

# HIV/AIDS: DETERMINANT AND DETERRENT OF FOREIGN DIRECT INVESTMENT

Gina Flakes

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Approved by:

Thomas Oatley

Mark Crescenzi

Stephen Gent

## ABSTRACT

GINA FLAKES: HIV/AIDS: Determinant and Deterrent of Foreign Direct Investment.  
(Under the direction of Thomas Oatley)

Given the attenuating effects of HIV/AIDS on a nation's working population, infrastructure and economy, it is likely that the virus may compromise the unindustrialized world's developmental prospects. Scholarship on Foreign Direct Investment (FDI), a well supported channel for development, suggests that AIDS would stand as a particular deterrent to these inflows, as foreign capital owners have primarily extractive, market, and/or efficiency seeking motivations. Thus, nations with a withering labor force, national infrastructure and/or markets are unlikely to be attractive investment destinations.

Prior investigations of FDI's determinants have focused on structural factors, e.g. regime type, economic status. These studies have not considered the role of societal conditions like disease prevalence in the investment calculus. This paper addresses the current empirical void, by conducting a statistical evaluation of AIDS' affect on foreign investment inflows. I find strong support for my hypothesis that AIDS has a negative impact on attracting FDI.

## **TABLE OF CONTENTS**

### **CHAPTER**

<b>I). INTRODUCTION.....</b>	<b>1</b>
<b>II). THEORETICAL BACKGROUND: HIV/AIDS &amp; FDI.....</b>	<b>6</b>
<b>III). STATISTICAL ANALYSIS.....</b>	<b>25</b>
<b>IV). CONCLUSION.....</b>	<b>37</b>

## **I) INTRODUCTION**

In July 2006, two of the world's most prominent and recognizable figures, former US president Bill Clinton and the world's wealthiest individual Bill Gates, joined together in hopes of generating greater international commitment to confronting the HIV/AIDS epidemic. Since that time, the "double-Bills" have traveled the globe raising social awareness, political coordination, and financial support for combating the disease which they, and many within the international community, have deemed "public enemy number one." Their petition for immediate and resolute action is predicated on the fact that HIV/AIDS is more than just a health concern, as it carries severe repercussions for a nation's economic as well as political situations, and ultimately its developmental prospects.<sup>i</sup>

Since HIV/AIDS was first identified during the early 1980s, the disease has claimed more than 30 million lives. The scope and severity of this epidemic continues to defy expectations. The World Health Organization's 1991 estimate that 40 million would be infected by 2000 has proven more than 20 million short. UNAIDS now projects that by the year 2011, AIDS will have prematurely ended the lives of around 100 million individuals ([UNAIDS/WHO AIDS Epidemic Update 2005](#)).

Beyond the tragic, untimely loss of lives, the harsh effects of the epidemic bleed across social, political and economic dimensions, as well as the North-South developmental divide. The disease, which primarily afflicts the most productive segment of society- adults aged 15-49, erodes the labor force, subsequently decreasing

national savings, investment, and productivity. Reductions in the labor force also diminish tax revenues, which in turn depletes government coffers and attenuates its infrastructural capacity (Gallup & Sachs 1997; Bloom, Sachs, Collier & Udry 1998). Such drastic losses in productivity and political capacity led delegates at the 2000 UN Millennium Summit to declare HIV/AIDS as one of the chief barriers to development, and included a specific objective to reduce the prevalence of HIV/AIDS in its Millennium Development Goals (MDGs).<sup>ii</sup>

While HIV/AIDS has a significant presence on every continent, save Antarctica Australia, the disease's strongest hold is on the developing world. In several lesser-developed countries (LDCs), infection rates hover near thirty percent, with many other nations seemingly headed toward that same mark. Yet, despite the epidemic's concentration in the global "South," the advanced industrial world, too, has a real interest in helping the LDCs overcome this developmental burden. First, the advanced industrialized countries (AICs) have economic interests in the matter. The stunted development of states compromises the efficiency of the open integrated global economy, limiting the array and amount of goods produced, as well as access to markets. The arrested development of the LDCs also means a continued need for transfers of aid and assistance from the advanced industrialized world. Second, there are interests of "high politics" involved. The disease's devastating effects on governmental capacity and national infrastructure effectively transforms countries into "weak states," which are purported to serve as havens for terrorist and/or insurrectionist activity, as well as ethnic strife. The US has long recognized HIV/AIDS as a significant security concern, and in 1999, the Clinton National Security Council officially declared the epidemic a threat to

US national security, fearing that its spread could destabilize the entire world (White House Press Release, April 28 2000).

These practical concerns, in addition of course to the obvious moral gravitas of the situation, have prompted developmentally oriented international organizations like the IMF and World Bank to explore the specific channels through which the disease compromises development. In December 2005, the IMF and World Bank released the unprecedented work, “The Macroeconomics of HIV/AIDS,” as it was the first to accommodate health conditions into the developmental agenda. The study provided strong empirical confirmation of the disease’s devastating impact on a nation’s macroeconomic situation. Specifically, it found that in addition to losses due to worker mortality, productivity was also depressed by the heavy healthcare costs forced on businesses. The study also demonstrated that the disease compromises market strength and domestic savings and investment, as families suffering income losses are forced to divert finances toward treatment costs.

The IMF-WB research also featured one of the first glimpses into the disease’s potential impact on foreign direct investment inflows (FDI). While it did not contain specific theoretical cause or empirical support, the study hypothesized that HIV/AIDS is likely to deter foreign investment inflows. It also highlighted the need for further exploration into this relationship, given a large amount of prior research indicating FDI’s potential to serve as an effective channel for development. FDI is argued to spur development by facilitating a host nation’s access to international markets and technology, creating new employment, imparting managerial expertise, and transferring savings from the AICs for investment in countries where domestic savings are limited, as

is most often the case in high prevalence HIV/AIDS countries (Bhagwati 2002, Oatley 2003, Moran, Graham, & Blomstrom 2005, Markusen 1997, Levine 1997).

Although there has been a great deal of research conducted on the determinants of foreign investment, for the most part, these studies have focused on structural factors, such as regime type and economic status (GDP). There has been little to no attention given, however, to the role that societal conditions such as disease prevalence play when foreign capital owners are deciding where to invest. Given the fact that foreign capital owners choose to invest primarily because of extractive, market seeking, and/or efficiency seeking motivations, it stands to reason that nations with a withering labor force, weakening national infrastructure and/or shrinking markets may be a less than attractive investment destination.

Thus, there remains a need to explore the role that health factors, such as the prevalence of infectious diseases, play in attracting, or more likely, deterring FDI.

The purpose of this paper is to address the current empirical void, by conducting a statistical evaluation of HIV/AIDS' affect on foreign investment inflows. Using new HIV/AIDS and FDI data from the World Health Organization 2003 (WHO) and World Bank (2004 World Development Indicators), I statistically test for a relationship between HIV/AIDS prevalence and FDI inflows, hypothesizing that the two variables are negatively correlated.

In the following section, I discuss the theoretical background behind my argument. I first provide a brief overview of the disease's epidemiological trends, as well as the literature regarding its economic effects. I then review the literature on FDI, beginning with a discussion of FDI's role in the development process. Next, I highlight the

theoretical arguments on foreign investing, and the empirical findings on the primary determinants of FDI. I conclude this section with an argument regarding how the epidemiological consequences of HIV/AIDS and the motivations of foreign investing, interact, or more likely conflict with each other. I also provide a brief case study on South Africa to illustrate my argument.

Section three includes the statistical analysis. In two sets of time-series cross-sectional regressions, while controlling for a number of third variables, I find solid statistical support for my argument. I conclude the study in section four, highlighting its academic contributions, and my hope that such research endeavors will catalyze greater international commitment to addressing this devastating epidemic.



