

Demand Side Factors Affecting the Inflow of Foreign Direct Investment to African Countries: Does Capital Market Matter?

Zenegnaw Abiy Hailu

Shanghai University of Finance and Economics

Department of Finance (International Finance)

North Zhongshang No 1 Road, 369, Shanghai 200083, China

E-mail: zenegnaw@gmail.com

Abstract

This paper aims at providing empirical analysis of the demand side determinants of the inflow of Foreign Direct Investment to African nations, with particular emphasis on stock market availability. Due to data heterogeneity, non-continuity and because the Hausman test favors it, cross section fixed effect Least Square Dummy Variable (LSDV) estimation technique is used. Natural resource, labor quality, trade openness, market accession and infrastructure condition are found to have positive and significant effect. Availability of stock market has the expected positive but insignificant effect. In search of possible explanation governments' expenditure and private domestic investment are added to the regression equation and are found to have positive effect, ruling out the possibility of crowding out effect. Stock markets in Africa are not structured in such a way that they can contribute to attract FDI and hence policy makers should restructure capital markets to get the most out of them. The bottom line is, policy makers of those countries have a lot of demand side instruments under their discretion to attract FDI inflow.

Keywords: African countries, Foreign Direct Investment inflow, Determinant factors, Stock market availability

1. Introduction

Most African countries are struggling to come out of poverty. One of the bottle necks for their development endeavor is availability of capital. Multinational enterprises (MNEs) are seen as part of the development solution for several reasons especially for countries where capital is the scarcest resource. Foreign direct investment (FDI) is viewed as a major stimulus to economic growth in developing countries though there are contradictory views on the issue. Elmawazini et al (2005) find that FDI and productivity growth for the host economy are not significantly related for developing countries. The vast majority of studies on the area in the contrary, as we will see soon, have highlighted the importance of FDI for economic growth from different perspectives. They argue, its ability to deal with multi-faceted major obstacles of development, namely, shortages of financial resources, technology and skills, has made it one of the best candidates of development instruments. Many countries and blocks of countries have benefited from this source of finance of development.

A study on African countries (Sharma and Abekah, 2008) finds that FDI has a positive effect on the growth of GDP in African countries. Another study on transition economies (Lee and Tcha, 2004) pin points that Total Factor Productivity (TFP) and Gross Domestic Product (GDP) in those countries grew together with the inflow of FDI and the marginal contribution of FDI to GDP is greater than that of domestic investment. Blalock and Gertler (2008) find strong evidence of productivity gains, greater competition, and lower prices among local firms in markets that supply foreign entrants for emerging markets. Borensztein, et al (1998) suggests that FDI is an important vehicle for the transfer of technology, contributing relatively more to growth than domestic investment does. Another study, Padilla-Perez (2008) show that technology transfers from FDI may impact diverse actors of the host region (local firms, universities, research centers, industry associations). FDI is found to have positive effect on economic growth directly (Saggi, 2002) and through its interaction with labor (Vua and Noyb, 2009). Levchenk and Mauro (2008) argue that FDI compared to other forms of financial flows provides better protection against crisis. Bashier and Bataineh (2007) identify FDI increases domestic saving, which is another vehicle for local investment increase. These are some of the studies so far that identify positive relationship between FDI and economic development.

Some other studies like Li and Liu (2005) put condition on the role of FDI on economic development. The interaction of human capital with FDI exerts a strong positive effect on economic development of developing countries while that of FDI with the technology gap has a significant negative impact. Although FDI is expected

to boost long-run economic growth, its growth enhancing effect is dependent of the degree of complementary and substitution between FDI and domestic investment, says De Millo (1999).

Despite all these potentials of FDI for economic development, its inflow to African countries compared to the total world flow is minimal. To attract FDI countries apply different economic and institutional incentives for potential investors. This, along with a wide range of factors, creates inter-country difference in the quantity and quality of FDI.

With this in mind, the main objective of this paper is to empirically identify determining factors of inflow of FDI among African countries. This paper is important for both policy making and academics. It entertains wide range of factors that could possibly affect FDI inflow and to the best knowledge of the researcher; particularly the effect of stock market availability was not addressed so far though both academicians and policy maker attribute a wide range of benefit to the factor.

The paper is organized as follows: section 2 provides a literature review over factors affecting inflow of FDI in developing countries, including African countries, and in international setting; section 3 derives some testable hypotheses that are to be analyzed using African countries data; econometric methods are applied to test the hypothesis in Section 4; empirical results are reported and discussed in Section 5 and finally, concluding remark are made in Section 6.

