Review

Chinese foreign direct investment in Africa: Making sense of a new economic reality

Claassen Carike[1], Loots Elsabé[2] and Bezuidenhout Henri[1]*

[1]School of Economics, North West University Potchefstroom Campus, Potchefstroom
South Africa.
[2]Faculty of Economic and Management Sciences, North West University Potchefstroom Campus, Potchefstroom,
South Africa.

China's economic progress and relations with other developing regions have received much attention, particularly the way in which Sino-African relations have evolved since 2000. This paper aims to put Chinese FDI in Africa into perspective and provide some answers on the nature and possible impact of these flows to the continent. The study examines Chinese FDI flows to Africa between 2003 and 2008. During this period, China's outward FDI to Africa was concentrated in diversified, medium growth economic performers, with Southern Africa being the most popular region for Chinese outward FDI. A literature survey on Chinese investment deals concluded in Africa, demonstrated a definite Chinese interest in mining, oil and infrastructure in Africa. Using panel data analysis, agricultural land, market size and oil are found to be important determinants of Chinese FDI. The fact that market size was important indicated that Chinese investment was not solely resource-driven. As regards the possibility that Chinese FDI could positively contribute to economic growth in Africa, causality tests concluded that the relationship between African GDP and Chinese FDI was bi-directional, while uni-directional relationships were established between Chinese FDI and African infrastructure and corruption, respectively.

Key words: Foreign direct investment, Sino-African relations, China.

INTRODUCTION

As a rising economic power, China's economy and its links with other countries has received much attention of late. Of particular interest is the growing social, economic and political relationship between China and Africa. This paper specifically examines the determinants of Chinese Foreign direct investment (FDI) to Africa between 2003 and 2008. The period is chosen mainly due to severe data limitations, since this is the only period for which detailed, disaggregated data on Chinese outward FDI (OFDI) could be obtained.

Since becoming a more open economy, and attaining increasing levels of economic growth, China has become an important source of outward FDI (OFDI). It seems that China chooses to invest especially in other developing regions, of which Africa is but one. The recent data indicates that Asia was the primary recipient of China's OFDI between 2003 and 2008, accounting for 63.7% of China's total OFDI. Latin America has been the second largest recipient, with 21.8% of total Chinese OFDI. Africa came in third, accounting for only 6.9% of China's total OFDI (MOFCOM, 2008). Europe, Oceania and North America were in fourth, fifth and sixth position respectively, accounting for 3.1, 2.7 and 1.9%. Though China's preference for investing in other developing regions is clear, questions abound about the nature of Chinese investment in Africa in particular (Verachia, Gordon Institute of Business Science conference, 2010).

China's FDI flows to Africa are only one aspect of a growing social, economic and political cooperation

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*Corresponding author.E-mail: Henri.Bezuidenhout@nwu.ac.za.
Tel: +27 18 299 1443. Fax: +27 18 299 1398.

between China and Africa. This relationship is embodied in the Forum on China-Africa Cooperation (FOCAC), and China's White Paper on Africa. It also comes as part of an increasingly open Chinese economy, which has become a much more proactive player in the international arena since the early 2000s[1].

In order to ascertain the drivers of China's FDI flows to Africa, the rest of this paper is structured as follows. Subsequently, the study provides an overview of literature regarding the relationship between FDI and economic growth, as well as the determinants of FDI to Africa. Next, it discusses Chinese FDI flows to Africa between 2003 and 2008, thereafter, it presents an empirical analysis of the determinants of Chinese FDI flows to Africa. Finally, the paper concludes.

LITERATURE REVIEW

Foreign direct investment is a widely researched topic. Within the economic literature on FDI, studies focus either mainly on the relationship between FDI and economic growth, or on the determinants of FDI. This section provides a brief overview of studies on FDI in developing countries published between 2000 and 2010. Since the literature on FDI and economic growth is very wide, this period is chosen in order to present a summary of more recent findings on the subject. Though the topic of Chinese FDI's influence on African growth will not be addressed empirically in this study, the growth literature is reviewed here in order to provide a broad and thorough background to the investigation of Chinese FDI in Africa.

In terms of the literature on the relationship between FDI and economic growth in developing countries, there is some disagreement between researchers on this relationship in developing countries (Table 1). Some studies found evidence of a uni-directional relationship, others evidence of a bi-directional relationship and a few no evidence that FDI enhances growth in developing countries. The results are dependent on the sample used, the period covered and methods applied. Generally, the majority of research indicates that FDI does enhance economic growth in developing countries. This seems to be especially true for countries that have the necessary absorptive capacities, such as well-developed financial markets, sufficient levels of human capital and open trade regimes.

When looking at the impact of FDI in Africa specifically, the literature on Africa differs substantially from those on developing countries in terms of the methods applied, sample of countries included, period covered and variables used. Data restrictions especially make the analysis of FDI in Africaproblematic. Analysis of the literature reveals that limited substantive evidence exists

of a specific relationship between FDI and economic growth in Africa. In general, the literature seems to suggest that Africa could benefit from FDI, especially if efforts are made to increase the continent's current level of human capital. This is confirmed by Asiedu (2004), who argues that Sub-Saharan Africa (SSA) will reap more benefits from FDI in terms of employment generation if human capital and infrastructure are upgraded. The author also argues that Africa should diversify its investment opportunities so that more FDI is aimed at non-primary industries. The relevant research on FDI in Africa, covering the period between 2000 and 2009, is summarised in Table 2.

The other aspect regarding research on FDI to Africa concerns the determinants of FDI to Africa. In summary, the available but fairly limited literature indicates that the important determinants of FDI to Africa are economic growth, openness to trade, inflation, foreign reserves, quality institutions, good governance, literacy levels, levels of domestic investment and natural resource endowment. It must be remembered that the sample, period covered and methods used in the relevant studies again differ substantially, and these factors influence the outcomes. Results from four relevant studies covering the period 2000 to 2010 are summarised in Table 3.

CHINESE FDI FLOWS TO AFRICA

This part of the paper presents an overview of the African countries that received FDI from China between 2003 and 2008. General Chinese FDI flows to Africa, as well as flows to specific African country groups are analysed. The African country groupings are based on economic growth performance, level of diversification and regional concentration.

Chinese FDI flows to Africa, 2003 to 2008

China's OFDI to Africa has increased exponentially in recent years. In 2003, China's total OFDI to Africa stood at US$74.8 million. This was the year in which China officially embarked on its so-called "open-door" policy (Buckley et al., 2007). By 2008, this figure had grown to US$5.49 billion. It is noticeable that China's presence in Africa is wide. The 2008 Statistical Bulletin of China's Outward Foreign Direct Investment shows that China invested in 45 of the 53 African countries during the period 2003 to 2008[2].

Table 4 presents an overview of the twenty African countries that received the highest average values of Chinese FDI (CFDI) inflows between 2003 and 2008, as

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[1]There is some debate as to whether there is a "China-Africa" strategy by large Chinese parastatal companies or whether private investors are leading the way (AFDB, 2010). This debate falls outside the scope of this study.

[2]The African countries that are not listed as receiving Chinese OFDI are Burkina Faso, Burundi, Comoros, Central African Republic, Guinea-Bissau, Sao Tomé & Principe, Somalia and Swaziland. It is not clear why China has not expanded to these countries yet.

