HOW MUCH EXTERNAL FINANCE WILL BE NEEDED TO MEET THE POVERTY-REDUCTION TARGET BY 2015?

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Abstract

This paper estimates the external financing needs of the developing world over the periods 2004-2010 and 2004-2015, using a savings gap model. In particular, it projects the external financing required to achieve the international target of halving extreme poverty by 2015 in each developing region of the world. Our projections show that the financing needs of the developing world are bigger than those projected by the World Bank. According to the projections, the external finance requirements far exceed even a very optimistic scenario of abundant capital flowing from the North to the South.

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1. Introduction

Since the beginning of the new century, international efforts have converged to the fundamental objective of significantly reducing poverty across the world. It is commonly accepted that economic growth is needed to achieve this objective, but it is not clear how much growth is needed, and how much external financing is required to sustain higher growth.

Hanmer et al. (1999) have provided estimates of the growth rates required to achieve the internationally agreed target of halving extreme poverty by 2015 in each developing region of the world. The World Bank in turn has suggested that aid flows would have to increase by at least U$ 50 billion in the next years to meet the millennium development goals (see Global Development Finance, 2004).

Based on a savings gap model, this paper estimates the external financing needs of developing countries over the 2004-2010 period, and in particular the external financing required to halve extreme poverty by 2015, using Hamner et al. (1999) growth estimates. It shows that the external financing gap facing developing countries is very large, and that the World Bank figure on needed additional aid flows is probably an underestimate of what the majority of developing countries, which do not have access to private capital flows, really need to meet the millennium development goals.

Following this introduction, section 2 provides projections on the external financing needs of each developing region in the world. Financing needs are estimated under

both a base scenario (section 2.1) and a poverty-reduction target scenario (section 2.2). Section 3 concludes.

2. External financing needs of developing countries

Based on a savings gap model[1], we can run simulations and estimate the net external financing needs of developing countries over the 2004-2010 period. Using the savings gap model involves two basic steps. First, based on the incremental capital-output ratio (ICOR), the investment rate required for achieving a certain growth rate is calculated. Second, the gap between the investment required and national savings is calculated. This gap should thus be filled through external financing (the model, assumptions and set of parameters used are presented in Appendix 2).[2]

The net external financing needs estimated by the model essentially correspond to the countries' projected current account deficits over the period being covered.[3] It takes account of four major determinants of the current account: the savings-investment gap (which is equivalent to the difference between imports and exports of goods and services net of factors), profit remittances, interest payments on external debt and unilateral transfers.

[1] The two- and three-gaps models are not used because under projected rapid and sustained growth financed with external resources, the savings gap, rather than the foreign exchange or the fiscal gaps, becomes the key binding constraint.

[2] In the past few years there has been some scepticism regarding the use of the gaps approach for the purpose of estimating external financing needs (see for example, Easterly, 1999; for a more favourable view, see Ranaweera, 2004). While we agree that the gaps approach has limitations, it should be clear that it can prove useful in estimating long-term financing needs for countries expected to experience sustained growth. The empirical evidence points to a stable long-term relationship between investment and growth (while it is true that in the short run the relationship appears rather variable); and although causality might run either way, it is of little dispute that investment is a crucial factor behind productive capacity and long-term growth.

Table 1 reports the annual average external financing needs of six developing regions over the 2004-2010 period under a ***base scenario***. In addition, it provides estimates of the annual financing required to halve poverty by 2015 – the ***poverty-reduction target scenario***.

Growth rates under the ***base scenario*** are drawn from the current forecast of The Global Development Finance 2004 report. This report offers growth rates for each developing region over the 2004-2006 period.[4] Such growth rates are somewhat similar to those experienced by the regions in the first years of this century, which was the period we drew upon to obtain some of the key parameters of the model, such as ICOR and savings rates. The Latin America & the Caribbean was an exception to that, as it had a poor growth performance between 2000 and 2003. Thus, in the case of Latin America & the Caribbean, the ICOR used was based on the years 1993-1997, when a better growth performance was observed.

The ***poverty-reduction target scenario*** uses the growth rates that are believed to be necessary to halve extreme poverty (i.e. those living on less than U$ 1 dollar a day) by 2015 in each developing region. These growth rates were drawn from Hanmer et al. (1999), and are also reported in DFID (1999).[5] The growth rates used to generate each of the above scenarios are displayed in Table 2.

[3] It therefore does not take account of the financing needs of the capital account, for example the financing necessary for principal payments.
[4] For the remaining years – 2007-2010 – growth rates being forecast for 2006 were used.
[5] Since such growth rates in Hanmer et al. (1999) and the DFID document are provided in per capita terms, in order to obtain total growth we use the average annual population growth rate over 1998-2015, drawn from World Development Indicators 2000.