2. Review of Previous Emperical Works

In this part, researches in the area of determinants of FDI inflow, both investor country and host country analysis, are reviewed. Global and country-specific factors are equally important in determining capital flow to developing countries, according to Taylor and Sarno (1997). Most researches on country-specific (host country), determinant factors of FDI addresses natural resource availability, political stability, infrastructure development, labor market condition, market accession, Intellectual Property Right (IPR) protection, corruption, exchange rate and volatility of exchange rate, interest rate, regulatory framework of the country on repatriation of capital and remittance of profit as main factors affecting FDI inflow. The other way of looking at these factors is on different categories such as resource base, macroeconomic factors, regulatory framework, political factors, infrastructure condition and global factors. Another point of worth noting is that this classification of factors is from broader perspective and overlaps may exist among categories. Let's see the main factors identified so far.

2.1 Resource base

Natural resources and labor resource are main considerations in FDI decisions. The effect on FDI inflow of abundance of natural resources in African countries (Dupasquier and Osakwe, 2006; Aseidu, 2002), is reported to be positive and significant underscoring the fact that FDI flow to Africa is mainly resource seeking. Another study (Deichmann et al 2003) on transition economies of Euro-Asia countries also support the importance of natural resources as determining factors for the inflow of FDI to these countries.

Human resource is another factor that can be categorized under this part. Researches on developing economies (Noorbakhsh et al, 2001); on human capital in general (Miyamoto, 2008) and on workers' productivity (Tarzi, 2005) identify relationship between labor market conditions and FDI. A study on labor cost in Pakistan (Khair-UZ-Zaman et al, 2006); labor productivity for Japanese FDI in Asia (Baeka and Okawa, 2001); relative labor cost on Korea's FDI from US (Jeon and Rhee, 2008); on UK's labor market flexibility (Floyd, 2003); wage rate for Central and Eastern Europe countries and Western Balkan Countries (Kersan-Skabic and Orlic, 2007) and labor market flexibility for transnational corporations located in UK (Whyman and Baimbridge, 2006) have all shown the significance of labor on FDI. Other researches on this variable have come up with opposing results to the majority of the studies we have seen so far. A study (Klein and Rosnegren, 1994) finds no evidence that relative wages have a significant impact on the determination of U.S. foreign direct investments. Another study on the inflow of FDI to Thailand (Brahmasrene and Jiranyakul, 2001) finds no significant effect of labor cost on FDI inflow.

2.2 Macroeconomic factors

A wide array of researches has signified the importance of macroeconomic conditions as factors affecting inflow of FDI to a country. Economic growth and economic competitiveness have been identified as determining factor for the inflow FDI to developing countries including Africa. Examination of the determinants of inward foreign direct investment to the United States from seven industrial countries over the period 1979-1991 (Klein and Rosnegren, 1994), Korea's FDI from USA (Jeon and Rhee, 2008) find strong evidence that relative wealth significantly affects inward foreign direct investment. Another study on Thailand (Brahmasrene and Jiranyakul, 2001) finds real income is a significant factor determining the inflow of FDI. Despite these evidences, other

studies like (Nnadozie and Osili, 2004) on African FDI from USA, finds less robust evidence on the role of GDP per capita on FDI inflow but GDP growth was found to have significant impact.

This factor is highly related to the market accession potential of a nation. Almost all researches on the effect of market size as a determinate factor of FDI concludes market size as a significant factor for FDI inflow. Case studies and panel data analysis on developing countries (Fedderke and Romm, 2006; Tarzi, 2005; Khair-UZ-Zaman et al, 2006; Zhang, 2001) all found out that it is a critical consideration for FDI. Econometric analysis of US FDI (Barrell and Pain, 1996; Nigh, 1986) also showed market size as a determining factor for FDI flow. Contrasting finding in Ghana (Coleman and Agyire-Tettey, 2008) confirms most foreign investors do not consider the size of the market in making a decision to invest or otherwise in Ghana.

Exchange rate as determining factor of FDI is rigorously studied by different researchers. These studies considered exchange rate from different angles and finding are varied. A case study on Ghana (Kyereboah-Coleman and Agyire-Tettey, 2008) on the volatility of real exchange rate showed that the volatility of the real exchange rate has a negative influence on FDI inflow. Empirical investigation of firm level data on the US FDI to Korea (Jeon and Rhee, 2008) proves that FDI inflows have significant association with real exchange rate and expected exchange rate changes. Other studies too (Ramiraz, 2006; Cushman, 1985) show significant relationship between the two variables. Contrary findings on the relationship between the two economic variables are also documented. Studies like (Brahmasrene and Jiranyakul, 2001; Dewenter, 1995) state there is no statistically significant relationship between the level of the exchange rate and foreign investment.

