Financing HIV Programmes:
The Role of External Support

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Abstract: The paper discusses the magnitude of the costs of HIV programmes across countries, and the role of external support. The countries facing the steepest challenges in terms of financing the response to HIV tend to be low-income countries with an HIV prevalence of 5-15 percent, and not the countries with the highest levels of HIV prevalence. Donor policies on HIV funding can be described by a rule whereby donors cover a high proportion (around 90 percent) of the costs of an HIV programme in least-developed countries, and this proportion declines as GNI per capita increases. To avoid high domestic financing burdens following a decline in external funding globally, donors would need to adapt their funding policies in case of a shortfall in external financing, allocating relatively more to low-income countries, but also covering a relatively higher share of the costs of HIV programmes in countries with high HIV prevalence.

Keywords: HIV/AIDS, aid, low-income countries, developing countries, development assistance, health, health financing, public finance.

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I.   Introduction

The financing of the global response to HIV poses significant challenges, both for national governments in countries facing a significant health shock, but also for donor countries who have supported the international response in the past, but are facing tightening fiscal resources at home. These pressures have been highlighted by the recent decision of the Global Fund to postpone its Round 11 Call for Proposals, because "substantial budget challenges in some donor countries, compounded by low interest rates have significantly affected the resources available for new grant funding" (GFATM, 2011a). This negative outlook for HIV/AIDS funding is also a matter of immediate concern for governments in countries whose national HIV programmes have been enabled by high rates of external support, including a number of low-income countries where external support has accounted for the bulk of the costs of the national HIV programme.

This paper discusses the costs of HIV programmes, and in particular the role of external financing, against the backdrop of a perceived tightening in external support. Section II provides an overview of the costs of HIV programmes across countries. It finds that the countries facing the steepest financing challenges (relative to available resources) are low-income countries, and not necessarily the countries with the highest HIV prevalence rates. Section III analyzes the role of external financing empirically, suggesting that donor policies can be summarized by a simple rule whereby external financing amounts to about 90 percent of the costs of the HIV programme and declines with the level of economic development. Section IV discusses the consequences of a global decline in external financing. Based on UNAIDS resource need estimates for 2015, it compares a situation where external funding is allocated using the established policy rule with a situation in which funding is reduced by 20 percent. It shows that a number of low-income countries are particularly vulnerable to a slowdown to external financing. To avoid large financing burdens in individual countries, donors need to differentiate their rate of support more strongly by level of economic development, while financing a relatively higher share of the costs of HIV programmes in countries with high HIV prevalence. Section V concludes.

II.   How Much Are Countries Spending on HIV Programmes?

HIV spending data for low- and middle- income countries, compiled by UNAIDS from UNGASS reports and National AIDS Spending Assessments (NASA), have been published in successive editions of the Report on the Global AIDS Epidemic (UNAIDS 2008, 2010a) and are available online at aidsinfoonline.org.[1] The data are available for a large number of countries – our analysis builds on 221 observations (i.e., data for one country and one year) which were available for low- and middle-income countries over the years 2007-2009. As

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[1] Data sources are documented in the Appendix.

the classification of expenditures by spending category in this dataset follows common guidelines, it is possible to review the weight of spending categories across countries.

