

**The next step in African development:
Aid, investment, or another round of debt?**

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Abstract

Amidst intense debt relief, and alongside dramatically improved governance, investment and growth increased substantially across Africa during the past decade. This paper interprets the timing of the Heavily Indebted Poor Countries (HIPC) Initiative, launched by the IMF and World Bank in the late 1990s, as a natural experiment to see whether these positive trends were specific to Africa, or specific to HIPC countries, as well as whether debt relief itself manifests deeper structural shifts in economic governance. As many HIPC countries are presently raising their external public debt levels, we question whether these loans would be a “good kind of debt” that leads to investment and development or the beginning of a new debt cycle leading to future needs of another round of debt relief programs. Data on external debt and capital development for 46 countries of sub-Saharan Africa and six other HIPC countries outside of Africa is used to evaluate structural breaks and parameter stability in a longitudinal panel analysis. Incorporating an identification strategy that isolates the debt relief initiatives from endogenous improvements to economic governance, we find that they had a statistically significant impact on foreign investment flows to Africa. We conclude that despite currently escalating debt levels, the data suggests investment will likely be the next step in African development.

Keywords: debt relief, foreign direct investment, panel-data econometrics, foreign aid

JEL Classification: F34, E22, C23

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“You control the debt, you control everything. You find this upsetting, yes?
But this is the very essence of the banking industry, to make us all,
whether we be nations or individuals, slaves to debt.”

-Umberto Calvini, *The International*

1. Introduction

The cycle of external debt for African governments has burdened their countries since the wave of independence in the 1950s and 1960s. Continuing efforts at debt relief through the 20th century proved ineffectual, as governments, tending to optimize on a short time horizon, would continue to borrow into indebtedness.¹ Times, however, may be changing, as success stories about investment opportunities on the African continent abound.²

This paper investigates the apparent transition from impoverishing debt to market-based investment in Africa, specifically focusing on the Heavily Indebted Poor Countries (HIPC) Initiative launched by the International Monetary Fund (IMF) and World Bank in the late 1990s. Our results suggest that a structural break in the nature of African debt and investment occurred in the last decade. Debt relief may have eliminated a disequilibrium of instability to create incentives for profit-oriented commercial loans.³ These loans would be a “good kind of debt” leading to investment and development.

We incorporate an identification strategy that isolates debt relief from accompanying policy improvements of economic governance. Endogeneity arises because HIPC initiatives occurred simultaneously with adoption of the exact types of policies that improve a country’s competitiveness as a destination for foreign direct investment (FDI). Moreover, these policies were often adopted precisely to reach the “decision point” of the debt relief, making it difficult to tease out whether the policies, the debt relief, or both lead to a structural shift. This interaction causes an inherent challenge for the analysis, a dilemma similar to isolating the impact of WTO accession on a country’s trade levels since the accession process deliberately focuses on the policies and commercial environment that facilitates international trade as a run-up to WTO membership.⁴

Our econometric analysis treats the HIPC debt relief program as an event study by creating control groups for HIPC countries and African countries. These two comparison sets of longitudinal panel data allow us to identify the specific impacts of HIPC while isolating pan-African geo-economic and –political trends. The results show that following debt relief, determinants of FDI in HIPC-designated countries reflect those of other countries in the world. We also show that that sub-Saharan Africa as a geo-political designation for economic activity does not matter: if Africa’s recent economic history differs from the rest of the world, it appears due to the features of being poor and indebted rather than something inherent to the continent. The HIPC initiative, which included policy improvements and debt relief, altered the economic landscape of Africa, and, as a result, FDI has flowed into the continent.

¹ See Easterly (2002) for a description of debt relief efforts in from the 1970s to the new millennium.

² Unless otherwise indicated, by “Africa” or “the continent” we refer herein to the 49 countries of sub-Saharan Africa.

³ See Addison (2006).

⁴ See, for example, Rose (2004).

The implications are that following the debt relief initiatives, we can anticipate that FDI will flow to Africa by similar mechanisms as in other regions. If the continent is “open for business”, the ability for countries to again engage in public financing to improve market conditions should be anticipated as a positive turn of events.

The next section provides background on debt relief measures from the decade of the 2000s. Section 3 discusses trends in private investment in Africa. Section 4 provides an econometric analysis of the data on debt and investment in Africa, and section 5 offers concluding remarks.

2. Literature Review and Context

2.1 Africa Rising

The results of this paper suggest that foreign aid in the form of debt relief conditional on improved economic governance has led to increased foreign investment and capital formation on the continent.⁵ These effects are evident in how private markets now view the continent. For example, McKinsey (2010) identified several African “lions” that have recently experienced growth acceleration and increased economic momentum. The report highlights a group of countries in sub-Saharan Africa with specific commercial opportunities due to a combination of export-oriented economies and the diversification of gross domestic product (GDP). As Africa becomes a profitable investment destination, governments in former HIPC countries have begun to increase debt levels, ostensibly for investment to support growth opportunities. This new borrowing may not necessarily lead to a new debt cycle, if a wave of fundamental changes in economic policy and democratic governance has taken place across the continent, as we postulate.

Radelet (2010) describes 17 countries in Africa as “success stories” due to sustained economic growth over the past decade. He identifies five specific reasons why emerging African countries have been growing: (1) democracy; (2) economic policies; (3) debt relief; (4) technology; and (5) entrepreneurship. Radelet states that the combination of these five factors helped to bring these countries out of a low-growth equilibrium, and that progress has been made in a variety of social, governance and economic factors that have helped emerging African countries grow more rapidly. Many of these factors reinforced each other; for example, eliminating a debt-to-GDP ratio of nearly 3,000 percent, as Liberia did in the mid-2000s, necessitates better economic policies in general and benefits substantially from an end to conflict and welfare. Radelet cites the cause of the debt crisis in Africa as the result of “poor economic management, unaccountable and highly corrupt governments, large amounts of borrowing at government rates, and a deep global economic shock.” He states that the fundamental shift for emerging Africa came from reforms in democratic and economic policies, but the growth has been sustainable as a result of debt relief, new technologies and entrepreneurship.

Clements, Bhattacharyua, and Nguyen (2005) suggest that Western aid agencies initiated the HIPC program on the basis that debt burden in the heavily indebted nations was stifling growth and creating impossible conditions for the countries to eradicate poverty. The literature on debt

⁵ Over the last several years many skeptics, like Easterly (2001, 2004) and Moyo (2010), have criticized aid in Africa as ineffective.

and economic growth holds that unsustainable debt-to-GDP stock creates disincentives for investment in the domestic economy because the government must divert revenue to service debt rather than invest in the domestic economy; rising debt levels then increase investor uncertainty. Unsustainable debt levels are thus linked with inflation-generating monetary policy and outright expropriation of private firms. Under such uncertainties investments tend to be in projects of a shorter duration and quicker returns and thus countries are less apt to invest in long term sustainable foreign direct investment. Furthermore, debt overhang has the tendency to delay necessary macro-fiscal policy reform.

Dorsey (2008) demonstrates the extent that capital flowed to debt-forgiven countries following debt relief. The aggregate current account deficit of low income countries fell from 3 percent in the mid-1990s to a near balance in 2006. Following the debt forgiveness plans, development aid has taken the form of grants instead of lending. Dorsey (2008) also points out that the African countries that have most benefited from this inflow are those with extractive sectors such as oil and mineral wealth. FDI flows to non-extractive-based economies have increased, due in part to concurrent policies such as the liberalization of the economy and a general opening of the market to foreign investors.

As Easterly (2002) suggested, in advance of the HIPC Initiative, debt relief should be offered only to governments that have demonstrated a clear shift in their orientation towards macroeconomic policy; otherwise, the program would essentially reward poor economic governance. To be eligible for the program, countries had to meet a set of conditions, both to improve their economies and governance to be eligible for debt relief. If this has held true, debt relief may be a “proxy-plus” for fundamental changes in economic governance undertaken by the debt relief recipients.