Another macroeconomic factor is trade openness. Measure of openness of the economy in Australia (Yih Yun et al, 2000) has been identified as a significant factor for the inflow of FDI. A study, (Asiedu, 2002) shows openness to trade promotes FDI to Sub-Saharan and Non-Sub-Saharan African countries. Openness can also be viewed from economic treaties and integration between and among countries. A study on developing countries (Neumayor and Spess, 2005) gives evidence that a higher number of bilateral investment treaties, which could have effect on trade openness, raise the FDI that flows to a developing country. In Canada (Globerman and Shapiro, 1999) and the North American Free Trade Agreement region in general (Feils and Rahman, 2008) have shown free trade agreement has significant effect for both inward and outward FDI. The process of association and negotiation with European Union for Central and Eastern European countries and Western Balkan countries (Kersan-Skabic and Orlic, 2007) was also proved to have significant effect on inflow of FDI to the region. Economic freedom is another factor that can be seen with openness. In developing countries (Kapuria-Foreman, 2007) foreign direct investment is found to vary positively with increases in certain components of economic freedom.

Inflation rate is also a macroeconomic factor of consideration as it may tell a story about economic stability of a country. According to a study on Africa (Nnadozie and Osili, 2004), inflation rate has a negative effect on FDI inflows, but less robust. Another study on the dynamic response of FDI to inflation rate in Thailand (Brahmasrene and Jiranyakul, 2001) also show insignificant effect of the later, while a study on Pakistan (Khair-UZ-Zaman et al, 2006) shows significant relationship.

2.3 Political factors

The effect of political stability on the inflow of FDI is ambiguous. On a rigorous essay entitled "Foreign Direct Investment and the Interstate Military Conflict" Li (2008) showed that FDI flow and military conflict are inversely related. Researches on Africa (Dupasquier and Osakwe, 2006) and Ghana (Kyereboah-Coleman and Agyire-Tettey, 2008) identify that political stability as a statistically significant factor affecting the inflow of FDI. Study on US manufacturing direct investment in Latin America (Nigh, 1986) shows that political factors do affect FDI decisions. Some other researchers have come up with contrary finding to those stated above. A study on foreign direct investments by US marketing activities (Bennett and Green, 1972) showed that political instability does not discourage such investments. In support of this finding, Kobrin, (1976) fails to establish any relationship between FDI and variables based upon political event data. This shows us that further research on the area is required to establish a concrete theory.

2.4 Regulatory framework of the country

Every country has its own legal system in place to keep order. In areas of business, particularly FDI, investors consider different dimensions of the potential business environment's legal framework before undertaking investment. Different researchers have drawn relationship between FDI inflow and the following elements of regulatory frameworks: poor governance and inhospitable regulatory environments (Dupasquier and Osakwe, 2006); several specific trade and FDI policies like, foreign ownership ceiling in sectors open for FDI, policy on repatriation of capital and remittance of profit (Tarzi, 2005), government regulations and restrictions on equity

holdings by foreigners (Cotton and Ramachandran, 2001) all are found to have negative impact on FDI inflow. Despite all these say Biglaiser and DoRouen (2006), governments that implement reforms are not always more likely to attract FDI inflow.

Corruption is another issue to be seen in relation to the legal system. Corruption has been implicated as hampering economic activity and economic development (Voyer and Beamish, 2004). Most researchers found out that the presence of high corruption and low transparency have negative effect on the inflow of FDI (Zhao and Du, 2003; Habib and Zurawicki, 2002; Kersan-Skabic and Orlic, 2007).

Intellectual Property Right (IPR) protection is also critical factor for importing and involvement in high-tech areas. Ensuring property right in South Africa (Fedderke and Romm, 2006) and developing countries (Kapuria-Foreman, 2007) were identified as one factor affecting FDI inflow. A large sample of host country study (Nunnenkamp and Spatz, 2004) points out that IPR protection affects FDI inflow. As it has been the case for other determinant factors, opposing views are forwarded for this variable. Investigation of the interaction of industry characteristics and IPR on multinational firms' behavior, (Nicholson, 2007), suggest that when IPRs are strong, firms in industries with high investment in research and development (R&D) are more likely to enter a market by licensing to an unaffiliated host firm resulting in lower FDI inflow. Hence the effect is dependent on the kind of investment under investigation.

