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AIDS, Economic Growth and the HIPC Initiative in Honduras

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Abstract

Success of the debt-relief HIPC and poverty-reduction PRSP initiatives demands annual growth rates of 5 percent sustained for fifteen years in Honduras. However, existing evidence on the impact of AIDS on economic growth in Africa raises concern on the viability of such growth targets in Honduras, despite incidence rates in the latter trailing long behind Africa's. Hence this paper estimates the magnitude of this threat, measured as the marginal impact of projected changes in AIDS incidence over the annual growth rates of GDP for the period 2001-10. Our estimates suggest that the mature stage of the epidemic in Honduras poses an unsubstantial threat to economic growth. This is true after substantial changes on the incidence of the epidemic, its public financing, the concentration of incomes, labor productivity gaps, and foreign capital inflows have all been simulated for the relevant period. The real threat accrues from an over-optimistically projected physical capital accumulation that proves insufficient to satisfy the demands for a viable HIPC Initiative.

Keywords: AIDS, Heavily Indebted Poor Countries, economic growth, foreign capital flows

JEL classification: I1, O4

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AIDS, ECONOMIC GROWTH AND THE HIPC INITIATIVE IN HONDURAS

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I. INTRODUCTION[1]

In July 2000 Honduras qualified for the High-Indebted Poor Countries (HIPC) Initiative, which conditions substantial debt relief to efforts directed on poverty reduction. This Initiative is articulated upon an ambitious poverty reduction strategy (PRSP)[2] that pursues a critical reduction of poverty (from the current 66% of households to 40%) in the course of fifteen years. This strategy brings together the traditional macroeconomic conditionality present in the faltered first wave of structural reforms in the Nineties (i.e., fiscal discipline, privatization, liberalization, and exchange rate adjustments) with atypical social-sector conditionality (in the form of social expenditure targets).

Rapid and sustained economic growth is one of the cornerstones of the joint debt relief and poverty reduction strategies in Honduras. República of Honduras (2001) estimates that the success of the strategy requires annual economic growth rates of 5% sustained over fifteen years. Several macroeconomic obstacles threaten this growth path, however. Thus, Cuesta (2001) identifies scant increases in productivity in most dynamic sector, the maquila, a high volatile export diversification, and the inconsistencies of the export promotion strategy as factors jeopardizing sustained high economic growth. In the same line, Lopez (2000) quantifies chronic fiscal indiscipline in excess of 3% of GDP as a compelling barrier for the completion of the Initiative.

However, threats to the Initiative do not confine to macroeconomic factors. The HIV/AIDS epidemic is a case in point for Honduras. In effect, the reduction in human and physical capital (especially as AIDS concentrates on prime working-age individuals) necessarily dents economic growth (Over 1992, Cuddlington 1993). In HIV/AIDS high-prevalence African countries, the setback on economic growth attributed to HIV/AIDS is estimated as 25% of real GDP over a similar period of the Initiative (Cuddlington 1993). Effects of this magnitude certainly raise a concern on the viability of HIPC Initiative, specifically in a country as Honduras that has become the epicenter of the disease in Central America. Nonetheless, there are reasons not to expect the worst in that country. First, prevalence levels are still a long way behind (at least three times lower than) African levels. Secondly, official estimates indicate that the epidemic has entered a plateau[3]. In any case, the true magnitude of the AIDS threat on economic growth, and, ultimately, the HIPC and PRSP initiatives remains unknown. This paper aims, therefore,

[1] The author thanks Manuel Rodriguez at the National Accounts Division of the Central Bank of Honduras for providing data and useful comments. Likewise, comments by Karel Jansen, S.J. Peiris and other participants in the 2001 WIDER Debt Conference (Helsinki) are highly appreciated. Remaining errors are entirely the author's responsibility.
[2] The strategic paper is currently in the final stages of elaboration in Honduras.
[3] These figures have been seriously questioned as underestimates of true incidence, as seen below.

at exploring the link between AIDS incidence and economic growth. In doing so, two important results stand out. First, the projected changes in the incidence of the epidemic pose an insignificant threat on the viability of the HIPC Initiative. Secondly, such a threat most likely accrues from the capital accumulation process, which may have well been overoptimistically projected for Honduras.

The paper is organized in five sections. Section 1 presents the facts on the HIPC Initiative and the epidemic specific to Honduras. Next, the paper sets up a methodology that links directly the annual variation of AIDS incidence with annual economic growth rates. Section 3 discusses in detail the existing and required data to draw relevant simulations comprising alternative AIDS incidence rates and financing conditions. Section 4 uses official AIDS projections, HIPC consistent macroeconomic aggregate projections, and own estimates on environmental variables to quantify the impact of AIDS incidences on economic growth in Honduras. Finally, conclusions bring this paper to an end.

II. THE HIPC INITIATIVE AND THE HIV/AIDS EPIDEMIC IN HONDURAS

II.1 The HIPC Initiative

In 1996 the IMF and the World Bank jointly launched the HIPC Initiative aimed at reducing the debt burdens of eligible countries into sustainable levels. As usual, financial aid was to be made conditional to the adoption of macroeconomic adjustment and structural reforms. In turn, multilateral and bilateral creditors were to provide substantial debt relief (at the *completion point* of the scheme), once the debtor country demonstrated its capacity to use prudently initial debt relief (at an earlier *decision point*). Eligible countries were economies expected not to achieve a sustainable external debt situation even after the full use of traditional debt-relief mechanisms that totaled 67% of net present value (NPV) of outstanding debt stocks[4]. A revised or "enhanced" Initiative regarded unsustainable a debt when its net present value over exports exceeded 150%, or 250% of fiscal revenues. On the aggregate, the Initiative is scheduled to provide debt relief and new concessional loans to the total of NPV US$ 27 billion[5], which in addition to NVP US$ 104 billion from traditional debt mechanisms, leaves outstanding NPV US$ 68 billion worth debt stocks (IMF 1999).

At the decision qualifying time, end of 1999, Honduras estimated debt stock amounted to US$ 3.3 billion, equivalent to 61% of GDP, 142% of exports and 322% of fiscal revenues (IMF 2000a) after the Naples terms' concessions were taken into account. In addition to NVP US$ 182 million relieved from traditional concessions, the HIPC Initiative is expected to contribute NPV US$ 585 million to bring down debt stocks to sustainable level (that is, 250% of fiscal revenues). As a result of this debt relief, it is also expected that the average debt service paid drops one third, while social expenditures should increase to levels three times higher than the country's debt service (IMF 2000b). Hence, social sector policies constitute a significant component of the Initiative, and its executive

[4] These constituted the Naples terms set by the Paris Club in 1995.
[5] This amounts rises to NPV US$ 36 billion if Sudan, Somalia and Liberia debt relief is also included.

instrument, the PRSP. Countries must meet performance requirements in the social services to receive HIPC assistance, fruit of reforms in the provision of social sectors and the reallocation of social public spending. These changes are paired with macroeconomic (and governance) reforms in a broader poverty reduction strategy paper that should be borne out of a consensus by the national government, the civil society and the international community. Conditional to the approval of this document (already in its final draft), Honduras will enter a completion phase expected to last fifteen years. Undoubtedly, success in the completion phase of the debt relief initiative requires a sustained healthy macroeconomy. Interestingly, the strategy itself provides official projections (República de Honduras 2001) shaping the macroeconomic scenario that ensures the viability of the Initiative. As Table 1 indicates below, Honduras is required to achieve simultaneously rapid and sustained annual growth rates of 5%, fiscal discipline (further tightened from 2005 on), control of current account imbalances, domestic price control, and rises in domestic savings in order to substantially reduce the incidence of poverty by twenty points in fifteen years. Table 1 presents such projections on selected macroeconomic aggregates:

Table 1: Selected Projections of Macroeconomic Aggregates, Honduras 2000-2010

	2000	2001	2002	2003	2004	2005	2006-2010	2011-15
GDP growth (%)	4.8	4.5	4.5	4.5	4.5	5.0	5.0	5.0
GDP per capita (current US$)	851	901	948	981	1023	1058	1400*	1895*
Poverty Incidence (%)	64.5	63.0	61.5	60.0	58.5	57.0	49.0	42.0
CPI (%)	10.1	9.0	8.0	6.0	6.0	5.0	5.0	5.0
Current Account (% GDP)	-3.4	-5.5	-3.2	-3.1	-3.4	-3.2	-2.4	-0.6
Gross Fixed Capital Formation (% GDP)	26.2	30.4	23.9	24.4	24.8	23.7	22.7	22.7
Domestic Savings (% GDP)	28.7	26.3	24.2	22.6	22.9	22.5	26.6	27.3
External Financing of NFPS (% GDP)	1.7	3.8	2.9	3.0	3.2	2.9	2.1	2.1
Central Government Balance (% GDP)	-4.7	-4.7	-5.4	-4.7	-5.0	-3.8	0.1	0.1
NPV of External Debt as % Fiscal Revenues	246.0	247.0	250.0	248.0	246.0	229.0	...	...