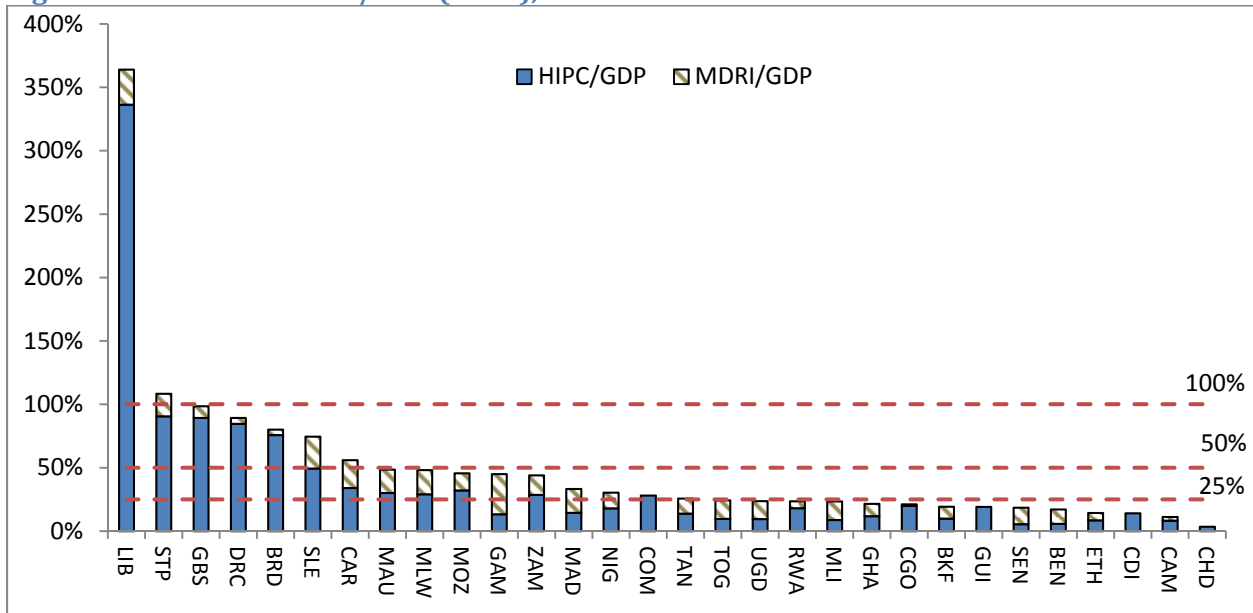
2.2 Debt and Debt Relief

In August of 1982, the year that Mexico defaulted on its sovereign debt triggering a global debt crisis, the average external debt-to-export ratio for sub-Saharan Africa was 325 percent, substantially higher than the “heavily indebted” threshold of 150 percent. African debt was stifling development efforts. In the mid-1980s, the Paris Club began to address these debt issues, first by restructuring loans and then through debt forgiveness.⁶ While the Paris Club was making some progress in debt relief, debt in Africa continued to soar. By 1992, the average external debt-to-export ratio for sub-Saharan Africa countries reached 760 percent, with many countries experiencing external debt-to-export ratios far higher. The most extreme case of indebtedness occurred in Liberia where, in 1997, the debt-to-export ratio reached an astonishing 9,212 percent. However, Liberia was not alone in Africa in having an extremely high debt burden. Since the beginning of the debt crisis in 1982 more than a dozen African countries had persistent external debt-to-export ratio of more than 1,000 percent.⁷ See Table A-1 in the Appendix.

⁶ <http://www.clubdeparis.org/sections/composition/historique-50-ans>

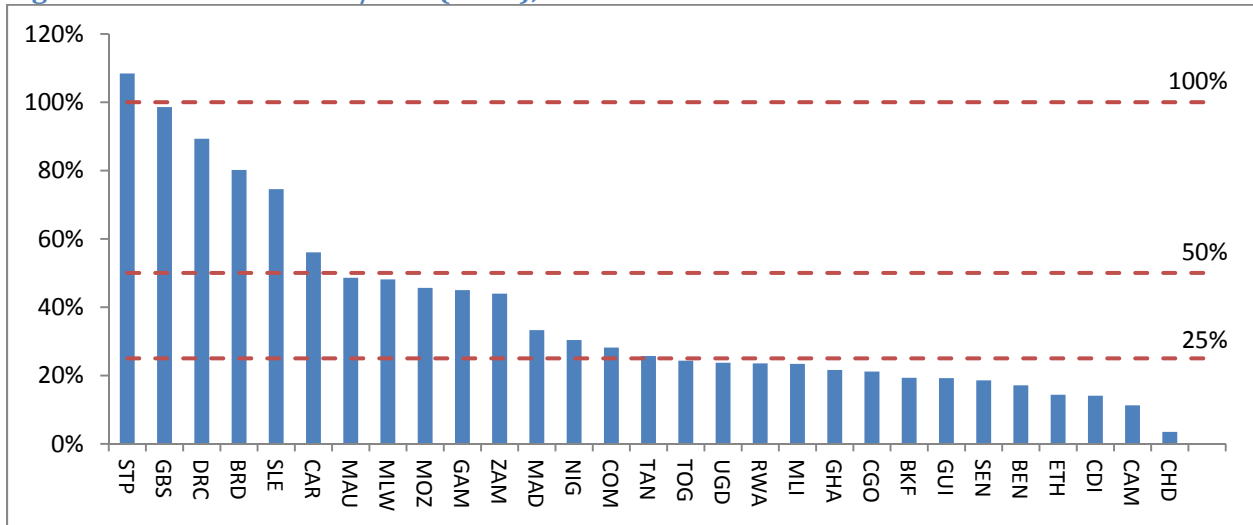
⁷ Burundi, DRC, Eritrea, Ethiopia, Guinea-Bissau, Liberia, Mozambique, Rwanda, Sierra Leone, Somalia, Sudan, Tanzania, and Uganda all had debt-to-export ratios of more than 1,000 percent for at least 3 years.

Figure 2: Total Debt Relief/GDP (2009), all countries



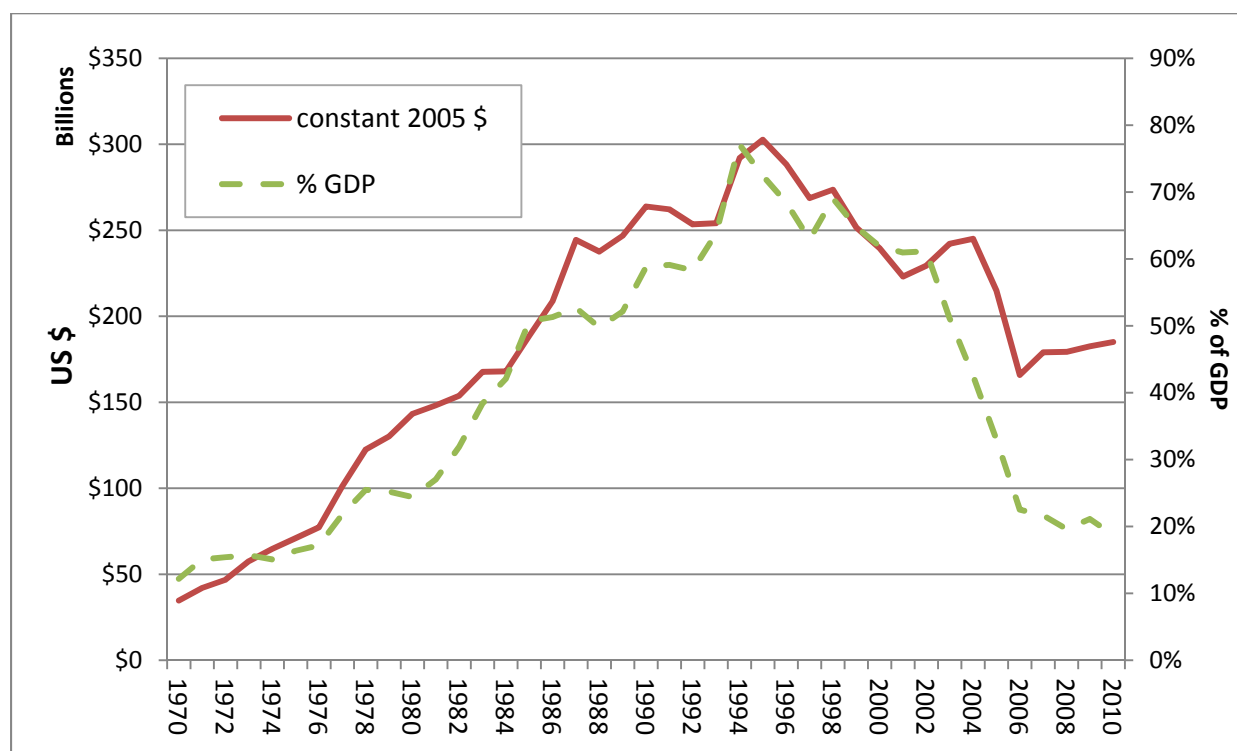
Debt relief for the West African country of Liberia is, literally, off the charts. To allow for visibility in a comparison to other recipients of debt relief in Africa, Figure 3 provides the same information as Figure 2 with Liberia excluded to adjust for the outlier.