2.5 Infrastructure condition

Different studies (Musila and Sigue, 2006; Dupasquier and Osakwe, 2006) on FDI shows FDI in Africa is dependent on the development of infrastructure. Other studies on developing countries (Mengistu and Adams, 2007; Cotton and Ramachandran, 2001); emerging economies (Zhang, 2001); Western Balkan Countries (Kersan-Skabic and Orlic, 2007) and Southeast European Countries (Botric and Škuflic, 2006) have shown the significant role of infrastructure development on attraction of FDI. In contrary to the above points, a study on US FDI flow to Africa (Nnadozie and Osili, 2004) found less robust evidence on the role of infrastructure on FDI.

2.6 Global factors

Global and country-specific actors (Kostevc et al, 2007) are equally important in determining the long-run movements in equity flows for both Asian and Latin American countries. One study (Globerman and Shapiro, 1999) on Canadian FDI inflow using US and UK GDP for world economic situation, as the two countries are major partners of the Canadian trade, showed statistically insignificant relationship.

2.7 Others

Other factors having effect on inflow of FDI include return on investment (ROI), IMF agreement, debt service ratio, financial difficulties at banks, interest rate and so on. Cultural affinity is also another consideration. Studies on developing countries (Head and Sorensen, 2005) and Spanish multinationals (Galan and Gonzalez-Benito, 2001) identify a relationship between cultural elements and inflow of FDI. ROI is also identified as one microeconomic factor affecting the inflow of FDI. South African FDI inflows (Fedderke and Romm, 2006) are found to be sensitive to ROI. In the contrary, a study on developing countries (Asiedu, 2002) reveals a higher ROI has a positive impact on FDI to non-sub-Saharan Africans but has no significant impact on the FDI of Sub-Saharan African, which are the majority in the continent. Countries that sign IMF agreement, *citrus paribus* are found to get lesser FDI than those did not sign (Jensen, 2004).

With these varied outcomes of previous studies, further investigation of the issue with larger sample size and broader time frame is justifiable. Considering all these factors, the next part puts the theoretical framework for the relationship between the main determinant factors of FDI inflow to African countries and FDI inflow itself.

3. Determinants of Fdi Inflow and Their Expected Direction of Effect

The empirical determinants of FDI are classified into demand side and supply side determinants. The demand determinants are aggregate variables grouped into three main categories (Agarwal, 1980): economic, social, and political. The majority of studies on the demand structure of FDI concentrate primarily on economic variables. Social and political influences are given limited consideration. The supply determinants which include oligopolistic reaction, intangible assets, and product life cycle are derived from the theory of the firm and are tested using microeconomic data. Thus, a simultaneous equation framework integrating both sides of the market is ideal for studying the emergence of FDI. For this particular study, however, since the main objective of the study is identifying determinant factors at country level and data sets are at macroeconomic level, the supply side determinants are disregarded.

3.1 *The Economic factors*

This group of factor distinguishes three types of influences on inward FDI. First, domestic market characteristics expressed by the market size and the direction of trade flows. The market size emphasizes the importance of a large market for efficient utilization of resources and exploitation of economies of scale. A direct relationship is expected between market size and inward FDI. In the contrary, one can argue that, due to the low income level in African countries, market seeking FDI may not be the dominant type of inflow.

The relationship between the host country trade openness and FDI inflow appears to be complex. The effect of trade openness on FDI can be seen from the two components of international trade, namely import and export. From the export side, potential foreign investors may target those countries that are export oriented as that gives them access to foreign market in addition to the domestic market. It is also a signal that there is a strong support for investments engaged in export from most countries hence higher export is expected to induce FDI. High import by a country indicates that there is demand that cannot be met by local supply that calls for foreign investors to take part. From both import and export side, FDI inflow is supposed to be positively affected by total trade. In general, higher trade openness indicates better integration of a country to the international market having a positive signal to potential foreign investor to undertake investment.

From the potential investors' perspective, lower cost of labor is a critical consideration. However, due to insufficient data, and taking the simple law of demand and supply, availability of labor force is proxied by population growth rate instead. With the kind of investments common in African countries, labor quantity is expected to have positive and statistically significant effect. Factors expressing the overall financial performance of the host country, such as the inflation rate have signaling effect for potential investors. High inflation indicates inability of the government to balance its budget, and failure of the central bank to conduct appropriate monetary policy. Thus, it is expected that high inflation will inhibit inward FDI. The inflation rate is measured by the host country GDP deflator. Private domestic investment and government expenditure can also be accommodated under this category. Most FDIs to African countries are towards sectors of the economy that cannot be undertaken by the domestic private sector due to huge capital or high-tech requirement, so no crowding out effect of one on the other is expected. For that matter, private investment may supplement FDI by providing inputs that can be produced locally, making the relationship positive. In the contrary, one may argue, MNEs, with their experience and economies of scale can crowd out private domestic investments hence a negative relation may be expected. Too much government involvements in an economy may indicate that governments are taking part in business activities that may have been undertaken by private sector. This may shy away foreign investors from undertaking investment in such a country. In the contrary, it may be perceived as, governments are doing their homework to make a country attractive for investment, relaying a positive message to foreign investors.

