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CHINESE AND INDIAN FOREIGN DIRECT INVESTMENT'S EFFECT ON AFRICAN
GROWTH

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ABSTRACT

This study analyzes the impact of Chinese and Indian foreign direct investment (FDI) from 2003-2012 in the economic growth of African countries. The results show that Chinese FDI is positive and significantly correlated with economic growth in Africa, but Indian FDI has an insignificant relationship. The positive and significant relationship of Chinese FDI stock as a percentage of GDP with per capita income growth implies that a consistent increase in Chinese FDI into African countries can leader to higher growth in the population. As the literature implies, FDI leads to technological transfers that could then lead to growth, which attracts further investments that further leads to increased transfers and continual absorptive capacities.

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Chapter 1

Introduction

Despite the traditional model of Western multinational corporations investing in

emerging nations, the continued rise of emerging economies has led to the increased presence of

emerging market multinational corporations. Western MNCs invest in developing countries to

capitalize on their cheap labor and resources and their high growth rates. However, with the rise

in emerging markets, investment flows are beginning to change as the global South now has

higher capital and their corporations also want to expand beyond their local markets to access

new customers and higher growth in other developing countries. As China and India have long

acted as the host of foreign investments and ventures of MNCs, their economies have grown

dramatically and now have relatively slowed down. And now these two powers are ambitious to

rise to global power status. Much of their investments has been focused throughout Africa, with

its high growth rates and vast opportunities.

While a plethora of research has shown the positive effects of foreign direct investment

(FDI) on growth in general, this paper will focus on how Chinese and Indian FDI affects

economic growth in African nations. FDI is an investment made by a resident enterprise in one

economy (home economy such as China or India) with the objective of establishing a lasting

interest in an enterprise that is a resident in another economy (host economy such as individual

Africa countries) ("Foreign Direct Investment" 2018). As FDI is motivated by the investors'

long-term prospects for making profits, investors will be more likely to engage in activities

favoring growth. Moreover, China and India are projected to be the first and third largest

economies by 2030 and the top two by 2060 ("GDP long-term forecast (indicator)" 2018); the

impact their investments have in Africa is of importance to the literature and to the development

of the population of the world with high levels of poverty. Half the extreme poor live in Sub-

Saharan Africa (SSA) ("No Poverty" 2017) and it is important to evaluate how Chinese and Indian

FDI will impact growth in Africa, as the size of their investments in Africa will likely increase as

their economy grows to overtake even the U.S. This will prove to be beneficial for development

and economic policy.

I will begin with a background of investment opportunities in Africa and then Chinese

and Indian investment opportunities in Africa. Then, I will discuss the existing literature on the

topics on FDI and growth as a base and then focus on literature concerning Chinese and Indian

FDI into Africa. Next, I will introduce my theory and hypotheses to introduce the model that I

will test. The data and analysis sections will then provide further detail on the data used to

operationalize the model and the results of a series of regression analyses. I will summarize the

results and findings in the conclusion to discuss the contribution of the analysis on my original

question.

Investments in Africa

First, it is important to analyze the investment opportunities in Africa. Investing in Africa

is all about turning gaps into opportunities. While the continent is extremely diverse, overall, it is

lacking in infrastructure and needs "connectors" regarding physical and soft infrastructure to

connect Africa to markets (Al Essa 2016). As the infrastructure industry is weak, the market

penetration is extremely low and investors in these connectors can grab market share and reap

high profits. In addition, lowered trade barriers allow for lower costs of entry and continued trade. On the consumer end, the middle class is rising, creating consumption demand. As consumers are changing, so are the economies as they begin to diversify beyond commodities. Particularly for China and India, the high growth rates are important as they are beginning to slow down and must turn outside for sustainable growth.

Despite the perceptions that the African continent is highly risky with high costs of doing business, investments from EMNCs, including Chinese, India, Brazilian, Middle Eastern, and Russian businesses have substantially increased their investments in Africa in the past couple decades, with some investments with comparable scale and sophistication of a United States Fortune 500 firm's investment in Europe ("What Are Chinese and Indian Firms Doing in Africa?" 2010). Overall, the potential risks are set off by the potential high rewards. The fact that foreign direct investment inflows to Africa stand at 3.4% of world shares in 2016 (*World Investment Report 2017*), the small percentage again can be reinterpreted as an opportunity to gain first-mover advantage as the shares in other emerging markets in Asia and Latin America are much higher.

Chinese and Indian Investments in Africa

Further analyzing the investment into Africa, developed countries continue to have the most investments in absolute terms, but China and India are the largest investors from emerging markets (not including South Africa with its geographic advantage). Along those lines, Chinese and India investment into Africa increased by 169% and 41.67%, respectively, between 2010 and 2015, shown in Figure 1. Despite the statistics, the fact that the majority of the cumulative stock

of FDI in Africa originates from the developed markets is "surprising to virtually all observers of Africa, who believe that Chinese (and Indian) firms now 'rule' Africa" due to the high growth rate of inflows in recent years dominated by Chinese and Indian multinational ("What Are Chinese and Indian Firms Doing in Africa?" 2010).