Figure 3: Total Debt Relief/GDP (2009), Liberia excluded



Thirty African nations received nearly \$50 billion in debt relief as part of the HIPC initiative and another \$24 billion as part of MDRI between 2000 and 2009.¹⁰ The impact of this debt relief is illustrated in Figure 4, which shows a dramatic decline in external debt as percentage of GDP from more than 75 percent in 1994 to less than 20 percent by 2000. As could be expected, African external debt fell substantially immediately following the relief initiatives. Figure 4 shows a clear downward trend from 1995 to 2006, but since then, the amount of external debt is again increasing to more than it was in the height of the debt crisis. The debt-to-GDP ratio has been quite flat for the last five years, and in 2010, the average external debt-to-export ratio for African countries was 136 percent, below the 150 percent threshold to be considered heavily indebted. However, debt in real dollars increased from \$154 billion in 2006 to \$189 billion in 2010. Liberia, the overachiever in debt relief, has recently crafted a medium-term expenditure framework to increase its public debt to 45 percent of GDP over the next three years in part through the issue of new treasury bills.¹¹ Should this be a concern to the donors who recently paid off \$75 billion of debt?

Figure 4: African external debt (2005 US\$ and as a percent of GDP)



According to Reisen and Ndoye (2008) the optimal debt-to-export ratio is no more than 150 percent. However, most African countries in the 1980s and 1990s reached a peak of more than 700 percent for the average emerging country, nearly 700 percent for threshold countries (excluding Liberia), and nearly 900 percent for oil producers and other sub-Saharan African countries. Only

¹⁰ This is in end-2009 net present value terms. Source: United Nations, Millennium Development Goals Indicators

¹¹ International Monetary Fund (2012)

recently, has the average debt-to-export ratio fallen below the 150 percent ratio level as recommended by Reisen and Ndoye.

As described earlier, each recipient country under debt relief faced two key dates: a “Decision Point”, under which they were deemed to be eligible for debt relief; and a “Completion Point”, when they essentially graduated from the debt relief program. Figures A1 to A4 in the appendix provide information about certain debt flows with highlights of these points for each country. At times, they illustrate the dramatic increase in FDI for particular countries. This relationship appears particularly strong in countries that have experienced consistent, robust growth in recent years. In the early 2000s, African countries began to take on new and better economic and democratic policies and they had a lessening debt burden. Around this time many African countries emerged from the low growth equilibrium many of them had been stuck in for decades. In this context, we consider the HIPC decision point as the start of a structural break; a kind of “proxy plus”, where both debt relief and policy changes made it possible for many African countries to break the debt circle and begin to grow their economies and reduce poverty. Further evidence of this structural break is shown in the World Bank poverty numbers where, in 2008, the absolute number of people living in poverty in Africa fell for the first time in history.¹²

3. Trends in African FDI

Debt relief represents one form of official development assistance (ODA) intended to spur long-term market-based economic growth. Moss (2011) refers to the concepts of “digging holes” and “capital flows”, of which the former represents service provision and infrastructure development, while the latter represents assistance intended to spur an enabling environment for growth. Trends in African FDI indicate whether ODA in the form of debt relief has appropriately triggered capital flows into a relatively assistance-dependent region.

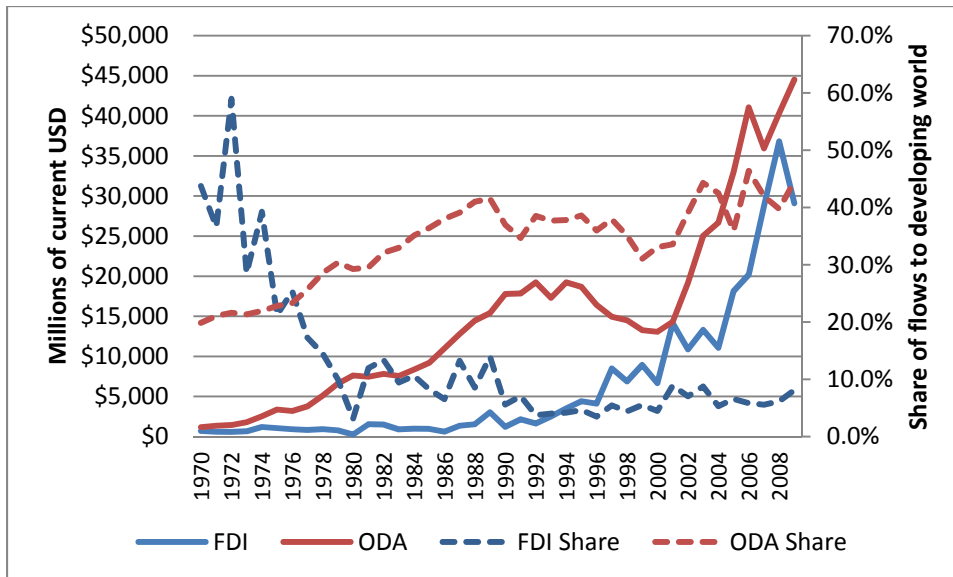
Throughout the latter half of the twentieth century, Africa lagged the rest of the world with regard to the creation or receipt of private investment, capital formation, and global FDI flows. For its primary source of external capital, Africa relied on development aid, usually in the form of concessionary loans. In an empirical analysis, Nicholson (2012) identifies sub-Saharan Africa as an “AID-oriented region” in which aid flows continue to dominate private investment flows.¹³ As Figure 5 shows, the African share of FDI in developing countries was more than 50 percent in the 1970’s, reaching a peak of 59 percent in 1972, but slipped below 10 percent by the 1990s; meanwhile, Africa’s share of development aid has reached around 40 percent.¹⁴

¹² <http://iresearch.worldbank.org/PovcalNet/index.htm?1>

¹³ This designation contrasts with “FDI-oriented regions” in which investment has overtaken development as the primary source of external capital. FDI-oriented regions include East Asia, Latin America, and the former Soviet Union, where development aid has been drawing down heavily in the past decade and private investment has been increasing substantially.

¹⁴ Regarding total global FDI (not just those to developing countries), in 1970, Africa received 6 percent of total global FDI, but these fell to around 1 percent for most of the 1980s and 1990s. Source: UNCTAD Stat. <http://unctad.org/en/Pages/Statistics.aspx>

Figure 5: Trends in development aid and FDI in Africa



Source: World Development Indicators

Asiedu (2002) investigates the “Africa effect” in which the explanatory factors for FDI in developing countries may not have similar force in sub-Saharan Africa. Using data for the years 1988 to 1997, she finds that determinants of FDI such as return on investment and infrastructure have positive impacts in developing countries outside of Africa but have no statistically valid impact in sub-Saharan African countries.¹⁵ In addition, she finds that “openness to trade”, as defined by the ratio of total trade to GDP, promotes FDI in all developing countries but has a significantly smaller marginal impact in sub-Saharan Africa. She concludes that, on this metric, Africa is different and suggests that effective policies elsewhere may not be effective here. Asiedu explains the lack of explanatory power of return on investment as due to a reputation effect across the continent, including risk of investment, lack of information, and the risk of policy reversal. The openness-to-trade indicator may be less effective in Africa due to the debt cycle story, and infrastructure could be related to resource-based FDI in Africa. Collier (2007) suggests that a potential issue for investment in Africa may have been the “time-consistency” problem, in that present governments are unable to bind themselves from confiscating investments in the future which then diminishes investment. This dynamic, however, may have changed based on a structural policy reform of the 2000s.