3.2 *The Social factors*

The social status of the host country can also be considered as an important determinant of FDI. However, FDI models based exclusively on host country social status characteristics have yet to be developed. This may be attributed to the difficulties associated with the measurement of social status as well as the possible correlation between social status characteristics and economic considerations. The degree of human capital development, infrastructure condition and the extent of urbanization can be taken as social factors. Human capital development is highly associated to the degree of urbanization (Glaeser and Maré, 2001) hence we consider only human capital and infrastructure conditions.

It can be argued that the degree of human capital development has a favorable impact on FDI inflow in terms of ensuring adequate supply of skilled labor. High labor force count alone does not make a country attractive for FDI unless the labor force has all the qualities (qualifications) it takes to engage in the potential investment area. A more educated labor force can learn and adopt new technology faster and is generally more productive. Therefore, this factor is expected to have a favorable impact on FDI inflow. Infrastructure condition of the recipient country believed to have positive and significant effect as infrastructure affects investment almost at every stage of the investment process including input acquisition, operation and market accession.

3.3 *The Political factor*

The political model involves variables of strictly political nature as well as variables in which the political component is implicit but nevertheless dominant. The presence of a political system hospitable to foreign capital in terms of property rights and civil liberties plays a favorable role for attracting FDI. The host governments' ethics also impacts directly the inflow of FDI as widespread government financial corruption imposes difficulties for the effective conduct of business. These variables with strict political nature are not entertained in this study

as such due to problem with data availability. The implicit political stability is taken into account.

3.4 Other factors

Apart from the above three classes of factors, natural resource bequest and stock market availability are believed to have a profound impact on FDI inflow. As far as natural resource bequest is concerned, African countries are rich in unexploited natural resources so this factor is the most important consideration for potential investors hence expected to have positive effect on FDI inflow. We will see the possible links between stock market and FDI in detail as it is the main objective of this study.

3.5 FDI and stock market availability

The stock market is seen as a preferred market-based institution to mobilize resources for industrial development. Even where, the FDIs working well it is suggested that the establishment of the stock market would provide a competing source of finance to the benefit of the country's industrialization. Of the total 55 countries of Africa, only less than 50% of them have stock market (Appendix 1 presents list of African countries that have stock market with the respective year of establishment).

Foreign investment may take different forms. They may participate in a foreign firm through acquisition of interest in an already existing firm or through setting up production facilities/service rendering entities – usually called green field investment. In the former case, the investment may be either FDI (where there is acquisition of controlling interest) or portfolio investment (where investors take part only on earning sharing without involving in management of the business). The later falls under the FDI category without ambiguity.

In the first case, where firms enter a foreign business environment through acquisition of interest in another firm, the role of stock market could be positive or negative depending on the level of investment or degree on control of the foreign investor. Where there is no restriction to the level of acquisition of a domestic firms' stock by a foreign investor, stock markets may be taken as a means to test the operating environment. The role of stock market is not restricted to the entry strategy of foreign investors; it also has positive effect in the ease of exit of investors. If investors want to leave an investment environment, they may sell out their ownership claim through stock market channel in the presence of stock market. These make stock market availability as a positive determinant of FDI inflow. Another possible nexus that can lead to a positive relation is that, foreign owned firms may want to raise part of their capital from domestic sources for different reasons.

There could also be a negative relationship between the two. In the presence of liberal stock market and well functioning financial system, foreign owners may undertake portfolio investment in any investment environment found to be attractive. Under such conditions private portfolio investment crowds out FDI, hence an inverse relationship is expected between FDI and stock market availability. This effect could be pronounced in a highly regulated market where foreigners' involvement is restricted to a level. Due to these two contradictory views, empirical study of the subject is justified.

4. Empirical Analysis

4.1 Data definition

The theoretical frameworks on the determinants of FDI and discussions of various factors affecting FDI, with the expected direction of effect, have already been presented in the previous parts. In this part, following recent empirical works, particularly (Aseidu, 2002) determinants of FDI for African nations have been investigated.

