model for total GFCF with total and disaggregated FDI.[10] Total FDI is observed to have a statistically positive contemporaneous and cumulative effect on GFCF. Decomposing FDI's contemporaneous effect by its source reveals that the estimated coefficients on FDI both from developed and other countries are positive. However, a statistically significant effect characterizes only FDI from developed countries and BRICS at the 1 and 10% levels, respectively.[11] The cumulative effect is also positive for FDI from these two groups of countries at the 10% level or lower. In contrast, the effect of FDI from the Developing+ group as a whole is insignificant both contemporaneously and more so cumulatively.

The majority of the control variables are statistically significant, carrying the expected signs. According to the estimates, the ceteris paribus effect of increases in real GDP growth, gross domestic saving, government spending, and trade openness is spurring total domestic capital formation. The coefficient on the indicator of natural resource endowment is estimated to be significantly negative. This result probably reflects the relative neglect of the non-extractive sector of the economy and the lack of complementarity between the latter and the extractive sector in stimulating entrepreneurial activity in the economy as a whole. The coefficient estimates on indicators of macroeconomic stability and quality of institutions appear to exert no significant effect on total fixed capital formation.[12]

The analysis thus far pertained to gross domestic fixed capital formation including public invest-ment as the response variable. Given potential or expected differences in the underlying motive and behavioural responses of investment activity between the private and the public sectors of the economy, the effect of FDI is also examined by focussing on GFCF by the private sector. Table 2 presents the estimates of the baseline model with GFCF by the private sector as the dependent variable.

The estimates for FDI's effect with domestic private fixed investment as the response variable are similar to those reported for total investment, although strict comparison is hindered by the fact that

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7. Developed versus developing and transition economies categories are used per UN classification.

8. Depending on the response variable consider, the number of study countries ranges between 39 and 43. The 43 countries are Algeria, Angola, Botswana, Burkina Faso, Cabo Verde, Cameroon, Central African Republic, Chad, Congo, Cote d'Ivoire, Djibouti, Egypt, Equatorial Guinea, Eritrea, Ethiopia, Gabon, Ghana, Guinea, Guinea-Bissau, Kenya, Liberia, Libya, Madagascar, Mali, Mauritania, Mauritius, Mozambique, Morocco, Namibia, Niger, Nigeria, Senegal, Seychelles, Sierra Leone, South Africa, Sudan, Tanzania, Togo, Tunisia, Uganda, Zambia, and Zimbabwe.

9. UNCTAD, Bilateral FDI Statistics (https://unctad.org/news/new-unctad-publication-bilateral-fdi-statistics) and World Bank, World Development Indicators, respectively. Model estimations and other statistical analyses of the paper were conducted using Stata 15.1.

10. The total FDI (from "All countries" in Table 1) is net FDI inflow (% of GDP), which does not necessarily equal the sum of the disaggregated data developed and Developing+ countries. Representing the "total" by the sum of the disaggregated data yielded qualitatively similar results.

11. Although we are using BRICS for ease of reference, the majority of FDI flows from this group to the study countries during the period under consideration, in terms of year–country observations (counts), are from China, which is distantly followed by India, South Africa, and Brazil.

12. In view of the correlation detected between total natural resources rent and the indicator of the quality of institutions, dropping the former and re–estimating the model left the statistical insignificance of the latter unaffected.