Source: República de Honduras (2001)
* Figures at the initial year of the period

II.2. The HIV/AIDS epidemic in Honduras

In the early Nineties, a new concern emerged with respect to the macroeconomic effects of AIDS. Cuddlington (1993) is among the first to enquire whether the macroeconomic consequences of AIDS are important in Sub-Saharan Africa, with infection rates in the adult population raising notoriously morbidity and mortality across the labor force. In effect, striking figures are reported for that region. According to UNAIDS (2000a) the epidemic started earlier in that region and its incidence now exceeds manifold incidences elsewhere: prevalence rates average 8.8% of adult population (14-49) in Sub-Saharan Africa the end of 2000; 2.3% across the Caribbean adult population; 0.5 to 0.6% in North America, South and South East Asia, Latin America, and below 0.35% in the rest of the world.

Although HIV/AIDS rates in Honduras lag a long way Sub-Saharan African rates, the epidemic constitutes a serious concern for the country. In fact, Honduras concentrates over 50% of all reported cases in the region (Ministry of Health 2001, UNAIDS 2000b).

The epidemic has also gone through a *feminization* of its cases, going from a 6:1 male to female ratio in the 1980s to 1.2:1 in 2000. Dramatically, AIDS has turned the largest single cause of death among fertile-aged women (UNAIDS 2000 b). The epidemic, in contrast with South America, North America and Europe (with dominating homosexual transmission -see Stillwaggon 2000- is on the main transmitted through heterosexual sex (83% of all cases in 2000). As usual, prevalence of HIV and incidence of AIDS are concentrated on prime working age population (15-45) and high-risk groups (8 to 10% of sex workers, male homosexuals, and Northern Coast black communities) according to Ministry of Health (2001).

More interestingly, there are large geographical differences behind the aggregate HIV prevalence rate of 0.8% of the adult population. Thus, a high-prevalence enclave is found around the most industrialized city in the country, San Pedro Sula. Its prevalence rate exceeds 3% of adult population, slightly above of Caribbean rates. Nevertheless, a fundamental distinction prevails with regards to future incidence projections. In Honduras, official projections indicate that the epidemic reached a plateau in the mid-Nineties. Projections for Caribbean countries[6] show, in stark contrast, prevalence rates on the rise up a 5% to 8% of the adult population, just trailing off current Sub-Saharan African levels. Honduras figures are, nevertheless, widely suspected of severe underestimation. Officially, the Health Ministry recognizes 15,000 sero-positive cases since the first reported case in 1985. UNAIDS country office and specialized grass-root NGOs in the country regard more plausible incidence levels in the vicinity of 58,000. Unfortunately, the generation of alternative more plausible incidence projections falls outside the scope of this paper.[7] The underestimation bias will, nevertheless, be kept in mind in the analysis of the size and sign of the simulated macroeconomic impact.

III. MODELLING HIV/AIDS EPIDEMIOLOGICAL CHANGES AND ECONOMIC GROWTH

Numerous studies have analyzed the macroeconomic impact of AIDS for Sub-Saharan Africa and the Caribbean, but no attempts were ever made for Central America and its specific circumstances. Nevertheless, the Honduras-relevant link between HIV/AIDS and the HIPC Initiative has not been overlooked. UNAIDS & World Bank (2001) emphases the opportunity to use the HIPC Initiative to include AIDS as part of the integral poverty reduction strategy and its financing. The present study, however, turns that link inside out. At the heart of this analysis lies the question of whether the incidence of AIDS jeopardizes the required economic growth that ensures the viability of the HIPC Initiative in Honduras.

Previous studies typically quantify the macroeconomic impact of AIDS as the potential GDP foregone with respect to a non-AIDS counterfactual case starting off before the outburst of the epidemic. As a consequence, these analyses project the theoretical output through a production function (typically a simple Cobb-Douglas) both with and without

[6] Jamaica and Trinidad & Tobago. See Nicholls et al (2000)
[7] That generation would require consistent epidemiological mathematical models, as explained below.

the reductions on human and physical capital accumulation resulting from the infection. Unknown productivity changes of the aggregated working-age population are arbitrarily set while the labor market may be further stylized by distinguishing formal from informal sectors, or across sectors of activity. Interestingly, these studies report macroeconomic GDP drops attributable to the epidemic in the region of 4 to 25 percent points in GDP and 0-10% drop in per capita income levels in Sub-Saharan Africa and the Caribbean[8].

Other macroeconomic aspects from AIDS may be also explored, such as capital formation, savings, or the public costs of the epidemic (see Nicholls et al 2000). Nonetheless, it appears appropriate to analyze the impact of annual variations in AIDS incidence rates on the growth of GDP, given the already quantified economic growth needs to ensure the viability of the HIPC Initiative. It is not so much the variation of aggregated product over a number of years that turns critical for the poverty reduction strategy viability, but rather, the satisfaction of high annual growth rates sustained over time. In addition, productivity changes are not arbitrarily set up; instead, the working-age population is divided in two productivity groups ("low-" and "high-human capital") and their productivity gap is estimated from existing income and expenditure household surveys. This productivity divide is associated with the completion of primary education, a good predictor for poverty incidence in Honduras (See Cuesta 2001). This grouping also captures the difference between –dominating- low productivity agricultural and informal activities and the rest of the economy. Consequently, further stylization of the model is not attempted.

Given the simplicity of the economy after the human capital divide, future gross domestic product is projected by an economy-wide Cobb-Douglas equation, the functional form best striking a balance between available data and simplicity[9]. Two accumulation equations project capital formation and savings. From these three equations, the impact of AIDS on capital accumulation is worked out, and the resulting projection of capital stock and labor under the presence of AIDS are plugged in back into the production function. This standard projection procedure deviates from previous studies in that it does not assume a HIV/AIDS-free counterfactual. Instead, it quantifies the effects of projected variations in incidence over an already AIDS-exposed economy, providing thus more realism to the model in addition to being more relevant to the HIPC Initiative viability question.

The production function that approximates the output generation process in the presence of AIDS in Honduras resembles Cuddlington (1993)' specification, in which the aggregated productivity (γ) of labor scales up the total input supply (L) to yield effective labor:

$$Y = A L_e^{a} K^{b} \qquad [1]$$

[8]Over (1992), Cuddlington (1993), Cuddlington & Hancock (1994), Arndt & Lewis (2000), Nicholls et al (2000)

[9] Stern (1984) shows this balance in economic modeling. Arndt et al (2000) argues for the need to strike such a balance in the context of macroeconomic impacts.

The proposed specification here, however, disaggregates economy-wide labor productivity into high and low human capital productivities ($\gamma_L < \gamma_H$, $\gamma_H = p\ \gamma_L$, $p>0$). Also, differentiated HIV incidence in each human capital group is stylized through two incidences rates ($a_L > a_H$, $a_L = r\ a_H$, $r > 0$). Arndt et al (2000) convincingly argue that the technological factor, A, should also reflect the impact of AIDS. However, the knowledge of the mechanisms transmitting such effects is still too vague, in addition to the lack of information for a satisfactory measuring in Honduras. The downward bias from these effects will be borne in mind, nevertheless.

In short, for convenience, AIDS-adjusted effective labor is expressed as a function of total labor supply, L, corrected by indices on productivity ("p"), AIDS incidence ("r") and size of the group ("n"[10]) with respect to the low human capital base case:

$$Y = A[\ L_{\gamma_L}\ (p + n(1-p) - a\,n - p\,a\,r\,(1-n)]^{\alpha}\ K^{\beta} \qquad [2]$$

Equation [2] includes so far AIDS-free capital stocks, and therefore is an incomplete AIDS-adjusted production function. In order to fully adjust GDP, the effect of AIDS in accumulation equations needs to be accounted for. In doing so, aggregated savings are first adjusted to AIDS incidence as follows:

$$S = s\,(Y_{-1} - P - \eta\ c\,(a\,L + R)) \qquad [3]$$

where s is the aggregated savings ratio, c is the unitary cost of treatment, P, is the prevention cost –assumed to be fixed[11]. Equation [3] therefore indicates that there is a share of output used to combat the incidence of AIDS that cannot be used for alternative (i.e., productive) activities.

