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Political Stability and FDI in SADC: A Love-Hate Relationship

Yani Karavasilev
Osaka University, Japan

Abstract

This study empirically analyzes the effects of political stability (PS) on FDI inflows in SADC members in the post-Cold War period (1996-2013) by utilizing panel-data-appropriate econometric models as well as regression discontinuity design methods, instrumental variable approaches, simultaneous equations and GMM as robustness checks. The main finding is that there is a non-linear causal relationship, whereby political stability can only positively influence FDI inflows once a certain minimum level of stability has been reached. The critical point is identified to correspond to an approximate value of -1.0 of the World Bank's 'Political Stability and Lack of Violence' governance indicator, which is used a measure for PS and a main independent variable. Angola and the DRC are identified as the only two members which display PS levels consistently below the cut-off point and also as the only two severely natural-resource-dependent countries. A narrative is developed of why these do not fit the pattern, while stressing the necessity to address PS and regional integration as key factors in FDI attraction and economic development in the SADC and other emerging economies alike.

Introduction

Foreign direct investment (FDI) is undoubtedly one of the most important factors for economic advancement in developed and developing economies alike. The theoretical and empirical literature supporting that claim is so massive it that cannot possibly be overviewed or cited without committing innumerable errors of commission, and in light of it, a similar exercise could not be said to constitute anything remotely newsworthy and as such will be omitted from this study, whose broad focus is to establish the aspects of governance in Sub-Saharan African countries (SSA) most relevant to the attraction of the so intensely desiderated FDI, and in particular, to evaluate the role of conflict and political stability in the member states of the Southern African Development Community (SADC) in post-Cold War trends in FDI inflows in the region. The aim to is to ascertain to what extent the level of political stability can affect FDI inflows in the very peculiar and unprecedented case of an economic community of

post-conflict and post-apartheid states and what sets them apart from other countries. The paper is organized as follows: first trends in FDI inflows to Africa and their determinants are overviewed, paying special attention to political stability, then an empirical model is formulated and estimated based on existing literature and hypotheses, and finally a discussion elucidates the causal relationships and the lack thereof elicited through the statistical analysis.

Trends in FDI Flows to Africa and SADC

Since the early 1980s[1], world FDI flows, now attributable to almost 54,000 transnational corporations (TNCs) which have an estimated $3.4 trillion invested in about 449,000 foreign affiliates throughout the world, have grown tremendously. The value of sales by these foreign affiliates has increased more rapidly than that of foreign trade (world exports), reaching an estimated $9.5 billion. Developing countries' share in total FDI inflows rose from 26% in 1980 to about 54% in 2013, excluding transition economies. Among developing countries, though, the distribution of world FDI inflows is uneven. In 1997, for example, developing Asia received 22%; Latin America and the Caribbean 14%; and Africa 1%. In relative terms, however, the picture looks different: expressed as a ratio of gross fixed capital formation (GFCF), FDI inflows to Africa were 7% of GFCF in 1996 due to the low GDP of African countries, which was the same ratio as in developing Asia. In other words, inflows to Africa have a greater impact on the countries of that continent in relative terms than the absolute figures might suggest. As far as SSA is concerned, FDI inflows there have increased dramatically in the past three decades, especially since 2000:

However, the FDI that goes to Africa is concentrated only in a few countries. The traditionally biggest recipients, namely Egypt, Nigeria, Angola and South Africa (the latter two being SADC members), pocket a significant proportion of FDI inflows – their share reached approx. 62 % of African FDI in 2002. On the one hand, the increased inflows that South Africa has enjoyed in recent times have been attributed mainly to the privatization process, the return of companies based in the neighboring countries during the apartheid period and the interest of investors in the South African large domestic market. On the other hand, Nigeria and Angola are the largest oil producers on the continent and FDI in the oil industry accounted for over half of all FDI inflows to Africa in 2002 (UNCTAD, 2005). Since FDI is highly concentrated, swings of FDI inflows to the main recipients exerts a major impact on the flows of FDI to Africa as a whole. (Ajayi 2006)

Not only has SSA's relative global FDI position relative to other developing regions deteriorated in the past decades, but in addition, the relative standing of SADC members within SSA, has been declining – whereas five out the top seven FDI destinations in

[1] World Investment Report, UNCTAD (2014).

SSA were SADC members back in 1980s (when SADC was first established as SADCC) and by 2014 that number has declined to three (refer to Table 1).

Figure 1. FDI stock in African regions (Millions of USD). Source: UNCTAD.

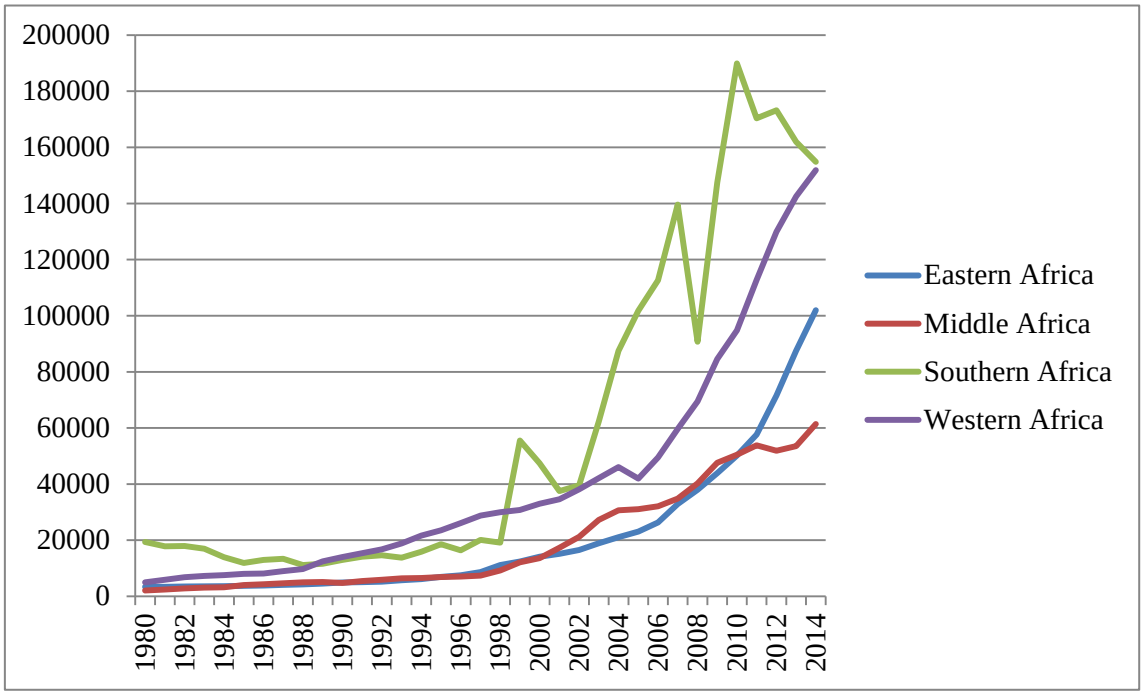


Table 1. Ranking of top SSA FDI recipients (Millions of USD). Source: UNCTAD.

1990		2000		2010		2014	
RSA	9,210	RSA	43,451	RSA	179,565	RSA	145,384
Nigeria	8,539	Nigeria	23,786	Nigeria	60,327	Nigeria	86,671
Liberia	2,732	Angola	7,977	Angola	16,063	Mozmbiq.	25,577
Zambia	2,655	Zambia	3,966	Ghana	10,080	Ghana	23,205
Namibia	2,047	Liberia	3,247	Tanzania	9,712	Congo	22,010
Botswana	1,309	Tanzania	2,781	Eq. Guin.	9,413	Eq. Guin.	17,250
Gabon	1,208	Côte d'Iv.	2,483	Congo	9,262	Tanzania	17,013
TOTAL	*36,716*	*TOTAL*	*108,156*	*TOTAL*	*385,312*	*TOTAL*	*470,098*

In terms of the sectoral allocation of FDI, Africa differs from the rest of the world in that whereas the structure of FDI has shifted towards services elsewhere, Africa continues to attract FDI mainly into sectors where competitive advantages outweigh the continent's negative factors which include minerals, timber, coffee, and oil (Mills and Oppenheimer 2002). Notably, a number of post-conflict economies, especially SADC members Angola and Mozambique have also seen sharp increases in mineral production

in recent years. Recently, however, FDI has been diversifying into other sectors, in particular manufacturing and the services, whereby the share of FDI into the primary sector is steadily declining. (Ajayi 2006) UNCATD (2005) reports that in Sub-Sahara Africa, the percentage of foreign investment flows to the primary sector range from 55% to 80%.

The Determinants of FDI in Africa

FDI is in general motivated by so-called pull and push factors. The push factors, which are exogenous to developing countries, focus primarily on growth and financial market conditions in high-income economies, whereas the pull factors depend on a number of characteristics of host countries. While the push factors determine the totality of available resources, the pull factors determine its allocation. There are countless studies on the theoretical determinants of FDI and a voluminous yet inconclusive stock of econometric literature on the determinants of FDI. In a survey of the evidences on the various determinants of FDI in Africa specifically, Ajayi (2004) identifies the following non-exhaustive list:[2] the size of the market and growth, the costs and skill of the labor force, the availability of infrastructure, the country risk, the openness of the economy, the institutional environment, the availability of natural resources, the concentration of other investors (agglomeration effects), the return on investment, the enforceability of contracts and transparency of the judicial system, the macroeconomic stability, and the business facilitation measures and initiatives by outside bodies to promote investment in Africa like bi- and multilateral agreements.

A number of Africa-focused studies have been carried out analyzing FDI determinants on the continent, and several of them conclude that Africa is different from the rest of the developing world. Notably, Asiedu (2002, 2003, 2004, 2006, 2013) has conducted extensive comparative research on African versus other developing economies. Asiedu (2002), using a cross-section data on over 70 developing countries for the 1980-1999 period, empirically shows that policies which have been successful in other regions may not be equally successful in Africa. The analysis, however, is focused on only three main variables – the return on investment, infrastructure availability and openness to trade and does not take into account natural resource availability, which is recognizably an important determinant of FDI to Africa. In a related study, Zeng et al. (2002) also find that policies that have been successful in other regions may not be so in Africa.

In fact, many other studies on FDI determinants in SSA such as Bende−Nabende (2002), Razafimahefa and Hamori (2005), Ezoha (2011), Rogoff and Reinhart (2003), Li and Liu (2005) do not focus on political stability, focusing rather on economic determinants such as monetary policy, exchange rates and financial development. In fact,

[2] See Ajayi (2003, 2004) and De Schutter et al. (2006).

Asiedu does include a political instability variable in her analysis but its effects are not found to be significant. Similar findings are reported by Loree and Guisinger (1995) who find that political risk had a significant negative impact on FDI inflows in 1982 but no effect in 1977. Jespersen et al (2000) and Morisset (2000) also find no significant impacts for political stability on FDI.