Table 1. Fixed-Effects Regression Results

Dependent Variable: *gfcf*				
Explanatory	FDI from:			
Variables	All Countries	Developed	BRICS	Other Developing+
Δfdi	0.2931	0.0572	0.7181	0.2536
	(2.94)***	(2.39)**	(1.88)*	(0.54)
fdi_{-1}	0.3364	0.0701	0.9879	-0.2792
	(3.56)***	(1.82)*	(3.11)**	(0.43)
nresources	-0.3936	-0.4580	-0.4242	-0.4355
	(5.14)***	(4.31)***	(4.03)***	(4.17)***
$gdpgrowth_{-1}$	0.1093	0.1216	0.1092	0.1258
	(2.98)***	(2.39)*	(2.00)**	(2.54)**
gds	0.2670	0.3218	0.2988	0.3030
	(5.48)***	(5.06)***	(5.17)***	(5.24)***
gov	0.3289	0.3365	0.3380	0.668
	(2.80)***	(2.29)**	(2.33)**	(2.43)**
itrade	0.1937	0.2238	0.2057	0.2125
	(7.63)***	(5.00)***	(4.75)***	(4.98)***
$inflation_{-1}$	-0.0462	0.0053	0.0060	0.0070
	(1.31)	(0.56)	(0.64)	(0.77)
instt	0.6127	0.5284	0.7732	0.7597
	(0.62)	(0.52)	(0.84)	(0.83)
# of obs.	426	411	413	413
R^2				
within	0.55	0.42	0.43	0.42
between	0.26	0.25	0.26	0.26
overall	0.30	8.5***	27.25	0.25
F stat	16.7***	9.47***	27.2***	9.47***

Notes:
 1. "Other Developing+" are developing and transition economies excluding BRICS.
 2. All variables except gdpgrowth, inflation, and institutions are shares of GDP.
 3. Figures in parentheses are absolute values of t-ratios based on robust standard errors. Single, double and triple asterisks denote significance at the 10, five and one per cent levels, respectively.
 4. Constant terms, country-specific trends, and year dummy variables are included in estimations but not reported for economy of space.

the estimates being discussed exclude the experiences of five countries lacking data on private-sector investment.[13] FDI sourced from developed and BRICS countries significantly affected GFKF by the private sector, while the average effect of FDI from the other group of countries is statistically zero. This is the case both for the contemporaneous and long-term effects. The control variables, which were statistically significant in explaining total GFCF, continue to be so for private GFCF except the indicator of fiscal policy. The latter turns insignificant, albeit positive, probably reflecting the differentially supportive role it plays in boosting public investment. Another difference observed pertains to inflation, which emerges with a statistically significant coefficient in all but one case. However, controlling for very high inflation episodes observed in the data renders the variable in question statistically zero, with an imperceptible effect on the other estimates of the model.

4.1   *Natural Resource Endowments and Institutions as Mediating Factors:*

The results presented above suggest that FDI both from developed countries and BRICS exert a positive impact on total as well as private domestic investment. The same is not true, however, for flows from the group of other countries whose average effect is neutral. Underlying the model estimates presented above is the assumption that domestic capital formation in the host countries responds to FDI flows in the same manner. Although country heterogeneity is taken into account by allowing the intercept term to shift, the slope parameter is assumed to be homogeneous across countries. There are, however, differences among host countries that may condition the degree and nature of the response of domestic investment to FDI flows.

One of the conditioning factors whose implications are investigated is natural resource endowment and the type of FDI it tends to attract.[14] Where FDI is oriented towards the exploitation of natural resources, FDI may adversely affect local industries through a "Dutch disease" type process or the "resource curse" effect. For example, the increase in exports of natural resources induces the appreciation of the real effective exchange rate, which further implies a loss of competitiveness of the other non-extractive tradable sectors (Sachs and Warner, 1997). The adverse effect could be magnified in countries with poor institutions where FDI-induced exploitation of their natural resources may aggravate rent-seeking and other political and economic distortions, generating negative externalities for the other sectors of the economy (Torvik, 2009). These distortions can create barriers to the emergence of new local manufacturing enterprises, contributing indirectly to the crowding out of domestically financed investment (Farla, et al. 2013; Rodrik and Velasco, 1999; Sachs and Warner, 1997).

The implications of natural resources for the link between FDI and GFCF are explored by segmenting pooled observation into two categories on the basis of total natural resource rents (per cent of GDP). As the 2nd panel of Table shows, the least resource-dependent economies (group 1) generated 11 per cent compared to the comparator whose share of natural resource rent is more than fourfold, averaging at 48.5 per cent. The rates of fixed investment are almost the same in both groups with a mean differential of less than three percentage points. There is, however, a clear difference between the two groups with respect to the flows of FDI. The more resource-rich economies attract more FDI, indicating the importance of the resource-seeking type of FDI in Africa during the study period; and most of the FDI from developed countries flowed to such economies.