The savings equation is also expanded to include distributive considerations. In doing so, output is transformed into incomes, a proportion θ_L captured by individuals of the low human capital group, while high human capital individuals captures the rest, θ_H ($\theta_H = g\theta_L$, $g>1$). Similarly, savings rates across human capital groups vary, as an array of studies in the developing world shows (see Szekely 1998 and references there). Different savings rates for low (s_L) and high (s_H) human capital groups capture this stylized fact. Given the relation between human capital and the generation of incomes, it is safe to expect that the savings rate of the high human capital group exceeds that of the low human capital group (that is, $s_H\,\theta_H\,Y = v\ s_L\,\theta_L\,Y$, $v>1$). Furthermore, households with AIDS-infected individuals are assumed to save only out of the portion of incomes disposable after AIDS treatment, if any. Treatment costs are, in turn, jointly financed by the State and by the patients. Specific to Honduras, Ministry of Health (2001) estimates

[10] "n" represents the proportion of low human capital, and "1-n" that of the high human capital.

[11] This implies that such costs are not directly related to the size of the epidemics, as occur for treatment costs. However, to the extend that current prevention is linked to expectations of future incidence rates, in turn, based on the success of current prevention, the assumption becomes less accurate.

that the private financing of total treatment costs amounts to 55% (η=0.55), the government, NGOs and firms financing remaining costs. There is also evidence that in Honduras treatment costs dramatically differ across socio-economic groups, reflecting differences in composition and costs according to the type of attention involved. This is captured by defining each group's unitary treatment costs, $c_H = \phi\, c_L$, $\phi > 1$.

As it was the case of effective labor, indices are used to capture discrepancies of income concentration (g), unitary costs (ϕ), saving rates (v), AIDS incidence (r), and the size of each group in the labor force (n). As a result, the distribution of incomes (left-hand side) and the financing of AIDS related costs (right-hand side in equation [4] below) both affect savings.

$$S = [\theta_L (Y_{-1} - P)(g\, s_L + s_H) + (Y_{-1} - P)s_F] - c_L a_L \eta L(\phi\, s_H r(1-n) + s_L n) \qquad [4]$$

The second accumulation equation, that is, capital formation, is typically defined as a function of domestic savings (with a constant relation captured by "k"), foreign resources, and annual depreciation of existing capital stocks. Interestingly, previous macroeconomic analyses of AIDS have typically ignored the role of foreign direct investments.[12] However, this omission is misleading in Honduras as such flows still represent a substantial proportion of GDP (about 5% in 2000, see Appendix 1). Hence, the current aggregate stock of capital is a function of past stocks, foreign additions of capital, as well as domestic savings.

$$\Delta K = F + k\, S - \delta\, K \qquad [5]$$

After plugging in savings (equation [4]) in the accumulation of capital (equation [5]), capital is made dependent on AIDS incidence and financing costs of the epidemic. Following the recent evidence on household savings, it is safe to assume that in Honduras, as elsewhere, investors only belong to the high human capital group. Equation [6] below shows the resulting capital stock simplified equation (after turning k_L=0).

$$K = \frac{1}{1+\delta}[(K_{-1} + F + s_F(Y_{-1} - P) + s_H g\theta_L (Y_{-1} - P)] - \frac{1}{1+\delta} k_h s_H \eta \phi c_L a_L r L(1-n) \qquad [6]$$

The capital equation, therefore, is a function of accumulating foreign investment and savings out of disposable incomes (left-hand side summand) and an AIDS-related term including incidence and treatment costs of the epidemic (right-hand side summand in equation [6]). Substituting the current stock of capital into the production function, equation [1], gross domestic product is also made a function of AIDS treatment (and prevention) costs, the share of public financing, savings and investment shares, and the

[12] Nichols et al (2000) assumes null foreign resources.

concentration of incomes. The Chain rule[13] permits to calculate the marginal impact of varying AIDS incidence rates in economic growth as:[14]

$$\frac{\partial(\dot{Y}/Y)}{\partial(\dot{a}/a)} = -\alpha\,[n + pr(1-n)]\frac{\dot{a}}{a}\frac{a}{1-a} \;-\; \beta\,\frac{1}{K}\,s_L\eta c_L k_H vr[\phi(1-n)L]\frac{\dot{a}}{a}a \qquad [7]$$

This equation shows that an inverse relation governs the impact of AIDS incidence in the growth rate of the economy both through effective labor (left-hand side) and capital (right-hand side). Increases in the productivity gap between human capital groups (p), lower shares of low-human capital groups (n), rises in the incidence gap between groups (r), increases in savings and investment rates (s_L,k_H) all lead to dents on economic growth rates. These impacts work *directly* through a reduction in effective labor and capital stocks in the production function. Additional factors affect *indirectly* the economic growth rate by affecting the capital accumulation process. That is the case of the concentration of incomes (θ, g) and foreign capital flows (F). Interestingly, lower inequality and higher foreign capital flows reduce the impact of the epidemic on economic growth. Table 2 below systematizes this and other predicted impacts.

The right hand side of the table indicates that increases on the considered variables may either rise or lower the rate of economic growth given decreasing changes in incidence. In others, the impact is theoretically ambiguous, as direct and indirect effects work in opposite directions. Their final impact becomes an empirical question (sorted out in section V). Earlier, however, Section IV discusses data requirements to carry out the simulations.

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[13] $$\frac{\partial(\dot{Y}/Y)}{\partial(\dot{a}/a)} = \frac{\partial(\dot{A}/A)}{\partial(\dot{a}/a)} + \alpha\,\frac{\partial LnL_e}{\partial L_e}\frac{\partial L_e}{\partial a}\frac{\partial a}{\partial t}\frac{a}{a} + \beta\,\frac{\partial LnK}{\partial K}\frac{\partial K}{\partial a}\frac{\partial a}{\partial t}\frac{a}{a}$$

[14] As it is assumed AIDS does not affect that total factor productivity, the effects of AIDS are exclusively transmitted through effective labor and capital accumulation. The resulting expression is:

$$\frac{\partial(\dot{Y}/Y)}{\partial(\dot{a}/a)} = [\alpha\,\frac{1}{L_e}\frac{\partial L_e}{\partial a}\frac{\dot{a}}{a}a] + [\beta\,\frac{1}{K}\frac{\partial K}{\partial a}\frac{\dot{a}}{a}a]$$

Table 2: Decomposition of Macroeconomic Impact of AIDS

			Direct assuming declining a/a	**Indirect** through K	**Total**
AIDS					
Incidence	a	Exogenous	positive	negative	?
Incidence, annual growth rate	a/a	Exogenous	positive	...	positive
Incidence, index	r	Exogenous	positive	negative	?
Prevention costs	P	Policy	...	negative	negative
Unitary costs, low-human capital	c_L	Exogenous	positive	negative	?
Unitary costs, index	ϕ	Exogenous	positive	negative	?
Public financing, share	η	Policy	positive	negative	?
ECONOMIC					
Labour productivity, index	p	Exogenous	positive	...	positive
Marginal labour productivities	α, β	Exogenous	positive	...	positive
Labour stock	L	Exogenous	positive	negative	?
Capital stock	K	Endogenous	positive	...	positive
Low-human capital share	n	Exogenous	positive	positive	positive
Saving rate, low-human capital	s_L	Exogenous	positive	?	?
Saving rate, index	v	Exogenous	positive	?	?
Investment rate, high-human capit	k_H	Exogenous	positive	?	?
Foreign Capital flows	F	Endogenous	...	positive	positive
INCOME DISTRIBUTION					
Income share, low-human capital	θ_L	Policy	...	positive	positive
Income share, index	g	Policy	...	positive	positive

Source: author.
Impacts reported assuming decreasing changes in incidence, as it is the case in most years of the simulation for Honduras.

IV. DATA REQUIREMENTS

IV.1. Data requirements on existing data[15]

A production function is estimated for the period 1990-2000 by regressing (1978 prices) real gross domestic output on capital and effective labor series provided by the Central Bank of Honduras bulletins (for the former two) and the National Institute of Statistics (for labor series). Information on labor force, productivity, the age composition of the population, gender, and education levels, all proceed from the *Permanent Household Surveys* (1991-1999). An indicator of labor productivity is constructed as the product per hour of work according to information in the above-mentioned surveys.

Estimates on capital stocks are not available in Honduras, for which gross fixed capital formation is annually added to an original stock of capital according to the widely accepted Permanent Inventory Method. The initial capital stock is a multiplier of 1950

[15] Appendix 1 presents the incumbent series.