On the opposite, Lemi and Asefa (2003) who, using a generalized autoregressive heteroscedastic (GARCH) model, analyze the determinants of U.S. FDI in 29 African countries over the period 1987-1999 with a special focus on uncertainty, conclude that for aggregate U.S. FDI in Africa, political instability is major concern both in the case of manufacturing and non-manufacturing FDI, in fact more important than uncertainty. Just like many of the other abovementioned studies, they find the market size is a significant factor. Mijiyawa (2012), who analyzed 53 African countries in 1970-2009 using a GMM model, also finds significant effects for political stability.[3]

In a study solely focused on Africa, Asiedu (2006) reexamines the impact of political instability and includes several additional factors including natural resource endowment. Employing panel data on 22 African countries for the period 1984-2000 she finds political stability is crucial for attracting FDI and debunks the notion that FDI in Africa is solely driven by natural resource availability and argues that while natural resources and large markets can attract more FDI, small countries and/or countries that lack natural resources in the region can also obtain FDI by improving their institutions and policy environment. In light of these findings, Asiedu (2006) stresses the importance of regional blocs such as the SADC in enhancing FDI flows to the region, arguing that in addition to expanding the size of the market, regionalism can promote political stability by restricting membership to countries with democratic political systems, as well as provide stick—or-carrot type of incentives for member countries to implement good policies.

A potential reason for the ostensibly ambbiguous evidence for the effects of political stability on FDI inflows emerging frm the various empirical studies might be the evasive nature of the concept and thus its measurement. For instance, Asiedu (2003) uses the average number of assasinations and revolutions as in Barro and Lee (1993) while in an earlier stuies Edwards (1990), who finds a significant effects for political stability, uses the probability of change of government as a proxy for political instability and the frequency of political assasination, violent riots and strikes as a proxy for political violence. Schneider and Frey (1985) also use the number of political strikes and riots as a proxy for poitical stability and find significant effects on a global level. Morisset (2000), on the other hand, uses the political risk indicator as measured by the

[3] In the same vein, but not focusing on Africa, Woodward and Rolfe (1993) find that political stability increases the probability that a country is selected as an investment location. Similar results have been found by Globerman and Shapiro (2003) and Li (2006).

International Country Risk Guide as a proxy for political stability and find no significant effects. The same measure is used by Mijiyawa (2012). Elbadawi and Mwega (1997) use the number of political upheavals as a proxy.

Measurement issues seem to affect conclusions about the role of natural resources in the region to a much lesser extent though. For example, although Asiedu (2006) utilizes the sum of minerals and oil, an independent variable within the regression analysis, as a proxy for natural resource endowment which contrasts with the method employed by Morisset (2000), who subtracts manufacturing from primary and secondary sectors to derive natural resource data, both authors obtain similar results, concluding that African countries can be successful in attracting FDI that is not based on natural resources by implementing policy reforms.

In addition to cross-country studies, there are also a number of country-specific studies. Comparing eight country case studies from Botswana, Cameroon, Cote d 'Ivoire, Ghana, Kenya, Nigeria, South Africa and Uganda, Ajayi (2006) draws the following conclusion about FDI in SSA:

- there is no unanimously accepted single factor determining the flow of investments;
- not all determinants are equally important to every investor in every location at all times;
- some determinants are more important at a given time than another time. The weights attached to factors vary between investors;
- macroeconomic and political stability are necessary but not sufficient;
- critical minimum level of factors is important for the flow of FDI and lastly polices do matter in each of the countries;
- for countries to derive positive effects of FDI, they must be at the driver's seat in terms of putting in a place an appropriate development strategy.

Apart from the cross-country and country-specific studies, however, there do not seem to exist any empirical studies focused specifically on regional economic blocs like SADC. It is therefore the purpose of this paper to help toward filling that gap in empirical literature.

Conceptual Framework

Sample and data sources

The data used in the present study was derived mainly form the World Bank and from the IMF, where World Bank data was unavailable. The sample contains data for all 15 SADC members for the period 1996 through 2014 (in practice 2013, since 2014 data was mostly unavailable as of the time of writing). All data is aggregated in country-year dyads. Restricting the analysis to SADC members obliterates the need to include variables accounting for regional integration.

An important caveat concerning statistical data on African economies is the degree

of data reliability. As Jerven contends in his widely acclaimed book "Poor Numbers" (2013), data used to report and assess development in Africa is in a precarious state. The author utilizes examples from multiple countries in Africa to show how controversial data on GDP growth, crop production and population numbers can be. The cases of Nigeria, where the director of statistics announced a 50% increase in GDP in 2011, Tanzania, where disagreement among sources concerning GDP growth figures are in the region of 1%-5% annually in the past few decades, Malawi, where crop production was arguably underestimated in order to attract more fertilizer subsidies, and Kenya, where the 2009 population census almost resulted in ethnic conflict due to the inclusion of a tribal ethnicity questionnaire which resulted in distorted numbers, and Uganda, where up until 2008 external trade statistics had been collected only based on goods passing through the Mombasa port in Kenya, are particularly striking. The quality of data in Mozambique and Malawi is particularly low among SADC members, and the DRC is not even discussed. Considering this, it is important to stress the limitations of any quantitative study using African data and therefore the results presented in the current one should be taken with a grain of salt.

Dependent variable

In contrast to other empirical studies, like Asiedu (2004, 2006), which mainly use either FDI stock or FDI inflows as a percentage of a country's GDP to measure FDI, in this study annual FDI inflows per capita in U.S. dollars are used as a dependent variable and this is done for several reasons.

A preliminary set of regressions, where the percentage version of FDI inflows was used instead, showed very contradictory results. A close look revealed that countries in the sample, such as Angola, which experienced extremely rapid economic growth in 2005-2007 (about 15-20% annually, contrasted to an average of 4%)[4], experienced also a relative decline in FDI inflows due to their relatively slower rate of increase. That, however, does not reflect the fact that FDI inflows per capita also increased, which might lead to contradictory results and spurious conclusions.

Additionally, since SADC countries display huge disparities in their per capita incomes, as can be observed in Table 2, which presents average values for the 1996-2013 period, using a ratio-based FDI measure might not tell the whole story. For example, the DRC, the per-capita-wise lowest income country in the sample (about ten times lower than the average), received FDI inflows in the range of 30-35% of its GDP in the period 1996-1999, which is sevenfold the average of 5% for the pooled sample, whereas in per capita terms, the FDI is three times lower than the average for the pooled sample. It is hoped that by using a per-capita FDI measure the distortion in the analysis is removed and this is confirmed by regression coefficients which are reversed once this

[4] Author's calculation based on World Bank data.

has been done.

Considering the determinants of FDI discussed in previous studies, the variables outlined in the next section were used in the empirical analysis.

Independent variables

Based on previous studies discussed in the previous section, a number of control variables were included in the model. Among them, the variable of interest in this study is political stability. The explanatory variable along with their sources are explained below.

Political stability and the Worldwide Governance Indicators

Political stability in this study is measured using the World Bank's Worldwide Governance Indicators (WGIs) which capture six key dimensions of governance:

- Voice and Accountability (VA)
- Political Stability and Lack of Violence (PS)
- Government Effectiveness (GE)
- Regulatory Quality (RQ)
- Rule of Law (RL)
- Control of Corruption (CC).

The indicators measure governance on a scale ranging from approximately -2.5 (weak) to 2.5 (strong governance performance).[5] They are a compilation of the perceptions of a very diverse group of respondents, collected in large number of surveys and other cross-country assessments of governance. Some of these instruments capture the views of firms, individuals, and public officials in the countries being assessed. Others reflect the views of NGOs and aid donors with considerable experience in the respective countries, and still others are based on the assessments of commercial risk-rating agencies. The data covers over 200 countries in the period between 1996 and present. Based on close to 40 data sources produced by over 30 organizations worldwide, such as Freedom House, Transparency International, the Economist Intelligence Unit, Reporters Without Borders, the EBRD and so on, the database has been updated annually since 2002 and has therefore been considered as the most comprehensive and authoritative method of measuring governance. Virtually all of the individual data sources underlying the aggregate indicators are, along with the aggregate indicators themselves, publicly available for free. Details on the underlying data sources, the aggregation method, and the interpretation of the indicators, can be found in Kaufmann and Mastruzzi (2010).

It is important to mention that WGI values for 1997, 1999 and 2001 are missing

[5] The composite measures of governance generated are in units of a standard normal distribution, with mean zero, standard deviation of one, and in certain cases they go outside of the -2.5-+2.5 range. In the case of SADC the minimum is -2.99, recorded in the DRC.

since at the time the WGIs were computed biannually. As results, those values were imputed by using the average of the previous and the following year. While not completely accurate, in most cases there were no striking shifts in PS, so the imputation was considered appropriate.

Since SADC members were on the average most politically stable between 2006 and 2012, and on the other hand average FDI inflows were at their highest between 2007 and 2013, with one year lag, the WGIs were used in their one-lag values as independent variables. As a robustness check their contemporaneous values were used, but the one-period lag values yielded more significant results (refer to highlighted cells in Table A1 in the Appendix).

In all estimated models, the PS variable is used in its one-year lag version. By lagging it by one-period, we follow the approach used by Sun et al. (2002) in an attempt to both reduce the likelihood of endogeneity as well as to account for the fact that since contemporaneous information is rarely available to investors, they have to rely on the most recent annual data, which is usually from the previous year. Also, political stability in particular is not something that changes by the day. Rather, it changes gradually, as can also be observed in Table A1 so a one-year lag is justified. The diagnostic regressions showed better predictive power for the first lag rather than for the contemporaneous value of the PS indicator.

Overseas development assistance

Yasin (2005) explores the link between the two major sources of external capital needed to fill Africa's significant resource gap (FDI and ODA), by using a panel data from 11 SSA countries for the period 1990 - 2003. The basic assumption is that Official Development Assistance (ODA, i.e. grants and loans from bilateral and multilateral organizations such as the World Bank) may remove some of the obstacles to FDI flows and thus improve the economic conditions that attract FDI. In line with previous studies, there is a positive relationship between bilateral ODA and FDI, which suggests that ODA granting countries have a significant influence on the locational decisions of the multinational corporations (MNCs) located in these countries. Thus, African countries need to formulate policies to enhance the economic and political relationships with donor countries. As regards to multilateral ODA, the empirical findings on its influence on FDI flows are controversial to date. Yasin's estimation suggests that these ODA flows are not a critical requirement for FDI activities by the MNCs in the developing countries.

Market size and GDP growth

As mentioned, is has been agreed that market size is very important for FDI and the prospective growth thereof is of specific relevance to investors. Consequently, following many other empirical studies on FDI determinants, such as Gastanaga, Nugent and

Pashamova (1998), Knickerbocker (1973), Lim (1983), Root and Ahmed (1979), Ryckegehem (1998), Singh and Jun (1995), Torrisi (1985) and Noorbakhsh et al. (2001), the GDP growth rate is used as a proxy for the growth of market size in host countries and also proxy for investment returns. Elbadawi and Mwega (1997) argue that while market size is relatively unimportant in explaining FDI flows to Africa, economic growth is an important determinant.

Exchange rate volatility and inflation

High inflation might reflect instability of the macroeconomic policy of the host country thereby engendering uncertainty in the investment environment and discouraging FDI (Bajo-Rubia and Sosvilla-Rivero 1994, Yih Yun Yang et al. 2000). In contrast, falling price levels and the resulting contraction in economic activities might trigger a deflationary spiral and eventually bankrupt the host country's firms, inducing local investors to sell off their interests in the host country's companies to foreign investors at low prices, thereby expanding the inflow of FDI. Including inflation in the estimation can also proxy for the volatility of exchange rates, which has often been identified as a significant impediment for the inflow of FDI. (Chakrabarti 2001). FDI investors lack the security of portfolio investors, as the latter can reduce the risk of exchange rate variability by hedging through the derivative market in the short run. As hedging is impossible in the long run, FDI investors must pay much closer attention to exchange rate volatility. This factor is a particularly robust determinant for risk-averse investors (Benassy-Quere et al. 2001).