However, the data also suffer from weaknesses that limit the scope for cross-country analysis. The spending data reflect national priorities, idiosyncrasies in the design of HIV programmes, differences in coverage rates of key HIV interventions, and differences in the extent to which HIV-related spending is captured by the spending estimates. Therefore, the spending data are not straightforward measures of the burden countries are facing. Additionally, data availability is uneven. While some data are available for most low- and middle-income countries, the data are frequently available only for specific years. Complete data over the years 2007-2009 have been reported for 34 countries only, not including any country facing very high HIV prevalence.[2]
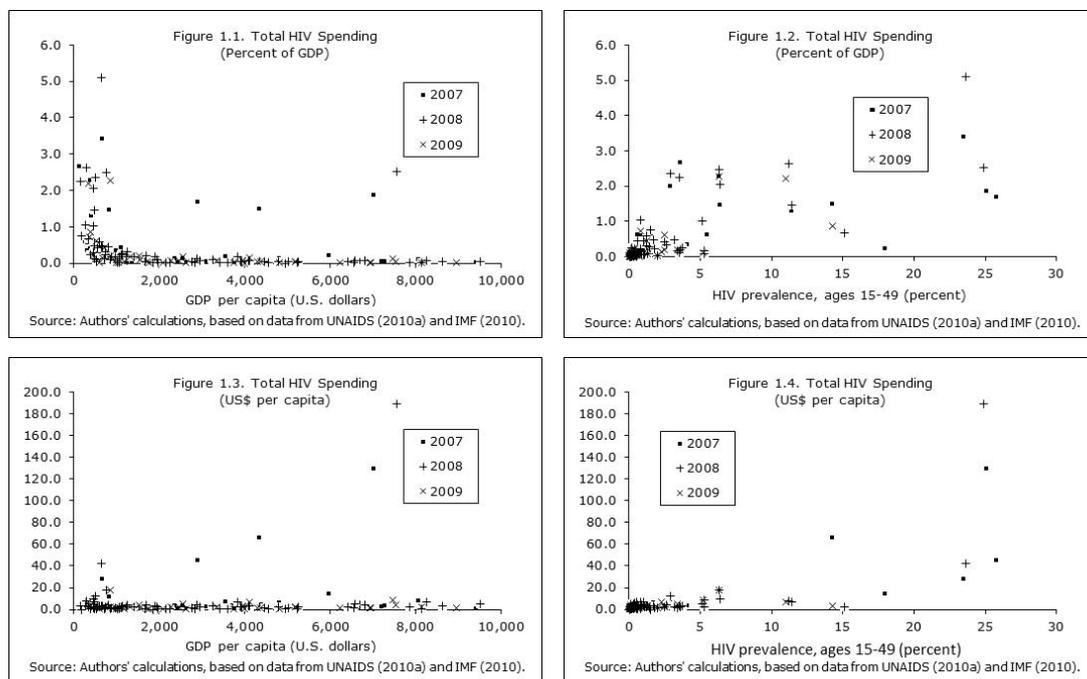
Figure 1. HIV Spending Across Countries, 2007-2009

Figure 1 summarizes the available spending data. HIV-related spending, in percent of GDP (Figure 1.2) and in terms of US$ per capita (Figure 1.4), increases in line with HIV prevalence. In terms of US$ per capita, spending in most countries is in the range of 0-10 US$, with little variation across countries. However, there are a number of outliers with spending of up to $180, largely middle-income countries high HIV prevalence. For spending in percent of GDP, the most pronounced variation occurs among low-income countries (approximately, countries with GDP per capita below US$1,000 in Figs. 1.1 and 1.3). In this group, HIV spending ranges from very low levels to about 5 percent of GDP. Moreover, Fig. 1.2 suggests that the low-income countries facing a very high burden include a number of countries where HIV prevalence is below 10 percent.

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[2] The country with the highest HIV prevalence for which data are available is Kenya (HIV prevalence of 6.4 percent of the population of ages 15-49, as of 2009 (UNAIDS, 2010a).

In summary, both HIV prevalence and GDP per capita are important determinants of the financial burden, relative to available resources, of financing the response to HIV/AIDS. The majority of countries where HIV-related spending has been very high relative to GDP are low-income countries which do not belong to the countries facing the highest HIV prevalence. However, low-income countries also receive the highest rates of external support, so that the domestic financing needs are much lower than total spending or resource needs. These outcomes are illustrated in Figure 2, which summarizes the available data on domestically financed HIV spending (UNAIDS, 2010). The domestic financing burden, relative to GDP, is spread much more evenly across countries than total spending. It accounts for more than 0.3 percent of GDP in only a few countries, predominantly countries with high HIV prevalence rather than low-income countries per se. The picture is less clear-cut when the domestic financing burden relative to the government's fiscal resources[3] is considered (Fig. 2.3). By this measure, the domestically financed portions of the costs of national HIV programmes tend to be higher in low-income countries (consistent with lower fiscal revenues, relative to GDP, in these countries).[4]