Table 1. The relationship between FDI and economic growth in developing countries: A literature summary.

Study	Method and period covered	Conclusion
Bende-Nabende et al. (2002)	Cointegration and vector autoregressive (VAR) analysis	FDI enhances growth
Nair-Reichert and Weinhold (2001)	Mixed Fixed and Random model, 1971-1995	A highly significant relationship between FDI and economic growth is found, even though this relationship differs widely across countries.
Zhang (2001)	Cointegration tests and error correction models, 1970-1997	FDI was found to positively influence economic growth in five of the eleven countries studied
Calvo et al. (2002)	Panel data analysis, 1970-1999	FDI enhances growth in the group of selected host countries. An important caveat to this finding is that host countries must display a given, pre-existing level of human capital, economic stability and free markets if they are to fully benefit from FDI.
Ram and Zhang (2002)	Cross country study, 1990-1997	FDI generally does accelerate economic growth in the host country
Kumar and Pradhan (2002)	Panel data estimations, 1980-1999	There is a positive relationship between FDI and economic growth. When conducting causality tests, however, the authors found that this relationship is not very strong.
Campos and Kinoshita (2002)	Production functions, 1990-1998	FDI contributes to economic growth, independent of any pre-existing level of human capital.
Bengoa and Sanchez-Robles (2003)	Panel data, 1970-1999	FDI enhances growth in Latin America, given economic stability and free financial markets in the host country.
Hermes and Lensink (2003)	Regression analysis, 1970-1995	FDI contributes positively toward growth, if the host country has a sufficiently developed financial system.
Choe (2003)	Panel VAR model, 1971-1995	The relationship between FDI and economic growth is bi-directional, with economic growth generally causing FDI.
Basu et al. (2003)	Panel cointegration model, 1978-1996	FDI is more likely to enhance growth in a host country with an open trade regime.
Alfaro et al. (2004)	Cross country analysis, 1975-1995	FDI will positively influence economic growth in countries that have well developed financial markets.
Makki and Somwaru (2004)	Cross-section analysis, 1971-2000	FDI and trade enhance growth in these countries, with FDI also positively influencing domestic investment.

Table 1. Continued.

Chowdhury and Mavrotas (2005)	Toda-Yamamoto causality test, 1969-2000	Overall, FDI positively influences economic growth (when controlling for factors such as the level of human capital, trade restrictions and functioning of the free market).
Li and Liu (2005)	Single and simultaneous equation techniques, 1970-1999	FDI is found to directly influence economic growth, as well as indirectly, via the positive spillover effect that enhances domestic human capital.
Sylwester (2005)	Cross-section study, 1970-1989	There is a positive relationship between FDI and growth in developing nations.
Basu and Guaraglia (2005)	Panel data, 1970-1999	FDI positively influences growth in the countries studied.
Johnson (2006)	Cross-section and panel data analysis, 1980-2002	FDI positively influences economic growth in developing countries.
Le and Suruga (2005)	Panel study, 1970-2001	FDI, along with public and private investment, is important for economic growth.
Hansen and Rand (2005)	Granger causality test, 1970-2000	There is a significant causal relationship between FDI and economic growth.
Baharumshah and Thanoon (2006)	Dynamic panel data, 1980-2001	FDI positively contributes toward economic growth in both the short and long run.
Hsiao and Hsiao (2006)	Vector autoregressive (VAR) model, 1986-2004	The relationship between FDI and GDP is uni-directional, with FDI causing GDP growth both directly and indirectly, through exports.
Duttaray et al. (2008)	Toda Yamamoto causality test, 1970-1996	FDI does cause economic growth in some countries, while in others economic growth causes FDI.
Sridharan (2009)	Vector error correction models (VECM), 1990-2007	Growth and FDI share a bi-directional relationship in Brazil, Russia and South Africa, whereas FDI uni-directionally causes growth in India and China.
Vadlamannati (2009)	Panel study, 1980-2006	Increased American FDI in developing countries enhances economic growth, independent of the absorptive capability of the host economy.
De Vita and Kyaw (2008),	Generalised method of moments (GMM), 1985-2002	The absorptive capacity of a country is crucial to its ability to enjoy the stimulating effect of FDI on economic growth.
Whalley and Xin (2010)	Growth accounting, 1995-2004	FDI inflows have contributed significantly towards China's economic growth.
Kottaridi and Stengos (2010)	Non-parametric techniques, 1970-2004	FDI inflows have a non-linear impact on economic growth and generally contribute to growth in developing countries.
Durham (2004)	Cross-section analysis, 1979-1998	There is no positive impact of FDI on growth.
Carkovic and Levine (2002)	GMM panel analysis, 1960-1995	FDI does not exert an independent influence on economic growth.
Herzer et al. (2008)	Cointegration techniques, 1970-2003	Did not find any country in which there is a positive, uni-directional effect of FDI on economic growth.

Table 1. Continued.

Qi (2007)	Error-correction model, 1970-1971; 2002-2003	Where the relationship between growth and FDI tends to be uni-directional in developed countries, the relationship tends to be bi-directional in developing countries.
Beugelsdijk et al. (2008)	Gravity equations, 1983-2003	Do not find a positive relationship between FDI and economic growth in developing countries.
Nicet-Chenaf and Rougier (2009)	Panel study, 1975-2004	FDI does not have an important direct influence on economic growth, though FDI does, to some extent, enhance growth indirectly via human capital formation.
Mah (2010)	Small sample cointegration test, 1983-2001	Economic growth in China causes greater FDI inflows, with FDI not having any causal effect on growth in the country.

Table 2. The relationship between FDI and economic growth in Africa.

Study	Method and period covered	Conclusion
Durham (2000)	Time series analysis of FDI and growth, 1968-1998	FDI enhances growth only in Uganda. Zimbabwe and Zambia are negatively influenced by FDI.
Akinlo (2004)	Error-correction model, 1970-2001	Economic growth in Nigeria is not influenced by FDI.
Lumbila (2005)	Panel study, 1980-2000	African growth is positively influenced by FDI, and the effect is increased with greater human capital.
Fedderke and Romm (2006)	Vector error correction model, 1956-2003	South African economic growth is enhanced by FDI.
Frimpong and Oteng-Abayie (2006)	Toda Yamamoto causality test, 1970-2002	There is no causal relationship between FDI and economic growth in Ghana.
Moolman et al. (2006)	Cointegration techniques, 1970-2003	There is a positive relationship between FDI and growth in South Africa.
Sharma and Abekah (2008)	Growth equations, 1990-2003	FDI has a positive influence on economic growth in Africa.
Seetanah and Khadaroo (2007)	GMM and panel analysis, 1980-2000	FDI has a significant impact on growth in SSA.
Ndikuma and Verick (2008)	Robust OLS, 1970-2005	FDI contributes toward growth in SSA by crowding in domestic investment.
Adams (2009)	Pooled panel data analysis, 1990-2003	Increased FDI inflows in the 1990s did not increase growth in SSA.
Okudua (2009)	Vector error correction model, 1975-2004	There is a positive relationship between FDI and growth in Nigeria.
Bezuidenhout (2009)	Panel estimations, 1990-2005	The growth impact of FDI in Southern Africa is limited.
Brambila-Macias and Massa (2010)	Bias-corrected least-squares dummy variable (LSDV) estimator, 1980-2008	FDI inflows have a significant positive impact on growth in SSA.