## **II) THEORETICAL BACKGROUND: HIV/AIDS & FDI**

### **A) HIV/AIDS: EPIDEMIOLOGY AND ECONOMIC CONSEQUENCES**

*Epidemiology*            One unintended consequence of increased world travel and interactions has been a surge in disease transmission, namely HIV/AIDS. Greater mobility within societies and abroad has helped make HIV/AIDS a global concern, with a commanding presence on each of the continents, save Antarctica and Australia.

According to the Brookings Institute, today's fastest growing front includes three of the world's largest nations, Russia, China, and India. UNICEF concludes that unless China institutes aggressive prevention programs, the nation could have 10 million AIDS cases by 2010. And while India's prevalence is low at present, the nation is second only to South Africa in terms of number infected, almost six million (Avert India 2003; UNAIDS 2005 ). What is more, the disease appears to be making the move from high risk groups- intravenous drug users and sex industry workers- into the general population within each of the aforementioned nations. Even European and high income nations are not immune to the situation, as they are currently experiencing rapid growth rates within their high risk and minority populations (Lancet 2001).

Of course, the epidemic's tightest grip is on Africa. It is one of the leading causes of death on the continent, and in some Sub-Saharan countries, the disease accounts for more than half of all fatalities (Piot, Global Impact of HIV/AIDS, UN Programme on AIDS ). According to UNAIDS, in high prevalence nations like Zambia and South Africa, a

fifteen year-old teenager faces a lifetime risk of infection and death of over fifty percent. In many Sub-Saharan nations, adult prevalence is approaching twenty percent, and the epidemic shows little sign of slowing.

The disease's epidemiological course has serious demographic, economic, political, and sociological implications. The demographic impact of HIV/AIDS is unique for two reasons. First, unlike the majority of other causes of death, AIDS fatalities will continue to increase as a result of infections that have already occurred. Second, HIV infection is highest among the most productive segment of society, including those in the best-educated and skilled sectors of the populations, as well women of child-bearing age, together with attendant transmission to children (Piot, 2003). Even in nations like Cambodia and Haiti, where infection rates are lower, AIDS is responsible for one-half of the deaths of those aged fifteen to forty-nine (Haaker, 2004).

Research indicates that the disease first appears within high-risk groups of society, including intravenous drug users and sex industry workers. The disease then makes its move into the general population, first spreading within more mobile, wealthier and better educated parts of the population. Once the disease becomes entrenched, it produces patterns of wider social vulnerability. Hence the positive correlation between higher educational levels and likelihood of infection characteristic in the initial stages of the epidemic reverses as it matures to a stable association between HIV and lower educational levels (Piot 2001, Vandemoortele and Delamonica 2000).

***Economic Implications*** The already tragic loss of millions of lives is compounded by the fact that these untimely deaths occur within the most productive sector of society. Unlike most diseases, which prey on the weakest segments of society- the young and

very old- HIV/AIDS afflicts presumably the strongest- adults aged 15-49 (Barks-Ruggles 2001). Long before the disease takes the life of an individual it incapacitates him or her to the point where working is impossible. Worker absenteeism/mortality, which inevitably follows infection, is not limited to low-skilled job sectors, but is experienced economy-wide. In 1996, medical doctor Josef Decosas conducted one of the first cross-sectional empirical studies on HIV/AIDS prevalence and development status, finding a strong negative correlation (-.751) between the two (Decosas 1996). In 1998, Richard Fredland became one of the first political scientists to pay systematic attention to the disease, arguing that HIV/AIDS is one of several inversely related determinants of development (Fredland 1998).

Aside from Fredland, however, political scientists have engaged little with the HIV/AIDS research agenda, leaving most work in the area to developmental economists and international organizations. Economist and developmental expert Jeffrey Sachs, head of the UN's Commission on HIV/AIDS Programme, found that HIV/AIDS' prevalence has a direct negative effect on specific dimensions of the economy, such as national productivity, savings and investment, and consumption, which ultimately hinder development (Sachs 1997, 1998, 2001).

The IMF and World Bank's 2004 study entitled, "The Macroeconomics of HIV/AIDS," confirmed the findings of the UN commission, and offered the IMF's unprecedented identification of health conditions, specifically HIV/AIDS prevalence, to be a factor of necessary inclusion within the developmental agenda. The three-hundred page publication used country level statistical modeling and analysis to delineate the channels through which the disease diminishes productivity. The study found worker

absenteeism and mortality to be the primary factor behind productivity losses. With fewer workers in the economy, production capacity is severely compromised, and subsequently, the nation's overall gross domestic product (GDP) decreases. According to the International Labor Organization, Zimbabwe, Botswana, and Namibia could lose 29-35 percent of their labor force by 2020 (Barkes-Ruggles 2001).

In addition to indirect revenue losses due to absenteeism, such as time off for care and funerals, recruitment and retraining, HIV/AIDS forces direct costs on companies, including sick leave, health benefits, death and disability benefits and pension liability. While at an individual employee level these costs may be nominal, when multiplied by the number of effected workers, they become quite significant. A Metropolitan Life insurance report projects that South African and Kenyan business expenses will be thirty percent higher by 2010 because of AIDS related costs. The report also estimates that the cost of life insurance as a proportion of salary will triple between 1997 and 2007, and pension benefit costs will nearly double.

HIV/AIDS also takes a harsh toll at the household level, constraining domestic consumption, savings and investment. Studies indicate that market strength can be compromised as families suffer income losses and are forced to divert finances toward treatment costs rather than conventional consumption spending. As household incomes and savings fall, discretionary spending must be diverted away from consumer goods to health care and funeral costs. Taking note of this loss in consumer spending, a number of South African industries, such as furniture and appliance manufacturer, JD Group, have relocated retail outlets to Europe.

Finally, many studies suggest that the disease places heavy strains on the state,

incurring substantial income losses as tax revenues fall. In addition, many governments have increased funding for HIV/AIDS related treatment costs, which subsequently reduces funding available for national infrastructure expenditures (Stover 1999).<sup>iii</sup>

Thus, the harsh effects of HIV/AIDS are not limited to just the economic arena, but extend into the social and political dimensions as well. However, for the purposes of this study, I limit my focus to the economic realm. I specifically look at the disease's implications for FDI, a relationship which has received limited theoretical and empirical attention. In the following section, I begin with a brief discussion on the critical and beneficial role that FDI can play in a nation's developmental process. I then provide a brief overview of the theoretical and empirical literature on FDI, and close this section with my theoretical argument on the interaction between HIV/AIDS and FDI.

## **B. FDI: DEVELOPMENT AND DETERMINANTS**

*Development* Beyond simply finding an interesting correlation between HIV/AIDS prevalence and FDI, the exploration of said relationship carries serious development implications. Thus, before beginning the evaluation of HIV/AIDS and FDI, it is first necessary to discuss what is meant by development, why it is desired, and how FDI affects its chances.

Within the context of international relations, development usually means the process whereby low-income national economies are transformed into modern industrial economies. Development entails a transition away from low value added sectors such as agriculture and natural resource extraction toward the establishment of both physical and institutional modern infrastructure.

A strong national economy in and of itself, however, is of little value unless it also

brings about improved living conditions for the inhabitants of the state. Thus, economic development is a means to the end of alleviating poverty among the citizens of the LDCs and thereby increasing their standards of living. There are certainly those who are skeptical of the relationship between national economic development and better living standards for the broad public, most commonly arguing that the fruits of growth are not evenly dispersed. The work of many scholars, most notably Dollar & Kraay and Ravallion & Chen, provides strong evidence to the contrary, demonstrating that as nations develop, poverty rates decline, while measures of inequality showed no tendency to get either better or worse (Ravallion and Chen 1997, Dollar and Kraay 2000). These studies have led development expert and World Bank official William Easterly, like many others, to conclude that “growth has been much more of a lifesaver to the poor” than other means like redistribution (Easterly 2002).