Conversely, economies with less natural resource endowments appear to be preferred destinations for FDI originating from developing countries including BRICS, the small magnitude of the flows notwithstanding.[15] These stark differences motivate not only the inclusion of natural resources in

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13. Algeria, Ethiopia, Morocco, Nigeria, and Zambia are not included in this analysis owing to missing data on private fixed investment for the study period.

14. In the forthcoming discussion, the term "resources" generally refers to "natural resources;" for example, when it appears in the phrase "resource-rich" economies.

15. Brautigan et al. (2018) document the increasing role of Chinese investment in Africa in the construction and manufacturing sectors.

the baseline regression but also exploring its interactive effect with FDI on GFCF, recognizing that resource- seeking type of FDI tends to be less responsive to risks, trade barriers and other factors that potentially influence the linkage between FDI and GFCF. The results of this exercise appear in the 2nd panel of Table 3, with private GFCF as the response variable.

Table 2. Fixed-Effects Regression Results (Dependent Variable: gfcf_ps)

Dependent Variab	*gfcfps*			
Explanatory		OI from:		
Variables	All Countries	Developed	BRICS	Other Developing
Δfdi	0.2856	0.0748	0.7787	0.1414
	(3.02)***	(2.77)***	(2.47)**	(0.19)
fdi_{-1}	0.3598	0.1023	1.884	−0.6665
	(4.35)***	(2.12)**	(2.04)**	(0.68)
nresources	−0.3178	−0.3923	−0.3418	−0.3655
	(4.32)***	(4.21)***	(3.53)***	(3.85)***
gdpgrowth	0.1452	0.1436	0.1206	0.1478
	(3.29)***	(2.67)**	(2.06)**	(2.70)***
gds	0.1831	0.2453	0.2160	0.2174
	(3.91)***	(3.70)***	(3.60)***	(3.60)***
gov	0.1278	0.1197	0.1267	0.1351
	(1.30)	(0.99)	(1.02)	(1.11)
itrade	0.1399	0.1765	0.1548	0.1600
	(5.10)***	(3.71)***	(3.33)***	(3.49)***
	−0.0390	0.0252	0.0263	0.0281
	(1.25)	(2.83)***	(3.12)***	(2.77)***
instt	−0.6510	−0.6886	−0.3132	−0.3850
	(0.79)	(0.65)	(0.33)	(0.40)
# of observations	345	333	336	336
R^2				
within	0.47	0.29	0.29	0.29
between	0.17	0.19	0.20	0.20
overall	0.19	0.13	0.15	0.14
F stat	30.4 ∗ ∗∗	11.9 ∗ ∗∗	11.8***	111.0***

Notes: see notes of Table 1

The effect of FDI from developed countries and BRICS is positive, with varying statistical significance depending on the host country group and the timing of the effect. In less resource–rich economies, the contemporaneous effect is significant at the 5% level for FDI from BRICS, while the cumulative effect is strongly significant for FDI from developed countries. The cumulative effects of FDI from these two groups of countries are positive but statistically insignificant in more resource–rich economies, while the contemporaneous effect from developed countries is moderately significant. FDI from other EM MNEs groups largely remains insignificant, except for its cumulative effect in resource–rich countries where a negative effect at the 10% level of significance is observed. Taken together, these results indicate that GFCF's effect of FDI, in general, and its cumulative effect, in particular, partly depend on whether the destination economy has a relatively large extractive sector; and this is so in spite of the relative size of FDI flows received by the two groups of host economies under consideration.