Table 3. Determinants of FDI to Africa.

Study	Method and period covered	Conclusion
Asiedu (2002)	Panel study, 1988-1997	The determinants of FDI to SSA differ from the determinants to other developing countries.
Onyeiwu and Shretsha (2004)	Panel study, 1975-1999	FDI to Africa is largely determined by growth, openness, foreign reserves and resource endowments.
Asiedu (2006)	Panel study, 1984-2000	Macroeconomic stability and sound institutions increase FDI flows to Africa.
Naudé and Krugell (2007)	Generalised Method of Moments, 1970-1990	Inflation, good governance, investment, government consumption and original literacy are important for FDI inflows.

Table 4. African recipients of Chinese FDI flows, 2003 to 2008.

Rank	Individual countries	Average CFDI received	Rank	Country groupings	Average CFDI received
				Regional concentration	
1	South Africa	896.2 million	1	Southern Africa	105.5 million
2	Nigeria	124.0 million	2	West Africa	16.5 million
3	Zambia	73.0 million	3	North Africa	16 million
4	Algeria	64.3 million	4	East Africa	11 million
5	Sudan	58.2 million	5	Central Africa	8 million
6	Niger	23.2 million			
7	Democratic Republic of the Congo	22.5 million		**Based on diversification**	
8	Madagascar	15.0 million	1	Diversified economies	203 million
9	Mauritius	13.2 million	2	Oil exporters	30.8 million
10	Egypt	11.6 million	3	Transition economies	12.9 million
11	Gabon	9.7 million	4	Pre-transition economies	10.8 million
12	Angola	9.1 million	5	Other	8.4 million
13	Guinea	9.0 million			
14	Ethiopia	8.9 million		**Based on historic economic growth**	
15	Libya	7.5 million	1	Medium growth economies	63 million
16	Congo	6.8 million	2	High growth economies	8 million
17	Benin	6.3 million	3	Low growth economies	6 million
18	Kenya	6.3 million			
19	Tanzania	5.9 million			
20	Sierra Leone	4.9 million			

Source: MOFCOM, 2008; World Bank, 2010a. The values representing the regional concentration, levels of diversification and historical growth performers are obtained by averaging the amounts of CFDI inflows received by individual countries within the regions or groups over the period 2003 to 2008.

well as country groupings that received CFDI inflows during this period, based on regional concentration, level of economic diversification, and historic economic growth performance.

In terms of individual recipients, the largest volume of flows over the period covered went to South Africa, Nigeria, Zambia, Algeria and Sudan, respectively. This group of countries accounted for 86.5% of China's total OFDI flows to Africa between 2003 and 2008. South Africa was by far the largest recipient of Chinese FDI during the period covered, receiving average Chinese FDI flows of US$ 896 million between 2003 and 2008. In terms of China's total OFDI to Africa between 2003 and 2008, South Africa alone accounted for 64.3 per cent of Chinese OFDI flows to the continent.

Examining Chinese FDI to various African regions, it can be seen that China is steering away from the mainstream investment destinations and focusing more on non-traditional investment destinations. This is because, since 2000, North Africa was the region that attracted the largest volume of flows (Loots, 2009). In contrast with this general trend, Chinese FDI is mainly aimed at Southern Africa.

In terms of economic diversification, the McKinsey Institute (Roxburgh et al., 2010) identified thirty one African countries that can be seen as the powerhouses driving Africa's growth during the past decade. Collectively, these countries were responsible for ninety seven percent of Africa's GDP growth between 2000 and 2008. The countries all had GDPs larger than US$ 10 billion in 2008, or had experienced real GDP growth of more than seven per cent between 2000 and 2008. These countries were classified as either diversified, oil exporting, pre-transition or transition economies, according to their exports per capita and economic diversification[3].

Since there is some preliminary reason to believe that China is investing in Africa for reasons of market expansion, it is interesting to note that the grouping that received the majority of average Chinese FDI inflows is the group of diversified economies, which accounted for 65.4% of China's total OFDI to the continent. This indicates that Chinese investors do take economic diversification into account when deciding on investment destinations. This observation, however, does come with a caveat. Though China invests in diversified countries, it does not necessarily mean that Chinese investment is diversified. Many of the countries classified as diversified do not lack natural resources. South Africa in particular stands out in this regard.

The fact that oil exporting countries are the second most prominent group in terms of average Chinese FDI inflows is not surprising, although taken as a percentage of China's total OFDI to Africa (16.2%), it is not as significant as one might have suspected. Pre-transition

and transition economies accounted for 2.7 and 6.6% of China's total OFDI to Africa, respectively. The last group of recipient countries which do not fall into any of the previous categories received the least amount of Chinese FDI during the period under investigation.

This indicates that the bulk of Chinese FDI to Africa has been concentrated in the classification provided by Roxburgh et al. (2010) to be the major drivers of African economic growth and lends preliminary credit to the idea that China is investing in Africa in order to obtain greater market access.

In order to gain a clearer picture of China's interest in securing market access, annual GDP growth rates of the various recipient countries were used to classify host countries into three groups, according to average economic growth obtained between 1995 and 2005. This period was chosen on the assumption that countries that achieved good historic economic growth rates would attract larger volumes of FDI inflows. High growth economies include economies that grew at a rate of more than five per cent on average between 1995 and 2005. Medium growth economies obtained average economic growth rates of between three and five per cent, while low growth economies[4] obtained growth rates of less than three percent.

The bulk of Chinese OFDI between 2003 and 2008 went to countries that historically were medium growth achievers, such as Tunisia, South Africa, Egypt, Nigeria, Namibia, Kenya and Mauritius, which also represents the larger economies on the continent. This once again seems to confirm the idea posited by Verachia (Gordon Institute of Business Science conference, 2010) that China is interested in investing in Africa in order to gain access to larger markets for its products, since around 97 per cent of all Chinese FDI flows went to countries that could sustainably grow at more than 3 per cent on average per annum.

The data presented in Table 4 presents an image of Chinese FDI in Africa that differs from traditional investors in the sense that Chinese FDI flows to the continent are more widespread than that of traditional investors, since traditional investors tend to focus on a handful of African economies (Loots, 2009), while China clearly invested in the majority of African countries. Chinese investment in Africa was also distributed across different regions than those more traditionally targeted. The clear interest in oil exporting countries, coupled with diversified and stable growth achievers, however, follow a more traditional pattern of FDI.

Since data regarding the exact sectoral composition of Chinese FDI in Africa are fragmented and anecdotal, it is difficult to verify precisely the nature of Chinese investment in Africa. It is, however, possible to examine the African countries that receive Chinese FDI and make some preliminary conclusions based on this. An overview

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[3]For more information on the meanings of these classifications and the measures of diversification, refer to Roxburgh et al.'s full report.

[4]High growth economies consisted of 14 countries, medium growth economies consisted of 24 countries, and low growth economies of 13.

of deals concluded between Chinese and African firms between 2006 and 2010 confirms China's involvement in construction, mining and oil in particular (Claassen, North West University, Master's thesis, 2011).