Figure 1. Top 10 Investor Economies by FDI Stock, 2010 and 2015 (Billions of dollars)
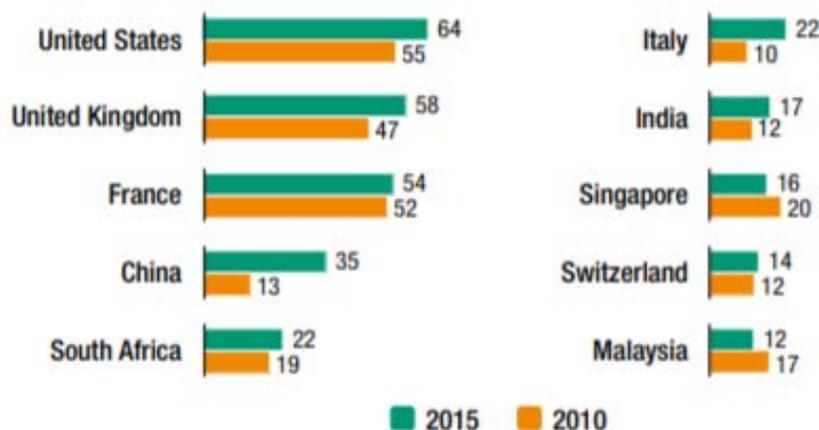
Source: *World Investment Report 2017*

Chinese multinationals in Africa are typically large or medium state-owned enterprises, with backing from the government. The state has designated about 180 companies to benefit from preferential finance, tax concessions and political backing to 'go global' and become true multinationals (Alden and Davies 2006). Chinese multinationals can couple bids with infrastructure projects or assistance to win bids. Chinese firms tend to enter new markets through greenfield investment by building new facilities and is highly integrated, as it buys a large portion of its inputs or sells a large portion of its outputs internally through corporate affiliates ("What Are Chinese and Indian Firms Doing in Africa?" 2010). Because of the high sunk costs

of foreign investment, particularly greenfield investments, investors will be more likely to engage in activities favoring growth.

On the other hand, Indian multinationals in Africa vary in size and are typically privately owned or may have some government ownership. Without the strong government backing and incentives like with Chinese firms, Indian firms do not benefit from the same economies of scale, which could be a cause for the lower penetration of Indian investments in Africa. In addition, Indian firms typically enter African markets through acquisitions and are less vertically integrated, sometimes preferring to procure inputs directly on the African market ("What Are Chinese and Indian Firms Doing in Africa?" 2010).

Overall, China and India are continuing to increase investments into Africa for both economic gains and profits, but also to establish themselves as a global power. With Africa's relative abundance in natural resources and the growing needs of both China and India, the typical point of entry into Africa has been through investments in natural resources (*World Investment Report 2017*), however investments have begun to diversify into telecommunications, financial services, food processing, infrastructure and tourism, and more. This demonstrates a spillover effect, as investments in oil and minerals require infrastructure and spillover to the general local economy.

Chapter 2

Literature Review

Borensztein, Gregorio, and Lee (1998) and Freckleton, Wright, and Craigwell (2012) provide a primer on empirical analysis on FDI and economic growth. The studies show strong complementary effects between FDI and human capital on the growth rate of income (Borensztein, Gregorio, and Lee 1999) and that FDI has a significant influence on economic growth in both the short run and the long run for developing and developed countries (Freckelton, Wright, and Craigwell 2012). Borensztein, Gregorio, and Lee utilize a cross-country regression framework, using data on FDI flows from industrial countries to 69 developing countries from 1970 to 1989 and find that FDI is a tool for technological transfer and has a larger contribution to growth than domestic investment. In addition, the complementary effects between FDI and human capital on the growth rate implies that a minimum threshold stock of human capital is necessary for a sufficient absorptive capacity of the technology brought by FDI to lead to increased growth rates of the host economy. On the other hand, Freckleton, Wright, and Craigwell use data for 42 developing countries and 28 developed countries from 1998 to 2008. In the short run and long term, the FDI has a positive and significant influence on economic growth. In addition, lower levels of corruption enhance the impact that FDI has on economic growth in the short run for developing countries. However, in the long run, there is no significant impact of corruption, which implies that investors are usually driven by prospects of profitability, government directive incentives, and local institutional and human capital effectiveness. These two papers show empirically the positive effect of FDI on economic growth,

one with a minimum threshold of human capital and the other both in the short and long term, using different country cases and time periods.

More on the host economies of interest, Adams (2009) focus on the effects of FDI on growth in SSA and Mlachila and Tabeke (2011) focus on effects of FDI from BRICS to low income countries (LICs). Mlachila and Tabeke use case studies focusing on Chinese FDI to SSA countries, specifically Angola, Liberia, Sudan, and Zambia, to conclude that the impact of BRIC investment is positive in LICs and tap into under-exploited mineral resources, building up mineral resources and helping foster regional integration, and can enhance technology upgrading and employment in LIC. Chinese FDI to SSA countries originates primarily from large state-owned firm investing in natural resources, particularly the mining industry, and infrastructure, but private firms focus on manufacturing and service industries. Initially, investments are state-owned and primarily in natural resources, but spread to agriculture, manufacturing, and service industries over time. On the other hand, Adams does not specify the origin of the FDI, but use panel data for 42 SSA countries for 1990-2003 to find that the increase in FDI through the 1990s to SSA countries did not lead to a proportionate positive impact of FDI on growth when country-specific effects are controlled for. Moreover, FDI has a crowding out effect on domestic investment, suggesting that any positive effect of FDI on economic growth may be due to an increase in total factor productivity rather than augmentation of domestic capacity. However, lagged FDI has a positive, but insignificant effect on economic growth, perhaps due to the low level of the development of financial markets in SSA, and it may be possible that the absorptive capacity of most of the countries in the region have not reached the threshold needed to make use of the technology, knowledge, and other skills associated with FDI (Adams 2009). Adams and Mlachila and Tabeke show differing results with a different set of countries. However, the time