Another feature of host economies whose role as a mediating factor we explore is the quality

of institutions, its correlation with natural resource endowment notwithstanding.[16] Partitioning the pooled observations into two groups based on the quality of institutions indicator described elsewhere generates the information shown in the third panel of Table 3. Although the quality of institutions in the typical study country leaves a lot to be desired, the average cross–panel difference is hardly negligible, with a range of 3.6 between the two groups constructed. The group with better institutions received a relatively higher percentage of FDI. The group associated with better institutions registered GFCF of about five percentage points higher than its counterpart with weaker institutions. A look at panel 4 of Table 3 indicates that FDI from BRICS exerts a favourable effect on GFCF in economies with better institutions at the 10% level of significance or lower in both the short run and long run, while its contribution elsewhere was not discernible. On the other hand, FDI from developed countries affected private GFCF positively in economies with weaker institutions, with a moderately significant favourable long-term effect observed in both cases. It is worth noting that the institution–group effects are analysed by controlling for the continuous series of the institution's indicator, which is found insignificant in explaining GFCF, due, probably, to its small temporal variation for a given country. Although the scale effect may be at work, since countries with better institutions received more FDI (as % of GDP), the results are suggestive of the implications of institutions for the effectiveness of FDI from emerging markets in promoting domestic investment.

In sum, an examination of the considered mediating factors reveals that the favourable effect of FDI is on average numerically and statistically larger in economies with less extractive sector activity, with FDI from developed countries found less sensitive to differences in the latter with respect to its cumulative effect. On the other hand, the link between FDI and private domestic investment is found to be weak in economies with high resource dependence. The same is true for economies with weaker institutions as regards FDI from BRICS.

4.2   Examining the Effect of FDI from One Source Holding On FDI from Another Source:

In the estimations conducted thus far, the effects of FDI from each source were investigated using separate regressions. To check the robustness of the results reported above, we estimate the model by incorporating FDI flows from different sources in the same regression. We focus on FDI from developed countries and BRICS, in light of the observed insignificant overall effect of FDI from other economies. To deal with the problem of correlation detected between the two FDI series and to remove the possible effects of other included regressors on FDI and thereby generate more accurate coefficient estimates, orthogonal variables are used.[17] The estimated coefficients on orthogonal FDI are presented in the top panel of Table 4, juxtaposed with estimates based on the original ("unpurged") series.

Coefficient estimates based on the original series, incorporating the two FDI flows in the same regression, remain positive, with diminished statistical significance, especially for the cumulative effect. Estimation involving the orthogonal FDI series considerably magnified the coefficients of FDI from developed countries, significant at the 5% level. Given FDI from developed countries, the positive effect of FDI from BRICS is statistically significant only in the short run. A comparison of the significantly positive short-run effects of the two sources of FDI shows that they are statistically

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16. Based on the reduced sample used for the private GFKF regressions, a pairwise correlation analysis of the indicators in question generates a coefficient of -0.5 between the two indicators for the pooled series and -0.29 for the groupings. This indicates that there is some overlap between the two indicators but not high enough to render the groupings based on the two indicators indistinguishable.

17. There is evidence pointing to the importance of natural resources, institutions, and trade openness in influencing FDI flows to Africa (e.g. Asiedu, 2006; Anyawu, 2012). The series for orthogonal FDI from developed countries are obtained by removing the effects of the explanatory variables of the model and the effect of FDI from BRICS on FDI from developed countries. Likewise, the orthogonal series for FDI from BRICS are generated by removing the effects of the included regressors and FDI from developed countries on FDI from BRICS.

Table 3. FDI and Gross Fixed Capital Formation by Resource Endowment and Institution Indicators in Host Countries and Interactive Effects

Dependent Variable: gfkf$_{p}s$					
FDI and Gross Fixed Capital Formation by Natural Resource Endowment					
	FDI (% of GDP) from:				
Group	Total Natural Resources rents (% of GDP)	Developed	BRICS	Other Developing+	GFCF_PS (% of GDP)
1	10.9	0.94	0.29	0.30	15.0
2	48.5	2.87	0.14	0.17	12.6