Labor costs and price level

The cost of labor in developing countries is very iportant pul factor for FDI, wth one important caveat: if the FDI in the high-tech sector, FDI might flow to high wage areas because of high skill requirements. That is a possible explanation why while a large number of studies are unequivolcal in that lower labor costs are a significant facotr for attarcting FDI[6], some studies such as Flamm (1984), Lucas (1993), Schneider and Frey (1985) and Wheeler and Mody (1992) do not find significant effects. Measuring labor cost, however, might be problematic as noted by Noorbakhsh et al. (2001), since data on wages might be a poor reflection of wages offered by TNCs, and that is especially relevant in a region with astronomical inequality levels such as SADC. For that reason, instead of inclusing a wage variable, a general price level variable was used in this study.

It is hoped that the variable captures not only labor cost in the broad sense, but also other expenses related to FDI such as utilities and infrastructure-renting expenditures and can be used as a proxy for the stability of real excgange rates (regardless of nominal

[6] See Wei (2000) and Kravis and Lispey (1982).

inflation rates). The nominal USD GDP to purchasing power parity USD GDP conversion factor is used to measure the price level of a country. The average conversion factor for the pooled sample is about 2.3 , which means that SADC price levels are on the average 2.3 times lower than the U.S. which is used a benchmark, the lowest being in Madagascar where the price level is 28% of the U.S. and the most expensive being Nambia with 52%. Elbadawi and Mwega (1997), however, find that a depreciation of the real effective exchange rate, an increase in a country's openness to trade, and the expansionary effects of fiscal balance have positive impacts on FDI.

Natural resources

FDI location decisions depend on multiple host country including the availability of natural resources (Sawkut et al., 2009). Whether the natural resources-FDI link is reinforcing or inverse (known as 'the natural resource curse') was most recently explored by Asiedu (2013) who, using a panel data of 99 developing countries over the period 1984-2011 and six measures of institutional quality from two different sources (five variablesmostly sourced from the International Country Risk Guide), found out that natural resources have an adverse effect on FDI, confirming the existence of the abovementioned 'curse'. Asiedu (2013), however, found that good institutions mitigate the adverse effect of natural resources on FDI, although institutions alone cannot neutralize that negative effect.

Excluded variables

Various variables, such as population density, foreign debt, total GDP (market size) among others, were used in preliminary regressions but excluded since they proved to be insignificant and make the model more cumbersome and decrease the degrees of freedom. Following the principle of parsimony, trade variables were excluded as well, since they are highly correlated both with both FDI and GDP per capita. There are numerous studies addressing the link among these macroeconomic indicators, and there is no general consensus concerning the causal relationships that exist among them, probably due to endogeneity reasons. Therefore, the exclusion of trade from the analysis was considered as a way of reducing both endogeneity and multicollinearity.

Other variables excluded due to multicollinearity were tertiary education and FDI stock. The exclusion of these variables is not considered to have led to an omitted variable bias, since earlier studies, such as Elbadawi and Mwega (1997), find that terms of trade shocks and the level of schooling are found to have little to no impact on FDI into Africa.

Estimation Model and Hypotheses

Considering the existing literature outlined in the previous section, it is hypothesized that PS will have a positive impact on FDI inflows in SADC members. It is also

hypothesized that there will be interaction effects between PS and other significant factors influencing FDI. Based on these hypotheses, the following equation (1) is used as a starting point for the pooled linear estimations:

$$(1)\ y = \alpha + \beta_1 X + \beta_{2\ldots n} Z + \varepsilon$$

and the following equation (2) was used for linear panel data models, respectively:

$$(2)\ y_{it} = \alpha + \beta_1 X_{it} + \beta_{2\ldots n} Z_{it} + \lambda_{it} + \varepsilon_{it}$$

where y is the FDI inflows per capita, α is the intercept, X is one of the six WGIs, Z is a vector of control variables including price levels (using the GDP deflator), natural resource rents, overseas development assistance, inflation rates, GDP growth and net flows on external debt, and ε is the robust standard error (whenever mathematically possible), λ is country-specific characteristics, i is an SADC member country, and t is a year between 1996 and 2013.

In addition, equations of the following kinds were used to estimate a non-linear (quadratic) regression (equation 3), 2SLS instrumental variables pooled and panel regressions (equations 4 and 5), and finally, dynamic system GMM linear and quadratic models (equations 7 and 8) with respect to the effects of political stability (PS) specifically:

$$(3)\ y = \alpha + \beta_1 X + \beta_2 X^2 + \beta_{3\ldots n} Z + \varepsilon$$

$$(4)\ y = \alpha + \beta_1 PS + \beta_{2\ldots n} Z + \varepsilon$$
$$PS = \alpha + \beta_1 NR + \beta_{2\ldots n} Z + \varepsilon$$

$$(5)\ y_{it} = \alpha + \beta_1 X_{it} + \beta_{2\ldots n} Z_{it} + \lambda_{it} + \varepsilon_{it}$$
$$y_{it} = \alpha + \beta_1 X_{it} + \beta_{2\ldots n} Z_{it} + \lambda_{it} + \varepsilon_{it}$$

$$(6)\ y_{it} = \alpha_{it} + \beta_1 L_k.y_{it} + \beta_2 PS_{it} + \beta_3 L_k.PS_{it} + \beta_{4\ldots n} Z_{it} + \varepsilon_{it}$$

$$(7)\ y_{it} = \alpha_{it} + \beta_1 L_k.y_{it} + \beta_2 PS_{it} + \beta_2 PS_{it}^2 + \beta_3 L_k.PS_{it} + \beta_3 L_k.PS_{it}^2 + \beta_{4\ldots n} Z_{it} + \varepsilon_{it}$$

where NR stands for the log of natural resource rents per capita, and is used an instrumental variable in the 2SLS (5), being able to predict PS but not FDI inflows. In the 3SLS equation (6) NR is treated as endogenous and GDP per capita is used an exogenous instrumental variable. In (7) and (8) L_k stands for the number of periods by which both the dependent variable (FDI inflows) and the explanatory variable of interest (PS) are lagged.

Various specifications of the above-mentioned estimation models were tested, whereby the control variables were used in both their aggregate form (usually percentage of GDP) and in their per-capita form, whenever possible. Also, considering that FDI is less volatile than other kinds of investments, such as portfolio, and thereby decisions are taken considering both the status-quo and recent developments alike, both contemporaneous and one-year lagged WGIs were employed. In the regression discontinuity design model, only observations with PS of over -1.0 were included, as will be justified in the next section.

In order to normalize the distribution of the variables by reducing skewness, all non-percentage variables were converted into a log format, following the standard procedure in related literature. Nevertheless, a data description analysis showed the presence of an outlier in the dataset, as far as the dependent variable is concerned. Following Hoaglin's outlier detection criteria, according to which moderate outliers would display FDI per capita of over USD 1375.5 and extreme ones would exceed USD 2091, the Seychelles were discovered to be an extreme positive outlier, most likely due to its tax-haven status[7], and were accordingly excluded from the empirical analysis:

Table 2. FDI versus GDP per capita in SADC members for 1996-2013.

Country	**FDI inflows per capita**	**GDP (PPP) per capita**
Seychelles	2111.12	19532.96
Botswana	410.33	11908.41
South Africa	385.35	11117.85
Mauritius	298.44	13281.36
Angola	184.22	4787.05
Namibia	184.14	7344.99
Zambia	155.38	2671.66
Madagascar	138.61	1401.46
Swaziland	92.31	5584.77
Lesotho	92.07	1913.25
DRC	63.88	583.14
Tanzania	62.75	1777.51
Mozambique	34.63	767.99
Zimbabwe	30.05	1933.92
Malawi	14.54	668.87
Average	*283.85*	*5685.01*

[7] See Hoaglin et al. (1986)

Empirical Analysis

Diagnostics and preliminary tests

Before proceeding with the analysis, various standard checks were performed to ensure the reliability and validity of the estimation. The non-stationarity of the variables was confirmed using the panel-data-appropriate Levin-Lin-Chu unit-root test, one of the most widely used panel data unit root tests in the literature (Li and Liu, 2005). The null hypothesis of the existence of a unit root in the residuals was rejected for all specifications. In addition, a pre-estimation correlation test and post-estimation variance inflation factor (VIF) test (for the OLS estimation) were used to corroborate the absence of multicollinearity. Histograms and descriptive statistics were used to make sure all already log-transformed variables are normally distributed and do not contain outliers. For the resulting balanced panel data set containing 266 (14x19) country-year dyads, STATA was used to estimate the empirical model.

Table 3. Correlation coefficients of WGIs (excl. Seychelles).

	PS	VA	GOV	REG	LAW	CORR
PS	1					
VA	0.7912	1				
GOV	0.7682	0.9094	1			
REG	0.8043	0.8912	0.9128	1		
LAW	0.8513	0.9086	0.9207	0.9315	1	
CORR	0.7911	0.8536	0.9126	0.8855	0.8987	1

Linear estimations

Diagnostic ordinary least squares (OLS) and weighted least squares (WLS) regressions were estimated for every one of the six WGIs and they yielded almost identical results. Only the WLS is reported here for brevity. Since all six indicators were highly correlated with each other, as confirmed both by a simple correlation test and by a principle component analysis, they were not simultaneously used in a single specification. The pooled regressions, excluding the Seychelles, and using robust standard error and log-converted variables, showed that all six indicators have significant and large positive effects across countries in the entire period considered. Notably, the Control of Corruption and the Government Effectiveness indicators had the largest coefficient, Political Stability having the lowest. The signs and the significance of the coefficients was in line with our hypothesis. The R-square coefficients were moderate, hovering about 20%, suggesting that there are factors other than the ones included in the estimation that influence FDI inflows.

Table 4. Weighted least squares, weight: population (excl. Seychelles); L = one-year lag.