To understand the import of the process in more clear terms, Easterly notes that development means a reduced occurrence of infant mortality, as well as death from nutrient deficiencies, starvation, or parasites (Filmer & Pritchett 1997, Pritchett & Summers 1996). National growth and development are also associated with decreases in societal atrocities such as the oppression of women and minorities, as well as the forced labor of children as soldiers and prostitutes (Easterly 2002, Kidron & Segal 1995, Narayan et al. 1999).

The goal of development in the global South is also shared by the advanced world for all of the aforementioned moral concerns, but for practical ones as well. According to the neoclassical/liberal theory that underlies the current global economic arrangement, stunted economic growth decreases the efficiency of the system. That is, nations unable

to integrate into the international system, means that the system is not functioning at full capacity in terms of goods produced and markets accessible. Likewise, lagged economic development also means the continuation of heavy transfers of either direct bilateral aid from AICs, or indirectly through the developmental organizations which they fund.

The disease's devastating effects on governmental capacity and national infrastructure also give rise to security concerns for the North. States facing severe and prolonged economic failure often struggle to carry out its governmental duties, and verge on devolving into "weak states." These states, lacking the capacity to fulfill their governmental responsibilities of enforcing the rule of law and controlling their borders, are widely believed to serve as incubators of security challenges, including havens for terrorist and/or insurrectionist activity, as well as ethnic conflict.

***FDI & Development*** Having established what it is meant by development and the practical as well as moral impetuses for its furtherance, we now look at FDI's role in the process.

Following the economic crisis that swept through the developing world in the early 1980s, many of these nations sought help from the IMF. According to the "Washington Consensus" rationale that underlined both institutions, stifled development was the result of inefficient economic strategies associated with high levels of state intervention into the economy. To cure such inefficiencies, the IMF prescribed developing nations a set of structurally oriented reforms (SAPs), aimed at expanding the role of the market. Privatization, free trade, and unfettered financial flows were believed to be panaceas to the LDCs development ills.

The decades of SAPs have resulted in varying degrees of developmental success,

and several lessons learned. One of the most notable features of the developmental learning curve concerns capital flows, specifically that not all types of flows are as reliable. As the Asian Financial Crisis demonstrates, inflows of certain types of capital such as portfolio, bond, and equity can result in unstable and devastating situations. Known as “hot money,” these flows can be easily injected, and more importantly, quickly withdrawn from a developing nation at the first sign of trouble. In addition to their potential for aggravating crisis, it is now widely argued that they provide limited long term contributions to development.

There is strong evidence that FDI, however, constitutes a more permanent and beneficial type of capital flow for developing nations. As FDI most often means the establishment of a firm affiliate (I elaborate further in the following section), it is therefore costly to withdraw capital and impossible to remove completely the physical structures erected, and likewise the technological and managerial expertise imparted (Bosworth & Collins 1999, Reisen & Soto 2001, Taylor & Sarno 1999).

It is well documented that FDI spurs development in the near term by raising the efficiency of resource use in the host economy, as well as engendering long-term technological and managerial “spillovers.” These occur through three primary channels. First and particularly critical to our case, foreign investment can provide the missing but essential capital foundation needed to stimulate development in nations with low savings rates. Second, investment facilitates a nation’s integration into the global economy by establishing and enhancing trade flows, as trade and investment are recognized as mutually reinforcing avenues for cross-border activities. Finally, FDI helps to transfer technology and expertise from the North to the developing countries. Generally, foreign



investors provide technical assistance, upgraded production facilities, managerial/employee training, and other information to ensure the quality of their product. Such provisions can be transferred outside the firm and are likely to endure even if FDI is removed (Balasubramanyam 1996, Markusen 1996, OECD 2002, Moran, Graham, & Blamstram 2005.)

These channels, however, do not lead to automatic development. As in any situation or problem, the application of the remedy is of immense import; governments must take contextual concerns and conditions into account to fully realize the merits of FDI. Yet while, it cannot be considered as the developmental “magic bullet,” there is strong evidence demonstrating FDI’s role as a viable and integral piece of the developmental process.

### ***FDI: Theoretical Background and Empirical Determinants***

Private capital transfers have increasingly become the dominant flow of international capital. In 1996, private capital transfers, primarily in the form of foreign direct investments, accounted for 85 percent of all international capital flows, almost double the amount in 1990 (IFC 1997, 14). FDI now constitutes the largest single type of capital flow, outpacing international trade, and increasing at an average rate of 13 percent per year (Mallampally and Sauvart 1999). For most countries, FDI comprises a significant portion of domestic investment. Research suggests that in nations with low savings rates, as in most high prevalence HIV/AIDS countries, foreign investment can provide the capital foundation needed to stimulate economic development (Markusen 1997, Bhagwhati 2004).

FDIs are defined as private capital flows from a parent firm to a location outside of

the firm's home nation. FDI implies that a multinational enterprise conducts the production of goods and services in more than one nation, transferring assets or intermediate products within the investing enterprise and without any change in ownership (Li and Resnick 2003). These investments include equity capital, intracompany loans/debt and reinvested earnings. FDI can be distinguished from portfolio investments as they have longer time horizons and give the parent firm some level of control over the management of the foreign component- usually ten percent (IMF- International Finance Corporation FDI criteria, 1997). Typically, these ventures are not initiated for speculative purposes.

Producing abroad, however, involves additional costs for establishing and maintaining operations in a foreign land. The disadvantages of operating overseas have prompted scholars over the years to explore why many firms decide to produce abroad rather than at home. Although the earliest writings concerning the determinants of FDI can be traced back to Adam Smith and John Stuart Mill, Bertil Ohlin's 1933 work was perhaps the first to explicitly address the motivations of firms to operate abroad. According to Ohlin, investors are primarily motivated by the opportunity of exploiting growing markets, along with the possibility of financing these investments at relatively low rates of interests in the host country (Ohlin 1933). Ohlin's other determinants included the necessity to overcome trade barriers and to secure sources of raw materials.

In 1960, Hymer offered the first systematic analysis of issues relating to the advantages of large multinationals, market imperfections and control. Hymer viewed FDI as the result of structural market imperfection and the firm's desire to pursue monopoly power using its firm specific assets. Kindleberger (1969) and Caves (1971),

continued Hymer's analysis, elaborating on the basic argument that structure dictates conduct. FDI's will be made basically in sectors that are dominated by oligopolies. However, later studies have critiqued this argument, also known as the HKC tradition, for its failure to account for the role that technological competition plays in transnational production (Cantwell 2000).

Yet, the most prominent theoretical work on the subject, from which my argument primarily draws, is John Dunning's "eclectic paradigm of international production," also known as the OLI framework- Ownership, Location, Internalization (Dunning 1973, 1981, 1988, 1993). According to Dunning, his approach must be considered a paradigm, as it brings together conflicting theories, including those based on the industrial organization approach, transaction cost economics and trade and location theory (HKC, Rugman 1981, Vernon 1966). Dunning's theory focuses on locational factors, emphasizing possession of raw materials, labor costs, government incentives, and servicing of local markets as important determinants for FDI.

Dunning proposed that international production is motivated by three sets of advantages perceived by firms. The first set is *ownership advantages*. Essentially, the ownership component provides multinationals some advantage over existing firms in the foreign markets. Ownership benefits can include common governance of cross-border production and intangible assets, such as product innovations, management practices, marketing techniques, and brand names. Diversification across borders also permits firms to exploit economies of scale and develop monopoly power (Li and Resnick 2003). MNC's invest in order to exploit these firm specific advantages in foreign markets and secure higher returns.