Interactive Effects of FDI and Total Natural Resources Rents (% GDP) Group					
	FDI from Developed		FDI from BRICS		FDI from Other Developing+
Group	1	2	1	2	1	2
Δfdi	0.1594	0.0428	0.8200	0.4527	0.1314	0.3563
	(1.65)	(1.94)*	(2.35)**	(0.16)	(0.21)	(0.21)
fid_{-1}	0.3623	0.0490	1.875	1.950	-0.5365	-2.737
	(3.03)***	(1.58)	(1.68)*	(0.90)	(0.60)	(1.73)*

FDI Flows and Gross Fixed Capital Formation by Quality of Institutions					
	FDI (% of GDP) from:				
Group	Quality of Institutions	Developed	BRICS	Other Developing+	GFCF_PS (% of GDP)
1	-1.83	0.94	0.18	0.15	12.6
2	1.74	1.28	0.38	0.42	17.4

Interactive Effects of FDI and Quality of Institutions Group					
	FDI from Developed		FDI from BRICS		FDI from Other Developing+
Group	1	2	1	2	1	2
Δfdi	0.0722	0.1333	0.2869	1.225	-0.0456	0.4160
	(2.92)***	(0.70)	(0.39)	(5.01)***	(0.03)	(0.60)
fid_{-1}	0.0939	0.7172	-0.2762	4.304	-2.263	0.6915
	(2.29)*	(1.76)*	(0.3)	(6.77)***	(1.51)	(0.64)

Controls: *nresources, gdpgrowth-1, gds, gov, openness, inflation-1, institutions, country-specific time trend, year* dummy variables

Notes: Estimates of baseline model allowing the slope parameters to shift by the considered conditional factors. Only estimates of slopes of the variable of interest shown in the interest of space. "Group" refers to the partition of pooled observations. See also notes to Table 1.

equal. However, estimating the corresponding standardized or beta coefficients, we find that one standard deviation (SD) increase in FDI from developed countries leads to a 0.12 SD increase in the rate of private investment. The corresponding figure for FDI from BRICS is lower at 0.07. While the cumulative effect is positive in both cases, it is significant only for FDI from developed countries, with a beta coefficient of 0.13.

The mediating factors explored earlier remain relevant in influencing the strength of the link between FDI and GFCF when the two sources of the former enter the regression as orthogonal covariates. As can be gleaned from the second panel of Table 4, the positive cumulative effect of FDI is statistically and numerically significant in low resource–dependent economies irrespective of the source. The quality of institutions appears to exert greater influence on the effectiveness of FDI from BRICS than that from developed countries. The cumulative effect of FDI from BRICS countries is positive and strongly significant in the group of economies with better institutions, while its effect on GFCF in the other economies is on average neutral. On the other hand, FDI from developed countries favourably affects domestic capital formation in both groups of host countries, with a more statistically significant but numerically smaller effect in economies with weaker institutions and a numerically larger effect, albeit at a lower level of significance in economies with better institutions.

Taken together, our findings lend support to the view that FDI can exert a favourable effect on domestic capital formation and, at the aggregate level, accord with some of the evidence from Africa previously cited (Ndikumana and Verick, 2008; Ndikumana and Blankson, 2015). However, our findings also reveal that the sources of FDI as well as the economic and institutional characteristics of the host countries are relevant in characterizing the nature and size of its effect. Overall, we find evidence that FDI from developed and BRICS countries contributed to domestic investment in the typical study country unlike flows from other developing and institutional economies the average effect of which is at best neutral.

4.3   *Implications for Domestic Investment by Local Enterprises*

The foregoing analysis pertains to the effect of FDI and other determinants on gross fixed capital formation, which, by definition, encompasses investment by foreign companies, especially where greenfield FDI is involved. Therefore, a statistically positive coefficient estimate on FDI implies that FDI contributed to total domestic investment including the component undertaken by foreign enterprises through FDI, not necessarily to locally financed domestic capital formation. The nature of FDI's effect on the latter may be surmised from the estimated coefficients on FDI terms. If the sum (in the presence of lagged terms) exceeds one and is statistically significant, it may be inferred that a crowding–in effect on locally financed investment is present. On the other hand, a sum less than one would signal the presence of a crowding-out effect (Agosin and Mayer, 2000).