China's strategy in securing African resources involves loans needed for infrastructure. These concessionary loans mostly do not carry any interest repayments, and where interest repayments are applicable the interest rate is very low. Loans are often repaid with resources, illustrating the unconventional way in which China does business (Sautman and Yan, 2009). This unconventional way of conducting business is a trademark of China's investment approach, and extends to China's relationship with Latin America as well (Naidu et al., 2009).These observations lead to the hypothesis that mining, oil and infrastructure could be important determinants of Chinese FDI to Africa.

Furthermore, evidence suggests that Chinese firms are investing in African agriculture. Hallam (2009: 2) argues that this is part of an increasing trend in which investors seek out opportunities in food production in developing countries, motivated by mounting concerns about food security and increasing food prices. Hallam (2009: 2) cites China, various Gulf states, and Korea as important global investors in food production, which includes agriculture. The main recipients of agricultural FDI in Africa are currently Sudan, Tanzania and Ethiopia. Other African countries receiving Chinese FDI which aimed at food security include Mozambique, Namibia and Gabon, where Chinese firms have entered into joint ventures in the fish industry. In Tanzania, Zambia and Zimbabwe, Chinese firms are hiring farming land (Naidu and Mbazima, 2008). From this, it is deduced that agricultural land might also be an important determinant of Chinese FDI.

MODELING CHINESE FDI TO AFRICA

The two main sources of data for the empirical analysis are the World Bank and the Chinese Ministry of Commerce. The World Bank provides data on various indicators in its African Development Indicators and World Governance Indicators Databases, while MOFCOM provides disaggregated statistics on China's OFDI to the rest of the world in its publication, the Statistical Bulletin of China's Outward Foreign Direct Investment.

The most recent Statistical Bulletin that could be obtained from MOFCOM is the 2008 version. This includes disaggregated data on China's OFDI between 2003 and 2008. Since data is only available for such a short period, the use of panel analysis is necessary. One also needs to take into account that comparable data for all African countries is limited as well, further restricting the use of more sophisticated proxies.

Using these variables as a basis from which to work, various models were run in order to find the best possible fit. The selected model was then used as a base model

which generally explains the determinants of Chinese FDI to Africa. After numerous iterations, the base model that provided the best fit is[5]:

$$CFDI = f(invest, polsta_{-1}, inflate_{-1}, ger_{-1}, rsa, openness, infra) \quad (1)$$

Where: CFDI[6] represents Chinese FDI to Africa; Invest is the domestic investment of the host country, measured as the host country's gross domestic investment; Polsta represents political stability and is an index compiled by the World Bank in its World Governance Indicators; Inflate is the host country's annual CPI inflation rate, which serves as a proxy for macroeconomic stability; GER is the gross secondary enrolment rate, a proxy for human capital which is used to substitute the more widely used literacy rate, for which the data for all African countries were not available; RSA is a dummy variable for South Africa, which is a major outlier, especially in the year 2007/2008, during which the ICBC obtained a twenty percent stake in Standard Bank; Openness stands for trade openness; and Infra represents the host country's infrastructure.

Political stability, inflation and gross secondary enrolment are lagged, as it is likely that the value of each of these variables in the current period will influence the value in the next period. For example, if a country is currently enjoying political stability and good governance, it will likely only influence FDI inflows to that country in the following period[7].

The restrictions of the estimated model must be kept in mind – because data is available for such a short period of time only, inevitably the estimated model will pose some limitations. However, the results obtained from such a panel analysis can serve as a broad platform on which to base further research and analyses regarding Chinese investment in Africa.

Once the abovementioned base model has been established, the following additional variables are added in order to test various hypotheses about China's investment in Africa:

The literature on Chinese investment in Africa suggests that food security could be an important consideration in China's African investment strategy. To test this hypothesis, the percentage of agricultural land currently in use in a host economy is used. Similarly, energy security seems to be an important preliminary motivation for Chinese investment in Africa. To test this hypothesis, a dummy variable for oil exporting countries is added to the model.

An important potential explanation for increased

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[5]The author is aware of the fact that, though these variables generally explain FDI inflows to host countries, China may very well follow a different pattern than traditional investors. However, a study of China's growth path vs. that of the West falls outside the scope of this study.

[6]Refer to Appendix A for a detailed description of variables and data sources.

[7]The time lag is fairly short due to data restrictions.

Table 5. Base model (dependent variable: Chinese FDI).

Independent variable	Base model	Agriculture model	Oil model
Constant	337161.9 (0.9193)	1384560 (0.6797)	14312872 (0.1661)
Domestic investment	0.003228 (0.0001)*	0.002966 (0.0002)*	-0.002207 (0.0001)*
Political stability (-1)	3351811 (0.0007)*	2929464 (0.0052)*	-7238274 (0.1288)
Inflation (-1)	-266.9016 (0.2661)	-291.1564 (0.2178)	-1069.113 (0.6118)
Gross secondary enrolment (-1)	28642.12 (0.2077)	13701.46 (0.5761)	-264036.9 (0.0704)
South Africa	4.20E+08 (0.0000)*	4.20E+08 (0.0000)*	3.96E+08 (0.0000)*
Trade openness	-3363422 (0.1202)	-3192646 (0.1699)	-8054702 (0.5167)
Infrastructure	-85749.98 (0.0272)*	-70894.7 (0.0707)	88057.05 (0.1974)
Agricultural land		-17252.09 (0.0392)*	
Oil			20930549 (0.0124)*
R-squared	0.899467	0.905622	0.965133
Prob(F-statistic)	0.000000	0.000000	0.000000

Source: Author's own estimations using e-Views 7. P-values are reported in brackets. Values significant at 5 per cent level are indicated with an asterisk.

Chinese FDI in Africa that is often overshadowed by the resource-seeking debate, is the possibility that Chinese firms are interested in investing in Africa as a means to expand market access and gain experience in establishing and managing brands. This is a hypothesis that seems feasible in light of the literature reviewed, and therefore it is expected that countries that represent a larger market will receive more Chinese FDI.

Adding market size (represented in the specification below as size) to Equation 1 provides the specification for the extended base model, represented by Equation 2. Note that Equation 2 is merely a refinement of Equation 1. The market size variable is added to Equation 1, while variables such as trade openness and gross enrollment rate, which were consistently insignificant, are left out.

$$\mathrm{CFDI} = \mathrm{f}(\mathrm{invest}, \mathrm{polsta}_{-1}, \mathrm{rsa}, \mathrm{size}, \mathrm{infra}) \qquad (2)$$

Other effects that are tested for include dummies for landlocked countries, Least Developed Countries (LDCs), ex-socialist regimes and an index for export diversification, but none of these variables proved to be significant.

Correlation matrices and Granger causality tests are used to rule out possible multicollinearity and endogeneity, where possible. The results of these tests are discussed in more detail later on in this paper. Note that three countries in the sample are outliers. Firstly, South Africa is by far the largest recipient of Chinese FDI in Africa and has received significantly greater volumes of Chinese foreign investment than other African countries.

The years 2007 and 2008 in particular saw a drastic increase of inflows to South Africa, with the conclusion of the ICBC's acquisition of a twenty per cent stake in Standard Bank Limited. In 2007, Zambia received an US$800 million investment deal from China that also causes variation in the sample (People's Daily online

news article, 2008). Also in 2007, Nigeria received payment from the China National Offshore Oil Corporation (CNOOC) for its acquisition of a forty five per cent stake in an offshore oil field (UNCTAD, 2009:78). A single dummy is assigned to South Africa, since South Africa is by far the largest outlier, where Zambia and Nigeria are marginal outliers. The subsequently, the study will summarise and discuss the results that were obtained from the panel analysis.