Anyanwu (2012) finds in an analysis of FDI from 1996 to 1998 that FDI flows to African countries are positively associated with market size, openness, rule of law, clusters, and natural resources. He also found that FDI is negatively correlated with higher financial development in Africa, and that “higher FDI goes where foreign aid goes.” He argues that foreign aid affects FDI

¹⁵ Note that Asiedu (2002)’s measures infrastructure by the number of telephones per 1,000 people, which may no longer be a reliable indicator given changes in telecommunication technology. She points out that infrastructure might not be as relevant for resource-based FDI, which is common to Sub-Saharan Africa.

through a “positive vanguard effect”, by lowering perceptions of investment risks and cultivating donor-specific norms, while also improving social and physical infrastructure.

In sub-Saharan Africa, incoming FDI increased from US\$6.7 billion in 2000 to US\$25.7 billion in 2010. With these trends, foreign investment has become a much more significant source of capital for investment in African countries and in 2009 accounted for 18 percent of their gross fixed capital formation.¹⁶ The catalyst for the change in investment flows could be a number of factors, including debt relief or other types of development aid. We reassess these statistics under the hypothesis that the debt relief programs represent a potential structural break in the African investment climate. The programs themselves may be representative of a broader geo-political shift in Africa: post-war and post-debt.

4. Identification Strategy and Econometric Analysis

Our identification strategy is based on the natural experiment presented by the HIPC debt relief program of the 2000s, by creating control groups of “non-HIPC countries in Africa” and “HIPC countries outside of Africa.” These two comparison sets of longitudinal panel data allow us to identify the specific impacts of HIPC while isolating pan-African geo-economic and –political trends. The identifying assumption is simply that HIPC debt relief initiatives affected only those countries that received debt relief, with all other differences among countries captured by either geography, fixed effects, or other relevant controls. By including both non-HIPC countries in Africa and HIPC countries outside of Africa we obtain sufficient heterogeneity to capture the impact of the policies.

To this point, we engaged in three different tests, outlined in Table 1.

Table 1: Different Tests

Research Question	Econometric Method	Result
Did something happen in Africa?	Clemente, Montañes, and Reyes (1998)	<ul style="list-style-type: none"> • Solves for global max in t-stat to identify “optimal” structural break over time
Did it affect the determinants of FDI?	Elliot and Müller (2006)	<ul style="list-style-type: none"> • Analysis of parameter stability of coefficients
Was it a result of debt relief?	Natural Experiment around an Event Study	<ul style="list-style-type: none"> • Control vs. HIPC shows whether the effects were due to HIPC or not • Control vs. Africa shows whether the effects were African-centric or not • Control vs. “Event” shows whether the effects were due to debt relief, or to a “proxy plus”

¹⁶ Data according to WDI. These figures dipped slightly following the global recession.

We collected data on debt, gross capital formation, and FDI from the World Development Indicators on 42 sub-Saharan African countries from 1970 to 2010 to test this proposition.¹⁷ Table 2 describes the data used in the analysis with summary statistics presented in the appendix using determinants suggested by Anwanyu (2012).

Table 2: Data Description

Variable	Definition
FDIflows	Foreign direct investment, net inflows
UrbPop	Urban Population (percent of total)
GDPpc	GDP per capita (constant 2000 \$)
Trade	Trade (percent of GDP)
Credit	Domestic credit to private sector (percent of GDP)
ExRate	Official exchange rate (local currency per US\$, period average)
Telephone	Telephone lines (per 1,000 people)
ODAflows	Net ODA received
GDPgrowth	GDP growth (annual percent)

Source: WDI Tables

4.1 Evidence of a shift: structural breaks in debt and FDI

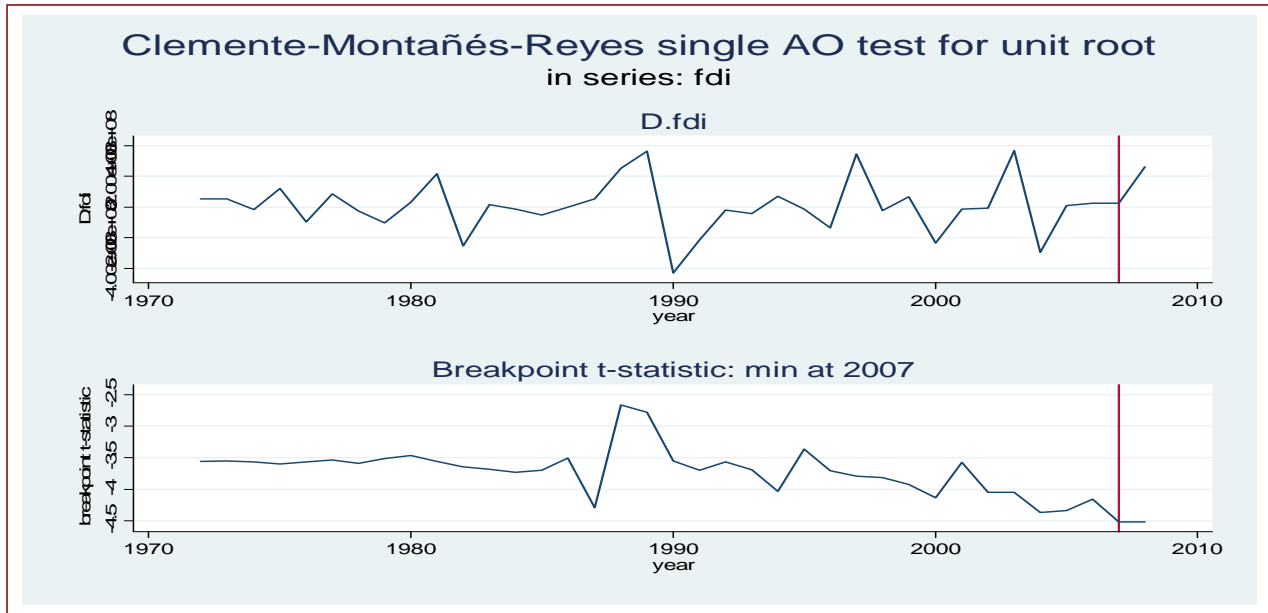
As shown in Figure 4 above, debt in constant dollars tracks very closely with debt as a percentage of GDP until around 2004 or 2005. In recent years, debt in constant dollars has slightly risen while debt as a percentage of GDP has fallen. Although African debt levels in nominal terms are beginning to return to pre-relief totals, could this recent increase represents investment that leads to growth? If there has been a fundamental change in the nature of public and private loans in Africa, it could manifest itself in macroeconomic data through a shift in the estimated relationships between different variables. For example, if debt prior to the break funded activities less conducive to economic growth, such as personal consumption or warfare, the estimated relationship between debt and growth would be different. In statistical terms, there would be a difference in the estimated coefficients at some measurable significance: that is, a structural break.

Clemente, Montañes, and Reyes (1998) develop tests that allow for the data to reveal structural breaks in a time series, which involves a global search for the maximum absolute value of the test statistic; as Baum (2005) describes the process, it yields “the strongest rejection of the unit root null hypothesis.” We employ this test to identify specific shifts in the data to provide an indication of whether a statistically significant shift occurred for individual countries of Africa over the past decade; that is, whether something fundamentally changed in the relationship of debt and investment.

¹⁷ Data was not available for Equatorial Guinea, Namibia, Niger, Sao Tome and Principe, and Somalia. Due to the time period under investigation, South Sudan was not included in the analysis.

Figure 6 shows the results for the FDI series for the example country of Liberia. The *clemao* test identifies the optimal structural break for Liberia in 2009, the year between its decision point and completion point. Note also the sharp movement in the FDI time series in 1989, the year that hostilities erupted in the country. The Stata command *clemao2*, incorporating the double-break model of Baum, Barkoulas, and Caglayan (1999) accounts for the possibility of two breaks and respects the implications of a both a global and a local maximum.