GDP according to Heston & Summers (1995) estimates on capital stocks per worker in Honduras. The costs of the Hurricane Mitch (estimated as emergency and reconstruction expenditures in public infrastructure[16]) are also deducted from 1998 output. Interestingly, the resulting ratio of capital to output for the period 1950-2000 in Honduras amounts to 2, which differs from the traditionally accepted ratio of 3. The former, however, seems more plausible in a labor-intensive economy as Honduras is. This is confirmed in the estimated Cobb-Douglas production function, of the following form:

$$Y = 0.01 (L_e)^{0.65} (K)^{0.35} \qquad [8]$$

The Central Bank of Honduras provides information on aggregate savings. These series are disaggregated for public and private sectors since 1950. Household domestic savings are then isolated from aggregate private savings. The series shows that, on average, over 60% of total household private accrue from households (as well as from non-profitable organizations, although in a much smaller suspected proportion). At the household level, the Central Bank's *National Incomes and Expenditure Household Survey* (*ENIGH* in Spanish) collected for the period 1998/9 is used to apportion aggregated household incomes among human capital groups. Thus, aggregated savings -defined as the difference between aggregated household incomes and expenditures- hide larger variations across household income deciles. These variations range from dissavings of 200% of the poorest decile's incomes to savings up to 50% of the upper decile's incomes. When grouped according to human capital levels, the differences are, however, less significant. Both groups average dissavings in the vicinity of 10% of their household incomes. Table 3 shows it. This evidence reveals that the decision to save is fundamentally determined by the availability of resources rather than by the level of human capital of the individual. This contrasts with the evidence found in Mexico (Szekely 1998) or Chile (Butelman & Gallego 1999). Nevertheless, as the last column in Table 3 indicates, high human capital individuals are present in all deciles of the distribution of incomes. In other words, high human capital groups also pertain to dissavings deciles.

[16] US$ 645 million or 14.5% of 1998 GDP, Republic of Honduras 1998.

Table 3. Household Domestic Savings in Honduras 1998-9.

Decile	Decil Average Income corr. L	Decil Average Consumpt corr. L	Decil Average Savings % income	Education level Household Head 1-4*
1	449	752	-69.1	1.6
2	826	1284	-28.1	1.6
3	1272	1696	-34.4	1.7
4	1704	2183	-28.7	1.9
5	2268	2830	-24.9	2.0
6	3012	3237	-7.6	2.1
7	4041	4029	0.2	2.3
8	5505	4361	20.6	2.3
9	8147	5858	27.4	2.5
10	21128	10247	45.7	2.8
Low	2844	2009	-11.6	1.0
High	5642	4254	-9.8	2.4
Total	5072	3797	-10.1	2.1

Source: Author's estimates from Central Bank's *ENIGH*.
The human capital group of the household head categorizes each household. "Low" refers to unfinished primary education, while "high" to at least primary completed. "1-4" educational categories refer to incomplete primary, completed primary, completed secondary, and completed tertiary.
Observations with dissavings rates over 250% of their incomes were considered outliers and, consequently, were excluded from the estimates.

Although it is known which deciles save, who invests remains unknown. For simplicity, it is assumed that only the wealthiest invests, thus linking investments with wealth, and, ultimately, with the availability of resources. Central Bank of Honduras also provides aggregated information on investment, but contrary to savings data, this series is no further divided at the household level (only between public and private aggregated categories). It is expected that most of private savings proceed from firms rather than households, although the divide is not always clear in small family businesses (relevant in the highly informal Honduran economy). In addition, Honduras lacks deep financial markets that can transform domestic savings into investments. This acts as a binding constraint especially for lower income groups that cannot recur to alternative financial markets. Given the lack of information, these facts are stylized -somewhat arbitrarily- assuming that approximately a third of total private investment proceeds from households while the rest from undistributed gains of firms. As a result, the high-human capital investment ratio over savings for the entire high-human capital group becomes 0.35.[17]

Distribution data come from the *Permanent Household Surveys*, collected each semester for the period 1991-1999. This survey is a labor-survey that provides information on labor status and incomes as well as social incomes (retirement pensions and cash and in-kind transfers). Available data show that income inequality has been reduced only minimally during the Nineties in accordance with World Bank (2000) figures.

[17] Calibrations of this ratio did not lead to significant variations of the impacts of AIDS in the GDP growth rate of the baseline case.

Furthermore, Honduras still remains among Latin American most unequal countries, only overtaken by Brazil, and comparable to Chile and Colombia records (World Bank 2000). More interestingly, low human capital groups are estimated to capture some 30% of total incomes as an average for 1991-1999.

Ministry of Health (2001) provides AIDS related statistics collected from sentinel surveys that report on infection rates across high-risk groups (i.e., sex-workers, pregnant women, blood donors, prisoners, newborns, teenagers, and homosexuals). In addition, Ministry of Health (1999, 2001) also provide information on medical provision costs related to AIDS in eleven public and private hospitals, as well as private costs in a sample of a thousand diagnosed AIDS patients. Interestingly, the gap in treatment costs applied to low and other income groups can be infer from Ministry of Health (1999) data, although the definition of income groups is not disclosed. In effect, considerable differences are reported by the private-public nature of the health center and by treatment. Thus, annual treatment costs reported in 1999 amount to US$ 2330, which combines $ 725 daily treatment costs in a private hospital for middle and high-income groups and US$ 153 daily costs for low-resource patients. Furthermore, public hospitals involved costs average US$ 148. Retroviral treatment costs amount to US$24,000 but are only used by 10% of total registered patients (all belonging to most affluent segments, as such treatments are not publicly covered). It is, however, expected that such costs have been already included in the average costs of private treatments, although confirmation on this point was not possible.

Prevention costs (comprising campaigns both to the general public and targeted to high-risk groups) reportedly amount to US$ 7.3 Million, equivalent to 32% of total public AIDS related and 5.5% of total health costs in 1999 (República de Honduras 2001). Another necessary information for simulation is the household and public financing shares of total treatment costs. In Honduras, household financing amounts to 55% of total treatment costs. The remaining costs are shared as follows: 16% by the government, 28% by the international community, and 1% by private firms (Ministry of Health 2001). This contrasts sharply with lower household contributions in other countries of the region (all with higher per capita incomes) for which information is available[18].

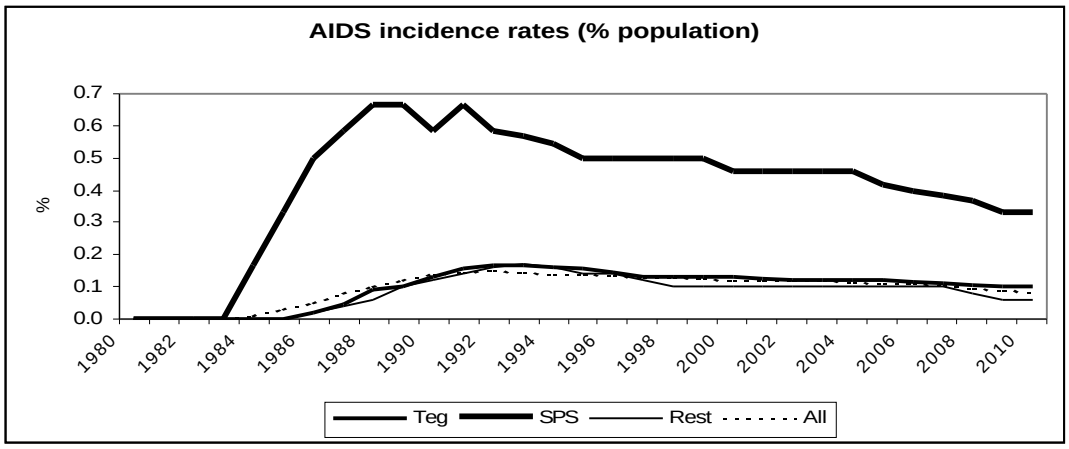
Although there is no direct information on AIDS incidence by education group, some evidence on incidence by occupation that Ministry of Health (2001) collects is rather useful to single out each group's incidence. Based on the obvious link between human capital and occupation, it is safely assumed that some occupations are mainly composed of low human capital workers, while others such as doctors, nurses, mechanics, or traders, require formal education and thereby pertain to the high human capital category. Thus, 24.5% of all recorded cases unambiguously fell within the high human capital groups, while 52.7% of recorded cases were assigned to low human capital individuals.