Figure 2. Domestically Financed HIV Spending, 2007-2009
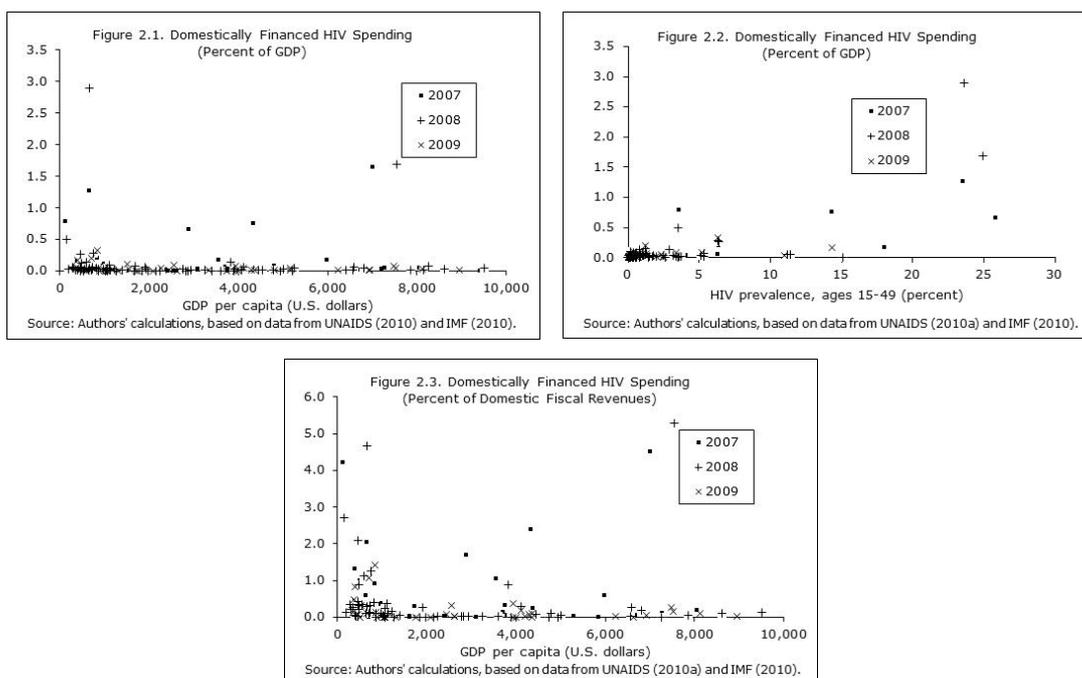
The data on HIV-related spending compiled by UNAIDS also offer some insights on the main drivers of spending, as data on spending in the main cost categories are available for a subset of countries. Figure 3 describes the roles of the costs of antiretroviral treatment and of support to orphans and vulnerable children. ART spending has accounted for a substantial

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[3] I.e., domestic tax or non-tax revenues, not including grants or loans.

[4] Average domestic government revenues accounted for 17 percent of GDP across low-income countries included in the sample, and 27 percent of GDP for middle-income countries.

share of HIV-related spending across countries (27 percent of total HIV spending covered by Figure 3). HIV prevalence and the share of spending on ART appear uncorrelated.[5]

Support for orphans and vulnerable children plays a smaller role (5.5 percent of total HIV spending covered by Fig. 3), but its role appears to increase with HIV prevalence, and ranges from 8 percent to 30 percent of total spending for the countries with the highest HIV prevalence. This increase is somewhat puzzling, as the number of orphans increases roughly in proportion with HIV prevalence. It may reflect that the design of HIV programmes accommodates the challenges arising from large numbers of orphans in high-prevalence countries, whereas orphan support occurs outside HIV programmes in countries with lower HIV prevalence.