Figure 6: *Clemao* analysis of structural break



Tables A-2 and A-3 in the Appendix show, the structural breaks for debt and FDI, respectively, for all African countries. For exposition, Figure 7 show histograms of the data in those tables. These histograms show debt with a peak in the late 1980s and FDI with a peak in the mid-2000s. This visual evidence is consistent with a story that a debt crisis occurred in Africa in the mid-1980s that was resolved by the mid-to-late 2000s, after which time foreign investment began to flow to the economies of the continent.

Figure 7: Structural breaks for FDI and debt

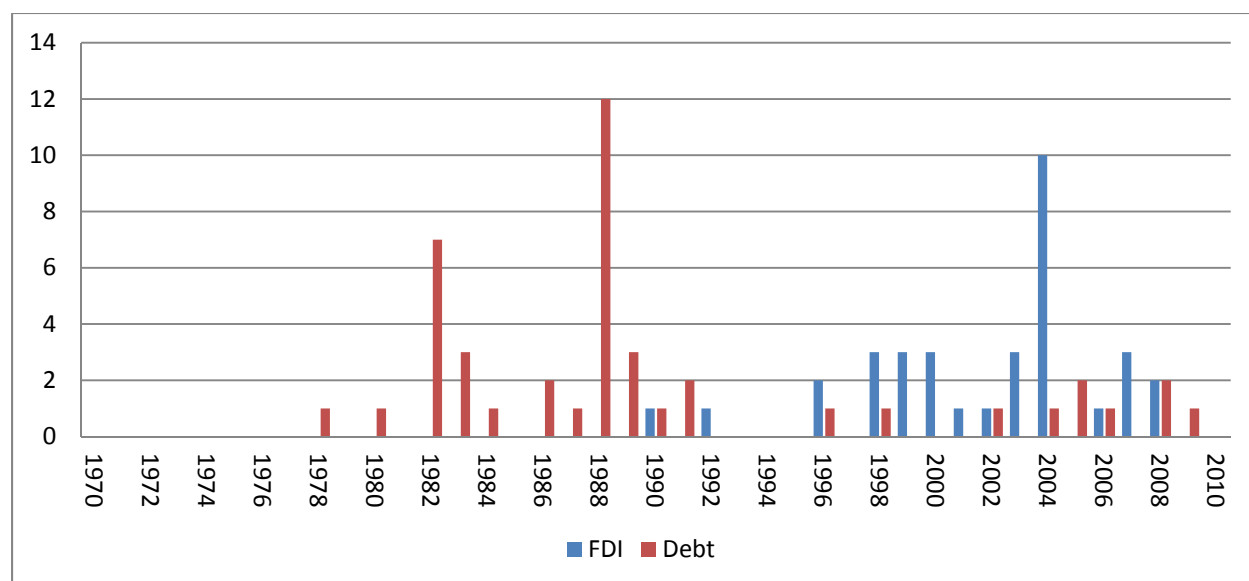


Table 3 shows the statistical relationship between external debt and private investment, as measured by gross capital formation and FDI. A negative relationship appears to exist between debt stock and gross capital formation, but this effect disappears when accounting for country-specific features through the inclusion of fixed effects. The flow of FDI as a share of GDP, however, is shown to be negatively related to external debt stocks when accounting for country and year fixed effects. These results suggest that lowering debt could increase FDI in a country.

Table 3: Debt/GDP impact on private investment

	Gross Capital Formation (n=1,473)	Foreign Direct Investment (n=1,495)
External Debt (no Fixed Effects)	-0.0071**	0.0058***
	(-2.11)	(3.69)
R ²	0.0030	0.0090
External Debt (with Fixed Effects)	0.0040	-0.0121***
	(0.77)	(-6.18)
R ²	0.0361	0.1045

T-statistics in parentheses. *** 99 percent significant ** 95 percent significant * 90 percent significant.

4.2 Impact on FDI: changes in parameter stability

Debt management, however, is not so much a determinant of FDI as it is a proxy for general conditions of economic governance and so we check if a structural break has occurred among the determinants of FDI in the same timeframe as debt relief. Although these results do not imply causality, they demonstrate that the changing nature of FDI flows to Africa are strongly linked temporally with the debt relief initiatives.

While the determinants of FDI flows have been discussed extensively in the economic literature¹⁸, research on Africa has tended to emphasize its differences. As referenced above, Asiedu (2002) concludes that the determinants of FDI may differ in Africa compared to elsewhere. As her data ended with 1997, the period prior to events investigated in this paper, Table 4 replicates the analysis using data from 1970 to 2010. As found by Asiedu, little correlation exists between openness and return on investment on FDI in Africa. Moreover, a Chow Test for the break year 2004 suggests that with regards to the determinants of FDI, no structural break exists for these determinants.

Table 4: Replicating Asiedu (2002)

	FDI (n=37)	
Openness	0.048 (1.33)	-0.020 (-0.50)
Telephones	612.3*** (4.17)	975.3*** (5.20)
ROI	-138.981 (-0.29)	-693.870 (-1.63)
growth		-2.068 (-0.32)
Govt		-0.418*** (-3.76)
Money		-0.000 (-0.09)
Intercept	-515.917	-957.189
R_sq	0.7218	0.8040
Chow test (2004):	F(3,30) = 0.03 Prob > F = 0.9920	

For individual countries, however, the relationship between FDI and African economies appears to have changed. Anwanyu (2012) asks: “Why Does Foreign Direct Investment Go Where It Goes?” and provides updates on the statistically relevant determinants of FDI for sub-Saharan countries. We use these previous analyses of FDI in Africa to investigate the impact of debt relief initiatives on foreign capital flow to the region. Replicating the Anwanyu determinants, we incorporate the Stata test *qLL* (quasi-local likelihood), based on Elliot and Müller (2006), to test for parameter instability. It tests whether any structural break occurred over the time period in question. Table 5 shows the *qLL* determinants for all countries, clearly suggesting a shift in the determinants of FDI for many African countries between 1970 and 2010.

¹⁸ See, among others, Caves (1982) and Markusen (1995).

Table 5: Parameter Stability for Determinants of FDI, individual African countries

Country	t-stat	Country	t-stat	Country	t-stat
Angola	no data	Gambia, The	-33.445	Rwanda	-36.48
Benin	-33.135	Ghana	-95.697	Sao Tome and Principe	no data
Botswana	-190.536	Guinea	-669.997	Senegal	-28.831
Burkina Faso	-42.947	Guinea-Bissau	-316.18	Seychelles	-38.58
Burundi	-124.561	Kenya	-42.199	Sierra Leone	-35.44
Cameroon	-49.068	Lesotho	-44.428	Somalia	no data
Cape Verde	-51.412	Liberia	-60	South Africa	-88.693
Central African Republic	-52.012	Madagascar	-54.297	South Sudan	no data
Chad	-56.459	Malawi	-56.24	Sudan	-154.853
Comoros	-349.867	Mali	-38.901	Swaziland	-42.155
Congo, Dem. Rep.	-34.908	Mauritania	-649.334	Tanzania	-124.502
Congo, Rep.	-45.171	Mauritius	-29.839	Togo	-78.739
Cote d'Ivoire	-29.716	Mayotte	no data	Uganda	-75.925
Equatorial Guinea	-869.616	Mozambique	-54.583	Zambia	-31.328
Eritrea	-52.313	Namibia	-228.327	Zimbabwe	-33.382
Ethiopia	-363.75	Niger	-38.408		
Gabon	-36.566	Nigeria	no data		
	Threshold Values (for statistical significance)				
	1 percent	5 percent	10 percent		
	-40.24	-35.74	-33.45		

4.3 Are these results a result of debt relief?

As the Clemente, Montañes, and Reyes (1998) test indicated structural breaks in both time series with peaks in expected years and the Elliot and Müller (2006) suggested statistically significant difference in determinants of FDI for particular countries, but not for Africa as a whole, this section incorporates a natural experiment that exploits information captured in panel data. For the natural experiment around an event study, we use:

- Control (non-HIPC countries) vs. HIPC shows whether the effects were due to HIPC or not:
- Control (non-African countries) vs. Africa shows whether the effects were specific to Africa
- Control (non-indebted countries) vs. “Event” shows whether the effects were due to debt relief (a “proxy-plus”).