Firms may also be motivated to invest abroad by *location-specific advantages*, or the characteristics of host countries regarding their economic environment or government policies. These advantages may be related to the actual endowments of the host country, such as scarce natural resources and abundant labor, or to the favorability of a nation's policy climate for foreign investment. For example, oil companies have to produce overseas where the necessary resources are available, while export processing firms usually base their decisions to invest on labor cost. Government policies on tariffs, domestic corporate taxation, investment or tax regulation of foreign firms, profit repatriation, royalties on extracted natural resources, technology transfer requirements, and labor market regulation, are also important considerations for investors. Firms may also invest in production facilities in foreign markets because transportation costs are too high to access these markets through exports.

Dunning's final factor, *internalization advantage*, speaks to the reason why firms decide to operate abroad rather than simply licensing a foreign provider to produce the good for the parent firm. Internalization advantages derive from a firm's hierarchical management of cross border production, and refer to a firm's direct control over its value added activities in multiple countries. When the risks of opportunism by foreign buyers and sellers are high, such as disrupting supplies and violating property rights in primary product and high technological industries, the firm has incentive to internalize production. Likewise, where economic rents from exploiting oligopolistic or monopolistic market structures are high, the firm is likely to claim hierarchical control of transnational production (Li & Resnick 2003).

A number of studies have attempted to assess empirically the theoretical work done

on the foreign investing. These studies have primarily concentrated on estimating the impact that different locational factors have on FDI (Agarwal 1980, Schneider and Frey 1985, Hein 1992). Although a definitive set of major determinants of FDI has yet to be reached, there are several variables that consistently appear throughout the literature. These variables include size of the market (annual GDP), development level (per capita GDP), and degree of openness. Other determinants related more to political conditions typically include regime type (democracy/autocracy), regime durability, and sociopolitical stability.

***HIV & FDI*** Aside from theoretical projections, however, researchers have paid limited attention to the role that health conditions, or disease prevalence, play in foreign investing. While the IMF/WB and UN Programme studies note that HIV/AIDS prevalence is likely to deter investments, they did not provide a theoretical grounds or empirical support for the claim. In this section, I combine the findings on HIV/AIDS' epidemiological and economic implications with the literature on FDI's determinants and provide a theoretical framework specifying how the disease deters foreign investment.

Apart from the concern that investors may have for sending their managers/staff into a place with high infection rates, HIV/AIDS deters investment as the economic and societal effects of the disease and FDI motivations directly conflict with each other. That is, the societal level tolls of HIV/AIDS- shrinking labor forces and markets and rising business expenses, are at odds with a foreign investor's designs for securing abundant resources or labor supply, cheap production costs, and/or large consumer markets. Thus, if we accept that capital owners have primarily extractive, market seeking, and/or efficiency seeking motivations, then it is not surprising that a country

burdened with a high HIV/AIDS rates would be a less attractive destination.

Specifically, I argue that HIV/AIDS can deter foreign investment in four primary ways.

1) ***Reduced labor supply***-Increased morbidity and mortality rates, direct and unavoidable consequences of HIV/AIDS prevalence, deter investors looking for locational advantages such as an abundant and/or cheap labor supply.

2) ***Increased direct costs to business***- In addition to the costs of establishing and maintaining production overseas, HIV/AIDS forces firms to bear more expenses from sick leave, health care coverage, and death/disability benefits.

3) ***Increased indirect costs***- Again, HIV/AIDS shifts additional expenses and production/profit losses onto firms through indirect means such as absenteeism, time-off for care and funerals, recruitment, and retraining. Both direct and indirect costs are clearly undesirable conditions, as owners are chiefly concerned with maximizing the firm's bottom line.

4) ***Attenuated markets***- Households affected by HIV/AIDS are forced to divert discretionary spending away from consumption to healthcare expenditures in both the public and private sectors. The disease compromises investors' intentions to exploit a nation's ownership-locational advantages by tapping into a strong consumer market.

### **C. South Africa: HIV & FDI**

These theoretical assumptions have been substantiated in survey data and interview transcripts. Anecdotal sources suggest that HIV/AIDS rates have become a key factor of consideration to capital owners deciding where to invest. According to a 2002 survey

conducted by BusinessMap Foundation, a non-profit investment think-tank, HIV/AIDS prevalence significantly contributed to an overall decline in African foreign investment (Kaiser 2003). The survey indicated that investors now seek premium rates of return, 15-20 percent in South Africa and above 25 percent in the rest of Sub-Saharan Africa, because of the increased risk profile for investment due to the region's AIDS situation. The survey also stated that while Southern Africa, with its abundant resources and tax-friendly policies, had traditionally been an attractive investment destination, increasing infection rates have drastically reduced investor interest (AEGIS-DMG 2002). Christopher Kopke, chief executive of Daimler Chrysler South Africa recently stated that "AIDS is definitely one of the factors inhibiting investment," and further added that "when I try to persuade foreign suppliers to invest here, they ask about four things- trade unions, cost of capital, crime and AIDS (World Markets Research Centre: In Focus 2002)." South Africa's chief economist, Gordon Smith echoed Kopke's belief that investors have become increasingly deterred by AIDS rates, stating that the destabilizing effects that AIDS has on populations is highly incompatible with investor interests. In the words of Smith, "uncertainty means sell rather than hold, much less invest more money, to investors (Africa Recovery 2001)."

**South Africa** The projected dynamic is borne out in the case of South Africa. The nation offers a particularly telling illustration as it is one of the world's most severely infected nations, despite its tradition of a strong and stable economy. South Africa's infection rates have soared to around 25 percent of the adult population, and the disease is prevalent among low and high income individuals (WHO 2003). These circumstances make it easier to dismiss the notion that HIV/AIDS is endemic to only the least

economically developed nations, those which would not be attractive destinations for FDI in the first place.

In South Africa, the disease accounts for over one third of all fatalities, and 40 percent of deaths among those aged 15-49, up from 9 percent in 1995 (World Markets Research 2002). The South African Department of Health reports that a staggering 60 percent of individuals aged 20-29 are HIV positive. The US Census Bureau projects that average life expectancy will be reduced from 65 years in 1998, to 35 years in 2008. Unless infection trends are reversed, South Africa's "population pyramid" will devolve into more of a "population chimney," as the majority of those lost will range from 15-49 years of age.

These trends are occurring in a traditionally strong and stable economy. South Africa has long been regarded as Africa's "economic powerhouse," accounting for over 40 percent of Sub-Saharan Africa's economic output, and boasting a relatively strong annual per capita income of \$10,270 (GNI/capita PPP International Dollars, World Bank 2004). The nation's economic stamina, however, has flagged in recent years, and many researchers attribute this decline, at least in part, to the rapid rise HIV/AIDS. In terms of the disease's macroeconomic impact, UNAIDS projects that the nation's GDP will be 17 percent lower than without the epidemic, constituting a loss of \$22 billion.

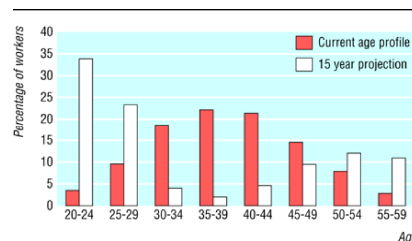
***Reduced Labor Supply*** HIV/AIDS has affected South Africa's labor supply across all sectors, skilled and unskilled. A 2004 International Labor Organization (ILO) report finds that South Africa's labor force is 10 percent lower today than it would have been without the epidemic, and by 2010 will have experienced a 25 percent reduction.

Deutsche Bank estimates that, currently, one third of semi and unskilled workers, and 13



percent of highly skilled are HIV infected. Much of South Africa's foreign investment derives from mining and automotive firms such as Debeers and Daimler/Chrysler, respectively. Considering the fact that both of these industries are highly dependent on a strong labor supply, it seems quite likely that South Africa's prospects for attracting and retaining FDI inflows will only continue to decline.