Base model estimation, results and discussion

Table 5 presents results for the base model and two other models that were estimated. In the column entitled *base model*, some fundamental determinants of FDI were estimated according to Equation 1. This model is, admittedly, a very broad specification, but the idea is that, with limited data, the base model should serve as a platform from which to develop more refined models.

The column entitled *agriculture model* is a model that was estimated in order to capture China's interest in food security when investing in Africa. The final column, entitled *oil model*, presents a model in which a dummy for oil exporting countries is added to the base model in order to test for China's interest in oil.

In the base model, the results show that domestic investment, political stability and infrastructure were significant at the five per cent level. When domestic investment in the host economy increased, Chinese FDI increased, suggesting that domestic investment crowded in Chinese FDI. There was also a positive relationship between political stability in the host country and larger Chinese FDI inflows. Given the literature on China, this finding was surprising since popular wisdom suggests that Chinese investors do not consider political issues at all.

Table 6. Extended base model (Dependent variable: Chinese FDI).

Independent variable:	Extended base model	Extended agriculture model
Constant	4659110 (0.3497)	17999729 (0.0091)
Domestic investment	-0.003287 (0.0000)*	-0.003318 (0.0000)*
Political stability (-1)	-9474066 (0.0353)*	-8847662 (0.0461)*
Infrastructure	20600.20 (0.7414)	1436.412 (0.9815)
Large economies (market size)	29200244 (0.0057)*	31225736 (0.0000)*
South Africa	3.95E+08 (0.0000)*	3.94E+08 (0.0000)*
Agricultural land		-346052 (0.0057)*
R-squared	0.964873	0.966090
Prob. (F-statistic)	0.000000	0.000000

Source: Author's own estimations using e-Views 7. P-values are reported in brackets. Values significant at 5 per cent level are indicated with an asterisk.

There was a negative relationship between Chinese FDI and infrastructure in the host economy, in line with model expectations. Traditionally, it would be expected that the converse must be true. However, given the Chinese proclivity for investing in infrastructure in Africa, this result seems to suggest that Chinese investors targeted countries where low infrastructure was pre-valent, since this provided an opportunity for Chinese businesses to provide infrastructure where the demand was high. The South African dummy was highly significant, showing that South Africa, *ceteris paribus*, received more investment than other African countries did, and also providing preliminary evidence of the market seeking motive in Chinese FDI.

The fact that inflation, gross enrolment and trade openness were not significant at any level indicated that China did not consider macroeconomic stability or human capital when investing in Africa. This outcome corres-ponded with expectations formed from the literature on China. The insignificance of the gross enrolment rate also confirmed the notion that Chinese FDI had more of a resource-seeking than efficiency-seeking motive.

Furthermore, trade openness was also not a significant variable. The R-squared value of the base model indicated a good fit, with 89.95% of the variation in Chinese FDI being explained by the relevant variables included in the base model.

To test for China's interest in food security, agricultural land was added to the base model in order to obtain the agriculture model. The significance and signs of the other coefficients remained largely the same as in the base model. The agricultural variable was significant and the coefficient negative, as expected. This means that China invested less in countries that were already close to utilising their full agricultural land. Chinese investors rather invested in countries with underutilised agricultural land for purposes of food security. The goodness of fit of the agriculture model, as indicated by the R-squared value, was 90.56%.

In the oil model, a dummy was added for oil exporting

countries to indicate whether China invested more in oil exporting countries than in non-oil exporting countries. This is a significant question, given the fact that current opinion on the subject suggests that oil and natural resource abundance is a very important determinant of Chinese FDI in Africa.

The oil dummy was significant when added to the base model and the relationship was positive, confirming the hypothesis that China has a significant interest in African oil. However, the signs of the coefficients of domestic investment, political stability and gross secondary enrolment changed. This most likely occurred due to some level of multicollinearity between the oil dummy and these variables. Since the variable used to measure oil is a dummy variable, it was not possible to draw up a correlation matrix in order to analyse this problem. The oil model had the highest goodness of fit of the three models estimated, accounting for 96.51% of the variation in Chinese FDI.

Extended base model estimation, results and discussion

A general concern of the base and other two models presented here was that they did not control for market size. Traditionally, this is an important determinant of FDI and controlling for market size would address an important question, namely if China's interest in Africa is for market expansion purposes.

To capture the effect of market size on Chinese FDI, a dummy variable was added. This variable identified the ten recipient countries of Chinese FDI that have the highest GDP. The model was then estimated according to Equation 2 (Table 6).

Adding the large economy dummy to the model as a proxy for market size had a significant impact on the results. Since inflation, gross secondary enrolment and trade openness were not significant in any of the iterations run, these variables were omitted and the large

economy dummy was added to obtain the extended base model. This model still had a very respectable goodness of fit, with an R-squared of 0.96.

The results showed that domestic investment, political stability and the dummies for the large economies and South Africa were significant. Infrastructure became insignificant, whereas in the previous base model estimated, it was significant. Though the two results were contradictory, they seemed to represent two possibilities.

Firstly, it could be that China invested in infrastructure in countries where the level of infrastructure was low because it provided the best opportunities for Chinese construction companies. This is consistent with the preliminary analysis of China's FDI to Africa, which showed that Chinese construction firms have taken an active interest in African infrastructure in recent years.

The second theory is that infrastructure was insignificant to Chinese firms, because they established their own infrastructure. This latter result, obtained from controlling for market size, seemed to suggest that Chinese firms are willing to invest in infrastructure if a particular market was attractive or large enough. It is also interesting to note that, once market size was controlled for, the signs on the coefficients of political stability and domestic investment changed. When controlling for market size, there was a negative but significant relationship between domestic investment, political stability and Chinese FDI, whereas in the base model, these variables showed positive signs throughout and only changed signs when the oil dummy was added.

A possible explanation for this change in coefficients is that there existed a degree of multicollinearity between domestic investment, political stability and market size. Though it was not possible to test for this by using a correlation matrix, since market size is a dummy variable, examination of the data showed that the countries with large markets (based on GDP), are also generally countries that rank poorly on the political stability index that was used in the model[8]. This in itself presented an interesting discussion point regarding Chinese FDI in Africa. It seems that China actually followed a very traditional investment pattern when market size was not controlled for. In other words China invested more in countries that were more politically stable when market size was not taken into consideration. However, as soon as market size was controlled for, this changed. This would seem to indicate that China is indeed set on expanding its market access, and if a country provides an attractive enough market, China will invest in it regardless of political stability. This idea is confirmed by Buckley et al. (2007), who conclude that political risk encourages rather than discourages Chinese FDI.

Similarly, with regard to domestic investment, many of the top ten largest economies were also economies with lower levels of domestic investment, or countries for which data on domestic investment was not complete. It seems, once again, that market size changed China's investment pattern in this regard.