period of the studies may cause an effect on the results as Adams states it is possible that the absorptive capacity has not reached the threshold need to make use of the transfers associated with FDI, which Borensztein, Gregorio, and Lee showed was necessary for positive and significant effects of FDI on growth.

While the previous literature focused on FDI and growth regardless of the origin, except for Mlachila and Tabeke's case studies, Chakrabarti and Ghosh (2014) and Busse, Erdogan and Muhlen (2016) further focus on FDI from China and India to Africa. Chakrabarti and Ghosh analyze the trend of Indian and Chinese FDI in Africa, focusing on revealing similarities and differences in the patterns to look into the consequences of Indian and Chinese FDI for Africa's economic development. China's involvement is rooted in state capitalism where India's involvement is market and private sector driven. Both are competing in Africa for strategic space to strengthen their respective clout in international political order. However, China has a larger presence in Africa than India while Indian FDI has concentrated in Mauritius. Chinese investment, mostly from the government, in Africa prioritized the construction and mining industries, while private investments targeted the manufacturing and services sectors. Overall, this paper provides a general context of Chinese and Indian FDI in Africa, serving as a primer for analyzing the effect of Chinese and Indian FDI in Africa on growth.

Busse, Erdogan, and Muhlen (2016) provide an empirical study on whether China's engagement in Africa has made a significant contribution to economic growth in Africa using panel data of 43 SSA countries from 1991-2010. While Chinese activity has resulted in an overall increase of trade, FDI, and aid in Africa, which could boost growth rates by increasing demand for African products, China's strong demand for raw materials and African economies' high dependence on the primary sector enhance the risk of encountering or deepening the

resource curse. Busse, Erdogan, and Muhlen use a simple Solow-type growth model along with a panel data approach. The model includes period-specific effects and country-specific fixed-effects, uses a lagged dependent variable, and 5-year averages are taken for all variables to control for business cycle effects to get 4 observations. The analysis follows a standard OLS fixed-effects model. Also, robustness checks are done including Northern African countries. Overall, FDI flows from China, Chinese economic cooperation, and foreign aid from other countries do not play a major role for the economic development of African countries. However, Sino-African trade has an important impact and African non-resource imports from China have a negative impact on economic growth in Africa. Busse, Erdogan, and Muhlen conclude that the insignificant results may point to an insufficient FDI environment in African countries, rather than serve as a display of FDI not playing a role for African growth, and that African governments are not taking full advantage of the opportunities that arise from China's activities in Africa. And so, the quantitative results counter the claims from the case studies that Chinese FDI will have a positive effect on growth.

My research will provide a comprehensive study analyzing Indian and Chinese FDI in Africa. In terms of Chinese and Indian FDI to Africa, previous quantitative studies focus on Chinese FDI. Freckleton, Wright, and Craigwell show that FDI does have a positive economic growth in developing countries in the short and long run; however, Busse, Erdogan and Muhlen show insignificant effects of Chinese FDI in Africa. The insignificant results counter the case study analysis provided by Mlachila and Tabeke and expectations that the fast growing Chinese FDI in Africa should lead to a positive impact on growth rates. Moreover, to the best of my knowledge the literature does not provide an empirical analysis of Indian FDI to Africa.

It is obvious that the literature provides countering results so I hope to expand on this important topic. India and China's economies are expected to overtake the U.S. and so their investments abroad are relevant to the global economy. On the other hand, it is important to analyze the effect of FDI in Africa due to the high levels of poverty and lagging growth compared to the rest of the world. And so, the specification of Indian and Chinese FDI in Africa is relevant to the global economy and for the development of Africa in general, as they are the primary investors in some African countries. Overall, my research will study a topic of interest for many government bodies and researchers, as Chinese and Indian FDI has had high growth in recent years. The previous literature does not study Indian FDI and does not show a common effect of Chinese FDI.

Chapter 3

Theory

I expect there to be a positive and significant effect of Chinese and Indian FDI on the growth of African nations. This explanation should be valid due to high spillovers from FDI, as China and India's terms of trade structure and technology are closer to those of Africa, compared to that of developed countries. As FDI is a tool for technological transfer that will lead to increased growth rate of the host economy given a sufficient absorptive capacity of the technology brought by the FDI (Borensztein, Gregorio, and Lee 1998), I predict a positive and significant effect of Chinese and Indian FDI. In addition, Adam's 2009 study using 1990s data concluded that it may be possible that the absorptive capacity of most of the countries in the region have not reached the threshold needed to make use of the technology, knowledge, and other skills associated with FDI. Therefore, as my study uses data from the 2000s to early 2010s, I predict that the absorptive capacity has increased enough for FDI to have a possible effect on growth. However, because data on human capital and technological capabilities are very limited for developing countries, I cannot measure the absorptive capacity. Therefore, I will use bilateral FDI data and per capita income growth to measure the effect of FDI on growth along with controls, including political controls that will control for factors that may prohibit FDI from effecting income growth. I hypothesize that there will be a positive and significant effect of Chinese and Indian FDI on per capita income growth.