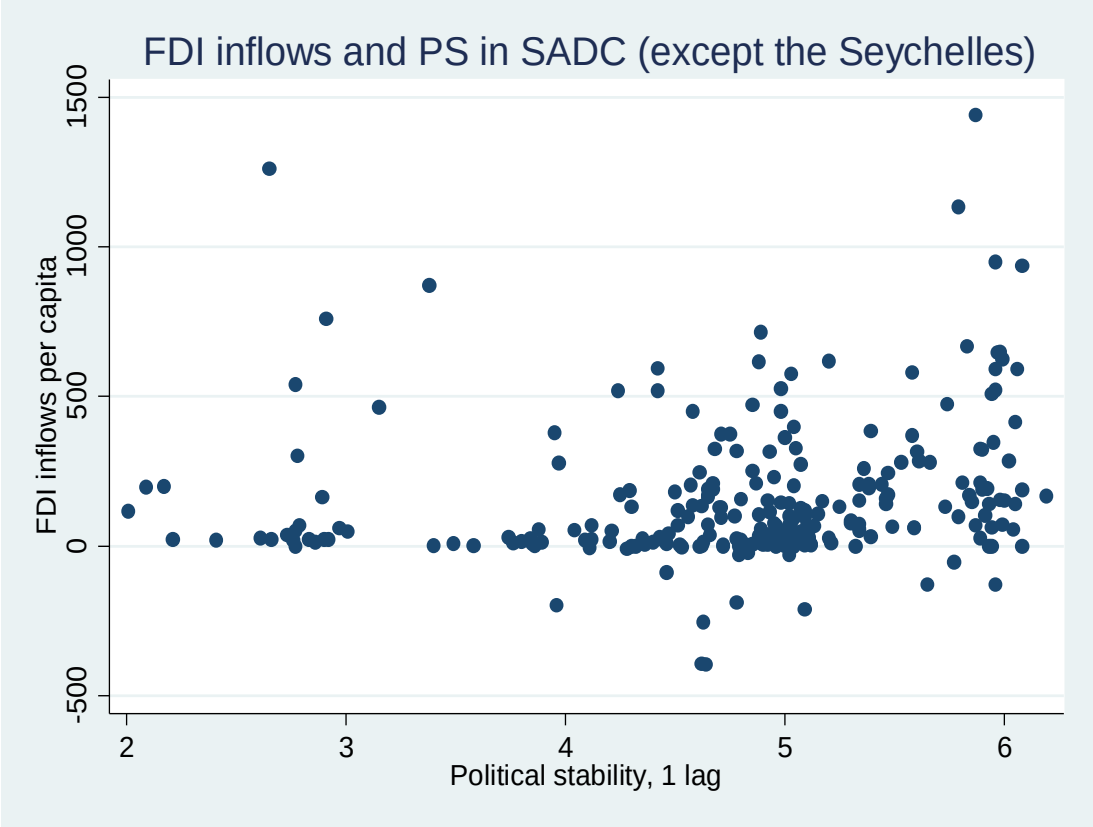
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	FDI inflows	FDI inflows	FDI inflows	FDI inflows	FDI inflows	FDI inflows
Price level	-1.588**	-1.744**	-1.735**	-1.763**	-1.594**	-1.728**
	(0.709)	(0.693)	(0.689)	(0.701)	(0.692)	(0.691)
GDP growth p.c.	-0.000106	0.000699	0.00456	-0.00136	-0.00107	0.00230
	(0.0114)	(0.00974)	(0.00999)	(0.00971)	(0.00993)	(0.0101)
Inflation	0.000388**	0.000536**	0.000556**	0.000556**	0.000497**	0.000541**
	(0.000169)	(0.000197)	(0.000201)	(0.000200)	(0.000191)	(0.000197)
ODA p.c.	0.346***	0.358***	0.389***	0.357***	0.355***	0.327***
	(0.126)	(0.120)	(0.124)	(0.122)	(0.124)	(0.116)
Natural res. p.c.	0.0485	0.0555	0.0412	0.0504	0.0656	0.0650
	(0.0568)	(0.0501)	(0.0513)	(0.0513)	(0.0511)	(0.0492)
L.Political stability	0.0780***					
	(0.0263)					
L.Voice and acc.		0.281***				
		(0.0483)				
L.Governance			0.305***			
			(0.0536)			
L.Regulatory qlty.				0.275***		
				(0.0465)		
L.Rule of Law					0.273***	
					(0.0466)	
L.Corruption ctrl						0.330***
						(0.0573)
Constant	5.044***	4.095***	3.985***	4.200***	4.094***	3.963***
	(0.310)	(0.250)	(0.265)	(0.245)	(0.276)	(0.284)
Observations	237	237	237	237	237	237
R-squared	0.191	0.320	0.332	0.304	0.278	0.321

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Noticeably, the effects of PS appear as much smaller than those of other indicators, although still highly significant. The post-estimation Breusch-Pagan test showed the presence of heteroscedasticity (chi2 (6) = 502.60, Prob > chi2 = 0.0000) which is also evident from the scatterplot – as the value of PS increases, the variance in the FDI inflows vary increasingly. Unfortunately, the issue of how to deal with heteroscedasticity is far from being settled in econometric literature. One alternative is to use the White heteroscedasticity-consistent estimator, whereas another is the Weighted Least Squares estimator. (Noorbakhsh et al. 2001) Accordingly, the OLS regression was weighted by the size of the population of each country, as SADC members have vastly different population levels. The heteroscedasticity can be clearly

seen in the scatter plot of all observations, excluding the Seychelles.

Figure 2.



To investigate further, a more panel-data appropriate fixed-effects general least squares (FE GLS) regression was estimated – the Hausman test indicated that a fixed-effects model was more appropriate than a random-effects one, which is far from unexpected, considering that the countries in the sample display very different characteristics. The fixed-effects estimation, which controls for country-specific effects, however, showed very different results from the OLS/WLS. All indicators except Control of Corruption appear with negative and insignificant coefficients although two of them are significant, notably Political Stability.

The results were not in line with expectations and opposite to those obtained via the OLS, suggesting there might be a non-linear trend. Indeed, a glance at the scatter plot above suggests the presence of a U-curve. Interestingly, a similar trend was observed for the other WGIs, except for Control of Corruption, where the trend is clearly linear. In order to ascertain whether that was the case in terms of statistical significance, a quadratic model was fitted.

Table 5. Fixed-effects general least squares (excl. Seychelles); L = one-year lag.

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	FDI inflows	FDI inflows	FDI inflows	FDI inflows	FDI inflows	FDI inflows
Price level	-1.942***	-2.547***	-2.607***	-2.514***	-2.520***	-2.617***
	(0.405)	(0.354)	(0.351)	(0.361)	(0.350)	(0.351)
GDP growth p.c.	0.0207**	0.0203**	0.0191**	0.0202**	0.0208**	0.0188**
	(0.00831)	(0.00848)	(0.00848)	(0.00849)	(0.00841)	(0.00849)
Inflation	0.000545**	0.000711**	0.000729**	0.000673**	0.000655**	0.000765**
	(0.000201)	(0.000196)	(0.000197)	(0.000205)	(0.000196)	(0.000195)
ODA p.c.	0.168***	0.203***	0.200***	0.192***	0.174***	0.205***
	(0.0564)	(0.0562)	(0.0569)	(0.0573)	(0.0574)	(0.0563)
Natural res. p.c.	0.189***	0.142**	0.141**	0.130**	0.146**	0.145**
	(0.0610)	(0.0605)	(0.0610)	(0.0621)	(0.0599)	(0.0606)
L.Political stability	-0.367***					
	(0.118)					
L.Voice and acc.		-0.213				
		(0.164)				
L.Governance			-0.111			
			(0.176)			
L.Regulatory qlty.				-0.168		
				(0.149)		
L.Rule of Law					-0.436**	
					(0.191)	
L.Corruption ctrl.						0.122
						(0.147)
Constant	7.226***	6.808***	6.363***	6.665***	7.882***	5.253***
	(0.527)	(0.815)	(0.911)	(0.805)	(0.948)	(0.730)
Observations	237	237	237	237	237	237
R-squared	0.274	0.247	0.243	0.246	0.259	0.244
Number of country	14	14	14	14	14	14

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Quadratic models

Considering the discrepant results of the OLS/WLS and fixed-effects GLS model estimations, quadratic equation (3) was estimated. The results are reported in Table 6.

Replacing the coefficients into the estimation equation yields the following:

$$FDI\ inflows\ per\ capita = 7.976 - 0.989 \times PS + 0.125 \times PS^2 + x + e$$

If this equation is then differentiated with respect to the PS coefficient, the following one is obtained:

$$(FDI\ inflows\ per\ capita)' = - 0.989 + 2 \times 0.125 \times PS$$

Table 6. OLS with squared terms (excl. Seychelles);
L = one-year lag, sq = squared term.

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	FDI inflows	FDI inflows	FDI inflows	FDI inflows	FDI inflows	FDI inflows
Natural res. p.c.	-0.00715	0.00322	0.0359	0.0266	0.0150	0.0551**
	(0.0274)	(0.0236)	(0.0227)	(0.0210)	(0.0235)	(0.0276)
Price level	-1.538**	-1.658**	-1.860**	-1.988***	-1.728**	-1.671**
	(0.713)	(0.706)	(0.717)	(0.728)	(0.711)	(0.699)
GDP growth p.c.	0.0122	0.0146*	0.0128*	0.0147*	0.0156*	0.00937
	(0.00783)	(0.00754)	(0.00747)	(0.00749)	(0.00794)	(0.00758)
Inflation	0.000280*	0.000550**	0.000483**	0.000509***	0.000445**	0.000476**
	(0.000154)	(0.000235)	(0.000190)	(0.000194)	(0.000184)	(0.000198)
ODA p.c.	0.185***	0.187***	0.209***	0.228***	0.206***	0.212***
	(0.0698)	(0.0637)	(0.0703)	(0.0699)	(0.0690)	(0.0707)
L.Polit. stability	-0.989***					
	(0.254)					
L.sq.Polit.stabil.	0.125***					
	(0.0302)					
L.Corrution		-0.998**				
		(0.396)				
L.sq.Corrution		0.141***				
		(0.0417)				
L.Voice & acc.			-2.052***			
			(0.377)			
L.sq.V. & Acc.			0.254***			
			(0.0435)			
L.Governance				-2.108***		
				(0.373)		
L.sq.Governance				0.268***		
				(0.0441)		
L.Regul. qlty.					-1.658***	
					(0.336)	
L.sq.Regul. qlty.					0.217***	
					(0.0410)	
L. Rule of law						-1.335***
						(0.294)
L.sq.R. of law						0.181***
						(0.0345)
Constant	7.976***	7.708***	9.917***	9.961***	9.016***	8.076***
	(0.639)	(0.949)	(0.864)	(0.849)	(0.747)	(0.624)
Observations	237	237	237	237	237	237
R-squared	0.205	0.283	0.307	0.337	0.296	0.265

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Solving the equation by applying the FOC would suggest that for a PS value larger than 3.956 in its converted non-negative form (2 to 7), which corresponds to 3.956 – 5 = -1.044 in its original form (-3 to 3), there is a positive linear relationship and for values smaller than that, the FDI-PS relationship is negative. A glance at the PS indicator for SADC countries reveals that the observations with a value below this cutoff are essentially restricted to the DRC in the entire period, Angola until 2002, and Zimbabwe between 1999 and 2010 (refer to Table A1 in the Appendix).

Regression discontinuity design

Based on the results from the quadratic estimations, a regression discontinuity model was utilized to estimate a linear equation. The results are presented in Table 7.

Table 7. OLS for observations with PS of over 0.0.