To obtain the extended agriculture model, the agricultural land variable was added to the extended base model. Available agricultural land was still significant. The sign was also as expected, showing that China invested less in countries that were already close to their maximum agricultural land utilisation. Furthermore, the signs of the coefficients and significance of the other variables remained as they were in the extended base model. The extended agricultural model had a good goodness of fit, accounting for 96.6 per cent of the variation in Chinese FDI. An extended oil model was not estimated, since the majority of the top ten largest economies in Africa are also oil-exporting countries and this caused estimation problems.

These results pose some interesting questions about China's motivations for investing in Africa. Controlling for market size seemed to suggest that China was looking to expand its markets. The top ten largest economies generally received much more Chinese investment than smaller economies did. However, food security and oil were still significant factors.

The results lead to the conclusion that China's investment strategy was broader and more complex than initially anticipated. What was clear was the fact that domestic investment, political stability, agricultural potential, oil exports and market size were significant factors in attracting Chinese FDI. Human capital, macroeconomic stability and trade openness were not significant determinants of Chinese FDI.

The relationship between Chinese FDI and the host country's infrastructure was inconclusive, with the base model showing the relationship between Chinese FDI and infrastructure to be negative and significant, and the extended base model showing that infrastructure was insignificant. Chinese investors seemed to either invest in countries where there was a shortage of infrastructure, or not to consider infrastructure at all, since they established their own infrastructure in the countries in which they invested.

Causality tests

Here, information on causality tests between Chinese FDI and various other variables is provided. These causality tests are not meant to provide any in-depth insights into the dynamics between Chinese FDI and various African performance variables, but instead to clarify some issues which are controversial, and could most likely serve as basis for future research and analysis.

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[8]The index measures "*the perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including domestic violence and terrorism*" (World Bank, 2011). The index ranges from negative 2.5 to positive 2.5, with higher values indicating better governance outcomes. Algeria, Angola, Egypt, Libya, Morocco, Nigeria, South Africa, Sudan and Tunisia on average scored towards the lower to middle, negative end of this scale between 2003 and 2008.

The causality between Chinese FDI and African GDP

Granger causality tests were used in order to establish the relationship between Chinese FDI and these important determining factors. The relationship between Chinese FDI and African GDP was found to be bi-directional. African countries with higher GDPs will most likely attract larger amounts of Chinese FDI, while Chinese FDI will enhance economic growth in African countries. This is consistent with the literature review earlier, which concluded that there is no clear-cut, uni-directional relationship between FDI and host country economic growth.

The causality between Chinese FDI and African corruption

A common perception of the Chinese way of doing business is that corruption is the order of the day. Similarly, Africa is well known for its corrupt regimes. Critics of China in Africa fear that the Chinese presence in Africa will only entrench the corrupt business mentality. It is against this background that the causal relationship between corruption and Chinese FDI is interesting – do Chinese firms invest in Africa because local corruption makes it easy for them to do so, or do African officials become corrupt because the Chinese firms enable them to?

   The Granger causality test showed that the null hypothesis that corruption does not Granger-cause Chinese FDI could be rejected at the five per cent significance level. The implication is that African corruption did Granger-cause Chinese FDI, signalling that Chinese investment in Africa took place because corrupt practices here made it easy for Chinese firms to enter African markets. However, the null hypothesis that Chinese FDI does not cause corruption could not be rejected at any level, which implied that corrupt Chinese practices were not necessarily standing in the way of Africa overcoming corruption.

The causality between Chinese FDI and African infrastructure

With China's demonstrated interest in contributing toward African infrastructure, the causal link between infrastructure and Chinese FDI is interesting to examine. Do high levels of African infrastructure make investments attractive to Chinese firms, or does the presence of Chinese firms in African countries enhance local infrastructure? The Granger causality test showed that the latter was true. It was not African infrastructure that attracted Chinese investment, but rather the absence of infrastructure that crowded in Chinese FDI. This was consistent with the findings in the extended base model.

The fact that Chinese investment contributed toward African infrastructure is positive. The most appealing trademark of FDI is that it should allow for spillovers to take place. The Granger causality test above showed that Chinese FDI is contributing towards more infrastructure investment in Africa.

The causality between Chinese FDI and African human capital

If Chinese FDI is to be beneficial to Africa, then the local population must be able to share in positive spillovers resulting from FDI. This includes access to technology, management skills and human capital. Ideally, local workers should learn from foreign investors and this should contribute toward African human capital. To test for the causality between Chinese FDI and human capital, a Granger test was conducted on Chinese FDI and gross secondary enrolment, which is the proxy for human capital in the model. The results showed that the relationship between these two variables was bi-directional, with human capital attracting FDI, but FDI also leading to the development of human capital (Table 7).

CONCLUSION

This article aimed at providing empirical evidence on some of the debates on Chinese investment in Africa. It is an issue that is often difficult to shed light on, given the level of political rhetoric and debates in the popular press surrounding it.   However, a literature review and an empirical analysis make it possible to steer the debate toward some clearer ground.

   China invests in the majority of African countries. During the period 2003 to 2008, China invested in 45 of the 53 African states. Chinese FDI was aimed at diversified, medium growth economies during the period under investigation. Southern Africa is the region which attracted the largest volume of Chinese OFDI, with South Africa being the country that attracted by far the most Chinese OFDI in Africa.

   Disaggregated data on Chinese OFDI to various African industries is not available. However, a survey of various articles in the popular and academic press indicates that China has a specific interest in African construction, mining and oil. Beijing follows a unique "infrastructure for oil" approach under which infrastructure is built in Africa, in exchange for various resources. This shows that resource security is an important consideration for Beijing.

   In modeling Chinese FDI in Africa, the results indicate that domestic investment, market size, agricultural potential and oil are important and significant determinants of Chinese FDI. Political stability of the host country is a

Table 7. Summary of Granger causality results.

Variable	Causality
Chinese FDI and African GDP	Bidirectional
Chinese FDI and African corruption	Unidirectional, with African corruption Granger-causing Chinese FDI
Chinese FDI and African infrastructure	Unidirectional, with Chinese FDI Granger-causing upgrade in African infrastructure
Chinese FDI and African human capital	Bidirectional

Source: Author's own estimations using Eviews 7.

significant determinant of Chinese FDI, though the exact relationship is unclear. It seems that political stability is, surprisingly, important to China but that this factor becomes less important if the potential market is attractive enough. Quality infrastructure is an inconclusive determinant of Chinese FDI. Chinese firms seem to either target countries where quality infras-tructure is low, or they seem not to consider infrastructure at all.

This study shows that China, as a growing world economic power, needs to expand its markets and establish world-class brands, as well as ensure food security for its large population. The country is evidently a very strategic economic player, with aspirations to become the world's leading nation once again, and its strategy in Africa should be viewed against this background. Africa is a growing market and provides opportunities for Chinese firms to gain more experience in the branding and management of their products. Africa also has agricultural potential which can be exploited in order to improve food security. Moreover, Africa consists of 53 individual states whose political support can be very valuable in multilateral platforms.

The results presented in this study refute the general perception of solely resource-driven Chinese FDI in Africa. China invested in diversified, medium growth economies between 2003 and 2008. This leads to the conclusion that, although resource security is an important consideration for Chinese investors, Beijing's approach to Africa does appear much wider than popularly believed.