Figure 3. Composition of HIV Spending

Source: Authors' calculations, based on data from UNAIDS (2010a) and IMF (2010).
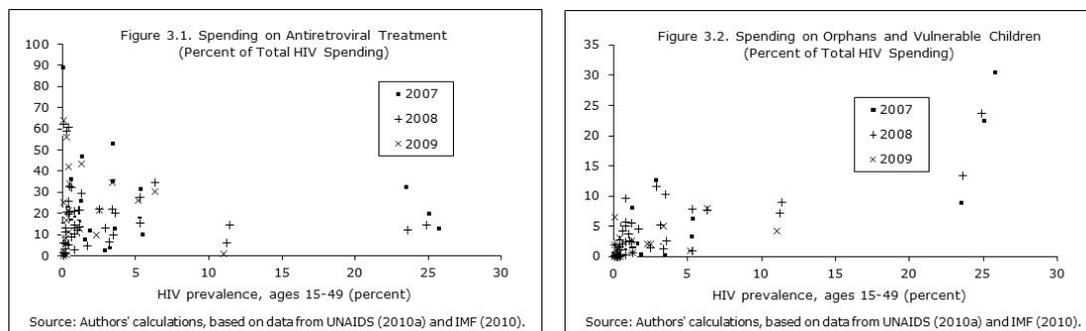
III.   How Have Donor Policies Contributed to Mitigating Domestic Burden?

External financing has played a very important role in the financing of the international response to HIV. UNAIDS (2010a) estimates that HIV spending from public sources amounted to US$ 15.9 billion across low- and middle-income countries in 2009, of which external aid accounted for just under one-half (US$ 7.6 billion). This global average, however, masks large differences in the role of external financing across countries, as it includes a number of large middle-income countries with relatively low HIV prevalence, and a very small role for external financing,[6] and many low-income countries where external financing accounts for more than 90 percent of HIV-related spending from public sources.[7]

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[5] A regression of the share of ART spending on HIV prevalence returns an insignificant coefficient very close to zero, and an R^2 of 0.0003.

[6] These include Brazil (with HIV prevalence of about 0.5 percent, and HIV-related public spending of US$ 623 million in 2008, of which external financing accounted for only one percent), and Mexico (HIV prevalence 0.3 percent, HIV-related public spending of US$ 218 million in 2009, of which 0.6 percent came from external sources (UNAIDS, 2010a)

[7] These countries include Central African Republic, Democratic Republic of Congo, Malawi, Mozambique, Niger, Rwanda, Sierra Leone, and Togo (UNAIDS, 2010a).

Figure 4 illustrates the role of external financing across countries. External financing typically accounts for around 90 percent of the costs of HIV programmes in low-income countries, and then declines fairly evenly as GDP per capita increases. There is no clear correlation between the rate of external financing (relative to total spending) and HIV prevalence.

Figure 4. The Role of External Support, 2007-2009
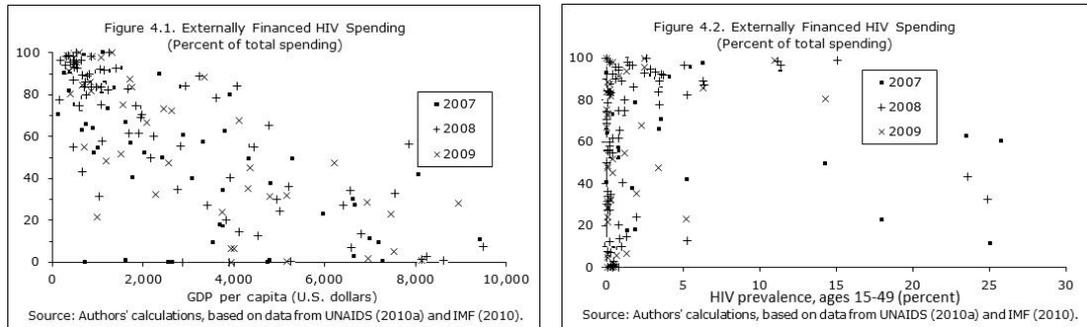
Owing to the rich availability of data on HIV-related spending and financing across countries, it is possible to analyse donor policies in allocating HIV financing more explicitly. Specifically, we postulate that donors allocate funding to HIV programmes according to a policy rule which could reflect the country's level of economic development or economic resources in general (measured by GNI per capita), its domestic fiscal resources, other aspects of government capacities, and the state of the epidemic.