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	FDI inflows	FDI inflows	FDI inflows	FDI inflows	FDI inflows	FDI inflows
Nat. res. rents, %	-0.00123	0.000531	0.0157***	0.0119**	0.0126**	0.0122**
	(0.00465)	(0.00471)	(0.00528)	(0.00475)	(0.00507)	(0.00555)
Price level	0.157	0.265	-0.277	0.0561	0.148	0.0430
	(0.374)	(0.314)	(0.345)	(0.304)	(0.301)	(0.315)
GDP growth p.c.	0.0116	0.0102	0.0109	0.00976	0.0104	0.0149
	(0.0105)	(0.0106)	(0.0104)	(0.0107)	(0.0100)	(0.0112)
Inflation	-0.00119	-0.000498	0.00129	-0.00116	-0.000697	0.00182
	(0.00671)	(0.00715)	(0.00670)	(0.00673)	(0.00675)	(0.00653)
Political stability	0.329***					
	(0.109)					
Voice and acc.		0.248***				
		(0.0609)				
Governance			0.440***			
			(0.0808)			
Regulatory qlty.				0.401***		
				(0.0777)		
Rule of law					0.358***	
					(0.0694)	
Corruption ctrl.						0.387***
						(0.0782)
Constant	4.441***	4.910***	4.152***	4.220***	4.361***	4.219***
	(0.527)	(0.310)	(0.345)	(0.341)	(0.353)	(0.398)
Observations	113	113	113	113	113	113
R-squared	0.170	0.184	0.297	0.282	0.242	0.261

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Based on the results of the quadratic equations, a cutoff value of –1.0 was initially selected. However, as other cutoff points, including the sample the mean of –0.8, were tested for robustness reasons, a PS indicator value of 0.0 proved to allow for most significant results of the linear model. Thus, it was used as a cutoff value and so for observations with PS indicator of 0.0 or higher, which represent about half of all observations, it is established that there is a significant positive relationship between all WGIs and FDI inflows using an OLS model.

A fixed-effects GLS model using contemporaneous or lagged values of the WGIs does not show significant effects of WGIs, no matter what and how many controls are included and what cutoff value is used. The results are not reported here for brevity. Nevertheless, using a three-period lag PS shows significant results at the 10% level, confirming that PS has positive impacts on FDI in countries which has already achieved some political stability, and that impact has a lag of about three years. Maintaining political stability of about three years seems to provide a good enough guarantee for investors.

Table 8. Fixed-effects general least squares with a 3-year lag PS for PS>0.0.

VARIABLES	FDI inflows
Lag 3 Political stability	0.275*
	(0.143)
Price level	0.161
	(0.536)
GDP growth per capita	0.0217
	(0.0135)
Inflation	0.00567
	(0.00762)
ODA per capita	0.0279
	(0.0693)
Natural res. rents per capita	0.000185
	(0.000208)
Constant	4.541***
	(0.801)
Observations	97
Number of country	11
R-squared	0.125

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Endogeneity issues and robustness

The models presented so far are single equations, which means that they might be, and most likely are, subject to endogeneity resulting in biased estimated coefficients,

meaning that the PS-FDI relationship might not be causal but might instead run both ways or be determined by a third unaccounted-for factor. To examine whether an endogenous relationship between FDI inflows and political stability truly exists, first a two-stage least squares (2SLS) instrumental variable (IV) OLS model was used. In the IV regression, PS was instrumented for by the amount of natural resource rents *as a percentage of GDP*, which was not found to be correlated with FDI inflows *per capita*, unlike natural resource rents *per capita* which is, and was correspondingly used as a control variable in the earlier regressions. Natural resource as a percentage of GDP can predict PS significantly in the first stage of the two-stage least squares IV regressions.

The results of the IV estimation confirmed the robustness of the results obtained in the previous sections, suggesting that there is a causal positive relationship between PS and FDI inflows on a cross-country basis. The coefficient remained roust as additional control variables were included in the equation, suggesting a 28% increase in FDI inflows as the PS indicator goes up by one unit[8]. The impact in fact not as large as it may seem, because one point increase in the PS indicator is equal to a 15-20% increase in political stability (the indicator ranges from approximately-3/-2.5 to +2.5/+3 only).

Table 9. Two-stage instrumental variable model estimates (Seychelles included).

	(1) IV OLS, all observations	(2) IV OLS, PS>-1.0	(3) IV FE GLS, all observations	(4) IV FE GLS, PS>-1.0
VARIABLES	FDI inflows	FDI inflows	FDI inflows	FDI inflows
Political stability	0.247***	1.113***	4.295	6.736*
	(0.0737)	(0.212)	(2.805)	(4.085)
Price level	-1.049***	-2.058***	-9.913*	-9.079*
	(0.318)	(0.500)	(5.414)	(5.439)
Inflation	0.000168	0.00395	0.00103	0.0441
	(0.000106)	(0.00507)	(0.000648)	(0.0286)
ODA per capita	0.00294***	0.00165**	0.00147	0.00171
	(0.000554)	(0.000720)	(0.00163)	(0.00213)
Debt flows p.c.	0.000252***	0.000222***	0.000159	0.000185
	(6.00e-05)	(7.14e-05)	(0.000157)	(0.000197)
Constant	5.360***	1.293	-10.51	-25.26
	(0.319)	(0.975)	(11.44)	(19.26)
Observations	252	213	252	213
R-squared	0.306	0.149		
No. of countries			14	13

Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

[8] $e^{0.247}=1.28$.

As an additional control for endogeneity, the post-estimation augmented Durbin-Wu-Hausman test was applied following the OLS test. The test was suggested by Davidson and McKinnon (1993) and can be easily conducted by including the residuals of each endogenous explanatory variable as a function of all exogenous variables in a regression of the original model, which, however depends on a subjective judgment about the exogenous nature of the variables considered.

The test results indicated that endogeneity is not significant, meaning natural resources are a really exogenous variable to FDI and political stability, and this gives credibility to the results obtained through the two-stage least squares IV estimation. Thus, a fixed-effects two-stage least squares model was estimated for both all observations and for PS>-1.0 observations alike. (Li and Liu, 2005) The fixed-effects model once again confirmed the results obtained in the previous sections, suggesting that they are robust. For countries with a PS indicator of over -1.0, one point (i.e. 15-20%) increase in the PS indicator can lead to a staggering eight-fold[9] increase in FDI inflows *within* a country. A cutoff point of -1.0 works better than 0.0 in these models, and the results do not change significantly once the Seychelles is excluded from the analysis (refer to Table A2 in the Appendix).

As a final robustness check a dynamic system GMM small-sample model was used. The Arellano-Bond system-GMM model, which uses lags of the dependent and independent variables as instruments, also confirmed the results obtained in the previous sections. A causal non-linear trend was confirmed, whereby both the linear and the squared PS were significant. The results are not reported for brevity. More interestingly and relevantly, when the analysis is conducted for observations where PS is larger than 0.0, the strongest predictor of FDI was PS with a two-year lag, which is similar to the results obtained in the previous section which showed that the three-year lag was the most significant. In any case, the robustness tests do confirm that even if it assumed that natural resources are not an inappropriate instrument for PS and if PS is itself assumed to be endogenous, PS is still a strong predictor of FDI, especially in countries which have already achieved the crucial PS of 0.0.

The Sargan test for over-identifying restrictions was not significant for all specifications except the 0-lag one, suggesting the goodness-of-fit of the model. However, the Sargan test might be biased in the case of heteroskedastic error term, which is unfortunately the case, as the Breusch-Pagan test previously showed, which might cast doubts on the validity of the results. Therefore, a further robustness check was performed.

As mentioned earlier, there were no issues with the stationarity of the data, so the system GMM was chosen over the first-differences GMM, as its estimation power is generally considered superior in the absence of non-stationarity. Standard

[9] $e^{6.736}$=842.18.

first-differences GMM (Arellano and Bond, 1991) requirements may be fulfilled if there is autocorrelation in the first order but no autocorrelation in the second order. Except for the zero (contemporaneous) and one-period lag specifications, that seems to be the case, so the first-differences GMM was also conducted for the two and three-period lag specifications as an additional robustness check, as the standard GMM may potentially have an edge over system-GMM from the point of view of instrument proliferation. It reduces the likelihood of instrument proliferation resulting in biases of the coefficients which might be present in the system GMM. (Roodman 2009). The results, not reported here for brevity, were consistent with the system GMM.

Table 10. Arellano –Bond system-GMM for observations with PS of over 0.0 (excluding the Seychelles).

	(4) PS, no lag	(1) PS, 1 lag	(2) PS, 2 lags	(3) PS, 3 lags
VARIABLES	FDI inflows	FDI inflows	FDI inflows	FDI inflows
Lag1 FDI inflows	0.218	0.150		
	(0.213)	(0.189)		
Lag 2 FDI inflows			0.0159	
			(0.196)	
Lag 3 FDI inflows				-0.0380
				(0.183)
Political stability	0.209	0.0852	0.520***	0.285**
	(0.167)	(0.159)	(0.170)	(0.135)
Natural resources .p.c.	0.000286*	0.000320**	0.000326***	0.000369**
	(0.000145)	(0.000136)	(0.000118)	(0.000142)
Constant	3.762***	4.865***	3.344***	4.966***
	(1.181)	(1.285)	(1.093)	(1.225)
Observations	108	108	104	98
Number of country	11	11	11	11
AR1	***	***	***	***
AR2	**	*		
Sargan OR	*			
Sargan GMM				
Difference in Sargan GMM	***			*
Sargan IV	*			
Difference in Sargan IV				

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Discussion

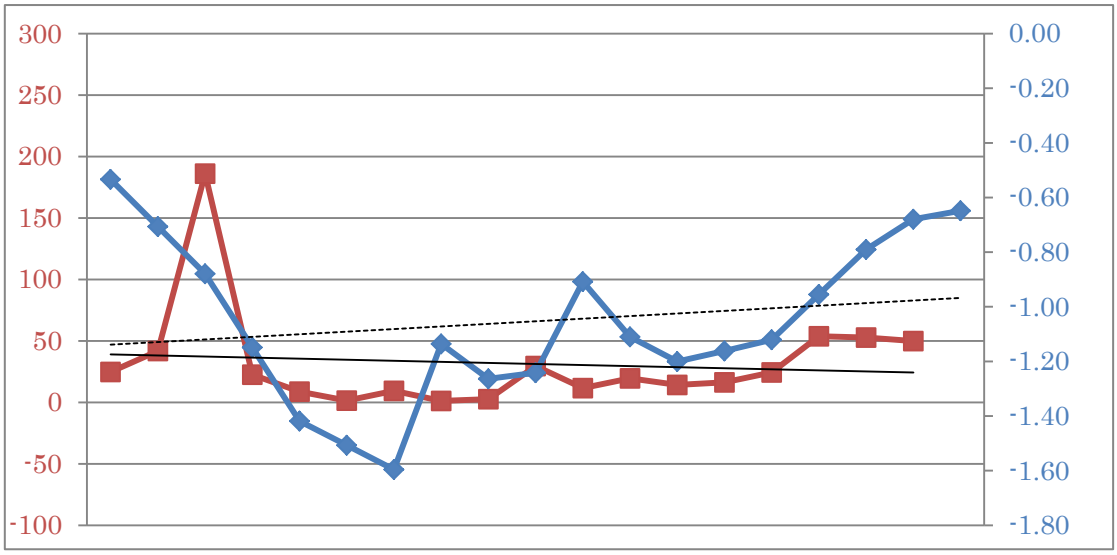
The U-curve narrative: the curious cases of Angola and the DRC

The non-linear relationship between PS and FDI identified in the present analysis can be

related to Barro's finding (1996, 2000) that there is a U-shaped relationship between FDI and democracy. To reiterate, it was identified that the lowest point of that U-curve lies at about a value of -1.0 of the PS indicator. Above this level of PS, and especially above 0.0, there is a relatively large, robust and positive causal relationship between PS and FDI inflows in SADC members, especially with a lag of one to two years. From Table A1 in the Apendix, it can be seen that the SADC members which are below the lower cutoff point are mainly the DRC, Angola and Zimbabwe. On the other hand, SADC members that have achieved respectable PS levels of over 0.0 includes Botswana, Mauritius, Zambia, Namibia, Mozambique and Lesotho. In other words, most countries in the SADC follow the expected linear trend between PS and FDI except Angola, the DRC and to a certain extent Zimbabwe, where the trend seems to be the opposite mainly due to the presence of a string of two or three years (within the entire almost two-decade period under consideration) of very strong correlation in the opposite direction, at least in the latter two cases: 1997-1998 in Zimbabwe and 1998-2000 in the DRC. This section therefore proceeds to explore why these countries do not fit the trend and what it is that separates them for the rest of the SADC members.