However, I expect to see a stronger impact from Chinese FDI due to higher volumes of greenfield investments and a much higher market penetration. Because of the high sunk costs of

greenfield investments, investors will be more likely to engage in activities favoring growth to make up for the high costs of entry. And so, Chinese companies may be trying to invest a lot quickly to gain market share and reap from economies of scale. Due to those costs, a short-term strategy would not be highly profitable. On the other hand, Indian investments are smaller and newer. The UNCTAD Bilateral FDI data suggest that Indian FDI started in 2010 while Chinese FDI in Africa had been around since 2003. And so, a smaller penetration and later entry with a smaller stock and flow of FDI would leader to smaller effects on growth.

The competing effect would then be a negative and/or insignificant effect. Adams' 2009 study did not lead to a proportionate positive impact of FDI on growth when country-specific effects are controlled for, but while the host economies were SSA countries, the origin of the FDI was not specified and the time frame was 1990-2003. In addition, Busse, Erdogan, and Muhlen (2016) used 1991-2010 data and found insignificant results to show that FDI flows from China do not play a major role for the economic development of African countries. However, they comment that the insignificant results may point to an insufficient FDI environment in African countries rather than display of FDI not playing a role for African growth and that African governments are not taking full advantage of the opportunities that arise from China's activities in Africa (Busse, Erdogan, and Muhlen 2016).

Nonetheless, my model will be able to test for both effects using country specific effects. The dependent variable being per capita income growth in year t+1 (Y'_{t+1}) and the main independent variables being FDI from China, India, and the rest of the world, to host economy i in year t ($FDI_{C,it}, FDI_{I,it}, and\ FDI_{R,it}$), as shown in Equation 1. FDI from the rest of the world is all FDI into country i minus the FDI from China and India into country i. However, when I exclude the Indian FDI data, FDI from RoW is measured as all FDI into country i (including

Indian FDI) minus the FDI from China into country i. I am utilizing a fixed-effects model, that is

assumed to be time invariant. The fixed effects specification, using a least squares dummy

variable model, allows me to control for unobserved country heterogeneity and the associated

omitted variable bias, which seriously afflicts cross country regressions (Adams 2009). This is

captured by the entity n (E_n). Since they are binary (dummies) I have n-1 entities included in the

model.

Equation 1. Model

$$Y'_{t+1} = \beta_1 lnY_{t-1} + \beta_2 FDI_{C,it} + \beta_3 FDI_{I,it} + \beta_4 FDI_{R,it} + \beta_5 school_{it} + \beta_6 trade_{it}$$
$$+ \beta_7 inflation_{it} + \beta_8 reg\_qual_{it} + \beta_9 govt\_eff_{it} + \beta_{10} govt\_exp_{it}$$
$$+ \beta_{11} control\_corruption_{it} + \beta_{12} pol\_instab_{it} + \beta_{13} voice\_acct_{it}$$
$$+ \beta_{16} natural\_resources_{it} + \gamma_n E_n + u_{it}$$

I control for a number of variables as shown in Equation 1. School is a proxy for human

capital to account for the absorptive capacity. Trade is exports plus imports, as a percentage of

GDP, and is a proxy for the degree of integration of a country in the world economy (Adams

2009). Economic variables such as trade, inflation, and government expenditure are included

because they are frequently used as determinants of growth in cross-country studies. I also

control for political risks, including regulatory quality, government effectiveness, control of

corruption, political instability, and voice and accountability, that may influence how FDI

impacts the host country's economy.

Chapter 4

Data

The data consist of 39 Africa countries from 2003-2012[1]. I used UNCTAD's Bilateral FDI Statistics to retrieve the variables of interest, Chinese and Indian FDI, which dictated the time period and country set. Table 1 lists the host countries in the data. To measure FDI, I used FDI stock, reflecting prices at the time when the investment was made. UNCTAD estimates FDI stocks by either cumulating FDI flows over a period of time or adding flows to an FDI stock that has been obtained for a particular year from national official sources or the IMF data series on assets and liabilities of direct investment ("FDI Stocks" 2018). I utilized FDI outstock (stock abroad) from China and India in African countries to measure FDI stock (instock) in African countries from China and India. I then divided by GDP to get FDI stock from China or India (% of GDP). On the other hand, I used FDI instock in African countries to measure FDI in African countries, regardless of the origin of the investment. Regardless, all of FDI variables are FDI originating from a foreign country (China, India, or the rest of the world (RoW) and invested in African countries. The measure for growth is GDP per capita growth (annual percentage change) to show the change in income per capita rather than aggregate growth.

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[1] Indian FDI stock data only covers 2010-2012.