These policy rules could reflect explicit rules applied by large donors. The Global Fund (2011b, 2011c), for example, has recently published new funding criteria, (re-)introducing explicit counterpart financing requirements. According to the new guidelines, domestic financing requirements amount to at least 5 percent of the total costs of a proposal for low-income countries, 20 percent for "lower lower-middle-income countries," 40 percent for "upper lower-middle-income countries," and 60 percent for upper-middle-income countries, which may only apply if they face at least a "high" disease burden.[8] Apart from explicit requirements for collateral financing, the estimated rules could also reflect an informal understanding across the donor community on what constitutes an appropriate rate of external support.

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[8] Additionally there are restrictions on the scope of the proposal ("focus on specific populations/interventions") which also constrain eligibility for funding across middle-income countries.

Table 1. Determinants of Rate of External Financing

Dependent variable:	External Financing (Percent of total spending)							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Constant	79.7***	81.2***	88.6***	81.8***	77.9***	78.6***	91.9	88.2***
	(16.3)	(22.4)	(12.4)	(19.1)	(10.4)	(14.1)	(7.94)	(22.9)
GNI per capita (2005 PPP US$)	-0.0057***	-0.0058	-0.0056***	-0.0057***	-0.0057***	-0.0057***	-0.0059***	-0.0067***
	(-10.3)	(-12.2)	(-8.07)	(-9.38)	(-6.80)	(-8.20)	(-6.32)	(-9.94)
Domestic govt. revenues			-0.33				-0.42	
(percent of GDP)			(-1.42)				(-1.11)	
HIV prevalence (ages 15-49, percent)	-0.03		0.36		0.43		0.86	
	(-0.09)		(0.84)		(0.84)		(1.48)	
LIC (=1 if low-income country,	12.0***	11.8***	8.12*	10.48**	12.14*	11.96**	6.59	
=0 otherwise)	(2.94)	(2.89)	(1.67)	(2.32)	(1.92)	(1.92)	(0.90)	
Government Effectiveness	-0.85		-0.30		0.18		2.25	
(index)	(-0.24)		(-0.07)		(0.03)		(0.37)	
Small (=1 if population below	6.1		0.38		-4.07		-10.7	
2 million, =0 otherwise)	(1.17)		(0.06)		(-0.54)		(-1.24)	
Number of observations	186	186	144	144	88	88	68	68
R-square	0.65	0.64	0.61	0.60	0.65	0.65	0.63	0.60
F-test on exclusions		0.59		0.56		0.26		1.12
(Prob. on F-test)		(0.62)		(0.69)		(0.85)		(0.36)

T-ratios in parentheses. One, two, and three stars indicate coefficients significant at the 10-, 5-, and 1-percent level of significance.

Table 1 summarizes our empirical findings. Cols. (1) to (4) offer estimates based on all data points available for 2007-2009 for low- and middle-income countries (186 observa–tions, reduced to 144 if domestic government revenues are included). Cols. (5) to (8) show estimates based on a sample that includes the latest observation available for each country only (88 observations, or 68 if domestic government revenues are included). The sample includes data for the 30 countries with the highest HIV prevalence worldwide, so we are confident that we capture most of the variety in the data as far as the impact of and the response to HIV is concerned.

The variables that are consistently significant are GNI per capita and a dummy for low-income countries (based on classification by World Bank (2010). For the least-developed countries, the extent of external support for their HIV programmes exceeds 90 percent of HIV spending. The extent of external support declines by about 6 percentage points for an additional US$ 1,000 in GNI per capita (and – in most specifications – an additional 8 to 10 percentage points between low- to middle-income countries). HIV prevalence is not significant, but tends to come out positive across specifications. The level of domestic fiscal revenues has a negative coefficient (additional government revenues equivalent to 1 percent of GDP translate into a rate of external financing that is 0.3 to 0.5 percentage points lower. The coefficient, however, is not well-determined, with t-ratios between –1.0 and –1.5. The index for government effectiveness and the small-country dummy (which may capture human resource constraints) do not play a role, with coefficients which are not significant and unstable across specifications.