Table 1: Net External Financing Needs of Developing Countries, by Regions

Annual average

	Base scenario[1] 2004-2010		***Poverty-reduction Target scenario***[2] 2004-2015	
	U$ billion [3]	% GDP	U$ billion [3]	% GDP
East Asia & Pacific	55.2	1.6	n.d.	n.d.
South Asia	80.3	7.8	36.9	3.4
Middle East & North Africa	17.0	1.9	67.5	6.5
Sub-Saharan Africa	27.4	6.6	61.9	10.8
Europe & Central Asia	24.1	1.1	n.d.	n.d.
Latin America & The Caribbean	4.1	0.3	188.7	5.9

Source: author's calculation. 1. Growth rates used in the ***base scenario*** are drawn from the current projections of the Global Development Finance 2004. 2. Growth rates used in the ***poverty-reduction target scenario*** are drawn from Hanmer et al. (1999), also reported in DFID (1999). 3. The values are set in 2002 constant prices.

Table 2: Annual growth rates

%

	Base scenario[1]			***Poverty-reduction target scenario***[2]
Years	**2004**	**2005**	**2006**[3]	**2004-2015**
East Asia & Pacific	7.4	7.4	7.4	4.3
South Asia	7.2	6.7	6.5	5.5
Middle East & North Africa	3.7	3.9	4.0	4.7
Sub-Saharan Africa	3.4	4.2	3.9	8.2
Europe & Central Asia	4.9	4.8	4.7	3.9
Latin America & The Caribbean	4.0	4.0	4.0	10.2

Sources: Global Development Finance 2004 and DFID 1999. 1. Growth rates used in the ***base scenario*** are drawn from the current projections of the Global Development Finance 2004. 2. Growth rates used in the ***poverty-reduction target scenario*** are drawn from Hanmer et al. (1999), also reported in DFID (1999). 3. The growth rates used in 2006 are replicated for the years 2007-2010, with the exceptions of East Asia & Pacific, for which rates from 2004 are used for the whole period, and Latin America & The Caribbean, for which the 4% growth rate is used.

2.1. *Base scenario*

The net external financing needs of each developing region, defined here by the amount of external resources needed to finance their current account deficits, vary considerably across regions, from US$ 4.1 billion a year in Latin America to US$ 80.3 billion a year in South Asia. These amounts correspond to 0.3% and 7.8% of their respective GDPs.

Of the four major determinants of the current account balance, the two most important are the savings-investment gap and interest rates on external debt. For example, these factors respectively explain 56% and 29% of external financing needs of the Sub-Saharan region in the year 2004. In South Asia, the savings-investment gap alone corresponds to 120% of the region's external financing needs. This is due to the fact that the projected growth rate is fairly high, thus requiring an investment rate well above the region's saving rate. These financing demands are partially met by workers' remittances. The latter corresponds to 23% of the region's total external financing needs for 2004.

Under the ***base scenario***, for all developing regions annual external financing needs over the 2004-2010 period amount to U$ 208.1 billion. This figure is roughly similar to the estimates for total net capital flows to developing countries in 2003 – of U$ 228 billion, reported by the Global Development Finance 2004.

However, most of these are private flows, 87% of which are concentrated in 3 developing regions: East Asia & Pacific, Europe & Central Asia, and Latin America & the Caribbean. The remaining 13% of these flows are shared by the Middle East & North Africa, South Asia and Sub-Saharan Africa. The share of the latter three regions is so low that, even if all estimated aid flows to developing countries - U$ 58.3 billion in 2002 – went only to these three regions, still they would be facing an external financing gap of U$ 40 billion (see Table 3).

Table 3. Net Capital Flows and Net External Financing Needs

US billion

	Net Private Capital Flows in 2003	***External financing needs Base scenario*** 2004-2010	***External financing needs Poverty-reduction Target scenario*** 2004-2015
South Asia	10.4	80.3	36.9
Middle East & North Africa	3.8	17.0	67.5
Sub-Saharan Africa	12.4	27.4	61.9
Total	26.6	124.7	166.3
Total plus net ODA for 2002 in the first column (U$ 58.3)	84.9	124.7	166.3

Source: Global Development Finance 2004 and Table 1.

2.2. *Poverty-reduction target scenario*

In this scenario we estimate the net external financing necessary to halve extreme poverty by 2015 in each developing region of the world. It builds upon growth rate targets which are believed to be necessary to meet such poverty reduction target. Such growth rates take account of the degree to which poverty reduction responds to growth, and have a strong correlation with levels of income inequality in each region. For example, it can be seen from Table 2 that regions such as Latin America & The Caribbean which are notable for having highly unequal income distribution will need extremely high growth to reduce poverty, whereas the opposite applies to regions with better income distributions such as East Asia & Pacific and especially Europe & Central Asia.

To calculate the external financing needs under the ***poverty-reduction target*** scenario, some of the parameters of the ***base scenario*** were modified, to remain consistent with the much higher growth rates required to meet the objective of halving poverty. If

such changes were not made, the new projections of financing needs would be completely unrealistic.

These changes, which are basically twofold, are applied to Latin America & The Caribbean and Sub-Saharan Africa. First, the average efficiency of capital is set to increase from the first year on (i.e. ICOR falls) given that these two regions will need particularly high growth rates to halve poverty by 2015, as can be seen from Table 2 (see detailed explanations in Appendix 2).[6] In addition, for the two regions savings rates are adjusted upwards.