ACKNOWLEGMENT

REFERENCES

Adams S (2009). Foreign direct investment, domestic investment and economic growth in Sub-Saharan Africa. J. Policy Modell. 31:939-949.

Akinlo AE (2004). Foreign direct investment and growth in Nigeria: An empirical investigation. J. Policy Modell. 26:627-639.

Alfaro L, Chanda A, Kalemli-Ozcan S, Sayek S (2004). FDI and economic growth: the role of local financial markets. J. Int. Econ. 64:89-112.

Asiedu E (2002). On the determinants of foreign direct investment to developing countries: Is Africa different? World Dev. 30(1):107-119.

Asiedu E (2006). Foreign investment in Africa: The role of natural resources, market size, government policy, institutions and political instability. World Econ. 29(1):63-77.

Baharumshah AZ, Thanoon MA (2006). Foreign capital flows and economic growth in East Asian countries. China Econ. Rev. 17:70-83.

Basu P, Chakraborty C, Reagle D (2003). Liberalization, FDI, and growth in developing countries: A panel cointegration approach. Econ. Inquiry 41(3):510-516.

Basu P, Guariglia A (2005). Foreign direct investment, inequality and growth. University of Nottingham Research Paper Series 2005/41. p.42.

Bende-Nabende A, Ford J, Sen S, Slater J (2002). Foreign direct investment in Asia: Trends and determinants. Asia Pac. J. Econ. Bus. 6(1):4-25.

Beugelsdijk S, Smeets R, Zwinkels R(2008). The impact of horizontal and vertical FDI on host country's economic growth. Int. Bus. Rev. 17:452-472.

Bezuidenhout H (2009). A regional perspective on Aid and FDI in Southern Africa. Int. Adv. Econ. Res. 15: 310-321.

Brambila-Macia J, Massa I (2010).The global financial crisis and sub-saharan Africa: The effects of slowing private capital inflows on growth. Afr. Dev. Rev. 22(3):366-377.

Buckley PJ, Clegg J, Cross AR, Liu X (2007). The determinants of Chinese outward foreign direct investment. J. Int. Bus. Stud. 38(4):499-518.

Calvo MB, Sanchez-Robles B (2002). Foreign direct investment, economic freedom and growth: New evidence from Latin America. Departmento De Economia, University Of Cantabria.

Campos NF, Kinoshita Y (2002). Foreign direct investment as technology transferred: Some panel evidence from the transition economies. William Davidson Institute working paper 438:35.

Carkovic M, Levine R (2002). Does foreign direct investment accelerate economic growth? University of Minnesota p.23.

Choe J (2003). Do foreign direct investment and gross domestic investment promote economic growth? Rev. Dev. Econ. 7(1):44-57.

Chowdhury A, Mavrotas G (2005). FDI and growth: A causal relationship. united nations University World Institute for development economics Research (UNU Wider) Research Paper No. 25/2005. p.12.

De Vita G, Kyaw KS (2008). Determinants of capital flows to developing Countries: A structural var analysis. J. Econ. Stud. 35(4):304-322.

Durham JB (2000). Time series econometrics of the real and financial effects of capital flows: Selected cases in africa and Southern Asia. QEH Working Paper Series No. 56:48.

Durham JB (2004). Absorptive capacity and the effects of foreign direct investment and equity foreign portfolio investment on economic growth. Eur. Econ. Rev. 48:285-306.

Duttaray M, Dutt AK, Mukhopadhyay K (2008). Foreign Direct Investment And Economic Growth In Less Developed Countries: An Empirical Study Of Causality And Mechanisms. Appl. Econ. 40:1927-1939.

Fedderke JW, Romm AT (2006).Growth impact and determinants of foreign direct investment into South Africa, 1956-2003. Econ. Modell. 23:738-760.

Frimpong JM, Oteng-Abayie EF (2006). Bivariate causality analysis

between FDI inflows and economic growth in Ghana. Munich Personal Repec Archive (Mpra) Paper No.315:23.

Hallam D (2009). Foreign investment in developing country agriculture: issues, policy implications and international response. paper presented at the organisation for economic development and cooperation. 8th Global Forum on International Investment. 7-8 December.

Hansen H, Rand J (2005). On the causal links between fdi and growth in developing Countries. United Nations University World Institute for Development Economics Research (UNU Wider) Research Paper No. 2005/31. p.22.

Hermes N, Lensink R (2003). Foreign direct investment, financial development and economic growth. J. Dev. Stud. 40:142-163.

Herzer D, Klasen S, Nowak-Lehmann F (2008). In search of fdi-led growth in developing Countries: The way forward. Econ. Modell. 25: 793-810.

Hsiao FST, Hsiao MW (2006). FDI, Exports, and GDP in East and Southeast Asia: Panel Data Versus Time Series Causality Analyses. J. Asian Econ. 17:1082-1106.

Johnson A (2006). The effects of FDI inflows on host country economic growth. The royal institute of technology centre of excellence for studies in science and innovation (Cesis) Electronic Working Paper Series 58:57.

Kottaridi C, Stengos T (2010). Foreign direct investment, human capital and non-linearities in economic growth. J. Macroecon. 32(3):858-871.

Kumar N, Pradhan JP (2002). Foreign direct investment, externalities and economic growth in developing Countries: Some empirical explorations and implications for WTO negotiations on investment. Research and information system for the non-aligned and other developing Countries (RIS), Discussion Papers, RIS-DP No. 2712002.

Le MV, Suruga T (2005).Foreign direct investment, public expenditure and economic growth: The empirical evidence for the period 1970-2001. Appl. Econ. Lett. 12:45-49.

Li X, Liu X (2005). Foreign direct investment and economic growth: An increasingly endogenous relationship. World Dev. 33(3):393-407.

Loots E (2003). Globalisation and Economic Growth in South Africa. S. Afr. J. Econ. Manag. Sci. 6(2): 218-242.

Loots E (2009). Foreign Direct Investment to Africa: Trends, dynamics and challenges. paper presented at the Sixth African Finance Journal Conference: Research and development in development Finance, Cape Town, 16 And 17 July.

Lumbila KN (2005). What makes FDI work? A panel analysis of the growth effect of FDI in Africa. Africa Region Working Paper Series 80:46.

Mah JS (2010). Foreign direct investment inflows and economic growth of china. J. Policy Modell. 32:155-158.

Makki SS, Somwaru A (2004). The impact of foreign direct investment and trade on economic growth: Evidence from Developing Countries. J. Agric. Econ. 86(3):795-801.

MOFCOM (2008). Ministry of Commerce. Statistical Bulletin of China's Outward Foreign Direct Investment p.90.

Moolman CE, Roos EL, Le Roux JC, Du Toit CB (2006). Foreign Direct Investment: South Africa's Elixir of Life? University of Pretoria Department Of Economics Working Paper Series 05:30.

Naidu S, Corkin L, Herman H (2009). China's (Re)-Emerging Relations With Africa: Forging A New Consensus? Politikon 36(1):87-115.

Naidu S, Mbazima D (2008). China-African Relations: A New Impulse in a Changing Continental Landscape. Futures 40:748-761.

Nair-Reichert U, Weinhold D (2001). Causality tests for cross-country panels: a new look at Fdiand economic growth in developing countries. Oxford Bull. Econ. Stat. 63(2): 153-171.