In summary, the policies applied by donors in allocating HIV funding can be summarized by a simple rule (based on Table 1, col. (6)) whereby

$$\frac{\text{Int}}{\text{Total}} = 78.6 + 12.0 \cdot \text{LIC} - 5.7 \frac{\text{GNIPC}}{1,000}, \qquad (1)$$

i.e., donors cover 90 percent of the costs of HIV programmes for least developed countries, this rate declines by 5.7 percentage points for each US$1,000 in GNI per capita, in addition to a drop of 12 percentage points between low- and middle-income countries. According to this specification, countries with high HIV prevalence gain larger external support as they spend more on HIV, but the share of external financing reflects the economic context and thus exhibits a similar pattern as development assistance more generally.[9]

IV. Vulnerability to Shortfalls in External Financing

As noted earlier, the countries facing the steepest challenges in financing their HIV programmes tend to be low-income countries with HIV prevalence in the range of 5 percent to 15 percent. In contrast, some of the countries facing the highest levels of HIV prevalence overall also enjoy relatively high levels of GDP per capita, so that they do not also rank highest in terms of the financing burden (relative to GDP). High rates of external support have enabled low-income countries to build their HIV programmes, and resulted in a fairly even distribution of the domestic burden of financing HIV programmes (in percent of GDP) across low- and middle-income countries. High rates of external financing among low-income countries (sometimes exceeding 90 percent of the total costs), however, imply that the financing of HIV programmes in these countries is vulnerable to shortfalls in external resources available.

This point is illustrated in Figure 5, which is based on UNAIDS resource need estimates for 2015. Figure 5.1 illustrates domestic financing needs across low- and middle-income countries based on the estimated donor policy rule for allocating external funding to HIV programmes (Equ. 1, above). In this scenario, external financing covers about one-half (US$ 10.4 bn) of total resource needs of US$ 20.1 bn.

Figure 5. Consequences of Shortfall in External Financing

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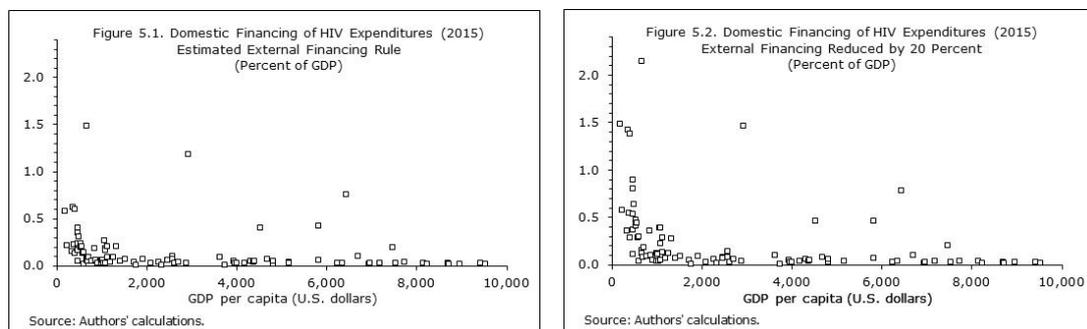
[9] From the perspective of development assistance, however, it can be argued that donors disproportionately support the costs of HIV programmes in middle-income countries. For example, the rate of external support for health spending declines more rapidly with GDP or GNI per capita than it is the case for HIV programmes. This may reflect a recognition of the extraordinary scale of the HIV epidemic in a number of middle-income countries.

This is contrasted, in Figure 5.2, with a scenario in which the availability of external financing is assumed to decline by 20 percent across the board. As a consequence, the domestic financing burden for low-income countries (broadly, those with GDP per capita below US$1,000) shifts up, and the number of low-income countries facing a domestic financing burden exceeding 0.5 percent of GDP increases from 4 to 10. This high vulnerability reflects the high dependence of HIV programmes in low-income countries on external financing – if external funding is cut by 20 percent in a country that relies on external financing for 90 percent of the costs of the HIV programme, this means that the rate of external financing declines to 72 percent, and the domestic financing needs increase almost three-fold (from 10 percent of the total costs to 28 percent).