All the data for this study are collected from World Bank, World Development Indicators (Note 1), online source except for stock market availability (Note 2). The study period is from 1980 to 2007. This will give us 28 data points for each of the 45 countries (Note 3) and a total of 1260 observations and when independent variables are lagged by one year, the remaining observation would be 1215; but due to missing data, the number of observation used in this study is only 657.

Any FDI decision is made based on historical data and hence all the independent variables that are supposed to have effect on FDI inflow would materialize their effect the next period onward. Therefore, all the independent variables are lagged by one period for all variables. As a robustness check the un-lagged output is also presented. As in any regressions analysis, there is of course always the possibility of omitted variable bias.

This paper also improved on previous works by taking larger sample size, longer time frame, accounting for factors that were not included on those previous works and by introducing a better measure of variables whenever data is available. The previous works' model is adopted in writing a reduced form specification of a demand for inward direct investment function with the above mentioned modifications. The model specification is consistent with the existing theories of international production where the demand for inward FDI depends on

a variety of characteristics of the recipient country. The dependent variable represents the host country demand for FDI:

$$FDI_{it} = f(NRB_{it}, SMA_{it}, ICC_{it}, LQN_{it}, LQL_{it}, MA_{it}, ONC_{it}, PSC_{it}, INFL_{it}, DPI_{it}, GFC_{it}, \dots) \quad (1)$$

Where;

FDI_{it} - FDI inflow to country i at year t ; ratio of FDI to GDP

NRB_{it} - Natural resource bequest of country i at year t ; mineral depletion (% of GNI) (Note 4)

SMA_{it} - stock market availability of country i at year t ; a dummy variable assuming 1 where there is stock market and 0 otherwise.

ICC_{it} - infrastructure condition of country i at year t ; fixed line and mobile phone subscribers (per 100 people)

LQN_{it} - labor quantity of country i at year t ; population growth (annual %)

LQL_{it} - labor quality of country i at year t ; urban population (% of total)

MA_{it} - market accession of country i at year t ; GDP growth (annual %)

ONC_{it} - openness (trade) of country i at year t ; trade (% of GDP)

PSC_{it} - political stability of country i at year t ; military expenditure (% of GDP)

$INFL_{it}$ - inflation of country i at year t ; GDP deflator (annual %)

DPI_{it} - domestic private investment of country i at year t ; domestic credit to private sector (% of GDP)

GFC_{it} - government expenditure of country i at year t ; government final consumption expenditure (% of GDP)

Due to non-availability of data, only those variables are selected that can be quantified and easily found from published sources. The time frame is dictated by data availability and its relevance for FDI.

4.2 Methods of Analysis

Quantitative studies of the determinants of FDI are based on a number of different models; gravitational approach, random effect regression model, fixed effect regression model. The gravitational model is disregarded as the available data is mainly from the host country. By saving on degrees of freedom, the random effect model produces a more efficient estimator of the slope coefficients than the fixed effect model. Furthermore the transformation used for the random effect estimation procedure does not wipe out the explanatory variables that are time invariant, allowing estimation of coefficients. The alternative is fixed effect estimation. This approach has two advantages. First, it allows the analyst to focus on changes within different units over time. Second, the estimates remain unbiased even when data is missing for some time periods for some cross-sectional units. Fixed effects estimation is particularly important for the analysis of FDI in Africa, since data is not available for some years, for several countries in the region (Table 1 – Ordinary correlations).

Hausman test was performed to determine the appropriate method. Since the estimated chi-square value is highly statistically significant, we reject the hypothesis that there is not significance difference in the estimated coefficients of the random effect and the fixed effect. This result favors the fixed effect over the random effect (Table 1 – Hausman test result).

In order to avoid a problem known as the "omitted variable bias," the regression model is developed to be as inclusive as possible. Interest rate was dropped from the analysis after repeated run show insignificant value and reduced the number of observation due to missing data. All the independent variables described earlier are included in the same model. Eviews software is used for analysis.

The estimation model is the following:

$$FDI_{it} = \alpha_i + \beta_1 NRB_{it} + \beta_2 SMA_{it} + \beta_3 ICC_{it} + \beta_4 LQN_{it} + \beta_5 LQL_{it} + \beta_6 MA_{it} + \beta_7 ONC_{it} + \beta_8 PSC_{it} + \beta_9 INFL_{it} + \beta_{10} DPI_{it} + \beta_{11} GFC_{it} + \varepsilon_{it} \quad (2)$$

5. Results and Interpretations

In this paper, wide ranges of factors that possibly affect FDI flow to African countries have been investigated using fixed effect (cross section) regression analysis technique. The result (see Table 2) and interpretations are presents as follows:

As has been discussed in the literature review part, FDI flows to African countries are mainly resource-seeking. This is also supported by our finding. Natural resource bequest of the country is positively related to FDI inflow and it is found to be statistically significant at 1%. The point here is natural resources are depletable resource and

the benefit goes with the resource. Governments of those countries that rely on natural resource should make sure that the level of investment in reproducible capital has been sufficient to offset the depletion of natural capital.