The mining industry, which accounts for almost 10 percent of the nation's GDP and employs well over 500,000 people on nearly 700 mines, has been hit particularly hard by the disease. A number of studies conclude that around 30 percent of gold miners are infected (BBC 2002). As the chart below indicates, the age composition of a typical South African mine will be considerably altered over the next decade. Whereas 60 percent of the 2002 mining workforce was aged between 30 and 44, in 2015 only 10 percent will come from this age bracket.



While the disease more prevalent among semi and unskilled individuals, those within the skilled sectors of the economy are not immune. In 2000, 20 percent of student nurses were HIV positive, and in a number of universities, incidence rates hover around 30 percent (McDonald 2002). The ILO found that AIDS was one of the leading causes of mortality among teachers, as 39 out of every 1000 deaths were AIDS related. These figures are particularly dire for South Africa as it already struggles with a weak skilled

sector. In a nation where such skills are scarce, the preceding trends pose an ominous threat to South Africa's economic development.

***Direct and Indirect Business Costs*** Businesses also are becoming increasingly aware of the significant costs of the disease. Metropolitan Life, a South African insurance company, estimates that payroll expenses will be at least 25 percent higher as a result of HIV/AIDS related costs, including pension and sick leave payouts (Africa Recovery 2001). Other studies suggest that expenses such as recruitment, retraining, absenteeism, and health care costs reduces the average South African firm's profits by 6-8 percent, annually (Avert 2004). For foreign investors whose chief concerns are their bottom-lines, these additional costs will be difficult to ignore.

***Attenuated Consumer Market*** Finally, the nation's shrinking consumer market has likely played a significant part in deterring investments. In 2002, The Kaiser Foundation released a report confirming that in households where at least one member is HIV/AIDS infected, spending on necessities is significantly lessened. The study estimated the following reductions in traditional spending because of HIV/AIDS related expenses (Kaiser 2002).

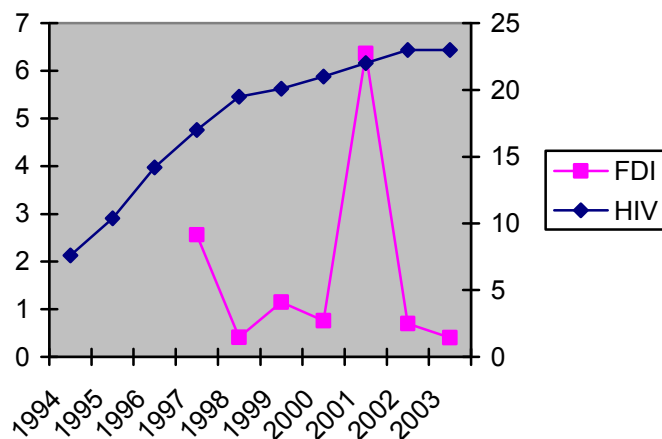
<b>*CLOTHING</b> 21%	<b>*ELECTRONIC</b> 16%
<b>*FOOD</b> 6%	<b>*OTHER SERVICES</b> 9%

Kaiser 2002

Such cuts in the "basics" suggest an even greater reduction in consumption on luxury and non-essential goods. Researchers estimate that by 2010, consumption per capita will be 12% lower as individuals are forced to divert spending toward AIDS related health care costs (Ardnt 2002). JD Group is just one of many firms relocating to

find broader consumer markets. For investors with “market seeking” intentions, South Africa has proven to be a less than attractive destination.

It is difficult to see how foreign investment could be anything but adversely impacted by the social and economic stresses HIV/AIDS has induced in South Africa. Since the late 1990's, South Africa's overall economic performance has steadily declined. More specifically, the momentum of FDI inflows has slowed and there seems to be strong evidence supporting the notion that AIDS has played a significant role in this trend. The chart below illustrates South Africa's increasing AIDS prevalence and decreasing net FDI inflows. There is, of course, one year of notable exception, 2001, to the overall declining FDI trend. The extreme rise in FDI inflows can be attributed to the unbundling of cross-share holdings involving London-listed Anglo American and DeBeers of South Africa, which economists regarded as more akin to portfolio flows in its economic effects than FDI (Gelb 2004).



### **III. STATISTICAL ANALYSIS**

In this section, I statistically evaluate the relationship between HIV prevalence and FDI inflows, in two sets of tests. The first set estimates the impact of HIV prevalence on FDI inflows using three different time series cross sectional ordinary least squares (OLS) models and one least squares dummy variable model (LSDV). The results from each of the tests confirm the expected negative correlation between HIV and FDI. The second set of models establishes the robustness of the findings by taking into account other variables or conditions that might instead be driving the relationship. The range of tests provides strong and consistent empirical support for my theoretical argument that HIV prevalence negatively affects a nation's ability to attract foreign investment inflows.

#### **Empirical Analysis: Time Series Cross Sectional**

The first group of times-series cross-sectional regressions (TSCS) uses country level data from seventy nations in Asia, Africa, and the Caribbean, over a seven year period (1996-2002). These nations were chosen on the basis of the availability and reliability of data for each, in addition to the wide range of values that the countries displayed across each of the variables of interest. In order to evaluate the effects of the predictors on FDI inflows persistent across time and space, I use TSCS analysis. While TSCS analysis best captures the dynamic effects of the relationships, this method is also vulnerable to serious assumption violations in terms of autocorrelation and heteroskedasticity (Stimson 1985). To address these issues, I also include an AR-1 test that corrects for autocorrelation, and a model that uses panel-corrected standard errors.

Additionally, I include a least squares dummy variable model, another method of estimation suitable for evaluating the hypothesized relationship.

Model 1 presents the findings from a standard OLS TSCS, while Model 2 shows the results from the AR-1 test and Model 3 those with panel-corrected standard errors (PCSEs). Model 4 displays the findings from the least-squares dummy variable (LSDV) model. These regressions were run using a fixed rather than random effects model for methodological and theoretical reasons. A Hausman test, which determines whether a fixed or random effects model would provide the more efficient coefficient estimations, indicates that the former is the better model in this case. This result can be theoretically supported, as the fixed effects model better takes into account the fact that there are country specific variables not included in the regressions. This model shows the consistent effect that each of the independent variables has across the units of analysis.

The dependent variable, net FDI inflows as a percentage of GDP from 1996-2002, is taken from the World Bank's "World Development Indicators 2004." The net FDI inflow figure measures a change in the position of foreign investors in a country (Jensen 2003), and is the most commonly used measure in the FDI determinants' literature (Jensen 2002, Li and Resnick 2003, Chan and Mason 1992, Oneal 1994). A country with a positive FDI inflow position is attracting new investments, while a country with a negative position is experiencing an outflow of capital. It should be noted that this measurement is different from net FDI flows, which is found by subtracting a nation's total FDI outflows of domestic capital from its total FDI inflows. Because this study is concerned with the impact that HIV prevalence has on attracting foreign investment and not with the decisions of domestic interests to move capital abroad, net inflows is the

more appropriate figure.

The data for the primary predictor of interest, HIV/AIDS prevalence, come from the World Health Organization and Population Reference Bureau's HIV/AIDS surveillance statistics (WHO 2003). The rates represent the percentage of each nation's adult population (15-49) that is infected with HIV/AIDS. Though ideally this study would include rates dating back to the late 1980s, when the disease was first identified, concerns of surveillance availability and reliability force 1996 to be the first point in the time series. While the rates included may not be perfect, they are the most reliable estimations available, and if anything have been underestimated (WHO).

The models also include the most frequently cited and supported determinants of foreign investment from the economics and political science literature as control variables. These variables are MARKET SIZE, ECONOMIC DEVELOPMENT LEVEL, REGIME TYPE, REGIME DURABILITY, and OPENNESS.