Table 1. List of Countries[2]

Eastern	Middle	Northern	Southern	Western
Eritrea	Angola	Algeria	Botswana	Cabo Verde
Ethiopia	Cameroon	Egypt	Namibia	Cote d'Ivoire
Kenya	Congo	Morocco	South Africa	Ghana
Madagascar	Dem. Rep. of the Congo	Tunisia	Swaziland	Guinea
Malawi	Equatorial Guinea			Liberia
Mauritius	Gabon			Mali
Mozambique				Mauritania
Rwanda				Niger
Seychelles				Nigeria
Tanzania				Senegal
Uganda				Sierra Leone
Zambia				Togo
Zimbabwe				
13	**6**	**4**	**4**	**12**

Both FDI and GDP data are from UNCTAD, the United Nations Conference for Trade

and Development. UNCTAD states that in compiling data, requests for verifications and

confirmation were made to national official sources for virtually all economies to reflect the

latest data revisions and accuracy; in addition, web sites of certain national official sources were

also consulted ("FDI Stocks" 2018). However, I found that UNCTAD data on GDP (total, per

capita, and per capita growth) changed from downloads in January to March 2018[3]. This even

includes data from 2003, but primarily starting from 2012. Therefore, this makes me question the

both the GDP related and FDI data since it is from the same organization. And so, the reliability

of the data is questionable, while the data seem valid. However, as the UNCTAD Bilateral

Statistics Database is the only public source of bilateral FDI data that I could find, I chose to get

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[2] Removed Libyan data due to a large variance in GDP per capita growth, ranging from -61% to 124%, (i.e. an outlier). Removed FDI data from India to Mauritius because of abnormally high levels of FDI, that was an extreme compared to other countries (e.g. the FDI stock from India (% of GDP) was over 100).

[3] For example, in January data, Malawi's growth in 2012 is 1.89, which the March data has it as -0.6. In addition, Namibia growth in 2003 is 1.45 according to the January data and is 4.2 in the March download. These numbers drastic for growth, particularly those with opposite signs.

my data on GDP, GDP per capita, and GDP per capita growth from UNCTAD as well for consistency.

The control variables are from the World Bank DataBank. The World Bank World Development Indicators include school, trade, natural resources, inflation, and government expenditure. School is the ratio of total primary school enrollment, regardless of age, to the population of the age group that officially corresponds to the level of primary school education. Trade is the total trade as percentage of GDP. Inflation is the annual percentage change in consumer prices. Government expenditure is measured as the general government final consumption expenditure, as a percentage of GDP. Last, natural resources is measured as the total natural resources rents, as a percentage of GDP. The World Development Indicators are relatively reliable and valid as they are compiled from officially recognized international source ("World Development Indicators" 2018). The World Bank World Governance Indicators include regulatory quality, government effectiveness, control of corruption, political instability, and voice and accountability. These indicators range from -2.5 to 2.5. Political instability is measured by the variable political stability and absence of violence/terrorism, which is defined as the perceptions of the likelihood of political instability and/or politically-motivated violence, including terrorism ("World Development Indicators" 2018). The World Governance Indicators compile and summarize information from over 30 existing data sources that report the views and experiences of citizens, entrepreneurs, and experts in the public, private and NGO sectors from around the world, on the quality of various aspects of governance ("Worldwide Governance Indicators" 2018) and therefore relatively valid and reliable. However, as all of the data are on developing countries, reliability is always of concern due to corruption, lack of resources in running accurate and consistent surveys to measure variables such as GDP, and human error.

Chapter 5

Analysis

First, I ran a series of univariate analyses of the FDI stock (% of GDP) and GDP per

capita growth of time t+1. Because there is Chinese FDI stock data from 2003-2012, Figure 2

represents the country with the maximum, 75th percentile, 25th percentile, and minimum average

FDI stock (% of GDP) from China. From 2003-2012, Liberia's FDI stock from China averaged

at 4.37% of GDP (the maximum). At the 75th percentile, Sierra Leone's FDI stock from China

averaged at 1.27% of GDP. The 25th percentile and minimum average FDI stock from China, as

a percentage of GDP, was 2.49% and .08% of GDP, that of Uganda and Tunisia. As Figure 2

shows, there is no relationship between Chinese FDI and per capita income growth. Although,

the average per capita income growth does decrease as the average FDI from China decreases.

For example, Liberia has the highest average FDI stock from China and its per capita income

growth ranges from 1-10%. Sierra Leone, Uganda, and Tunisia's average FDI stock from China

decreases in that order, while their per capita income growth ranges from 0-2%, 0 - <1%, and

close to 0%, respectively. However, there is still no correlation within each country between the

two variables. The fact that there is no relationship can be explained by the fact that there are

many determinants of growth and FDI in general, and particularly from one country alone, would

not have enough impact to drive growth alone. FDI is only a component of many other factors

that drive economic growth.