We develop the econometric approach for an event study by isolating both a policy event (such as the HIPC decision point) and a control group (such as non-HIPC country).¹⁹ The control group is impacted by all other influences *except* for the policy event. This approach directly accounts for the implications that the “something” that happened in Africa over the past decade resulted from deeper shifts in economic governance; that is, we isolate the “proxy-plus.” The control groups address whether HIPC occurred due to better economic governance, leading to a shift in the

¹⁹ As an example of this approach, see Buraimo, Migali, and Simmons (2012).

impacts of FDI, or whether better economic governance lead to both HIPC debt relief *and* a shift in the inflows of foreign direct investment. Figure 8 diagrams the event study into quadrants.

Figure 8: Event Study

	Non-HIPC Country (J=0)	HIPC Country (J=1)
Pre-Decision Point (D=0)	Event=0	Event=0
Post-Decision Point (D=1)	Event=0	Event =1

The estimating equation is based on Anwanyu's (2012) determinants of FDI in Africa:

$$(1) \quad FDI_{i,t} = \alpha_i + \alpha_t + \beta_1 FDI_{i,t-1} + \beta_2 urbpop_{i,t} + \beta_3 GDPpc_{i,t} + \beta_4 Trade_{i,t} + \beta_5 Credit_{i,t} \\ + \beta_6 ExRate_{i,t} + \beta_7 Telephone_{i,t} + \beta_8 ODA_{i,t} + \beta_9 GDPgrowth_{i,t} + \varepsilon_{i,t}$$

We conduct estimation of (1) for the three natural experiments using the Stata command *xtregar* to account for autoregressivity in the time series. Table 6 shows the results.

Table 6: Results of FDI flows

	<u>Baseline</u>	<u>Control</u>	<u>HIPC</u>	<u>Control</u>	<u>Event</u>	<u>Control</u>	<u>Africa</u>
L.FDIflows	0.467*** (17.59)	-0.0443 (-0.63)	0.397*** (7.42)	0.403*** (14.40)	-17.12 (-0.11)	0.671* (2.17)	-0.206 (-0.66)
urbpop	1.481*** (4.73)	1.811* (1.97)	-0.614 (-1.08)	1.586*** (4.46)	0.386*** (4.27)	0.242 (0.11)	1.292 (0.59)
GDPpc	0.0680* (2.14)	0.234 (0.98)	-0.145 (-0.63)	0.0757* (2.32)	0.0356 (0.11)	-0.0714 (-0.17)	0.138 (0.33)
Trade	1.693* (2.21)	1.443 (0.59)	0.119 (0.08)	1.432 (1.73)	0.143 (0.86)	1.752 (0.68)	-0.0886 (-0.03)
Credit	8.701*** (4.32)	34.50*** (5.37)	-16.02*** (-4.11)	10.35*** (4.82)	1.810 (1.41)	2.781 (0.53)	7.284 (1.27)
ExRate	0.0537 (1.53)	1.749 (1.72)	-0.853 (-1.67)	0.0522 (0.63)	-10.10 (-1.83)	-1.681 (-0.57)	1.733 (0.58)
Telephone	-24.00** (-3.11)	-73.87** (-3.04)	34.16 (1.77)	-29.17** (-2.98)	-0.0106 (-0.12)	14.29 (0.35)	-40.06 (-0.96)
ODAflows	0.00245*** (5.09)	0.0118*** (7.48)	-0.0057*** (-6.04)	0.00307*** (5.82)	1.448 (0.04)	-0.00026 (-0.13)	0.00298 (1.41)
GDPgrowth	2.411 (1.01)	5.961 (0.73)	-2.226 (-0.50)	2.896 (1.16)	-0.00171* (-2.07)	3.141 (0.30)	-0.479 (-0.04)
_cons	-774.0*** (-6.52)	-500.6*** (-3.54)		-800.2*** (-6.20)	-5.000 (-0.68)	-736.6*** (-5.21)	
N	1303	1303		1303		1303	
adj. R-sq	0.303	0.358		0.304		0.307	
t-statistics in parentheses							
* p<0.05 ** p<0.01 *** p<0.001"							

The first result to acknowledge is that none of the coefficients in the analysis for Africa are statistically significant. Although this lack of statistical relevance is due in part to the small sample size of non-African countries, it underscores a stronger implication: the variance of determinants of FDI are not affected as much by the presence of countries in sub-Saharan Africa as much as by the HIPC designation and the “event” of the Decision Point for debt relief. Debt relief is a story about Africa only because most debt relief took place in Africa.

The baseline results are consistent with Anyanwu (2012) with the statistically significant variables UrbPop, Trade, and ODA carrying signs consistent the conclusions that: 1) FDI flows to countries that receive more foreign aid; 2) large market size (represented by Urban Population) attracts FDI; and 3) export-oriented economies facilitate foreign direct investment. Also in the baseline, the coefficient on Telephone is negative, which is counterintuitive and calls into question the continued relevance of using kilometers of telephone lines as a measure of infrastructure in developing countries.

The impact of debt relief initiatives is manifest in the variables Credit and ODA. The coefficient on Credit is positive in the baseline model, which suggests that higher levels of domestic credit to the private sector (as a percentage of GDP) has a positive impact on FDI flows. For the HIPC analysis, the Credit coefficient is positive for the control groups in both the HIPC and Event analyses but statistically half the size for HIPC countries.²⁰ These results suggest that the impact of domestic markets on FDI is a dominant factor in financially secure (non-HIPC) economies. The Event study provides further supporting evidence in that the diminished impact on the Credit coefficient is statistically insignificant. The conclusion is that by the standards of statistical relevance, Credit has a negative influence on FDI for heavily indebted poor countries that disappeared following the debt relief initiatives. That is, prior to the initiatives, a heavy dose of domestic credit negatively impacted FDI. Following debt relief, the levels of domestic credit did not affect FDI. By these standards, recently increasing debt levels in formerly indebted countries are “a good kind of debt.”

ODA follows a similar pattern, although with a much smaller impact on the magnitude of the coefficient. While FDI may follow foreign aid, the effect is diminished in heavily indebted, poor countries. These results are consistent for both the HIPC and Event control groups, although the HIPC countries have a smaller aggregate coefficient for ODA flows.²¹ This result suggests that while FDI may follow foreign aid, the effect is diminished in heavily-indebted, poor countries. The diminished effect on ODA does not extend to the Event analysis, suggesting that following the Decision Point the relationship between foreign aid and foreign direct investment is the same in HIPC countries as elsewhere, which supports the widely-expressed idea that “aid works in good environments.”²²

²⁰ $34.50 - 16.02 = 18.48$

²¹ $0.0118 - 0.0057 = 0.0061$

²² See, among others, Burnside and Dollar (2000).

5. Conclusions

Our results suggest that the next step in African development, following debt relief, should be investment. We conclude that a fundamental shift in economic governance occurred over the past decade creating market-based incentives for private investment. Although the climate can shift quickly, through such events as another global recession or a resurgence of civil conflict, the evidence implies that the debt relief initiatives were successful and African economies are currently in the process of sustained, market-based growth.

While recognizing that HIPC and MRDI may be a proxy for deeper economic governance, the debt relief itself appears to have played a substantive role regarding foreign direct investment. Since much of the \$75 billion in debt relief granted to HIPC countries was in the form of overseas development assistance, these results pose an interesting question about the relationship between foreign aid and FDI, whether aid is a “signal” for confidence in the markets of developing countries or whether aid offers a direct channel to improve market conditions. This paper has demonstrated a direct impact, to the extent that debt relief itself was manifested in assistance and has positively affected the flows of foreign direct investment to formerly indebted countries.