**MARKET SIZE (GDP)** There is strong empirical support for the positive impact that the size of the host market has on its ability to attract FDI. Schneider and Frey (1985), Chan and Mason (1992), Jun and Singh (1996), and Li and Resnick (2003) posit that large markets are more likely to attract FDI because of an expected stream of future returns. Consistent with these studies, I proxy a nation's market size with its yearly GDP converted to international dollars using purchasing power parity (PPP) rates for intercountry comparability and log the variable to deal with its skewed distribution. These figures are from the World Bank's World Development Indicators 2004, and are expected to positively affect FDI inflows.

DEVELOPMENT LEVEL (PER CAPITA GDP) Prior studies exploring the relationship between development level and FDI inflows have produced inconclusive results. The work of Jensen (2003) and Li and Resnick (2003) suggest that more developed countries attract higher levels of FDI than less-developed nations, because of differences in consumer purchasing power, capital endowment, and infrastructure. However, this argument has achieved limited statistical validation, appearing significant in only a small portion of tests. Other studies have found a negative correlation between development and FDI inflows. This somewhat surprising relationship can be explained perhaps by the fact that nations at higher developmental levels have greater savings rates, and therefore are less likely to need or seek foreign investment (Oatley 2005). Likewise, investors looking for a cheap labor markets may be less inclined to invest in nation's with higher developmental and living standards. I operationalize DEVELOPMENT LEVEL using a nation's yearly per capita GDP based on international PPP, and log the figures to deal with its skewed distribution. All figures are from the World Bank's World Development Indicators.

REGIME TYPE There remains much debate among scholars over the impact that regime type has on foreign investing. Olsen, Jensen, Feng, Tsebelis, and Pastor, to name just a few, argue that characteristics of democratic regimes, such as stronger property rights protection and more stability, are more conducive for attracting FDI. Contrastingly, scholars such as Rodrik, O'Donnell and Haggard contend that investors favor autocracies because dictators are able to shield them from popular pressure for higher wages, stronger labor protection, or less capital friendly taxation policies. Still others, Przeworski, Alvarez, Cheibib, and Limongi, have found that regime type has no

real influence on FDI inflows. Using Jagers and Gurr's Polity IV data set, I created a dichotomous variable to evaluate regime type. Their data provides an ordinal ranking of political regimes on a scale of -10 to 10 (autocracy to democracy). Consistent with other studies including a dichotomous measure of democracy, I code nations with scores ranging from -10 to 5 as autocratic (0), and those scoring from 6 to 10 as democratic (1).

**REGIME DURABILITY** The econometric literature regarding the effect of regime and durability indicates that capital owners are more likely to invest in nations with stable governments. According to the work of Schneider and Frey and Li and Resnick, volatility of regime change increases investors' uncertainty about a host country's future economic policies, including interest rates, taxes, etc. Other work, however, finds there to be no statistically significant relationship between regime durability and FDI inflows (Sethi, Suisinger, Phelan and Berg 2003). To operationalize REGIME DURABILITY, I use Jagers and Gurr's Polity IV data. According to the Polity manual, this score is reached by taking the number of years since the most recent regime change, defined by a three-point change in the Polity score over a period of three years or less, with the end of transition period marked by either the lack of stable political institutions or the year 1900, whichever comes last. The first year in which a new polity is established is coded as the baseline "year zero" (value=0) and each subsequent year increases the value of the variable by one. I expect there to be a positive correlation between REGIME DURABILITY and FDI inflows.

**OPENNESS** Constraints on foreign capital inflows and outflows should carry a negative effect on a foreign investors decision where to invest. Under various



restrictions, foreign investors may have difficulty accessing a nation, become trapped on shore after investing, or both. Conversely, it is assumed that nations relatively open to foreign inflows should be associated with FDI inflows. Studies conducted by Gastanaga et al. (1998) have empirically corroborated this assumption, finding that fewer capital flow restrictions are associated with greater capital inflows. Using the World Development Indicators' measurement of openness, I expect that openness to be positively correlated with FDI inflows.

## **Findings**

Table 1 presents the statistical results from three model specifications. Model 1 features the findings from the TSCS regression, model 2 the AR-1 autocorrelation, and Model 3 the regression with PCSEs. The first number refers to the coefficient and the second to the standard error. Appendix 1 lists all countries used in the estimations and Appendix 2 features the correlation matrix of variables based on the estimation sample in Table 1.

The statistical results provide strong support for my theoretical argument that HIV prevalence negatively affects FDI inflows, while also remaining consistent with the findings of core econometric studies. Across each of the OLS models, MARKET SIZE remains positive and significant. The variable loses significance in the LSDV model. The results are consistent with the findings of previous studies, making MARKET SIZE one of, if not the most frequently supported determinants in the FDI literature. While DEVELOPMENT LEVEL is not significant using the LSDV method, it appears significant in each of the OLS models, however, in a negative direction. This finding is not altogether surprising as the empirical history of this determinant's effects has been

mixed. Recent studies conducted by Oatley find a similar negative relationship between development level and FDI.

The tests shed no light on the regime type debate, as the DEMOCRACY variable does not meet the standards for statistical significance in any of the models.<sup>iv</sup> My findings can be considered as somewhat of a testament to the sensitivity of the operationalization of this variable. Jensen's research, which relies on a more complex rubric for democratic classification, produce a very different, and much brighter picture, of the impact that democratic regimes have on attracting foreign investment inflows. Yet many have found that autocracies are more likely to attract FDI (Haggard), or that the direction of the relationship depends on regime type conjunction with other country conditions and policies (Li and Resnick). REGIME DURABILITY, however, appears to have a mild positive effect on FDI inflows in models 1 and 3, at the .1 significance level. This result is consistent with Li and Resnick's 2003 study on FDI and Democratic Institutions (Li & Resnick 2003).

Despite the seemingly obvious positive correlation expected between OPENNESS and FDI inflows, the results of my models do not display a significant correlation between the two variables. The result, however, is not inconsistent with other studies, which have also produced results that were not statistically significant, or even negative (Jensen 2003). This somewhat confounding finding might be the result of selection effects. That is, countries with little possibility of attracting FDI flows do not employ capital constraints, while those that attract high levels of FDI may institute policies to somewhat control or monitor inflows.

The empirical results in Table 1 demonstrate the hypothesized inverse correlation

between HIV prevalence and FDI inflows. HIV is the only variable to remain significant across each of the four models. The HIV coefficient is remarkably similar across the tests, varying only from -.225 to -.252. The results from the fixed effects and the PCSE model indicate that for every one percent increase in HIV prevalence, FDI inflows correspondingly decreases by .225 percent of the nation's GDP. Moving just half a standard deviation above the mean, in terms of HIV/AIDS prevalence while holding other variables at their means, pushes the FDI coefficient to -.9407. This figure suggests that a nation with a steadily increasing HIV prevalence stands to lose substantial amounts of capital inflows over the years. Actual economic figures from South Africa affirm the predictive value of the coefficient. From 1996 to 2002, South Africa's HIV/AIDS rates increased by around nine percent. The model predicts that South Africa's FDI inflows as a percent of GDP should have decreased by two percentage points, and lie somewhere around .6, down from its 1996 figure of 2.6. This estimation is extremely close to the nation's actual 2002 FDI figure of .69 percent of GDP.

$$y(\text{net FDI inflows}_{1996-2002}) = \alpha + \beta(\text{Independent variables}_{1996-2002}) + \varepsilon_i$$

**Table 1. *Effect of HIV/AIDS on FDI inflows to nations 1996-2002***

VARIABLES	MODEL 1	MODEL 2	MODEL 3	MODEL 4
		(AR 1)	(Panel Corrected)	(LSDV)
HIV	-.2252** (.0842)	-.2529** (.1044)	-.2252* (.1374)	-.2434** (.1243)
Market Size	16.5093** (5.5813)	14.1731** (9.9627)	16.5093** (5.9135)	4.6539 (11.6879)
Development Level	-16.4233** (6.9476)	-13.4728** (11.4285)	-16.4233** (7.2332)	-3.1304 (11.4004)
Democracy	-.5476 (1.1367)	-1.4260 (1.3282)	-.5476 (.7045)	-2.7130 (.2.2756)
Regime Durability	.0763* (.0409)	.05625 (.0524)	.0763* (.0166)	.05354 (.0874)
Openness	.0283 (.0243)	.04434 (.0310)	.02829 (.0358)	.0600 (.0525)
Constant	-268.0857 (85.8469)	-234.897 (140.136)	-285.4611 (94.4131)	-
Rho	-	.9840	-	-
Observations	325	260	325	195
R <sup>2</sup>	.0205	.0562	.7005	-

*Note:* All regressions are cross-sectional time series fixed effects estimates with standard errors in parentheses, using net FDI inflows as a percentage of GDP from 1996-2002 as the dependent variable.