Figure 2. FDI Stock from China (maximum to minimum average FDI stock) and GDP per capita growth

Figure 3. FDI Stock from India (% of GDP) and GDP per capita growth
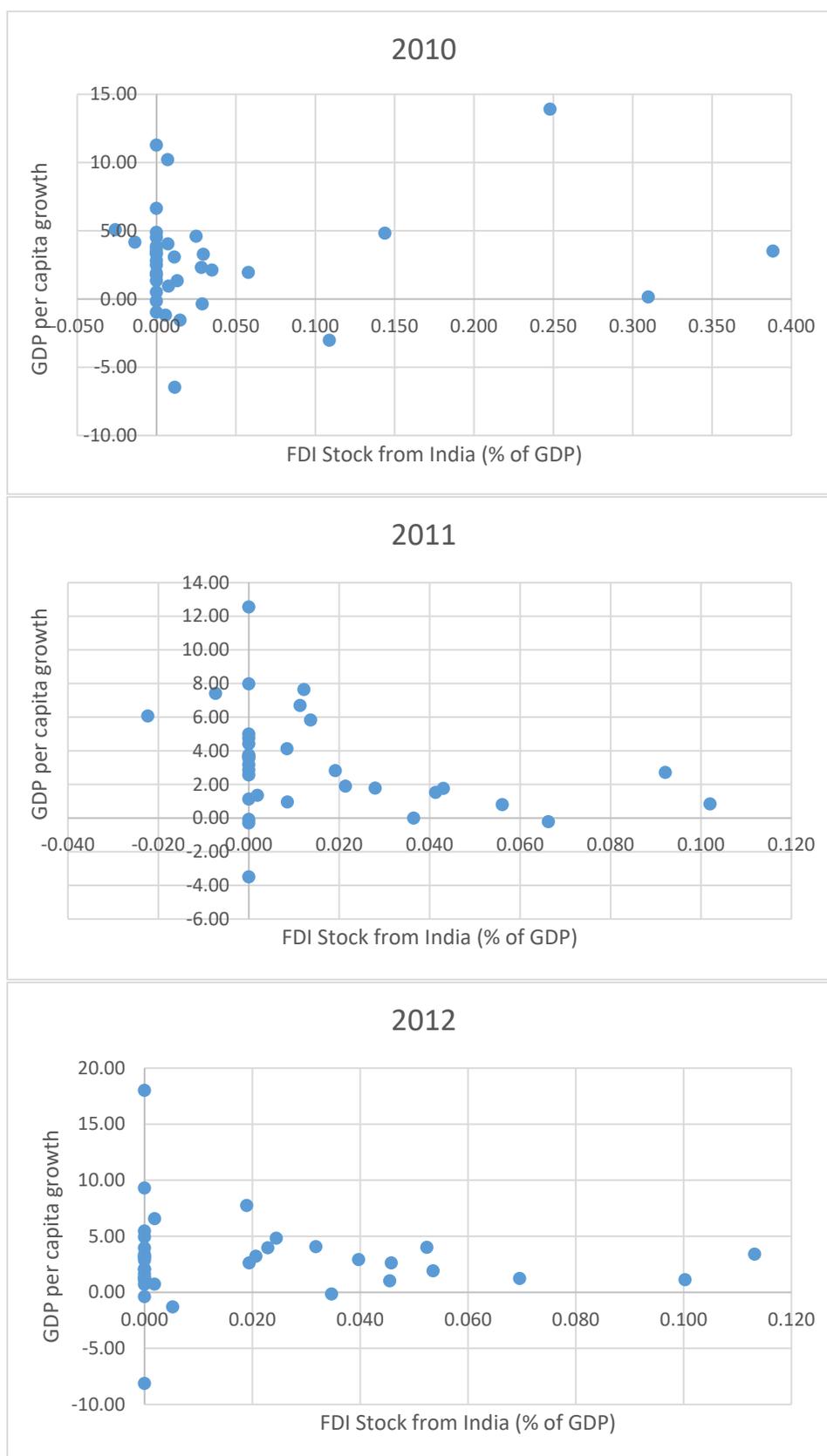
Due to the limited data on Indian FDI, I ran univariate analyses by time period. In Figure 3, each point represents a specific host country. For the 2010, I removed Liberia from the plot, as its FDI stock from India was 1.397% of GDP, which is marginally higher than next highest at 0.388%, to better display the other plots. Regardless, it is obvious there is no relationship between FDI from India and per capita growth in 2010. I also removed 4 countries with the highest FDI stock in 2011 (with 34 observations remaining), to better display the general relationship. Again, there is no relationship between FDI from India and per capita growth in 2011. I also removed the top 2 countries with the highest FDI stock from India in the 2012 plot and observe a relatively negative, but very weak relationship. Each time period shows no correlation between FDI and per capita income growth, even when removing outliers. However, the presence of a few outliers in each time period shows that Indian FDI is concentrated. Therefore, it would be difficult to draw any conclusions. Similar to the Chinese case, FDI is only a component to the many factors that drive growth.