Another conclusion to be drawn is that there is no statistical difference for HIPC countries in Africa compared to HIPC countries outside of Africa. To the extent that African countries have historically offered different incentives for FDI and other market-based activities, these differences appear to have arisen because countries in Africa have skewed towards being heavily-indebted and poor. One story is that when it comes to debt and FDI, Guinea is more like Guyana than like Botswana. Debt relief is a story about Africa only because most debt relief took place in Africa. An implication is that following the debt relief initiatives, we can anticipate that FDI will flow to Africa by similar mechanisms as in other regions. If the continent is “open for business”, the ability for countries to again engage in public financing to improve market conditions should be anticipated as a positive turn of events.

One future direction will analyze FDI by sector, specifically disaggregating the flows to account for extractive industries. As foreign investment in Africa has traditionally been focused on natural resources, further indications that the market potential of the region has shifted in the past decade will be indicated by the mix of investment opportunities. This line of research would also benefit from a stronger measure of infrastructure that accounts for roads, electricity, and internet access.

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Appendix

Table A-1: Debt-to-Export Ratios

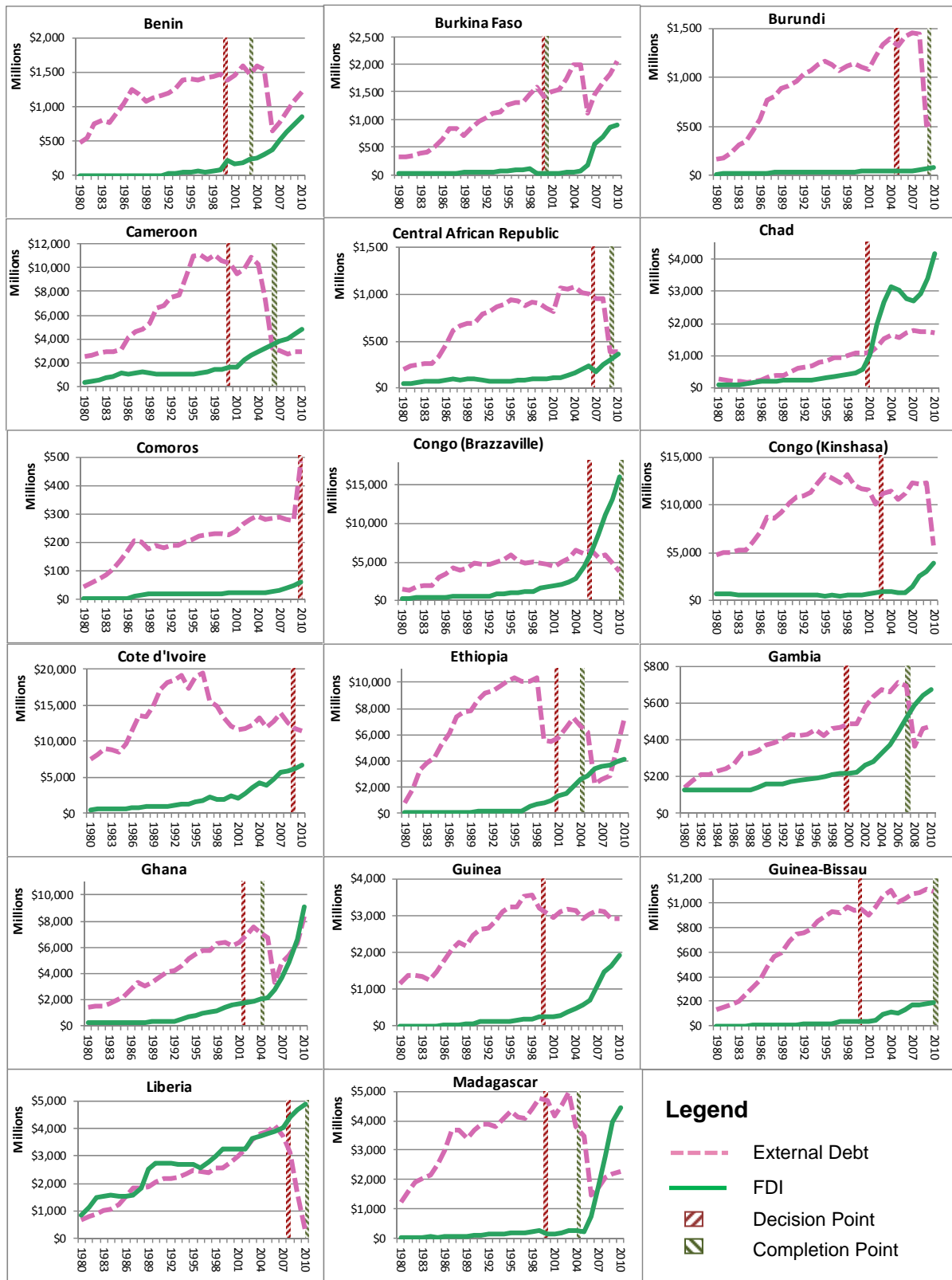
Country	1970	1980	1985	1990	1995	2000	2005	2010
Angola				215 %		115 %	49 %	38 %
Benin	86 %	214 %	365 %	425 %	345 %	405 %	266 %	130 %
Botswana	73 %	24 %	47 %	26 %	29 %	15 %	9 %	35 %
Burkina Faso	84 %	191 %	333 %	245 %	378 %	600 %	368 %	
Burundi	58 %	205 %	359 %	1018 %	899 %	2014 %	1457 %	
Cameroon	48 %	137 %	116 %	292 %	532 %	441 %	214 %	46 %
Cape Verde				311 %	228 %	219 %	130 %	133 %
Central African Republic	40 %	97 %	193 %	318 %	414 %	454 %	599 %	
Chad	46 %	162 %	176 %	219 %	266 %	465 %	49 %	52 %
Comoros		409 %	690 %	527 %	461 %	669 %	509 %	
Congo (Brazzaville)	125 %	147 %	243 %	326 %	430 %	185 %	120 %	37 %
Congo (Kinshasa)	45 %	201 %	312 %	372 %	824 %	1213 %	433 %	169 %
Cote d'Ivoire	72 %	210 %	296 %	504 %	411 %	288 %	143 %	123 %
Djibouti				64 %	140 %	134 %	141 %	
Eritrea					28 %	313 %	1070 %	
Ethiopia				1287 %	1401 %	558 %	334 %	211 %
Gabon	65 %	55 %	58 %	145 %	148 %	112 %	69 %	29 %
Gambia	26 %	133 %	248 %	194 %	228 %	239 %	358 %	199 %
Ghana	121 %	372 %	467 %	376 %	347 %	252 %	174 %	88 %
Guinea				299 %	416 %	417 %	292 %	185 %
Guinea-Bissau	0 %	978 %	2275 %	2865 %	3021 %	1384 %		
Kenya	100 %	158 %	269 %	320 %	248 %	224 %	120 %	95 %
Lesotho	97 %	79 %	430 %	404 %	355 %	263 %	99 %	76 %
Liberia	68 %	112 %	268 %			2319 %	1940 %	
Madagascar	228 %	230 %	720 %	721 %	564 %	394 %	246 %	
Malawi	192 %	270 %	373 %	348 %	527 %	606 %	480 %	60 %
Mali	555 %	277 %	661 %	594 %	568 %	456 %	235 %	
Mauritania	31 %	322 %	355 %	454 %	292 %	613 %	344 %	110 %
Mauritius		73 %	100 %	54 %	60 %	34 %	21 %	21 %
Mozambique			2214 %	2285 %	2114 %	1029 %	199 %	170 %
Niger	45 %	140 %	410 %	472 %	497 %	534 %	394 %	
Nigeria	79 %	47 %	408 %	270 %	274 %	126 %	42 %	11 %
Rwanda	19 %	113 %	196 %	488 %	1545 %	841 %	512 %	
Senegal	61 %	176 %	310 %	258 %	260 %	276 %	164 %	115 %
Seychelles		84 %	81 %	80 %	71 %	63 %	94 %	
Sierra Leone	46 %	187 %	557 %	807 %	752 %	1035 %	599 %	239 %
Somalia	212 %	329 %	2955 %	2641 %				
South Africa					74 %	67 %	46 %	45 %
Sudan	112 %	642 %	1251 %	2958 %	2561 %	845 %	350 %	178 %
Swaziland	47 %	51 %	114 %	39 %	24 %	23 %	20 %	30 %
Tanzania				1199 %	582 %	525 %	284 %	145 %
Togo	32 %	193 %	253 %	235 %	347 %	350 %	197 %	
Uganda	52 %	285 %	256 %	836 %	532 %	530 %	336 %	73 %
Zambia	85 %	202 %	547 %	585 %	555 %	652 %	216 %	52 %
Zimbabwe		50 %	193 %	163 %	183 %	149 %	213 %	139 %

Source: World Bank, World Development Indicators and Author Calculations. Countries with no data are removed from the table.