\*\*p<.05

\*p<.1

### **Empirical Analysis: Robustness**

The second set of models assesses the generalizability and robustness of the findings, using the same predictors as in the first set, while adding an Africa dummy variable in Model 4, and limiting the sample universe to only African nations in Model 6.

Model 7 includes an interaction variable between HIV and DEMOCRACY, which explores whether democracy mitigates losses as suggested in the literature (Sen 2000). Table 2 displays the results from the fixed effects method. The HIV/AIDS coefficient under AR-1 and PCSE specifications are consistent with the fixed effects results, while MARKET SIZE and DEVELOPMENT LEVEL no longer appear significant. The results of the Arellano Bond and PCSE models are included in the appendix.<sup>v</sup>

The Africa dummy variable included in Model 5 serves to address a potential selection effects critique, i.e. that the negative relationship between HIV and FDI is really a function of the fact that many African nations are represented in the panel data. The results, however, go a long way to counter the selection bias claim, providing strong support for the robustness of my findings. While the coefficient of the dummy variable is negative, the result is not significant. Moreover, the presence of the dummy variable does not have a meaningful impact on the other predictors. HIV remains negative and significant at the .01 level. The coefficients of the MARKET SIZE and DEVELOPMENT LEVEL variables are also significant and in the same direction as in the first set, while REGIME DURABILITY again displays a small positive correlation at the .1 level. As in the first set, REGIME TYPE and OPENNESS are not statistically significant.

Limiting the sample set to only African nations, I find essentially the same results as in the first set of models. The HIV coefficient is negative (-.199) and significant at .06, while MARKET SIZE and PER CAPITA GDP are also significant in the same directions as in prior models. The only difference from the findings within this model is that openness is now positive and significant.

The insignificant Africa Dummy variable and consistent findings with in the Africa sub sample indicate that the relationship is not a statistical artifact of low levels of FDI into African nations. Rather these results highlight the robustness of my theoretical argument as the coefficient maintains its sign and significance in the full and restricted sample sets.

In Model 7, I explore whether the interaction of two of independent variables (democracy and HIV) has a distinct effect on FDI inflows. The work of scholars, namely Amartya Sen, provides theoretical and empirical grounds for exploring this relationship. Sen's research on democracy and development suggests that democracies are more inclined and better equipped for addressing public health concerns like an HIV epidemic. Sen contends that the merits of this type of political system- an "intrinsic value for human life and well-being" and leaders accountable to their people- compel the government to take a more proactive and aggressive stance against public health concerns (Sen 1999). Given this argument, one would expect to find that the relationship between FDI and the interaction variable might instead be positive.

The results of the model, however, provides no greater insight into the impact that democracy has on coping with HIV prevalence, with respect to attracting foreign investment inflows. Though the sign of the coefficient is now in the anticipated positive direction, the results do not meet the standards for statistical significance.

**Table 2.** *Effect of HIV/AIDS on FDI inflows to nations 1996-2002*

VARIABLES	MODEL 5	Model 6	MODEL 7
	(Africa dummy)	(Africa Sub-Sample)	(HIV & Dem.)
HIV	<b>-.2215**</b> (.0843)	-.1999* (.1072)	-.2406** (.0864)
Market Size	16.4667** (5.5823)	18.3085** (7.1684)	16.283** (5.5922)
Development Level	-16.5405** (6.9450)	-18.0258** (8.8525)	-16.2881** (6.954)
Regime Type (Democracy Dummy)	-.5424 (1.1369)	1.4886 (2.7221)	-.9035 (1.221)
Regime Durability	.0765* (.0409)	.0445 (.0534)	.0727 (.0412)
Openness	.0329 (.0248)	.0992** (.0397)	.0273 (.0243)
DEM & HIV	-	-	.1250 (.1561)
Africa Dummy	-3.336 (3.455)	-	-
Constant	-264.4863 (85.9391)	-296.5501 (110.2116)	-263.7023 (86.082)
Observations	325	195	325
R <sup>2</sup>	.0728	.1142	.0717

*Note:* All regressions are cross-sectional time series fixed effects estimates with standard errors in parentheses, using net FDI inflows

as a percentage of GDP from 1996-2002 as the dependent variable.

\*\*\*P<.010

\*\*p<.05

\*p<.1

## **V. CONCLUSION**

In light of the epidemic's harsh ramifications across a state's social, political and economic dimensions, the somewhat odd partnership between political and financial leaders, Bill Clinton and Bill Gates respectively, proves all too fitting. The disease's epidemiological trajectory places unavoidable strains on the economy and governmental capacity. Thus while the disease is a significant burden for the health and functioning of any country, for those nations in the midst of the development quest, HIV/AIDS represents an especially significant obstacle.

One specific way HIV/AIDS negatively affects a state's economic situation, and ultimately the developmental process, is by deterring foreign investment inflows. Though FDI is by no means the "magic bullet" for development, there exists a great deal of research affirming its capacity to facilitate development. FDI represents a more reliable and lasting form of capital flow from the AICs to the developing world, which can provide the investment capital necessary for developmental efforts, help integrate the host nation into the international economy, and transfer technology and expertise.

The research presented in this paper provides theoretical backing and empirical support for the argument that HIV/AIDS prevalence negatively affects a nation's ability to attract foreign investment inflows. The statistical tests display a strong and robust negative correlation between HIV/AIDS prevalence and FDI inflows, holding other factors constant, including GDP, development level, and geographic locale (i.e. whether it is an African nation). The results also remained consistent with previous work



exploring the determinants of FDI, namely the positive correlation of national GDP to FDI inflows and negative relationship between development level (GDP per capita) and FDI. The relationships between other factors such as regime type, regime durability and openness were statistically insignificant, as in the majority of past studies.

The inverse relationship between HIV/AIDS and FDI inflows is rather pleasing intuitively, given what we know about the motivations and objectives of capital owners looking to invest abroad. Investors in search of strong and abundant labor forces, low production costs, and/or healthy markets are likely hesitant to invest in a high prevalence HIV/AIDS nation where those very conditions are steadily deteriorating.

The negative interaction between HIV/AIDS prevalence and foreign investment decisions is borne out in the case of South Africa. Despite the nation's solid economic history and record as a popular FDI destination, foreign capital inflows have steadily decreased over the past decade and a half. It would seem more than just coincidence that this decline has followed in the heels of the nation's ever intensifying struggle with the epidemic. Indeed, the interview transcripts of foreign investors indicate that there is a real correlation between HIV/AIDS prevalence and foreign investment decisions. The numbers, and just as significantly, the testimonies of actual foreign investors affirm HIV/AIDS' role as a significant deterrent to FDI, thereby highlighting the need to expand the conventional investigation of FDI and its determinants to conditions outside just structural ones.