Table 2 reveals some positive and significant results. Regression 2.3 and 2.4 show that FDI from China has a positive and statistically significant impact on economic growth. When controlling for FDI stock from RoW (all countries, except for China) initial income, trade, human capital, government expenditure, inflation, natural resources, and a series of political controls, regression 2.4 shows that a 1% increase in FDI stock from China will lead to a 0.575% increase in GDP per capita growth. This is a relevant increase in income per capita growth and follows my hypothesis that Chinese FDI growth will lead to higher growth in Africa. With the control variables, the coefficient of FDI from India is negative and not statistically significant with a very high standard error. However, regressions 2.1 and 2.2 have 61 and 52 observations and cannot conclude whether FDI from India has any effect on per capita income. The various univariate analyses from the regression tables and graphs above do not show a relationship

because the positive impacts hold only when controlling for the variables listed above. While I

expected to see a positive and significant effect of Indian FDI on growth, there a negative and

highly insignificant relationship. Again, this may be due to the small sample size, smaller

investment size, and smaller duration (in the data). Because the coefficient is so insignificant, it

is difficult to determine if there is a relationship at all and what the sign would be. As Indian FDI

has grown since 2012, it would be beneficial to test the effects on a longer time period.

Table 2. Regression Table[4]

	Dependent variable:			
	$(\text{GDP per capita growth})_{t-1}$			
	(1)	(2)	(3)	(4)
$\ln(\text{GDP per capita})_{t-1}$	-15.573	2.446	-13.266***	-14.323***
	(12.700)	(12.203)	(2.180)	(2.197)
FDI stock from China (% of GDP)	0.624	1.007	0.920***	0.575***
	(0.940)	(1.724)	(0.221)	(0.217)
FDI stock from India (% of GDP)	1.287	-4.048		
	(12.145)	(13.926)		
FDI stock from RoW (% of GDP)	-0.007	0.044	0.0003	-0.003
	(0.013)	(0.055)	(0.007)	(0.007)
School Enrollment		-0.257*		0.095**
		(0.141)		(0.038)
Trade		-0.199**		0.071***
		(0.069)		(0.017)
Inflation		-0.106		0.008
		(0.083)		(0.018)
Regulatory Quality		-5.486		2.257
		(7.396)		(1.579)
Govt Effectiveness		10.927*		-1.004
		(6.187)		(1.888)
Govt Expenditure		0.480		-0.005
		(0.339)		(0.076)
Control of corruption		-1.609		0.093
		(3.931)		(1.614)
Political Instability		3.851		0.129
		(2.813)		(0.719)
Voice & Accountability		7.778***		1.689
		(1.876)		(1.321)
Natural Resources		0.002		-0.076*
		(0.294)		(0.044)
Observations	61	52	366	309
R2	0.826	0.963	0.514	0.679
Adjusted R2	0.678	0.878	0.453	0.615
Residual Std. Error	2.538 (df=33)	1.354 (df=16)	3.815 (df325)	3.052 (df=258)
F Statistic	**5.584***(df=28; 33)	**11.440***(df=36; 16)	8.380***(df=41; 325)	**10.682***(df=51; 258)

Note: *p<0.1; **p<0.05; ***p<0.01

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[4] Appendix A includes the full regression results with the n-1 country-specific fixed effects.

Chapter 6

Conclusion

This paper concludes that Chinese FDI has a positive and significant impact on African growth. On the other hand, the analyses did not find an impact of Indian FDI on African growth. However, this is most likely due to the lack of data on Indian FDI. Nonetheless, while my study does not provide a contribution do the literature on Indian FDI, this supports the positive, significant impact of Chinese FDI on African growth, as the literature did not have overwhelming support. Therefore, the results are in support of increased Chinese FDI into Africa. Because my FDI data is as a percentage of GDP, the increase in FDI flows much be proportionate to the increase in GDP to maintain the same amount of positive impact on per capita income growth. And so, as African countries continue to grow, only a continual increase in FDI flows will lead to an increase FDI stock, as a percentage of GDP, that will have an effect on growth. In addition, it is important to note that the results are applicable to the country-set. The effect of FDI in African countries outside of the countries in this study is unclear. In addition, due to the reliability issues of concerning UNCTAD data, I encourage future studies with a different set of FDI and GDP data. While my study showed insignificant effects of Indian FDI, it has increased since 2012 and a comprehensive study on the effect of Indian FDI would be beneficial to policymakers. Overall, FDI leads to technological transfers that could then lead to growth, which attracts further investments that further leads to increased transfers and continual absorptive capacities. A continuation of this cycle could further accelerate the growth of Africa.

Appendix A

Table 3. Regression Table (Full)

| | (GDP per capita growth)t-1 | | | |
	(1)	(2)	(3)	(4)
ln(GDP per capita)$_{t-1}$	-15.573	2.446	-13.266***	-14.323***
	(12.700)	(12.203)	(2.180)	(2.197)
FDI stock from China (% of GDP)	0.624	1.007	0.920***	0.575***
	(0.940)	(1.724)	(0.221)	(0.217)
FDI stock from India (% of GDP)	1.287	-4.048		
	(12.145)	(13.926)		
FDI stock from RoW (% of GDP)	-0.007	0.044	0.0003	-0.003
	(0.013)	(0.055)	(0.007)	(0.007)
School Enrollment		-0.257*		0.095**
		(0.141)		(0.038)
Trade		-0.199**		0.071***
		(0.069)		(0.017)
Inflation		-0.106		0.008
		(0.083)		(0.018)
Regulatory Quality		-5.486		2.257
		(7.396)		(1.579)
Govt Effectiveness		10.927*		-1.004
		(6.187)		(1.888)
Govt Expenditure		0.480		-0.005
		(0.339)		(0.076)
Control of Corruption		-1.609		0.093
		(3.931)		(1.614)
Political Instability		3.851		-0.129