IV.2 Projections

[18] Brazil, Guatemala, and Mexico public contributions reached 80, 70, and 66%, respectively. Ministry of Health (2001)

Ministry of Health (2001) presents projections on HIV prevalence and AIDS incidence rates for the period 2000-10 using mathematical models (SPECTRUM) comprising assumptions on demographics, access to services, previous records of HIV prevalence and treatment options. Methodologically, regional and nationwide estimates are constructed from collected incidence in high-risk sentinel surveys later adjusted (by gender, age and urbanity) to make that sample representative of the adult population. These estimates show that the incidence of AIDS reached its peak in 1991 in San Pedro Sula and 1996 in the rest of the country. Thereafter, the epidemic stabilized at levels of 0.50% in San Pedro Sula, and 0.10% in the rest of the country[19]. Figure 1 shows these projections:

Figure 1: AIDS incidence (1980-2010)



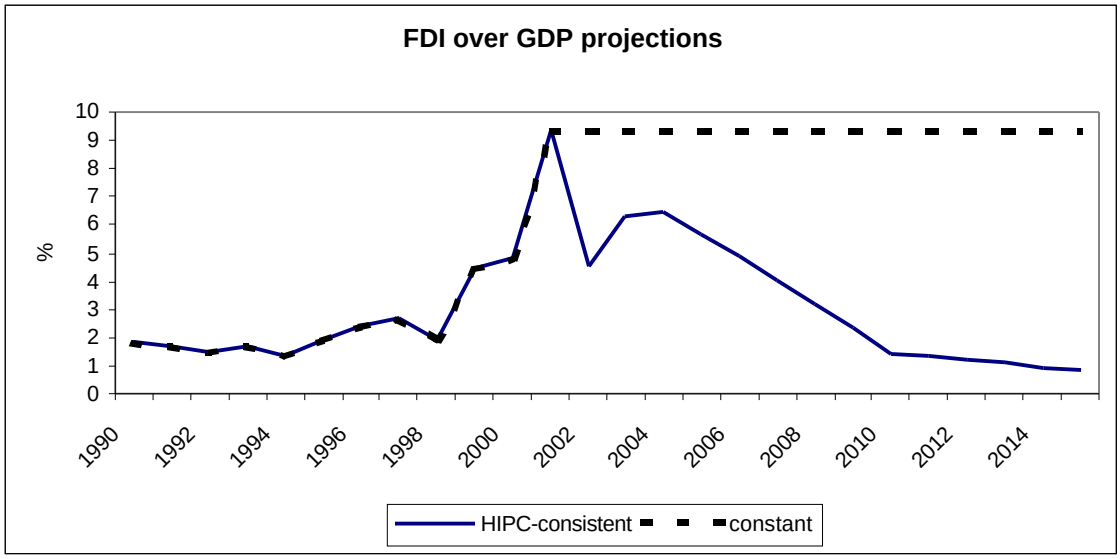
Source: Ministry of Health (2001)

Central Bank provides information on foreign capital flows to Honduras, although there are marked differences on the quality of such flows. Foreign direct investment (FDI) series from 1970 to 2000 are directly obtained from the Balance of Payments statistics of the Central Bank. However, official development aid data accrue from OECD series on multilateral and bilateral ODA. Projections on FDI –assumed to be part of the process of fixed capital accumulation- for the period under consideration do simply not exist. Future FDI is therefore obtained as a residual of the projected non-domestic investment required to close off the gap between projected gross fixed capital formation and projected total savings over the period considered. In doing so, savings and investment projections consistent with the HIPC Initiative are combined with available data from previous years on savings, investments, and FDI. The domestic investment rate, "k" in equation [6], is worked out from such previous series, and then, maintained over the HIPC projected series on future savings and investment. FDI is then worked out as the gap between both series. The resulting FDI over GDP ratio for the period 2000-2010 is shown in the Figure 2. It can be noticed the inverted U pattern, with its decreasing area since 2004 as total investment rates are projected to lower and domestic savings rates to increase.

[19] HIV prevalence shows a different pattern. San Pedro Sula rates already achieved its peak in 1996 at levels of 3% of the population. Tegucigalpa and the rest of the country still expanded their prevalence rates up to 2000, stabilizing since at a 0.8% of the adult population.

Finally, an alternative FDI series is simulated. In effect, the HIPC-consistent FDI is, however, not technology-driven, but is induced by macroeconomic balances. In order to provide an alternative scenario, FDI is also projected so that its ratio over real GDP remains constant since its peak in 2001. This imposed stability of FDI is supported by its lower volatility with respect to other foreign capital flows such as equity or debt.[20]

Figure 2: FDI Projections



Source: Author's estimates from República de Honduras (2001)

The remaining variables in the analysis, that is, saving rates, productivity gap, inequality, treatment and prevention costs, differences in costs by public and private treatments, public financing of treatment costs are all projected over the simulation period by keeping constant (in real terms, when applicable) their value observed at the last available year. Table 3 presents all the parameters required for the simulations.

[20] FDI could have also been made endogenous to human capital accumulation. It is suspected, however, that the model would increase its complexity without a parallel gain on explanatory power. Indeed, Cuesta (1996) estimates econometrically a very low elasticity of FDI inflows to variations of human capital in a sample of 60 developing countries.

Table 3: Projections for Simulations of Macroeconomic Impact of AIDS

		Source	Description	Value	Units
AIDS					
Incidence	a	Mtry. Health (2001)	1980-2000	(0.08-0.42)	% population
Incidence, annual growth rate	a/a	Estimate	Estimates from incidence data	(0-10.7)	annual growth rate, %
Incidence, index	r	Mtry. Health (2001)	Data for 1999	2.15	index
Prevention costs	P	Mtry. Health (2001)	Data for 1999	32.5	% public health spending
Unitary costs, low-human capital	c_L	Mtry. Health (2001)	Data for 1999	2,330	1999 US$
Unitary costs, index	ϕ	Mtry. Health (1999)	Data for 1999	3.3	index
Public financing share	η	Mtry. Health (2001)	Data for 1999	16.8	% treatment costs
ECONOMIC					
Labor productivity index	p	Permanent HH Survey	1991-1999 data	3.3	index
Marginal input productivities	α, β	Estimate	1991-1999 data	0.65, 0.35	...
Labor stock	L	Permanent HH Survey	1999-2000	1,906,370	individuals
Capital stock	K	Estimate	Permanent Inventory, 1950-2000	6,720	1978 Mill US$ for 2000
Low-human capital share (household heads)	n	Permanent HH Survey NIEH Survey	1991-1999 1998-9	34	% household heads
Saving rate, low-human capital	s_L	NIEH Survey	1998-9	-11.6	% household incomes
Saving rate, index	v	NIEH Survey	1998-9	21	ratio saved incomes
Investment rate, high-human capital	k_H	Estimate	1999	35	% high human capital incomes
Foreign direct investment	F	OECD Special Tables	1968-2000	187.4	Mill US $ (annual period average)
INCOME DISTRIBUTION					
Income share, low-human capital	θ_L	Permanent HH Survey	1991-1999	36.8	% total incomes
Income share, index	g	Permanent HH Survey	1991-1999	2.7	index (high/low human capital groups)

Source: Author

V. SIMULATIONS

The impact of AIDS on economic growth is estimated for eleven scenarios capturing variations in the levels of incidence projected for the country, alternative financing of AIDS treatment, and the structure of the economy. Table 4 characterizes every scenario. The initial scenario keeps constant 2000 values over the period of consideration, this constituting the baseline for simulation. Alternative scenarios stylize the incidence of AIDS for the whole country taking the high, intermediate, and low levels observed in San Pedro Sula, Tegucigalpa, and the rest of the country, respectively. Other scenario, using the baseline (i.e., countrywide) incidence, eliminates observed differences in incidence across human capital groups. The remaining scenarios halve treatment costs, level up costs for each human capital group, reduce substantially public prevention costs, and rise public financing shares of treatment costs, respectively. Two additional scenarios capture the structure of the economy. In the first of these scenarios, the concentration of incomes between both human capital groups is lowered to levels observed in Chile, a country with similar aggregated income dispersion but differences in the structure of human capital groups (i.e., differences in size of each group). In the final scenario, the low human capital group substantially increases its labor productivity until halving its gap with that of the high human capital group.