One policy response for a country facing a shortfall in external financing is rationing, i.e., reducing the coverage of services. Our example suggests that this is not a powerful tool from a fiscal perspective. Using the same numerical example (90 percent of the costs of the HIV programme financed externally, drop in availability of external funding of 20 percent), it appears that this country would need to scale down the HIV programme by 18 percent initially. However, if donors would observe this cut in domestic commitments and cut their collateral financing (as suggested by the estimated policy rule), the resulting cut in HIV spending could be as high as 64 percent.[10]

Thus, from the perspective of the domestic financing needs of national HIV programmes, a drop in external financing places a disproportionate burden on low-income countries, and threatens the sustainability of HIV programmes in these countries. This, however, assumes that the decline in financing occurs across the board, i.e., the policy rule (obtained by multiplying all coefficients in Eq. (1) by 0.8) becomes

$$\frac{\text{Int}}{\text{Total}} = 62.9 + 9.6 \cdot \text{LIC} - 4.6 \frac{\text{GNIPC}}{1,000} . \tag{2}$$

Alternatively, donors might be concerned about the large domestic financing burden in some countries resulting from this rule. To study the policy scope for mitigating such excessive burdens, Eq. (3) presents an alternative policy rule, based on three criteria: (1) The rule should resemble Eq. (2), which allocates funds in proportion with the estimated policy rule (Eq. (1)). (2) The rule should avoid very large domestic financing burdens. (3) Total external funding declines by 20 percent relative to the estimated rule (as is the case for the across-the-board cut).

The alternative rule is calibrated by minimizing the sum of two components, subject to a budget constraint: The sum of squared deviations of domestic financing needs (in percent of
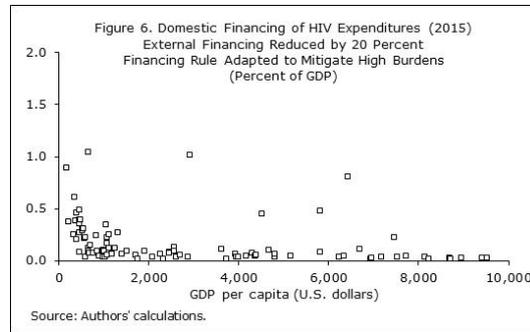
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[10] This is calculated so that the domestic resource needs following the shift in external funding (28 percent of total HIV spending) are equal to the domestic resource needs (10 percent of total HIV spending) before the policy shift. Note that we do not take account of general equilibrium effects in this example. To the extent that domestic governments globally respond to higher domestic financing requirements by reducing the scale of their HIV programme (and thus external financing requirements), the share of external financing on the programme level would need to decline by less than the assumed 20 percent drop in the availability of HIV funding globally.

GDP) according to the modified rule from those under the rule in Eq. (2), and the sum of squared domestic financing needs (in percent of GDP).[12] Where the rule returns a negative share of external financing (the country would need to become an HIV donor), we set external funding to zero. In addition to the variables included in Eq. (2), we admit HIV prevalence as a potential determinant of external support, as donors in the new financial environment may differentiate more strongly by disease burden.

The modified rule comes out as

$$\frac{Int}{Total} = 69.3 + 12.9 \cdot LIC - 7.3 \frac{GNIPC}{1,000} + 0.89 \cdot HIVPREV \quad , \tag{3}$$

and the resulting distribution of domestic financing burdens of HIV programmes is illustrated in Fig. 6.

Figure 6. Domestic Financing of HIV Expenditures (2015)
External Financing Reduced by 20 Percent
Financing Rule Adapted to Mitigate High Burdens
(Percent of GDP)

Source: Authors' calculations.

The modified rule is successful in avoiding very high domestic financing burdens – the profile of domestic financing needs in Figure 6 is similar to the one in Fig. 5.1 (preceding the assumed drop in external financing). To achieve these outcomes, it would be necessary to adapt donor policies in three directions:

- Allocate a higher share of funding to low-income countries (compare the constant and the coefficient of LIC in Eq. (3) to the corresponding numbers in Eq. (2)).

- Differentiate more strongly by level of income (the coefficient of GNIPC is larger in Eq. (3)).

- Cover a higher share of funding in countries with higher HIV prevalence (inclusion of HIVPREV in modified rule).