First of all, a detailed look at the within-country trends in those three cases reveals that the cases of Zimbabwe and the DRC are not so detached from the general trend as is Angola. In the case of Zimbabwe, except for 1998 which saw a peak in FDI inflows, the rest of the time FDI and PS are visibly correlated in their annual fluctuations (Figure 3).

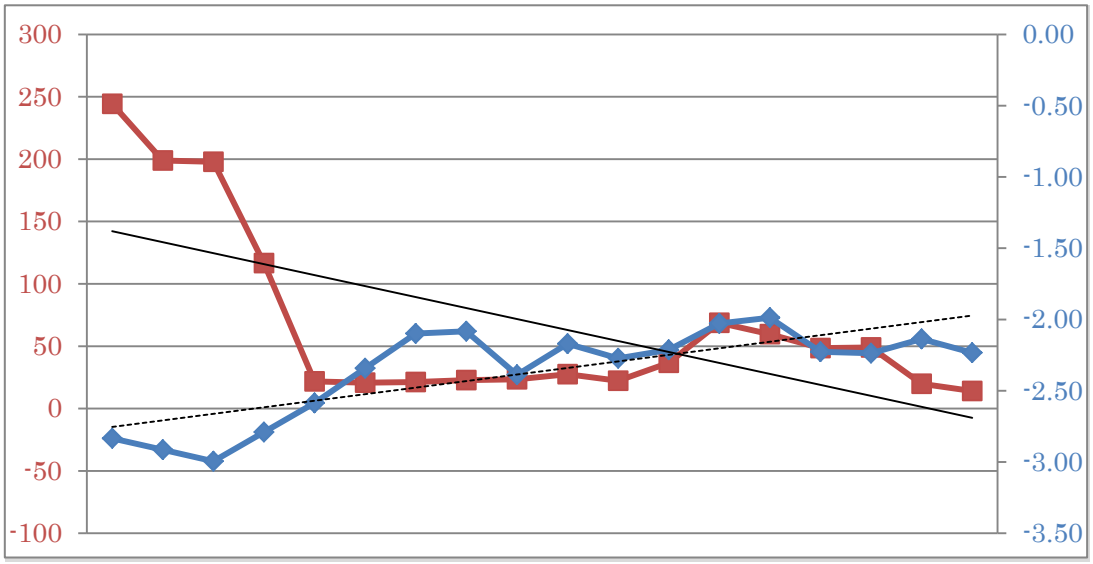
Figure 3. Political Stability (blue, right scale) and FDI inflows (red, left scale) in Zimbabwe, 1996-2013. Source: World Bank, 2016.



The same is true for the DRC after the onset of the Second Congo War in August 1998 (Figure 4). Zimbabwe's involvement in the Second Congo War in 1998 might

partially explain partly why FDI inflows there were particularly high in that year – most of the DRC's neighboring nations, particularly Malawi, Angola and Zimbabwe received increased amounts of FDI around and after the onset of the war suggesting a potential flight and/or diversion of FDI from the DRC to the neighboring areas.

Figure 4. Political Stability (blue, right scale) and FDI inflows (red, left scale) in the DRC, 1996-2013. Source: World Bank, 2016.



Concerning the DRC in particular, a closer look at the geography of FDI there suggests that there might be no relation between PS and FDI there. The DRC is the largest country in SSA, approximately one-fourth the size of the USA or China, and in addition the largely underdeveloped infrastructure obstructs quick coordination among the already largely economically, linguistically and ethnically different parts of the state. This line of thought would render the analysis of the DRC as a single politico-economic entity counterintuitive to say the least. The map below (Figure 5) shows that what could be described as the economic powerhouse of the country is in essence a relatively small region bordering Zambia, situated in the Katanga Province which itself is home to a mere 6-7% of the population of the country. The reader can verify on the map what a tiny part of the DRC said area is.

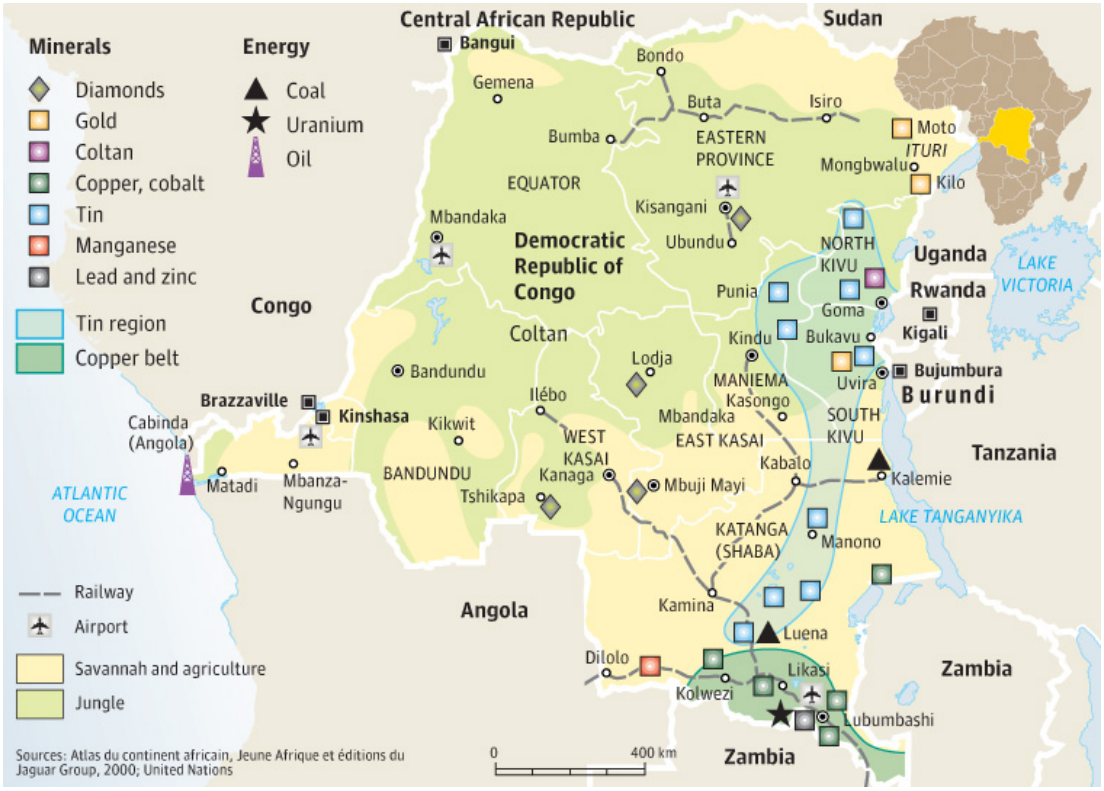
The region, whose center is the city of Lubumbashi, could be said to account for upwards of 70% of the DRC's total exports (about 78% of the DRC's exports are either raw or processed copper and cobalt, most if not all of which are extracted in southern Katanga. Approximately the same amount of the FDI flowing into the country should be expected to be concentrated in the region, based on data from the DRC's National Investment Promotion Agency (2016) and on Oxford Policy Management data (2016), who report that 70-90% of overall FDI is concentrated in the mining sector (numbers vary depending on the year). The region has been largely unaffected by the conflict in

the country, which has taken a heavy toll on the North and South Kivu provinces in the Eastern Part of the country, and which has understandably had an impact on the overall PS in the DRC.

Table 11. The DRC's Exports in 2013.
Source: Observatory of Economic Complexity, MIT (2016)

Commodity	Percentage of exports	Value in USD
Refined Copper	33.0%	$2,380,000,000
Copper Ore	19.0%	$1,370,000,000
Crude Petroleum	12.0%	$888,000,000
Cobalt	8.8%	$626,000,000
Raw Copper	7.5%	$536,000,000
Cobalt Ore	6.9%	$491,000,000
Cobalt Oxides	3.2%	$229,000,000
TOTAL	*90.40%*	*$6,520,000,000*

Figure 5. Map of natural resource extraction in the DRC.
Source: Le Monde Diplomatique based on UN data (2016).

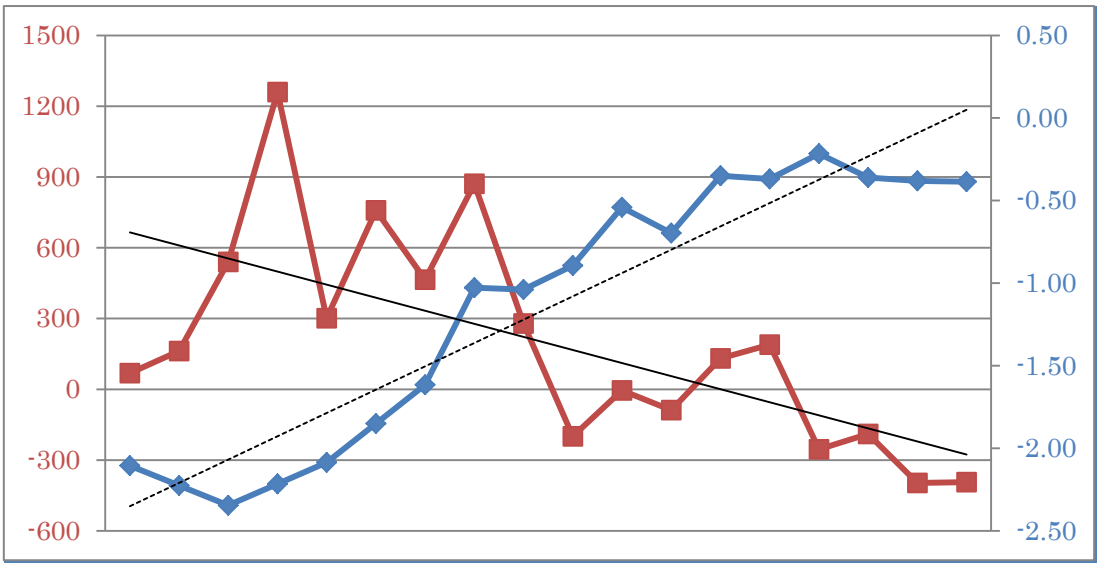


To support the idea that PS is not the most relevant factor in investment decisions in

the mining sector in the south, a backward interpretation of the following numbers is considered. Namely, according to a Fraser Institute survey reported by Oxford Policy Management (2016), the DRC's political environment was picked out as a major negative factor influencing FDI - the survey found that over 50% of investors surveyed the said that the DRC's policy environment was a deterrent to investing in the country's mining sector. By comparison, only 5% of investors considered South Africa's and Tanzania's policy environment to be a deterrent. While this is certainly true, one does have to look from the opposite angle and recognize that for almost 50% of investors the policy environment is not a major issue. At least not in comparison with other factors, such as corruption, which was found to be a deterrent to 100% of investors (compared to 60% for neighboring Zambia), and the infrastructure problems of the DRC, which concerned close to 100% of investors, compared to only 50% for Zambia, for instance.