Naudé WA, Krugell WF (2007). Investigating geography and institutions as determinants of foreign direct investment in africa using panel data. Appl. Econ. 39:1223-1233.

Ndikuma L, Verick S (2008). The linkages between fdi and domestic investment: unravelling the developmental impact of foreign investment in sub-saharan Africa. forschungsinstitut Zur Zukunft Der Arbeit/Institute for the study of labor (IZA) Discussion Paper Series, IZA DP No. 3296: 34.

Nicet-Chenaf D, Rougier E (2009). FDI and growth: a new look at a still puzzling issue. groupe de recherche en economiethéoriqueetappliquée(GRETHA) Working Paper 2009-13. p.26.

Okudua H (2009). Foreign direct investment and economic growth: co-integration and causality analysis of Nigeria. Afr. Financ. J. 54(11): 54-73.

Onyeiwu S, Shretsha H (2004). Determinants of foreign direct investment in Africa. J. Dev. Soc. 20:89-106.

Qi L (2007). The relationship between growth, total investment and inward fdi: evidence from time series data. Int. Rev. Appl. Econ. 21(1):119-133.

Ram R, Zhang KH (2002). Foreign direct investment and economic growth: evidence from cross-country data for the 1990s. Econ. Dev. Cult. Chang. 51(1):205-215.

Roxburgh C, Dörr N, Leke A, Tazi-Riffi A, Van Wamelen A, Lund S, Chironga M, Alatoviki T, Atkins C, Terfous N, Zeino-Mahmalat T (2010). Lions on the move: the progress and potential of African economies. Mckinsey Global Institute (MGI) p.82.

Sautman B, Yan H (2009). Friends and interests: china's distinctive links with Africa. Afr. Stud. Rev. 50(3):75-114.

Seetanah B, Khadaroo AJ (2007). Foreign direct investment and growth: new evidence from sub-saharan african countries. University of Mauritius p.27.

Sharma B, Abekah J (2008). Foreign direct investment and economic growth of Africa. Atlantic Econ. J. 36:117-118.

Sridharan P (2009). The causal relationship between foreign direct investment and growth: evidence from BRICs Countries. Int. Bus. Res. 2(4):198-203.

Sylwester K (2005). Foreign direct investment, growth, and income inequality in less developed Countries. Int. Rev. Appl. Econ. 19(3):289-300.

United Nations Conference on Trade And Development (2008). World Investment Report. Transnational corporations and the infrastructure challenge. New York: United Nations.

United Nations Conference on Trade And Development UNCTAD (2009). World Investment Report. Transnational Corporations, Agricultural Production and Development. New York: United Nations.

Vadlamannati KC (2009). Growth Effects of U.S. FDI In 64 Developing Economies, 1980-2007: The Role Of Absorptive Capabilities. Munich Personal Repec Archive (MPRA) Paper No.14709: 34.

Whalley J, Xin X (2010). China's FDI and non-FDI economies and the sustainability of future high Chinese Growth. China Econ. Rev. 21:123-135.

World Bank (2010a). World Development Indicators.http://data.worldbank.org/data-catalog/world-development-indicators Date Of Access: 3 Aug. 2010.

World Bank (2010b). Africa Development Indicators.http://data.worldbank.org/data-catalog/africa-development-indicators Date Of Access: 8 Sep. 2010.

World Bank (2010c).World Governance Indicators.http://info.worldbank.org/governance/wgi/sc_country.asp Date of Access: 8 Sep. 2010.

World Bank (2011). World Governance Indicators. http://info.worldbank.org/governance/wgi/index.asp Date Of Access: 11 Mar. 2011.

Zhang KH (2001). Does foreign direct investment promote economic growth? Evidence from east asia and Latin America. Contemp. Econ. Policy 19(2):175-185.

Appendix 1.

In the equations estimated, the variables are:

CFDI represents Chinese FDI to Africa: This is the data on Chinese FDI obtained from MOFCOM, and the data is in current figures, given in millions of US dollars. Using the World Bank's GDP deflator, with 2000 being the base year, the data was transformed to constant prices[9]. Invest is the domestic investment of the host country, measured as the host country's gross domestic investment. Data was obtained from the World Bank's African Development Indicators (World Bank, 2010b) and is in constant 2000 terms. Traditionally, it would be expected that high levels of domestic investment in the host country will crowd in foreign investment.

Polsta: represents political stability and is an index compiled by the World Bank in its World Governance Indicators (World Bank, 2010c). The index ranges from negative 2.5 to positive 2.5, where positive and higher values reflect higher levels of stability.China's stance on political sovereignty is well known. It is part of the country's official foreign policy not to intervene in the political affairs of the countries it conducts business with, and therefore it is expected that political stability of the host economy will not be a significant determinant of Chinese FDI in Africa. Though China's non-interference policy leads to the expectation that the variable will be insignificant, it is tested in order to establish an empirical relationship, since this is a very contentious issue in the China-Africa debate.

Inflate: is the host country's annual CPI inflation rate, which serves as a proxy for macroeconomic stability. Data was obtained from the World Bank's African Development Indicators. The literature shows that Chinese FDI, being largely driven by Chinese state-owned enterprises (SOEs), is not subject to the normal profit maximisation motive that drives traditional investors. Because of this, it is expected that macroeconomic stability will be an insignificant factor in determining Chinese FDI to Africa.

GER: is the gross secondary enrolment rate, a proxy for human capital which is used to substitute the more widely used literacy rate, for which the data for all African countries are not available.Though the secondary enrolment rate is a poor measure of human capital which is unable to capture the quality of human capital (P. Strydom, North West University, South Africa. Personal communication, 2011), data limitations for the majority of African countries unfortunately necessitate the use of this proxy.Similarly to political and macroeconomic stability, human capital does not seem to be important for Chinese firms investing in Africa, since the literature shows that China prefers to use its own rather than local employees in foreign investment projects. It is against this background that it is expected that human capital will be an insignificant determinant of Chinese FDI.

RSA: is a dummy variable for South Africa, which is a major outlier, especially in the year 2007/8, during which the ICBC obtained a twenty per cent stake in Standard Bank.

Openness: stands for trade openness, which is based on a conventional index used in the literature that is calculated as the sum of a country's exports and imports, as a percentage of GDP[10]. Given the preliminary indications of China's interest in gaining access to larger markets, it is expected that China will invest more in countries with higher levels of trade openness, since this will enable Chinese firms operating in African countries to partake in export opportunities. This variable is included in the model because it was shown in the literature study to be a determinant of FDI.

Infra represents the host country's infrastructure: The number of telephone lines per 1000 people is used as a proxy for quality infrastructure. This is conventional in the literature. The analysis of Chinese FDI shows that Chinese firms have been very active in the construction sector of Africa. This variable is tested in order to determine exactly how important the quality of the infrastructure is to Chinese investors. It can be argued that China invests in African infrastructure in order to facilitate the operations of Chinese firms in Africa. Against this background it is expected that the relationship between Chinese FDI and African infrastructure will be negative – countries with better quality infrastructure will require, and therefore receive, less Chinese investment.

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[9]Current figures were also used to run the specified model, but this has no impact on the significance and sign of coefficients.

[10]Though this measure of trade openness is known to be flawed (Loots, 2003), the limited data available for most African countries once again necessitates the use of this particular measure.