Table 4. Simulation Scenarios, 2000-10

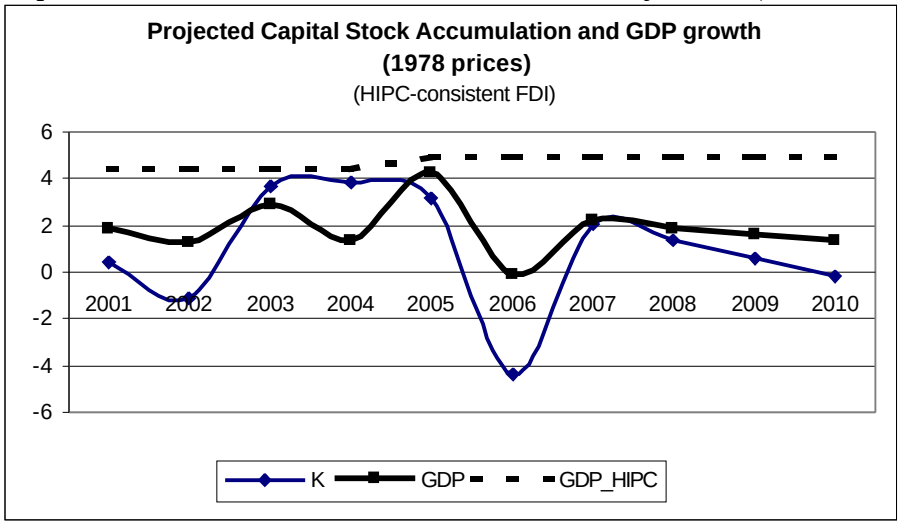
Scenarios	Simulation	Incidence Rate % a	Incidence Growth % a/a	Treatment Costs Index ϕ	Treatment Costs US$ c	Prevention Costs % P	Socioeconomic Incidence Index r	Public Financing % η	Income Concentration Index g	Productivity Gap Index p
Baseline	*Base*	0.11	-3.4	3.3	2,230	32.50	2.15	16.8	2.7	3.3
High Prevalence (SPS levels)	*High*	0.41	-3.5	3.3	2,230	32.50	2.15	16.8	2.7	3.3
Intermediate Prevalence (Tegucigalpa levels)	*Medium*	0.12	-2.6	3.3	2,230	32.50	2.15	16.8	2.7	3.3
Low Prevalence (rest of country levels)	*Low*	0.09	-4.1	3.3	2,230	32.50	2.15	16.8	2.7	3.3
No socioeconomic differences in prevalence	*Uniform*	0.11	-3.4	3.3	2,230	32.50	1.00	16.8	2.7	3.3
Half treatment costs	*Halfcost*	0.11	-3.4	3.3	1,165	32.50	2.15	16.8	2.7	3.3
Equal treatment costs by socioeconomic group	*Equalcost*	0.11	-3.4	1.0	2,230	32.50	2.15	16.8	2.7	3.3
Half expediture on prevention	*Prevention*	0.11	-3.4	3.3	2,230	16.25	2.15	16.8	2.7	3.3
Mesoamerican public financing levels	*Financing*	0.11	-3.4	3.3	2,230	48.75	2.15	68.0	2.7	3.3
Chilean income concentration	*Distribution*	0.11	-3.4	3.3	2,230	32.50	2.15	16.8	2.0	3.3
Half productivity gap	*Productivity*	0.11	-3.4	3.3	2,230	32.50	2.15	16.8	2.7	1.65

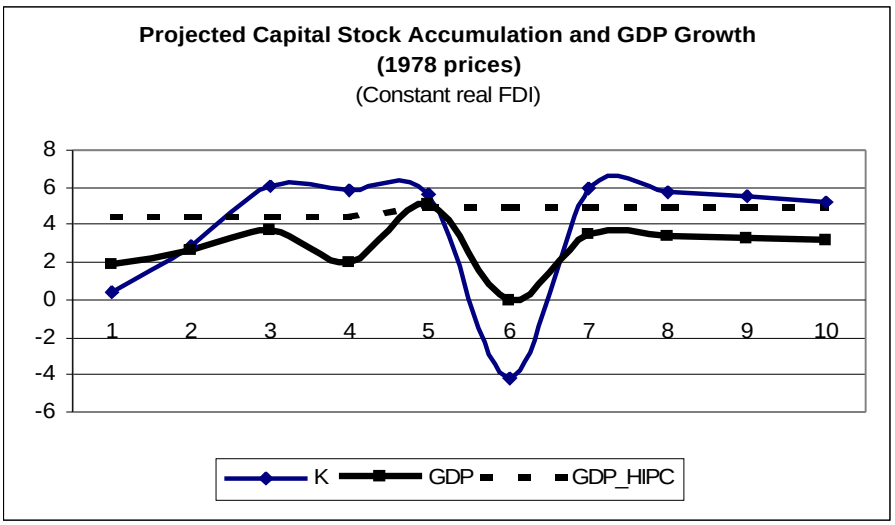
Source: Author
* Figures reported in this table average annual projection rates used year by year in the simulations.

As indicated in Section III, the estimation of the impact of AIDS requires first the projection of gross domestic product and capital accumulation in the presence of AIDS. From the theoretical expression for capital accumulation [equation 6] and the Cobb-Douglas production function (equation [9]), both capital stocks and GDP are projected for the period 2001-10. These projections indicate three important results. First, real GDP fluctuates widely within an annual –1% and 5% band. Secondly, the stock of capital is also subject to large fluctuations that average a modest annual accumulation of 1%. Thirdly, there are significant variations when the inflow of FDI is assumed to remain constant at peak levels. In fact, capital accumulation averages an annual 4% and the GDP growth rate rises to an annual 3%, one percent point above the average growth rate with HIPC consistent FDI. Figure 3 shows these results.

These results have strong implications. First, economic growth projections using inflation rates, savings, fixed capital formation, and FDI consistent with the HIPC framework fall short of the economic growth rates required for the viability of the debt reduction initiative. Although this present analysis does not use a general equilibrium model with which confirm that the original HIPC economic growth projections are time inconsistent, the discrepancy between AIDS-related estimates and HIPC projections is large enough to raise serious doubts over the officially projected sustained 5% annual rates. Secondly, the annual accumulation of capital resulting from domestic savings and foreign direct investment is not sufficient even to fully cancel out capital depreciation. This necessarily brings in a slowdown in the growth of product, ultimately impairing the viability of the HIPC Initiative. Thirdly, even when substantial FDI inflows are maintained over the projected period (at the 2002 peak level of almost 10% of GDP), capital accumulation is still only able to restore depreciated stocks.

Figure 3: Capital Stock Accumulation and GDP Growth Projections (2001-2010)





Source: Author's estimates
GDP_HIPC indicates the official GDP growth projections.

This substantial role of capital accumulation on economic growth contrasts with the meager role that changes in the incidence of AIDS inflicts on GDP growth. Table 5 presents the results for the first four scenarios simulated, capturing all variations in the impact attributable exclusively to different incidence rates. These and the remaining impacts are presented below in Figure 4 (see Appendix 2). Table 5 also shows the separated contribution of AIDS on economic growth attributable to individual impacts on labor and capital, respectively[21].

[21] Such contributions are calculated from equation [7] in section III

Table 5: Projected Impact of AIDS Incidence on Economic Growth Rates, 2001-2010 (annual %)

	Baseline	High prevalence	Medium Prevalence	Low Prevalence	Compositional Effects Labour	Capital
2001	0.006	0	0.024	0	101.8	-1.8
2002	0	0	0.006	0	109.1	-9.1
2003	0.013	0	0	0	114.6	-14.6
2004	0.013	0	0	0	115.3	-15.3
2005	0.013	0.103	0	0	116.6	-16.6
2006	0.011	0.043	0	0	118.3	-18.3
2007	0.013	0.043	0.011	0	119.5	-19.5
2008	0.024	0.041	0.011	0.043	121.1	-21.1
2009	0.013	0.038	0.017	0.04	123.8	-23.8
2010	0.013	0	0	0	131.2	-31.2
Average	0.0119	0.0268	0.0069	0.0083	117.1	-17.1

Source: author's estimates
Estimates using FDI projections consistent with HIPC projections

As expected from the declining AIDS incidence projections, their effect on the rate of GDP growth is positive. This effect is unsubstantial, though. The estimated effects fall within a 0.007 and 0.027% of GDP band. Although these results are not directly comparable with African or Caribbean studies (as the latter work out a no-AIDS counterfactual), the cumulated impact on the Honduran GDP ranges from positive 2.8% to 12.6%. The magnitude of the range is in line (but opposite in sign) with reported impacts for Caribbean countries -with similar incidence rates- while, expectedly, falls short of Sub-Saharan African countries, whose incidence levels are substantially higher than in Honduras. Interestingly too, the largest impact is observed in the high prevalence scenario, this indicating that higher gains on economic growth are realized when initial incidence rates are reduced the utmost.