Whereas political stability turned out to be a major concern for approximately 80% of investors, only half of them (40%) reported they would not pursue *any* investment in the DRC. The reverse reading of the survey results is very much in line with the results in this study as explained by the economic geography and the geographical concentration of conflict and political instability in the DRC.

Figure 6. Political Stability (blue, right scale) and FDI inflows (red, left scale) in Angola, 1996-2013. Source: World Bank, 2016.



Finally, the case of Angola is the only one where a clear negative relationship between PS and FDI be observed, and it is the SADC member that is responsible for the "hate" part of the relationship, i.e. the downward-sloping part of the U-curve. Angola is the only other severely natural-resource dependent country in SADC alongside the DRC, and specifically, it is oil-dependent, being the only OPEC member within SADC. The overwhelming part of FDI in Angola goes into the oil sector, which accounts for more

than 90% of the country's hard-currency revenue (i.e. exports). The number of oil extraction wells more than doubled between 1993 and 2003. US companies, especially ChevronTexaco, dominate oil investment in Angola (Goldstein, 2004). In light of the fact that FDI in the oil sector depends mainly on the discovery of reserves and on global demand for oil, it is not surprising to see huge fluctuations from 1300 to 300 USD per capita in the 1990s, as well as outflows of FDI due to falling demand in the recent years despite constantly improving political stability.

The most relevant part of Angola's dependence on oil in fact the geography of its oil extraction industry, very much in parallel with the DRC's mining sector. Hodges (2004:151) reports that over 98% of Angola's oil is pumped from fields offshore, in the Atlantic Ocean, so there is almost no direct contact between the oil industry and the onshore political and social development. Since any potentiality of political violence is virtually non-existent, it follows logically that there should be no relationship between the PS indicator and the FDI inflows.

FDI within SADC

Lastly, the natural resource dependence and the lack of relationship between FDI and PS in Angola and the DRC are not the only characteristics that differentiate them from the rest of the SADC members. The two countries, together with the Seychelles which is considered an outlier in this study, are the only ones which do not participate in the SADC Free Trade Area established in August 2008 (SADC, 2012). As a result, they are not as deeply integrated into the community, with tariffs, regulations and visas limiting their participation in cross-border value chains, FDI and joint-venture projects.

To illustrate the lack of integration, FDI outflows from SAR to other SADC members are examined. SAR is an FDI powerhouse not only in the region but in Africa as a whole, and a lot of FDI in SADC members originate from SAR. Clearly, DRC and Angola are the only SADC member which did not experience an increase of FDI from SAR, and Angola even experiences disinvestment, which could explain why the FDI stock in 2012 is negative (Table 12).[10]

Curiously, apart from some SAD FDI in Angola, no other African country reports investing in either the DRC or Angola, and of the latter, Angola has minimal investments in Mozambique and SAR, whereas the DRC only has some FDI in Zambia. The overwhelming part of FDI in the DRC originates from Belgium and China, and in the case of Angola, the main contributors are France, Norway, Portugal, the USA, China and Brazil. Considering this, one would wonder whether the DRC and Angola are part of SADC, or for that matter the African community at all.

[10] Negative FDI flows are a common phenomenon, but not FDI stock. It is not completely clear why UNCTAD reports a negative FDI stock figure. It is probably a mix-up of the flow/stock categories.

Table 12. SAR's FDI stock in SADC members (sorted by FDI in 2013). Source UNCTAD.

SADC member	FDI stock, 2001	FDI stock, 2012	Percent increase, 2001-2012
Mauritius	546.3	10622.0	1944%
Mozambique	339.5	2175.4	641%
Namibia	115.9	1119.5	966%
Botswana	42.1	1112.8	2643%
Zimbabwe	48.4	905.8	1871%
Lesotho	218.0[a]	810.0[b]	372%
Zambia	7.3	551.3	7552%
Swaziland	12.6	470.3	3733%
Tanzania	43.7	425.1	973%
Malawi	1.5	223.1	14873%
Seychelles	4.5	39.1	869%
Madagascar	0.0	1.6	n.a.
DRC	0.0[c]	0.0[c]	n.a.
Angola	0.0	-140.0[d]	n.a.

Superscripts: a: data for 2007 (earliest available), b: data for 2010 (latest available), c: neither DRC nor SAR reported mutual FDI inflows or stock, d: refer to footnote 10.

Concluding Remarks

It is hoped that the results from the empirical analysis, combined with the narrative developed to shed light on the reasons behind Angola's, the DRC's and to a certain extent Zimbabwe's non-compliance with the observed linear trend between political stability and FDI, can provide a relevant case in point for policymakers not only in SADC member states, but also in other emerging regions which have embarked on the way to regional integration and development cooperation such as Mercosur, ASEAN, CIS and perhaps even regions as advanced as the EU. The importance of political stability cannot be understated in the context of regional economic integration, and the present analysis suggests that governments in SADC should foster integration and political stability in order to achieve sustainably high levels of FDI inflows in the region, thereby achieving par with other rising regions, such as Asia which currently attracts the lion's share of FDI going to low and middle-income economies. Overcoming political instability might eventually break the vicious circle of natural resource-dependence in countries like the DRC and Angola by attracting FDI in sectors different from the extraction of natural resources and eventually bring about a more equitable and prosperous future.

References

Ajayi, S. I. (2006) 'FDI and Economic Development in Africa', Paper presented at the ADB/AERC International Conference on Accelerating Africa' s Development Five Years into the 21st Century, Tunis, Tunisia.

Ajayi, S. I. (2004) 'The Determinants of Foreign Direct Investment in Africa: A Survey of the Evidences', Paper presented at the IMF/AERC Special Workshop on the determinants of Foreign Direct Investment in Africa, Nairobi, Kenya.

Ajayi, S. I. (2003) 'Globalization and Africa', *Journal of African Economies*, 12 (Suppl. 1): 120-150.

Arellano, M. and Bond, S. (1991) 'Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations', *The Review of Economic Studies*, 58(2): 277-297.

Asiedu, E. (2002) 'On the Determinants of Foreign Direct Investment to Developing Countries: Is Africa Different?', *World Development*, 30 (1): 107-119.

Asiedu, E. (2003) 'Foreign Direct Investment to Africa: The Role of Government Policy, Governance and Political Instability', Mimeo. University of Kansas.

Asiedu, E. (2004) 'Policy Reform and Foreign Direct Investment in Africa: Absolute Progress but Relative Decline', *Development Policy Review*, 22 (1): 41-48.

Asiedu, E. (2006) "Foreign Direct Investment in Africa: The Role of Natural Resources, Market Size, Government Policy, Institutions and Political Stability", *World Economy*, 29 (1): 63-77.

Asiedu, E. (2013) 'Foreign Direct Investment: Natural Resources and Institutions', International Growth Centre working paper, London School of Economics.

Bajo-Rubia, O. and Sosvilla-Rivero, S. (1994) 'An Economic Analysis of Foreign Direct Investment in Spain', *Southern Economic Journal*, 61(1): 104-117.

Barro, R. J. (1996) 'Economic Growth in a Cross Section of Countries', *The Quarterly Journal of Economics*, 106 (2): pp. 407-443.

Barro, R. J. (2000) 'Rule of Law, Democracy and Economic Performance', in G. O'Driscoll, K. Holmes, and M. Kirkpatrick (eds.), *2000 Index of Economic Freedom*. Washington DC: The Heritage Foundation and Dow Jones & Company, Inc.

Barro R. J. and Lee J. (1993) 'Losers and Winners in Economic Growth', NBER Working Papers 4341, National Bureau of Economic Research, Inc.

Benassy-Quere, A., Fontagne, L. and Lahreche-Revil, A. (2001) 'Exchange Rate Strategies in the Competition for Attracting Foreign Direct Investment', *Journal of the Japanese and International Economies*, 15: 178-198.

Bende-Nabende, A. (2002) 'Foreign Direct Investment Determinants in Sub-Saharan Africa: A Co-Integration Analysis', *Economics Bulletin*, 6 (4): 1 - 19.

Chakrabarti, A. (2001) 'The Determinants of Foreign Direct Investment: Sensitivity Analyses of Cross-Country Regressions', *Kyklos*, 54: 89-114.

Davidson, R. and McKinnon, J. G. (1993) *Estimation and Inference in Econometrics*. New York: Oxford University Press.

De Schutter O., Swinnen, J. and Wouters, J. (2006) *Foreign Direct Investment and Human Development: The Law and Economics of International Investment Agreements*. Routledge Research in International Economic Law Series.

DR Congo National Investment Promotion Agency (2016) 'Volume of Foreign Direct Investment'. Available at <http://investindrc.cd/index.php?option=com_content&view=article&id=485&Itemid=797&lang=en>, retrieved March, 2016.

Edwards, S. (1990) 'Capital Flows, Foreign Direct Investment and Debt-Equity Swaps in Developing Countries', NBER Working Paper no. 3497.

Elbadawi, I. and Mwega, F. (1997) 'Regional Integration, Trade, and Foreign Direct Investment in Sub−Saharan Africa', in Iqbal, Z. and Khan, M. (eds), *Trade Reform and Regional Integration in Africa*, IMF, Washington DC.

Ezoha, A. and Cattaneo, N. (2011) 'FDI Flows to Sub-Saharan Africa: The Impact of Finance, Institution and Natural Resource Endowment', Paper Submission for the CSAE Conference 2011: Economic Development in Africa.

Flamm, K. (1984) 'The Volatility Of Offshore Investment', *Journal of Development Economics*, 16: 231-248.

Gastanaga, V., Nugent, J. and Pashamova, B. (1998) 'Host Country Reforms And FDI Inflows: How Much Difference Do They Make?', *World Development*, 26: 1299-1312.

Globerman, S., and Shapiro, D. (2003) 'Governance Infrastructure and US Foreign Direct Investment in the Caribbean Basin', *Journal of International Business Studies*, 24 (1): 121-44.

Goldstein, A. (2004) *Regional Integration, FDI and Competitiveness in SADC*. OECD Development Centre Studies.

Hoaglin, D., Tukey, J. W. (1986) 'Performance Of Some Resistant Rules For Outlier Labeling', *Journal of the American Statistical Association*, 81(396): 991-999.

Hodges, T. (2004) *Angola: Anatomy of an Oil State*. Bloomington: Indiana University Press.

Jaspersen, F., Aylward, A. and Knox, A. (2000) 'The Effects of Risk on Private Investment: Africa Compared with other Developing Areas', in Collier, P. and Pattillo, C. (eds), *Investment and Risk in Africa*, St Martin's Press, New York.

Jerven, M. (2013) *Poor Numbers: How We Are Misled By African Development Statistics and What to Do About It*, Cornell University Press.

Kaufmann, D., Kraay, A. and Mastruzzi, M. (2010) 'The Worldwide Governance Indicators: A Summary of Methodology, Data and Analytical Issues', World Bank Policy Research Working Paper No. 5430.