Labor resource is another factor entertained. Labor quantity, population growth rate, is found to have positive but statistically insignificant effect using annual data. As to the labor quality, it is one of the significant factors, at 99% confidence interval, that determine FDI inflow. Poor countries have considerable discretion over how much to invest on education and training. The more African countries spend on human capital, it is found out that, the more FDI flows to that country.

Infrastructure is another statistically significant and positively influencing factor for FDI inflow. The significance of this factor is robust both for the lagged and un-lagged regressions. Trade openness is also significant under both conditions at 1% significant level and has positive effect on FDI inflow. Since this variable has two subparts, namely import and export, the significance value should not be taken at face value. One should ask which one of the two contributes more to the openness? If the openness is due to higher export value, African countries may realize foreign currency by attracting more FDI but if it is due to higher import value, it may deplete the already small foreign currency reserve of these countries.

Stock market availability has positive but statistically less robust effect on FDI inflow. Capital markets are supposed to facilitate the capital mobilization effort of countries both from domestic and foreign sources but we do not see significant effect on foreign investment capital. There are two possibilities for this; either the stock markets are not liberalized enough to allow foreign investors to participate or there is crowding out of foreign investors by domestic private investment or too much involvement of the government in economic activities that would have been handled by foreign investors. To see if there is crowding out either by private or government sector on FDI, two more variables were added to the regression equation; namely government expenditure and private investment.

Both domestic private investment and government final consumption are also found to affect FDI inflow positively and the result is statistically insignificant for the former but significant (at 10% significance level) for the latter. The private domestic investment, under normal circumstance, is expected to supplement foreign investment but the effect is less robust. The more governments invest; it is found out that, the more FDI flows to these countries. This is in line with the expected role played by governments in infrastructure construction, regulatory works, and facilitator roles. If governments in the continent had been engaged in investment activities that could have been taken care by foreign and private investors, it would have left less room for potential foreign investors. Fortunately, this is not the case.

For normal operation of their investment activities, foreign investors consider political stability as one factor before ever mobilizing their resources to any country. Political instability, though statistically less robust, is found to have adverse effect on FDI inflow in to the continent as expected.

Host country's market has statistically significant and positive effect, at 90% confidence interval, on FDI inflow signaling that investors may target local market besides the export market when undertaking FDI decisions. It may appear that, since most African countries has lower income hence lower household expenditure, FDI flow towards such countries may not be market seeking. Actually, market size is found to have positive effect on attracting FDI.

Inflation, as expected, has a negative effect on attracting FDI but statistically less robust. As to the inflation, it may have dual information content; macroeconomic instability and highly active economic activity like the case of economic over-heating. Most African countries have not recorded sustainable economic growth leave alone overheating, so it can be argued that the informational content of inflation goes more to economic instability. Policy direction, both monetary and fiscal, may play a role in maintaining economic stability hence policy makers could fine tune the economy to stabilize the macroeconomy in order to reap its positive effect.

6. Conclusions and Recommendations (Note 5)

This paper studies the effect of host country factors on the inflow of FDI to Africa. In general, the results support the finding of previous researches for most parameters. From the resource side, natural resource and labor quality are found to have positive effect. The result also shows that keeping a stable political environment plays a role in attracting FDI. Infrastructure conditions of the host country and trade openness are positively related to FDI inflow. These show that policy makers can influence the inflow of FDI by, say, keeping stable political environment, encouraging trade, enhancing infrastructure condition of the country.

Stock market availability has insignificant effect on FDI inflow, though the sign is positive as expected. To shed

light on possible explanation, two more variables were added to the regression equation, in case such a phenomenon is a result of some sort of crowding out effect either by the domestic private sector or the public sector. Actually, both government expenditure and private domestic investment are negatively related with FDI inflow. One possible explanation for the negative relationship between private domestic investment and FDI inflow could be countries that do not receive high FDI may raise capital from local capital market. As to the government expenditure, governments in most African countries are involved in economic activities that can be undertaken by private sectors, both domestic and foreign. So, crowding out is the most likely possibility for the inverse relationship between the stock market FDI inflow and both private domestic investment and government expenditure. If this is that case, governments should concentrate on playing facilitator role, rather than directly participate in investment activities.