Appendix: Data Summary Statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
FDI	1742	3.07	8.17	(82.89)	145.20
UrbPop	2080	0.31	0.15	0.03	0.86
GDPpc	1885	891.18	1,322.63	54.51	9,279.11
Trade	1855	72.83	40.31	-	280.36
Credit	1802	18.84	17.84	0.68	161.98
ExRate	2125	339.05	1,122.41	0.00	18,498.60
Telephone	1776	1.96	4.07	0.01	30.30
ODA	1820	12.17	13.12	(0.25)	181.01
GDPgrowth	1890	3.72	7.28	(51.03)	106.28

Figure A 1: HIPC Countries in Africa



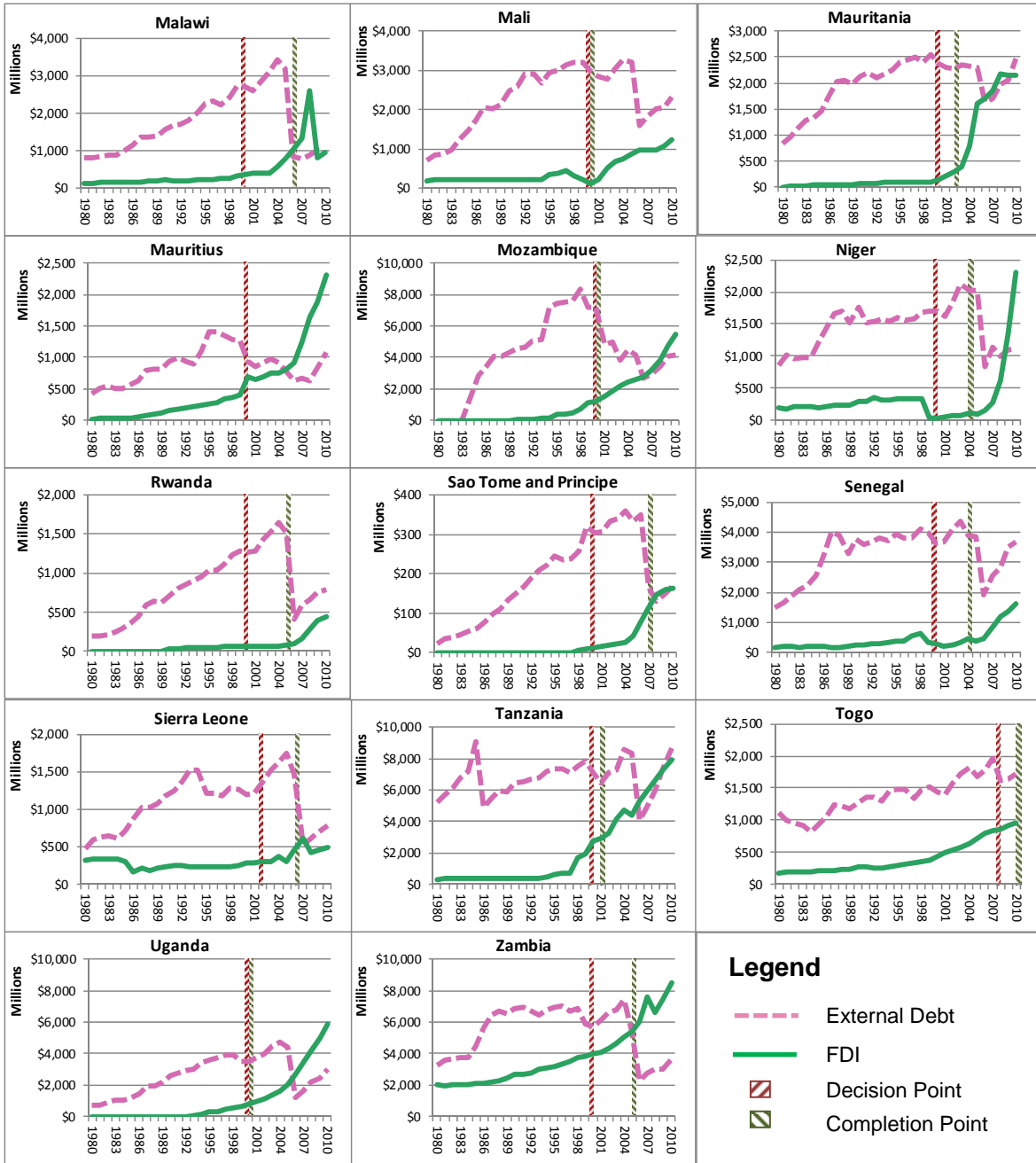


Table A-2: Structural Breaks, debt

Country	One break	Two breaks		Country	One break	Two breaks	
AGO	2009	2000	2004	MLI	1986	1987	2007
BDI	1988	1988	2005	MOZ	2002	1991	2002
BEN	1983	1983	2007	MRT	1983	1979	1988
BFA	1988	1984	1995	MUS	1988	1988	2002
BWA	2006	1988	2002	MWI	1988	1991	2007
CAF	1988	1982	1988	NER	1982	1982	2007
CIV	1982	1982	1993	NGA	1984	1984	2007
CMR	1996	1991	2007	RWA	1988	1989	2007
COG	1982	1982	1991	SDN	1991	1983	1991
COM	1988	1989	2005	SEN	1982	1983	2003
CPV	2004	2000	2008	SLE	1982	1980	1988
ERI	2005	2000	2005	STP	1990	1992	2004
ETH	1983	1984	2000	SWZ	1998	1979	1998
GAB	1988	1988	2004	SYC	2008	2002	2007
GHA	1991	1983	1992	TCO	2005	1992	2004
GIN	1989	1982	1991	TGO	1980	1980	1993
GMB	1988	1983	1995	TZA	1978	1979	2003
GNB	1989	1984	1991	UGA	1988	1988	2007
KEN	1988	1981	1988	ZAF	2008	2004	2007
LBR	1988	1988	2004	ZAR	1987	1979	1988
LSO	1989	1984	1991	ZMB	1982	1984	2007
MDG	1982	1983	2007	ZWE	1986	1983	1991

Table A-3: Structural Breaks, FDI

Country	One break	Two breaks		Country	One break	Two breaks	
AGO	gaps in data	gaps in data		MLI	2006	1992	2000
BDI	1998	1998	2007	MOZ	gaps in data		
BEN	2004	1989	2004	MRT	2003	2000	2003
BFA	2004	1991	2004	MUS	2004	1998	2006
BWA	1999	1999	2003	MWI	2000	2000	2005
CAF	2004	1979	2005	NER	2007	1978	2005
CIV	1990	1990	1994	NGA	2004	1986	2004
CMR	1999	1999	2005	RWA	2004	1991	2004
COG	2008	2004	2007	SDN	gaps in data		
COM	gaps in data			SEN	2003	1994	2006
CPV	2004	1996	2005	SLE	2001	1984	2003
ERI	2000	2000	2003	STP	gaps in data		
ETH	gaps in data			SWZ	2003	1986	2003
GAB	1999	1992	1999	SYC	2002	1994	2002
GHA	2007	1995	2007	TCO	2000	2000	2004
GIN	2004	1998	2004	TGO	1998	1980	1998
GMB	gaps in data			TZA	1996	1996	2002
GNB	gaps in data			UGA	gaps in data		
KEN	2004	1993	2004	ZAF	1998	1994	2005
LBR	2007	1987	2007	ZAR	gaps in data		
LSO	1992	1994	2001	ZMB	2004	1986	2004
MDG	2008	2004	2007	ZWE	1996	1994	1996