Knickerbocker, F. (1973) *Oligopolistic Reaction and the Multinational Enterprise*.

Cambridge, MA: Harvard University Press.

Kravis, I. and Lispey, R. (1982) 'The Location Of Overseas Production And Production For Exports By US Multinaitonal Firms', *Journal f International Economics*, 12: 201-223.

Lemi, A. and Asefa. S. (2003) 'Foreign Direct Investment and Uncertainty: Empirical Evidence from Africa', *African Finance Journal*, 5 (1): 36 – 67.

Le Monde Diplomatique (2016) 'Democratic Republic of Congo's Mineral Resources', Map. Available at < https://mondediplo.com/maps/congo2006>, retrieved March, 2016.

Li, Q. (2006) 'Political Violence and Foreign Direct Investment', *Research in Global Strategic Management*, 12: 225-49.

Li, X. and Liu, X. (2005) 'Foreign Direct Investment and Economic Growth: An Increasingly Endogenous Relationship', *World Development*, 33 (3): 393-407

Lim, D. (1983) 'Fiscal Incentives and Foreign Direct Investment in Less Developed Countries', *Journal of Development Studies*, 19: 207-212.

Loree, D. W., and Guisinger, S. E. (1995) 'Policy and Non-Policy Determinants of U.S. Equity Foreign Direct Investment', *Journal of International Business Studies*, 26 (2): 281-299.

Lucas, R. B. (1993) 'On The Determinants Of Fooreign Direct Investment: Evidence From East And South-East Asia', *World Development*, 21: 391-406.

Mijiyawa, A. G. (2012) 'What Drives Foreign Direct Investments in Africa? An Empirical Investigation with Panel Data', Mimeo. African Center for Economic Transformation (ACET).

Mills, G. and Oppenheimer, J. (2002) 'Making Africa Succeed', in Gibb. R., T. Hughes, G. Mills and T. Vaahtoranta (eds), *Charting a New Course. Globalization, African Recovery and the New Africa Initiative*. Johannesburg: South African Institute of International Affairs.

Morisset, J. (2000) 'Foreign Direct Investment in Africa: Policies Matter', *Transnational Corporation*, 9 (2): 107-125.

Noorbakhsh, F., Paloni, A. and Youssef, A. (2001) 'Human Capital and FDI Inflows to Developing Countries: New Empirical Evidence', *World Development*, 29 (9): 1593-1610.

Observatory of Economic Complexity (2016) 'Democratic Republic of Congo', country profile. Available at <http://atlas.media.mit.edu/en/profile/country/cod/>, retrieved March, 2016.

Oxford Policy Management (2013) 'The Impact of Mining in the Democratic Republic of Congo: Performance to Date and Future Challenges'. Available at <http://www.opml.co.uk/sites/default/files/DRC%20mining%20report%20-%20OPM%20-%20Final%20Eng.pdf>, retrieved March, 2016.

Razafimahefa, I. and Hamori, S. (2005) 'An Empirical Analysis of FDI Competitiveness

in Sub−Saharan Africa and Developing Countries', *Economics Bulletin*, 6 (20): 1−8.

Rogoff, K. and Reinhart, C. (2003) 'FDI to Africa: The Role of Price Stability and Currency Instability', Working Paper 03/10, International Monetary Fund.

Roodman, D. (2009) 'How to do xtabond2: An introduction to difference and system GMM in Stata', *Stata Journal*, 9 (1): 86.

Root, F. and Ahmed, A. (1979) 'Empirical Determinants of Manufacturing Direct Foreign Investment In Developing Countries', *Economic Development and Cultural Change*, 27: 751–767.

Ryckeghem, W. (1998) 'Domestic Policy Variables and Foreign Direct Investment Inflows in Latin America', in P. K. M. Tharakan and D. Van Den Bulcke (eds.), *International Trade, Foreign Direct Investment and the Economic Environment: Essays in Honour of Professor Sylvain Plasschaert*. London: Macmillan.

Sawkut, R., Seetanah B., Ramessur-Seenarain T., and Sannassee V. (2009) 'Determinants of FDI: Lessons from African Economies', *Journal of Applied Business and Economics*, 9(1): 70-81.

SADC (2012) 'Integration Milestones: Free Trade Area'. Available at <http://www.sadc.int/about-sadc/integration-milestones/free-trade-area/>, retrieved March, 2016.

Schneider, F. and Frey, B. (1985) 'Economic and Poitical Determinants of Foreign Direct Investment', *World Development*, 13: 161-175.

Singh, H. and Jun, K. (1995) 'Some New Evidence on Determinants of Foreign Direct Investment In Developing Countries', Policy Research Working Paper No. 1531, World Bank, Washington, DC.

Sun, Q., Tong, W. and Yu, Q. (2002) 'Determinants of Foreign Direct Investment across China', *Journal of International Money and Finance*, 21: 79-113

Torrisi, C. (1985) 'The Determinants of Direct Foreign Investment in a Small LDC', *Journal of Economic Development*, 10: 29-45.

UNCTAD (2005) 'World Investment Report 2005'. Available at <http://unctad.org/en/Docs/wir2005_en.pdf>, retrieved November, 2015.

UNCTAD (2014) 'World Investment Report 2014'. Available at <http://unctad.org/en/PublicationsLibrary/wir2014_overview_en.pdf>, retrieved November, 2015.

UNCTAD (2015) 'Statistical database'. Available at <http://unctad.org/en/Pages/Statistics.aspx >, retrieved October, 2015.

Wei, S. J. (2000) 'How Taxing is Corruption on International Investors?', *Review of Economics and Statistics*, 82 (1): 1 - 11.

Wells, L. and Wint, J. (1990) 'Marketing a Country, Revisited', FIAS Occasional Paper No. 13.

Wheeler, D. and Mody, A. (1992) 'International Investment Location Decisions: The

Case Of US Firms', *Journal of International Economics*, 33: 57-76.

Woodward, D. and Rolfe, R. (1993) 'The Location of Export-Oriented Foreign Direct Investment', *Journal of International Business Studies*, 34 (1): 19-40.

World Bank (2015) 'Worldwide Governance Indicators'. Available at <http://data.worldbank.org/data-catalog/worldwide-governance-indicators>, retrieved October, 2015.

Yasin, M. (2005) 'Official Development Assistance and Foreign Direct Investment Flows to Sub−Saharan Africa', *African Development Review*, 17 (1): 23−40.

Yih Yun Yang, J., Groenewold, N. and Tcha, M. (2000) 'The Determinants of Foreign Direct Investment in Australia', *The Economic Record*, 76: 45-54.

Zeng, L. D., Tong, Q. S., Wang, L. and Qian, W. (2002) 'On the Determinants of Foreign Direct Investment to Developing Countries: Is Africa Different?', *World development*, 30 (1): 107-119.

Biographical Note

Yani Karavasilev is a PhD candidate at the Osaka School if International Public Policy at Osaka University, Japan. His primary research focus is the interaction among foreign direct investment, governance and the media and their macroeconomic impact on development.

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Appendix

Table A1. PS scores per country, SADC average PS, and Total SADC FDI inflows (USD millions), 1996-2014. Soruce: World Bank.
Highlighted: PS scores of over -0.05; Annual FDI inflows of over 350 USD mill.

YEAR	1996	1997	1998	1999	2000	2001	2002	2003
ZIMBABWE	-0.53	-0.71	-0.88	-1.15	-1.42	-1.51	-1.60	-1.14
ZAMBIA	-0.23	-0.07	0.09	0.02	-0.05	-0.20	-0.35	0.17
TANZANIA	-0.72	-0.60	-0.48	-0.64	-0.80	-0.57	-0.35	-0.88
SWAZILAND	-0.30	-0.20	-0.11	-0.09	-0.07	-0.04	0.00	0.04
SOUTH AFRICA	-0.43	-0.50	-0.58	-0.42	-0.25	-0.29	-0.32	-0.33
SEYCHELLES	0.96	0.98	1.00	1.09	1.19	1.02	0.84	0.63
NAMIBIA	0.77	0.58	0.39	0.00	-0.38	-0.15	0.09	0.44
MOZAMBIQUE	-0.11	-0.04	0.04	-0.06	-0.15	-0.01	0.12	0.21
MAURITIUS	1.04	0.99	0.95	0.84	0.73	0.89	1.05	0.99
MALAWI	-0.54	-0.38	-0.21	-0.34	-0.47	-0.28	-0.08	0.00
MADAGASCAR	0.11	0.10	0.09	0.07	0.04	-0.12	-0.29	0.59
LESOTHO	0.12	-0.05	-0.22	-0.12	-0.02	-0.10	-0.18	0.07
DRC	-2.83	-2.91	-2.99	-2.79	-2.59	-2.34	-2.10	-2.08
BOTSWANA	0.92	0.90	0.87	0.91	0.96	0.87	0.79	1.08
ANGOLA	-2.11	-2.23	-2.35	-2.22	-2.09	-1.85	-1.62	-1.03
SADC average PS	-0.26	-0.28	-0.29	-0.33	-0.36	-0.31	-0.27	-0.08
TOTAL SADC FDI	126.60	180.70	252.80	310.30	159.90	246.60	292.80	287.80

2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
-1.26	-1.24	-0.91	-1.11	-1.20	-1.16	-1.12	-0.96	-0.79	-0.68	-0.65
0.15	0.07	0.36	0.34	0.46	0.53	0.46	0.47	0.61	0.38	0.21
-0.65	-0.57	-0.33	-0.35	-0.21	0.07	-0.02	-0.05	0.02	-0.17	-0.54
0.02	-0.37	-0.29	0.04	-0.08	0.01	-0.04	-0.49	-0.42	-0.44	-0.52
-0.12	-0.15	0.05	0.20	0.04	-0.11	-0.02	0.03	-0.02	-0.04	-0.08
0.67	0.94	0.92	0.82	0.77	0.62	0.88	0.96	0.76	0.84	0.42
0.65	0.60	0.79	1.02	1.19	0.90	0.81	0.89	0.94	0.93	0.62
-0.03	0.12	0.49	0.30	0.34	0.59	0.34	0.30	0.34	-0.28	-0.35
0.97	1.00	0.74	0.83	0.85	0.66	0.58	0.94	0.96	0.94	0.74
0.09	0.08	0.11	0.06	-0.06	0.05	0.06	-0.07	0.00	-0.21	0.12
0.20	-0.05	0.13	0.03	-0.49	-0.75	-1.05	-0.76	-0.58	-0.70	-0.54
0.39	0.02	-0.13	-0.39	-0.22	0.34	0.47	0.38	0.25	0.32	-0.27
-2.39	-2.17	-2.27	-2.21	-2.03	-1.99	-2.23	-2.24	-2.14	-2.23	-2.27
0.89	1.06	0.96	0.98	0.98	0.93	0.96	1.05	1.08	1.08	1.02
-1.04	-0.89	-0.54	-0.70	-0.35	-0.37	-0.22	-0.36	-0.38	-0.39	-0.27
-0.10	-0.10	0.01	-0.01	0.00	0.02	-0.01	0.01	0.04	-0.04	-0.16
222.00	216.90	290.20	399.40	474.30	388.10	381.00	394.80	396.40	353.00	126.60