The policy experiment – comparing a drop in funding across the board with a modified rule that avoids very large domestic financing burdens – can also be interpreted in terms of the ability of countries to contribute to the costs of HIV programmes. First, middle-income countries are generally better placed to increase the share of domestic funding – the modified rule therefore envisages a less-than-proportional drop in funding to low-income countries. Second, as external funding declines, the magnitude of the HIV health burden

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[12] The weights applied, of course, are arbitrary. The example serves to illustrate how distributional concerns can be mapped into alternative policy rules; we do not take a position on the correct weights.

matters more. Low-income countries with moderate or high HIV prevalence (and large costs of HIV programmes) are the most vulnerable, but the fiscal costs of HIV are also serious in a number of middle-income countries. The scope for increasing domestically financed HIV spending in these two types of countries is therefore small, and this reflected in higher allocations to high-prevalence countries in the modified policy rule.

V.   Conclusions

Our findings can be grouped in three areas: determinants of the financial burden of HIV across countries, donor policies allocating funding to HIV programmes, and the consequences of a shortfall in the availability of external funding.

Ultimately the financial burden is caused by the scale of the epidemic. However, the analysis shows that economic capacities are an equally important determinant of the financing challenges countries are facing. Indeed, the countries facing the steepest challenges in terms of financing the response to HIV tend to be low-income countries with an HIV prevalence of 5-15 percent, and not the countries with the highest levels of HIV prevalence.

Donor policies on HIV funding can be described by a simple rule whereby donors cover a high proportion (around 90 percent) of the costs of an HIV programme in least-developed countries, and this proportion declines as GNI per capita increases. While higher HIV prevalence means higher costs, it does not have a noticeable impact on the *share* of the costs covered by external support.

High rates of external support translate into vulnerabilities to a shortfall in external financing. Rationing – which also could be undesirable for medical and equity reasons – is not an effective strategy to contain the domestic costs of HIV in response to a shortfall in external support. To avoid high domestic financing burdens, donors would need to adapt their funding policies in case of a shortfall in external financing. , allocating relatively more to low-income countries (at the expense of middle-income countries), but also covering a relatively higher share of the costs of the HIV programme in countries with high HIV prevalence. Such an adaptation would have implications for the eligibility and allocation decisions currently being made by major bilateral and multilateral donors.

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Data Appendix

GDP, GDP per capita, government revenues, and government expenditures: Obtained from the IMF's World Economic Outlook Database (IMF, 2010). GDP and GDP per capita (in national currency or in US$) were available for all countries and years in the dataset. The availability of fiscal data was more limited, for the latest observations of HIV-related spending (covering 93 countries), fiscal data for only 69 countries were available. In some cases where fiscal data were not available from IMF (2010), we have complemented the data with data taken from recent IMF staff reports.

Government effectiveness: Obtained from the World Bank (2011), available for all countries and years included in the analysis.

Gross national income was obtained from the World Bank (2010), and is available for all countries and years included in the analysis.

HIV prevalence and people living with HIV: As reported in UNAIDS (2010a) or UNAIDS 2010b (the latter also provides annual estimates from 1990-2009). The data reported by

UNAIDS, however, are truncated, as only ranges are available for estimates of people living with HIV or AIDS deaths below 1000 ("<1000," "<500," "<200," and "<100"), or an HIV prevalence below 0.1 percent. These range estimates were overwritten with the mid-points for the respective range (e.g., 750 instead of "<1000"). For three countries (Brazil, Democratic Republic of Congo, and Mexico), UNAIDS reports high and low estimates, but no point estimates. For these countries, we use the arithmetic mean of the high and low estimates.

HIV spending and financing: Compiled by UNAIDS from UNGASS Reports and available from aidsinfoonline.org (accessed February 2011). 404 observations (i.e., data for one country and one year) over the years 2005-2009 were available as of February 2011, our analysis focuses on data for low- and middle-income countries for the years 2007-2009 (221 observations). In most cases, the data are based on the accounts of the national HIV/AIDS program and the accounts tracking disbursements from and spending financed by major donors like the Global Fund, PEPFAR, or the World Bank. While there are some common guidelines, data may differ across countries in terms of the depth (availability of disaggregated data) or scope of the data (e.g., coverage of certain social expenditures and of non-ART health services to people living with HIV/AIDS).**Resource needs estimates**: Country-level resource needs estimates are based on internal UNAIDS data, obtained in 2011.