Table 5 also shows that the impact of AIDS on GDP growth is asymmetrically transmitted through labor and capital accumulation. Declining rates of AIDS incidence exert a greater impact through labor, typical in a labor-intensive economy. In turn, declining AIDS does not necessarily strengthen economic growth through capital accumulation. Rather, both AIDS-induced changes in the composition of high and low human capital groups, on the one hand, and in the dispersion of incomes, on the other, shape its total effect on capital accumulation, and, ultimately, GDP growth. In Honduras, this combination has resulted in a negative impact on capital accumulation, as Figure 4 shows. As a result, the impact of AIDS incidence variations on growth through negative capital accumulation rates averages 20% of the total impact, contrasting with the 120% contribution to the total economic growth effect through labor (see Table 5)[22]. The remaining scenarios shown in Figure 4 confirm that substantial changes in the structures of epidemic financing and the economy do not magnify the meager effects from a mature epidemic. In this line, not even higher incomes and substantial increases in labor

[22] Again, these results are not sensitive to the projected FDI: virtually identical projections are obtained when FDI is maintained constant in real terms at 2001 peak levels.

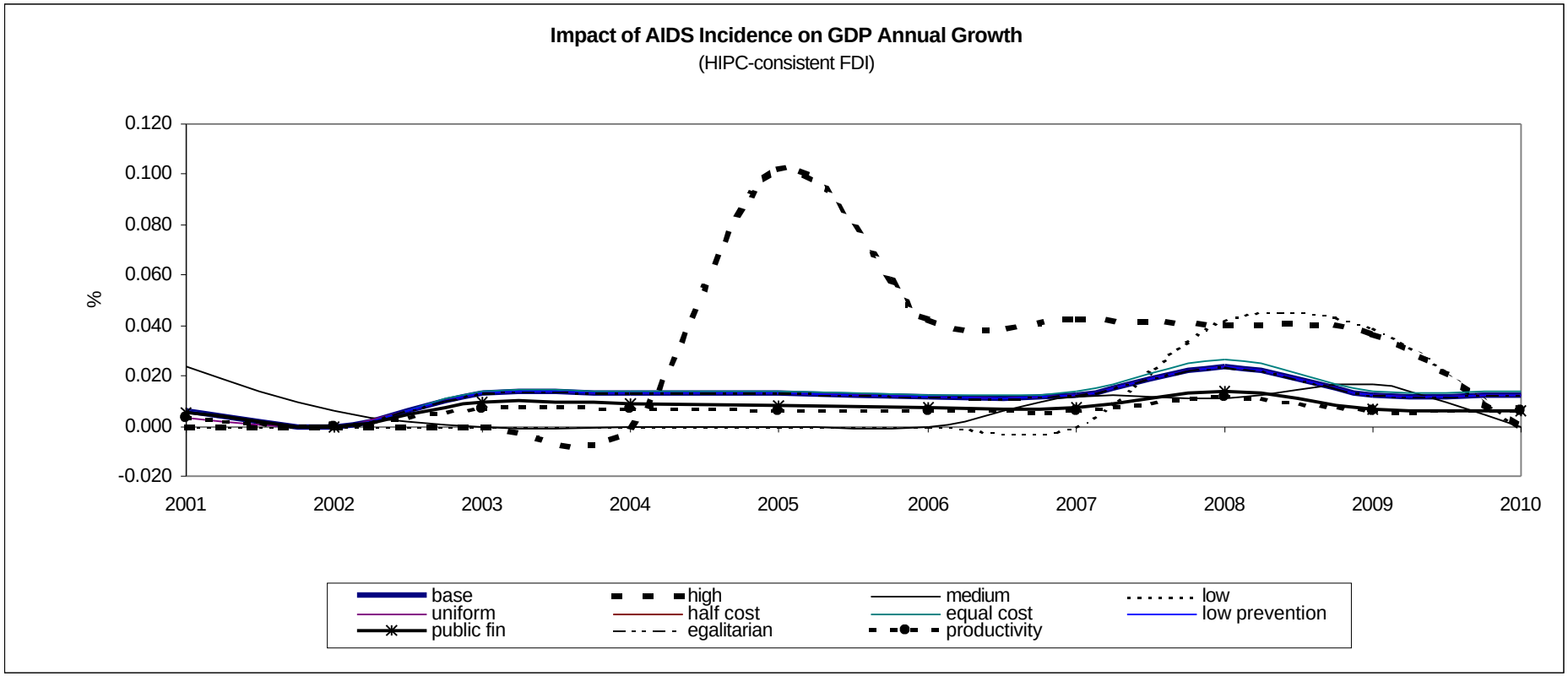
productivity both benefiting the low human capital group cause major deviations respect to the impacts simulated in the baseline scenario.

VI. CONCLUSIONS

The high macroeconomic cost –typically estimated as foregone potential output- of the expansionary AIDS epidemic in Sub-Saharan Africa has raised alarm in Honduras. While in Sub-Saharan Africa and the Caribbean the magnitude of HIV prevalence and AIDS incidence fully justify a macroeconomic concern, this is of a different nature in Honduras. Although AIDS incidence rates in that country remain much lower than in Africa, their macroeconomic impact could impair the viability of a highly demanding debt relief HIPC Initiative and, ultimately, the associated poverty reduction strategy. Hence, this analysis complements the on-going attention on the debt relief and poverty reduction strategies, and the combat of AIDS by quantifying how much of a threat the epidemic poses for those strategies in the medium and long run.

Methodologically, this paper does not follow the traditional estimation of macroeconomic impact of AIDS as the cumulative gap between AIDS-ridden and the counterfactual AIDS-free GDPs. Instead, such an impact is directly estimated as the marginal effect of AIDS incidence variations on the annual growth rate of GDP. Thus, the marginal gains on economic growth as a result of incidence declines must not be confused with the dent on the aggregated product that the epidemic has since its onset caused. The marginal gains, however, are the relevant impact to gauge the real threat the epidemic poses on the viability of the HIPC Initiative. This marginal effect is further divided in two components, each quantifying the transmission effect of AIDS on human and physical capital accumulation. Inputting this (partial equilibrium) setting with official AIDS incidence projections, as well as inflation, fixed capital formation, and savings rates consistent with the debt relief and poverty reduction strategies projections, the total effect of declining AIDS incidence is found rather unsubstantial. The reduction of incidence has a positive impact on the annual rate of economic growth, which ranges from 0.007 to 0.027 percent points (depending on alternative incidence scenarios simulated). Incidence variations appear to affect economic growth mainly through labor rather than capital. This explains the very small impact of AIDS on GDP growth, as modest capital accumulation –unable to fully restore depreciated capital – appears to underlie fluctuating economic growth rates. Such rates remain between annual 2% to 3%, well below the annual 5% required for the viability of the debt relief and poverty reduction strategies. Nonetheless, the contribution of AIDS declines to economic growth may well be biased downwards as the productivity gap between low and high human capital groups has been maintained constant over time (as changes in the labor composition resulting from AIDS are unlikely to be significant). Nonetheless, this bias is expected rather low, as simulated substantial reductions in the productivity balance of low and high human capital groups hardly magnify the effect of AIDS changes in growth. Other policy changes, such as substantially higher public financing of AIDS, significant reductions in treatment costs, and uniform treatment costs across socioeconomic groups, leave virtually unaltered the baseline estimates.

Figure 4: Impact of AIDS Incidence on GDP Annual Growth (with HIPC-consistent FDI)



Source: Author's estimates

A number of policy conclusions stand out from these results. First, this analysis requires further revision with alternative AIDS incidence projections for Honduras. Unfortunately, expansionary projections of the epidemic supporting the widespread skepticism on the existing official projections do not exist. Had such alternative projections existed, both the magnitude and sign of the macroeconomic impact of AIDS might well be susceptible of substantial variations. In this respect, the application of the proposed methodology to projections of increasing African AIDS incidence are of great interest. Secondly, even higher nationwide incidence rates (comparable with the Caribbean rates) of AIDS bring in a very limited impact on economic growth if the epidemic is in a plateau state. Thereby, reallocating higher public spending on AIDS in that context would not likely jeopardize the economic growth path in Honduras. The simulation of substantially higher public financing of treatment costs explicitly confirms this point. Thirdly, our projections of GDP cast serious doubts on the consistency of sustained real GDP growth rates at 5% per annum. Although a general equilibrium model of the economy does not generate our estimates, the discrepancy between our results and official projections is large enough as to raise a strong concern. In any case, capital accumulation constitutes a more compelling threat to the debt relief and poverty reduction strategies than AIDS incidence.