A look at the estimates on the cumulative effect of FDI indicates that in most cases the estimated coefficient associated with the cumulative effect is far less than one, pointing to the presence of a crowding-out effect on locally financed domestic investment. This effect, albeit implied, is consistent with the findings reported by Yiheyis and Cleave (2018). In regressions where mediating factors are not included, the cumulative effect exceeds one and is statistically significant only for FDI from BRICS with private GFCF as the dependent variable, with a coefficient of 1.9 (Table 2). From the estimates based on orthogonal variables with mediating factors, a crowding–in effect on locally financed domestic investment appears to characterize FDI from BRICS and developed countries flowing into economies with less natural resource dependency and better institutions (Table 5).

5.   Summary and Conclusions

The flow of FDI to developing countries including Africa has been on the rise, and its relative significance as a source of foreign capital has increased for many African countries. The observed rise is mostly attributable to FDI from emerging market economies including BRICS. However, the

empirical evidence on the effects of these flows on the economies of host countries is mixed and the evidence of whether the origin of FDI matters for the nature of the effects is thin, particularly in the context of Africa. The nature and durability of FDI's effect on host economies partly depend on its impact on the performance of domestic firms and domestic capital formation. This study, therefore, sought to investigate whether this was the case and whether the flows from EM exerted a differential impact compared to flows from traditional sources of FDI. We estimated an empirical model that distinguishes between short-run and cumulative effects on panel data drawn from African countries with relevant data, spanning the 2001- 2012 period.

The dependent variables considered are total gross fixed capital formation and its component undertaken by the private sector, with a focus on the latter. As well, estimations were conducted incorporating potential mediating factors and using orthogonally transformed series for FDI. Overall, the results suggest that total FDI favourably influenced GFCF in the study countries during the period under consideration. The nature and significance of the effect appear to be sensitive to the source of FDI as well as the structural and institutional characteristics of the host economies. According to the results based on disaggregated FDI by origin, FDI from BRICS and developed countries seem, for the most part, to have contributed to overall domestic capital formation at least in the short run. The average effect from other developing countries as a whole is mostly insignificant, probably reflecting the relatively lower scale and duration of FDI operations of these countries in host economies. Compared to FDI from BRICS, we find the cumulative effect of FDI from developed countries more robustly significant.

An investigation into some of the characteristics of host countries that may have conditioned the response of fixed domestic investment by the private sector to FDI reveals the importance of natural resource endowment and the quality of institutions as mediating factors. The results show that natural resources play a vital role in the inflow of FDI from developed countries. The positive cumulative effect of FDI is, on average, larger in economies with less extractive sector activity, suggesting that whether FDI was the resource-seeking type mattered.

Our results also show that FDI from BRICS appears to generate a greater favourable effect on private GFCF in economies with better institutions, scale effect notwithstanding. The implications for locally financed domestic capital formation are not, however, as favourable. To the extent that greenfield FDI was a significant component of the inflows, the point estimates scarcely suggest a crowding-in effect on domestic investment by local enterprises, except in the case of FDI flows from BRICS and developed countries to economies with better institutions and lower extractive activity. This underscores the importance of sound institutions and diversification of economic activity to render FDI beneficial to host economies. The reported results are informative and justify disaggregating FDI by its origin to characterize its effects on domestic investment at the macro level. However, a cautionary note is in order, given the nature and paucity of data used for the analysis.

In conclusion, there appears to be a positive relationship between aggregate FDI and gross fixed capital formation. At the disaggregated level, FDI from BRICS and developed countries affected overall GFCF favourably, with an important role played by institutions and natural resource endowments as mediating factors. Natural resource-rich countries continue to attract more FDI from developed countries, but its impact on GFCF is small or neutral. There is significant growth in FDI flows to other countries, indicating diversification in the types of FDI flowing to the continent with a potential to spur domestic capital formation and its locally financed component in the presence of stronger institutions and more accountable host governments. This suggests that increasing economic diversification and improving institutional quality is important not only as an end in itself but also as a means in this case to attract FDI flows that potentially stimulate locally financed domestic capital formation.

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