With the incorporation of social or health matters into the FDI research agenda, future work should then explore whether HIV/AIDS, or other health conditions, affect various types of FDI, e.g. extractive, labor seeking, etc., to different extents.

Moreover, there remains a need to better incorporate health/disease conditions into the broader developmental research agenda. The academy, and in particular the political science discipline, has yet to truly engage in this issue. The World Bank and IMF's work indicates that there is need for further research on both the disease's impact on governmental capacity, as well as the government's potential for effecting the scope and course of the epidemic. Specifically, the notion of "political will" and its interaction with the disease is an area ripe with potential. Exploration of cases in which "political will" has been deemed the decisive factor behind successful HIV/AIDS reduction efforts, may help provide a better understanding of the concept which is so prevalently cited, despite the fact that the concept remains scantily defined.

Beyond the academic merits, such research advances will hopefully direct more attention to the epidemic and the need for an immediate and lasting commitment to combating it. Thus, meaningful programs and techniques tailored to meet the needs and circumstances of individual nations, not overly broad and reaching plans must be developed. Though most nations are not yet as severely plagued by the disease as South Africa, quite a few, unfortunately, seem to be headed down a similar path. Research indicates that with strong government commitment, or "political will," like in Uganda and Thailand, prevalence can be reduced. The key then, is to discover what exactly this "political will" is, and how it can be cultivated in other nations. Equally as important as improving the situation in Sub-Saharan Africa is preventing it from occurring in other areas of the world.

While the HIV/AIDS epidemic is primarily concentrated in the "South," it is not simply an issue of the lesser developed nations, as the disease's harmful effects extend

into the advanced industrial world as well. There are, of course, pragmatic reasons for concerted international efforts, including economic and security stability. But the need for the entire global community to join in this fight remains first and foremost a moral one, as this devastating epidemic represents what has been rightly deemed “the greatest humanitarian catastrophe of our time.”<sup>vi</sup>

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## NOTES

<sup>i</sup> XVI International AIDS Conference- Toronto, Canada, August 13-18, 2006

<sup>ii</sup> UN Millennium Development Goals which provided a framework for bridging the North-South developmental divide and significantly advancing the well-being of the world's poor and by 2015"

<sup>iii</sup> This is not, of course, to say that governments should withhold funding to HIV/AIDS treatment programs, but that the disease forces the state to divert financial support away from other programs like education, communications, etc.

<sup>iv</sup> Democracy remained insignificant even when HIV was not included in the model.

<sup>v</sup> The HIV/AIDS coefficient remained negative in each of the models, but was not significant within the Africa Dummy-PCSE model. The Africa dummy, however, was neither significant.

<sup>vi</sup> Greg Behrman. The Invisible People: How the U.S. Has Slept Through the Global AIDS Pandemic, the Greatest Humanitarian Catastrophe of Our Time. Free Press 2004

## APPENDICES

### Appendix 1: List of Countries Included in Estimation

Algeria	Egypt, Arab Rep.	Madagascar	Sri Lanka
Angola	Eritrea	Malawi	Sudan
Bahamas, The	Ethiopia	Malaysia	Swaziland
Bangladesh	Fiji	Mali	Tanzania
Benin	Gabon	Mauritania	Thailand
Botswana	Gambia, The	Mongolia	Togo
Burkina Faso	Ghana	Morocco	Trinidad and
Burundi	Guinea	Mozambique	Tobago
Cambodia	Guinea-Bissau	Namibia	Tunisia
Cameroon	Haiti	Nepal	Uganda
Central African	Hong Kong, China	Niger	Vietnam
Republic	India	Nigeria	Zambia
Chad	Indonesia	Pakistan	Zimbabwe
China	Jamaica	Papua New Guinea	
Congo, Dem. Rep.	Japan	Philippines	
Congo, Rep.	Kenya	Rwanda	
Cote d'Ivoire	Korea, Rep.	Senegal	
Djibouti	Lao PDR	Sierra Leone	
Dominican	Lesotho	Singapore	
Republic	Liberia	South Africa	

## Appendix 2: Correlations Matrix of Variables Based on the Sample in Table 1

Variable	Mean	Std. Dev.	Min	Max			
+-----							
fdi	3.00476	4.902678	-8.520027	40.58426			
hiv	5.628308	7.595192	.01	39.8			
LOG_GDP	23.92634	1.875749	20.62565	29.21617			
LOG_GDP_PC	7.620197	.8996712	6.102559	10.16585			
DEM	.3353846	.4728528	0	1			
openness	61.20626	41.6464	12.9	297.7356			
durability	12.46154	14.81978	0	52			
+-----							
	fdi	hiv	LOG_GDP	LOG_GD~C	DEM	openness	durabi~y
+-----							
fdi	1.0000						
hiv	0.0631	1.0000					
LOG_GDP	-0.1044	-0.2805	1.0000				
LOG_GDP_PC	0.0766	-0.0488	0.5048	1.0000			
DEM	-0.0280	-0.0655	0.2692	0.3497	1.0000		
openness	0.4542	0.0585	-0.0389	0.4823	0.0746	1.0000	
durability	0.0322	-0.1527	0.3917	0.4296	0.0950	0.1326	1.0000

### Appendix 3: AR-1: Afr. Dummy, Afr. Sub-sample, HIV/AIDS & Dem. Interaction

VARIABLES	MODEL 7	Model 8	MODEL 9
	(Africa dummy)	(Africa Sub-Sample)	(HIV & Dem.)
HIV	-.2553** (.1043)	-.2488* (.1347)	-.2560** (.1069)
Market Size	14.4445 (9.8508)	16.7873 (13.0126)	14.1798 (9.9622)
Development Level	-13.6398 (11.3322)	-16.5272 (14.7252)	-13.5253 (11.4231)
Regime Type (Democracy Dummy)	-1.4097 (1.3251)	-1.2884 (3.3352)	-.14817 (1.4087)
Regime Durability	.05666* (.0522)	.0288 (.0693)	.0558 (.0527)
Openness	.0403 (.0323)	.1176** (.0511)	.0442 (.0311)
DEM & HIV	-	-	.0275 (.2015)
Africa Dummy	1.3566 (3.6561)	-	-
Constant	-240.6752 (140.2686)	-271.8253 (190.6346)	-234.6495 (140.7626)
Observations	260	156	260
R <sup>2</sup>	.0575	.0950	.0565

#### Appendix 4: PCSEs- Afr. Dummy, Afr. Sub-sample, HIV/AIDS & Dem. Interaction

VARIABLES	MODEL 10	Model 11	MODEL 12
	(Africa dummy)	(Africa Sub-Sample)	(HIV & Dem.)
HIV	-.0317 (.0461)	-.0444** (.0526)	.0122 (.0641)
Market Size	-.0768 (.1022)	.1252 (.0935)	-.1105 (.0882)
Development Level	-.2375 (.4083)	-.7357* (.3968)	-.2447 (.4828)
Regime Type (Democracy Dummy)	-.1025 (.4039)	-.2947 (.5080)	-.2013 (.3382)
Regime Durability	.0051* (.0119)	-.0475 (.0317)	.0021 (.0131)
Openness	.0291 (.0143)	.0671** (.0336)	.0279* (.0141)
DEM & HIV	-	-	-.0136 (.0716)
Africa Dummy	.5819 (.5856)	-	-
Constant	3.150 (1.955)	1.438 (1.844)	4.441 (2.268)
Observations	260	156	260
R <sup>2</sup>	.5080	.5053	.0566

\*Robustness tests also included AR-1 and PCSE's, with HIV/AIDS remaining negative and statistically significant in four of six new tests (not in PCSE w/ Africa dummy or interaction, but Africa dummy was not significant either). Market size and Development level, however, maintained their signs, but were no longer significant.



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