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APPENDIX 1. DATA SERIES

Year	real GDP 1978 prices	FBCF 1978 prices	k stock 1978 prices Mitch adj.	Net Dom Savings sav / GDP total	Net Dom Savings sav / GDP household	Investment total FBCF corr	Investment private FBCF corr	Non-capital enterprise over priv. FBCF	ODA DAC-bi	ODA Multi	ODA Total	FDI	CPI Annual variation %	CPI Index 1978=100
	mill L	mill L	mill L	%	%	mill L	mill L	mill L	mill US$	mill US$	mill US$	mill L		
1950	1142	89	1,066	8.20	4.90	49	42							
1951	1193	113	1,126	10.12	6.78	62	53							
1952	1219	138	1,207	10.12	6.50	76	60							
1953	1293	155	1,302	11.09	7.63	85	66							
1954	1211	125	1,362	9.31	8.46	69	52							
1955	1283	144	1,438	7.97	5.30	79	64							
1956	1342	145	1,511	7.92	5.85	80	61							
1957	1397	160	1,595	6.12	3.95	88	68							
1958	1475	149	1,665	5.92	4.04	82	65							
1959	1510	144	1,725	7.77	5.08	79	65							
1960	1545	153	1,792	8.53	5.29	84	65		23					51.20
1961	1588	140	1,842	6.27	4.87	77	58		28				1.40	51.90
1962	1668	192	1,942	9.09	4.48	106	73		23				1.90	52.90
1963	1722	221	2,066	7.56	4.27	122	90		27				0.80	53.30
1964	1826	222	2,185	7.11	2.84	122	98		43				1.30	54.00
1965	2014	240	2,316	8.85	3.83	132	108		18				2.80	55.50
1966	2134	289	2,489	9.55	4.73	159	132		19				2.30	56.80
1967	2232	387	2,751	11.96	4.93	213	173		18				1.90	57.90
1968	2394	410	3,024	11.39	5.16	226	178		15	7	22		1.70	58.90
1969	2402	442	3,315	10.83	4.90	244	159		18	1	19		1.20	59.60
1970	2403	485	3,634	9.26	3.98	268	173		17	2	19	17	3.90	61.90
1971	2499	445	3,897	10.12	3.97	253	182		20	2	22	15	2.10	63.20
1972	2643	417	4,119	10.77	4.79	245	188		21	2	23	6	3.20	65.20
1973	2851	516	4,429	11.95	4.11	325	237		22	2	24	13	4.60	68.20
1974	2816	585	4,793	10.39	2.95	433	311		26	4	31	-2	12.80	76.90
1975	2876	637	5,190	3.56	-0.27	476	314		39	11	50	14	8.10	83.10
1976	3178	652	5,583	4.60	1.15	550	360		28	7	35	10	5.10	87.30
1977	3508	765	6,069	12.76	5.36	711	445		33	7	40	18	8.40	94.60
1978	3859	932	6,697	12.46	7.84	932	577	300	33	7	40	17	5.70	100.00
1979	4039	908	7,270	12.04	7.57	1036	666	346	49	9	58	56	12.10	112.10
1980	4066	948	7,855	6.18	3.88	1258	781	405	47	12	58	12	18.10	132.40

DATA SERIES, CONT.-

Year	real GDP 1978 prices	FBCF 1978 prices	k stock 1978 prices Mitch adj.	Net Dom Savings sav / GDP total	Net Dom Savings sav / GDP household	Investment total FBCF corr	Investment private FBCF corr	Non-capital enterprise over priv. FBCF	ODA DAC-bi	ODA Multi	ODA Total	FDI	CPI Annual variation %	CPI Index 1978=100
	mill L	mill L	mill L	%	%	mill L	mill L	mill L	mill US$	mill US$	mill US$	mill L		
1981	4169	738	8,200	3.94	2.47	1088	634	329	53	14	67	-7	9.40	144.80
1982	4111	649	8,439	-0.41	-0.26	1009	478	248	62	20	83	28	9.00	157.80
1983	4073	660	8,677	-0.21	-0.13	1028	411	213	114	31	146	35	8.20	170.80
1984	4250	750	8,993	0.92	0.58	1251	514	267	163	37	201	41	4.70	178.90
1985	4428	726	9,270	4.81	3.02	1234	587	305	217	28	245	55	3.40	184.90
1986	4460	591	9,397	2.68	1.68	1045	598	310	246	30	276	60	4.40	193.00
1987	4729	630	9,557	5.11	3.21	1132	707	367	215	33	248	57	2.50	197.80
1988	4947	764	9,843	7.72	4.85	1429	962	499	233	44	277	97	4.50	206.70
1989	5161	920	10,271	4.92	3.09	1884	1295	672	156	32	188	102	9.80	227.00
1990	5166	877	10,635	11.41	7.17	2533	1710	888	315	33	348	231	23.30	280.00
1991	5334	879	10,982	12.11	7.61	3096	1928	1001	682	25	708	281	34.00	375.10
1992	5634	1116	11,549	11.89	7.47	4202	2254	1170	177	76	253	278	8.80	408.00
1993	5985	1516	12,487	18.14	11.40	6535	3711	1927	156	25	180	378	10.70	451.80
1994	5907	1514	13,377	21.46	13.49	8110	4908	2548	113	19	132	390	21.70	550.00
1995	6148	1296	14,004	21.07	13.25	8994	5237	2719	151	32	183	718	29.50	712.00
1996	6368	1378	14,682	20.42	12.83	11468	7275	3777	133	26	158	1158	23.80	881.80
1997	6686	1596	15,544	22.54	14.17	15732	11573	6008	130	19	149	1672	20.20	1059.60
1998	6880	1761	13,722	22.32	14.03	19874	16078	8347	206	28	234	1367	13.70	1204.70
1999	6750	1872	14,908	24.33	15.30	22977	18200	9449	337	29	366	3441	11.60	1344.45
2000	7073	1784	15,947	22.75	14.30	23826	18797	9759				4269	10.05	1479.56

Source: Central Bank of Honduras Bulletins (various years), OECD Special Tabulations, Heston & Summers (1995), República de Honduras (1998)

APPENDIX 2: PROJECTED IMPACT OF AIDS INCIDENCE ON ECONOMIC GROWTH RATES (HIPC CONSISTENT FDI)

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI
	base	high	medium	low	uniform	half cost	equal cost	prevention	financing	distribution	productivity
2001	0.006	0.000	0.024	0.000	0.003	0.006	0.006	0.006	0.006	0.006	0.003
2002	0.000	0.000	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2003	0.013	0.000	0.000	0.000	0.013	0.013	0.014	0.013	0.009	0.013	0.007
2004	0.013	0.000	0.000	0.000	0.013	0.013	0.014	0.013	0.009	0.013	0.007
2005	0.013	0.103	0.000	0.000	0.013	0.013	0.014	0.013	0.008	0.013	0.006
2006	0.011	0.043	0.000	0.000	0.011	0.011	0.012	0.011	0.007	0.011	0.006
2007	0.013	0.042	0.011	0.000	0.013	0.013	0.014	0.013	0.008	0.013	0.006
2008	0.024	0.040	0.011	0.042	0.024	0.024	0.026	0.024	0.014	0.024	0.012
2009	0.012	0.037	0.016	0.039	0.012	0.012	0.014	0.012	0.007	0.012	0.006
2010	0.012	0.000	0.000	0.000	0.012	0.012	0.014	0.012	0.006	0.012	0.006

PROJECTED IMPACT OF AIDS INCIDENCE ON ECONOMIC GROWTH RATES (CONSTANT REAL FDI)

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI
	base	high	medium	low	uniform	half cost	equal cost	prevention	financing	distribution	productivity
2001	0.006	0.000	0.024	0.000	0.003	0.006	0.006	0.006	0.006	0.006	0.003
2002	0.000	0.000	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2003	0.013	0.000	0.000	0.000	0.013	0.013	0.014	0.013	0.009	0.013	0.007
2004	0.013	0.000	0.000	0.000	0.013	0.013	0.014	0.013	0.009	0.013	0.007
2005	0.013	0.103	0.000	0.000	0.013	0.013	0.014	0.013	0.009	0.013	0.006
2006	0.011	0.043	0.000	0.000	0.011	0.011	0.012	0.011	0.008	0.011	0.006
2007	0.013	0.043	0.011	0.000	0.013	0.013	0.014	0.013	0.008	0.013	0.006
2008	0.024	0.041	0.011	0.043	0.024	0.024	0.026	0.024	0.015	0.024	0.012
2009	0.013	0.038	0.017	0.040	0.013	0.013	0.014	0.013	0.008	0.013	0.007
2010	0.013	0.000	0.000	0.000	0.013	0.013	0.014	0.013	0.007	0.013	0.007

Source: Author's estimates