		(2.813)		(0.719)
Voice & Accountability		7.778***		1.689
		(1.876)		(1.321)
Natural Resources		0.002		-0.076*
		(0.294)		(0.044)
factor(host)Algeria	131.505	25.047	111.979***	110.034***
	(106.325)	(100.201)	(18.203)	(18.010)
factor(host)Angola			110.653***	106.447***
			(17.615)	(17.713)
factor(host)Botswana	138.834		118.041***	109.486***
	(109.644)		(18.858)	(18.448)
factor(host)Cabo Verde			109.139***	98.750***
			(17.501)	(17.219)
factor(host)Cameroon	113.634	30.327	96.032***	93.522***
	(91.002)	(87.370)	(15.615)	(15.412)
factor(host)Congo			105.138***	101.091***
			(17.019)	(17.010)
factor(host)Cote d'Ivoire	112.957	43.149	94.804***	93.409***
	(89.888)	(86.143)	(15.494)	(15.359)
factor(host)Dem. Rep. of the Congo			77.664***	75.915***
			(12.400)	(12.544)
factor(host)Egypt	121.906	27.732	104.773***	102.132***
	(99.310)	(96.702)	(16.824)	(16.485)
factor(host)Equatorial Guinea			131.112***	127.169***
			(21.109)	(21.268)
factor(host)Eritrea			81.796***	91.632***
			(13.580)	(14.811)
factor(host)Ethiopia	95.887	36.500	79.753***	79.694***
	(71.588)	(66.446)	(11.824)	(11.879)

factor(host)Gabon	141.178	39.279	118.654***	115.465***
	(112.800)	(109.307)	(19.623)	(19.241)
factor(host)Ghana	118.031	23.366	97.983***	90.982***
	(91.273)	(88.835)	(15.388)	(15.031)
factor(host)Guinea			85.403***	84.922***
			(13.917)	(13.854)
factor(host)Kenya	109.215	30.706	92.316***	85.430***
	(86.764)	(84.375)	(14.827)	(14.585)
factor(host)Liberia	94.283	35.914	76.892***	71.014***
	(68.630)	(72.029)	(11.881)	(12.597)
factor(host)Madagascar	93.843	42.285	81.168***	71.399***
	(77.216)	(77.003)	(13.423)	(13.145)
factor(host)Malawi			81.899***	73.738***
			(13.090)	(12.936)
factor(host)Mali			88.704***	84.820***
			(13.826)	(13.620)
factor(host)Mauritania			95.392***	91.358***
			(15.258)	(15.242)
factor(host)Mauritius			119.035***	109.119***
			(19.065)	(18.772)
factor(host)Morocco	127.289	24.546	107.427***	102.252***
	(100.972)	(98.972)	(17.050)	(16.769)
factor(host)Mozambique	97.748	24.391	81.962***	75.131***
	(75.813)	(74.596)	(12.789)	(12.699)
factor(host)Namibia	136.118	9.031	115.503***	107.709***
	(108.239)	(105.640)	(18.410)	(18.071)
factor(host)Niger	89.775	15.377	75.974***	75.800***
	(70.385)	(65.329)	(12.413)	(12.381)

factor(host)Nigeria	122.499	30.598	104.394***	103.980***
	(98.053)	(93.949)	(16.582)	(16.345)
factor(host)Rwanda	103.429	38.322	86.601***	80.570***
	(79.765)	(78.868)	(13.412)	(13.307)
factor(host)Senegal	107.366	16.631	91.939***	87.398***
	(87.265)	(84.568)	(14.990)	(14.739)
factor(host)Seychelles			124.318***	111.797***
			(19.773)	(20.073)
factor(host)Sierra Leone			82.527***	83.875***
			(12.789)	(12.922)
factor(host)South Africa	139.285	-2.398	118.740***	113.603***
	(112.213)	(109.138)	(19.197)	(18.916)
factor(host)Tanzania	104.827	19.176	88.077***	83.525***
	(82.384)	(79.488)	(13.985)	(13.762)
factor(host)Togo			82.578***	74.954***
			(13.590)	(13.491)
factor(host)Tunisia	130.120	23.183	111.503***	105.523***
	(105.347)	(102.730)	(17.889)	(17.700)
factor(host)Uganda	99.971	30.973	85.498***	79.261***
	(80.369)	(78.659)	(13.593)	(13.306)
factor(host)Zambia	110.608	13.076	95.427***	91.465***
	(88.267)	(82.243)	(15.085)	(14.800)
factor(host)Zimbabwe	111.736		83.624***	82.007***
	(80.659)		(13.588)	(14.482)
Observations	61	52	366	309
R2	0.826	0.963	0.514	0.679
Adjusted R2	0.678	0.878	0.453	0.615
Residual Std. Error	2.538 (df = 33)	1.354 (df = 16)	3.815 (df = 325)	3.052 (df = 258)
F Statistic	5.584*** (df = 28; 33)	11.440*** (df = 36; 16)	8.380*** (df = 41; 325)	10.682*** (df = 51; 258)

Note: *p<0.1; **p<0.05; ***p<0.01

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United Nations | New York, NY   May 2017 – Aug. 2017
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