Another possibility is that, capital markets in African countries are too much controlled to play their intended role. In light of this, in order for African countries to attract FDI, they should attempt to enforce a capital allocation system with strict and transparent rules and regulations. At the same time, they should not exert excessive control over capital account transactions, such as exchange-rate controls and/or foreign ownership. Creating an inviting capital market to foreign investors and encouraging public investment by government on areas that facilitate foreign investment play good role in attracting FDI.

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Notes

Note 1. World Development Indicators Online (WDI) provides direct access to more than 800 development indicators, with time series for 209 countries and 18 country groups from 1960 to now, where data are available, <http://web.worldbank.org/WBSITE/EXTERNAL/DATASTATISTICS> date accessed February 12, 2009.

Note 2. Appendix 1 presents list of African countries that have stock market with the respective date of establishment. Source: http://en.wikipedia.org/wiki/List_of_African_stock_exchanges, date accessed, March 22, 2009.

Note 3. All African countries except Djibouti, Equatorial Guinea, Eritrea, Liberia, Libya Mayotte, Sao Tome and Principe, Seychelles and Somalia are included in the study. These countries are excluded due to missing multiple data sets for long period of time.

Note 4. The common proxy used for natural resource bequest is the ratio of mineral and ores export to total export but repeated trial with this measure gives inconclusive result so we change it to mineral depletion. This could be due to the missing data of multiple countries for multiple period.

Note 5. For the sake of this paper, FDI is taken to be of economically important for African countries though the issue is unsettled as it is presented in the introduction part.

Table 1. Hausman test

Correlated Random Effects - Hausman Test			
Test cross-section random effects			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	58.407735	11	0.0000

Table 2. Regression output of annual data; one year lagged and un-lagged

Variables	One year lag		No lag	
	Coefficients	Std. error	Coefficients	Std. error
C	-9.199366***	2.088403	-10.76956***	1.902513
NRB_2	0.500377***	0.139649	0.199964*	0.112966
SMA01	0.348355	0.753914	0.083418	0.688264
ICC	0.036160**	0.017876	0.022160**	0.008976
LQNM	0.024117	0.146319	0.054582	0.136428
LQL	0.284781***	0.055050	0.274190***	0.049463
HFCM	0.057125*	0.029556	0.050855*	0.027534
ONC	0.00326***	0.0012264	0.030151***	0.011067
PSCM	-0.050839	0.132493	-0.080248	0.123159
IPS	0.011752	0.020976	0.007014	0.018876
GFC	0.097329*	0.052019	0.094435**	0.047679
INFL	-0.004520	0.006307	-0.005394	0.005706
N	657		679	
R ²	41.39%		40.35%	
*, ** and *** are significant level at 10%, 5% and 1% significance level respectively.				

Table 3. Appendix 1 presents list of African countries that have stock market with the respective date of establishment.

Exchange	Founded
West African regional stock exchange - Bourse Régionale des Valeurs Mobilières	1998
Algeria - Bourse des Valeurs Mobilières d'Alger	1997
Botswana - Botswana Stock Exchange	1989
Cameroon - Douala Stock Exchange	2001
Cape Verde - Bolsa de Valores de Cabo Verde	2005
Egypt - Cairo & Alexandria Stock Exchange	1988
Ghana - Ghana Stock Exchange	1990
Kenya - Nairobi Stock Exchange	1954
Libya - Libyan Stock Exchange	2007
Malawi - Malawi Stock Exchange	1995
Mauritius - The Stock Exchange of Mauritius	1988
Morocco - Casablanca Stock Exchange	1929
Mozambique - Maputo Stock Exchange	1999
Namibia - Namibia Stock Exchange	1992
Nigeria -	
Abuja Securities and Commodities Exchange	2001
Nigerian Stock Exchange	1960
Rwanda - Rwanda Over The Counter Exchange	2008
South Africa	
AltX	2003
Bond Exchange of South Africa	1989
JSE Securities Exchange	1887
The South African Futures Exchange	1990
Sudan - Khartoum Stock Exchange	1995
Swaziland - Swaziland Stock Exchange	1990
Tanzania - Dar es Salaam Stock Exchange	1998
Tunisia - Bourse de Tunis	1969
Uganda - Uganda Securities Exchange	1997
Zambia - Lusaka Stock Exchange	1994
Zimbabwe - Zimbabwe Stock Exchange	1993

Source: http://en.wikipedia.org/wiki/List_of_African_stock_exchanges, date accessed, March 22, 2009