This is accomplished in two steps, the first in the year 2004 and the second from the sixth year on. The underlying rationale of this upward adjustment is that in these two regions the particularly high growth rates being projected are expected to induce a quick and sustained increase in the regions' savings levels (see details in Appendix 2).[7] This correction addresses the endogenity problem regarding savings sensitivity to growth. It should be noted however that for this to happen conditions favourable for growth should be in place, otherwise additional external finance might result in higher consumption levels (thus leading to stagnating investment and lower savings) rather than higher investment and savings.

Even after such adjustments (intended to reduce the projected financing gaps), the external financing needs of Sub-Saharan Africa and Latin America & The Caribbean are significantly higher than in the ***base scenario*** (see Table 1). The estimated

[6] The ICOR is set to fall by 30%. For Latin America & The Caribbean it falls from 4.67 (base scenario) to 3.27, and for Sub-Saharan Africa, from 5.7 (base scenario) to 3.99 (see Appendix 2).

external financing needed for Latin America is 5.9% of the region's GDP, and for Sub-Saharan Africa, 10.8%.

The growth rates used under the ***poverty reducing scenario*** are based on the assumption that they should be observed every year over the 1990-2015 period. Clearly, between 1990 and 2003 the required growth rates in Sub-Saharan Africa and Latin America & The Caribbean were entirely missed. This implies that at least for these two regions, the growth rates used in the projections are by now not even sufficient to meet the poverty reducing target by 2015. Both regions would therefore have to combine the very high growth rates indicated in Table 2 with at least some degree of income redistribution towards the poor, in order to meet the poverty reducing goal.

As can be seen in Table 1, under the ***poverty reducing scenario***, both the East Asia & Pacific and Europe & Central Asia would not require external finance to halve extreme poverty by 2015. This is because the growth rates needed to achieve the target in these two regions are fairly modest, and they are well on track to meet them. However, for South Asia, the Middle-East & North Africa, Sub-Saharan Africa and Latin America & the Caribbean, the external financing needs amount to U$ 355 billion a year between 2004 and 2015. This is well above current total net capital flows to all developing countries.

[7] It should be noted that for the purpose of reducing the financing gap, adjusting savings rates up is equivalent to using lower growth rates.

Sub-Saharan Africa is, among all the developing regions, the one that requires the highest level of external finance as a proportion of its combined GDP to meet the poverty reducing target. The projected financing needs are of about U$ 62 billion a year. This figure is not too dissimilar, but clearly higher, tot hat obtained by the UN Millennium Project, of about U$ 42 billion.[8] As Table 3 shows, total net private capital flows to the region was only U$ 12.4 in 2003, according to the Global Development Report 2004. Aid flows to the region would therefore have to increase significantly to fill the financing gap.

Looking more broadly at the external financing needs of the three developing regions that have little access to external private capital flows – South Asia, Middle East & North Africa and Sub-Saharan Africa - we can notice that their annual external financing gap, after taking into account external private flows, is at least U$ 80 billion (see Table 3). This figure is well above the additional aid flows the World Bank believes as necessary to meet the millennium development goals.

[8] The UN Millennium Project used a sectoral approach to calculate such needs. It looked at the financing needs in infrastructure, social-service provision and human resources, for selected Sub-Saharan African countries. Under this approach, the external financing needs are U$ 60 dollars per person. If we multiply that amount by Sub-Saharan Africa population – of about 700 million people (figures for 2001) – the total external financing needs are about U$ 42 billion (see Sachs, 2004).

3. Concluding Remarks

The latest Global Development Finance report states that current aid flows to developing countries are well below the levels required to meet the Millennium Development Goals. Our study amply supports this statement. It shows that the external financing needs of developing countries far exceed the amounts of capital flowing from the North to the South. Given the concentration of private capital flows in very few developing countries, the projected financing gap would have to be filled with a significant increase in aid flows, particularly to the poorest countries of the world.

4. References

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Appendix 1. List of Countries (by Region)

The classification by regions draw on Global Development Finance 2004.

East Asia & Pacific
- *Cambodia*
- *China*
- *Indonesia*
- *Korea, Rep.*
- *Malaysia*
- *Philippines*
- *Thailand*
- *Vietnam*

South Asia
- *Bangladesh*
- *India*
- *Nepal*
- *Pakistan*
- *Sri Lanka*

Middle East & North Africa
- *Algeria*
- *Egypt, Arab Rep.*
- *Jordan*
- *Morocco*
- *Syrian Arab Republic*
- *Tunisia*
- *Yemen, Rep.*

Sub-Saharan Africa
- *Angola*
- *Benin*
- *Botswana*
- *Burkina Faso*
- *Burundi*
- *Cameron*
- *Cape Verde*
- *Central African Republic*
- *Comoros*
- *Congo, Dem. Rep.*
- *Congo, Rep.*
- *Cote d'Ivoire*
- *Eritrea*
- *Ethiopia*
- *Gabon*
- *Gambia*
- *Ghana*
- *Guinea*
- *Guinea-Bissau*
- *Kenya*
- *Lesotho*
- *Madagascar*
- *Malawi*
- *Mali*
- *Mauritania*
- *Mauritius*
- *Mozambique*
- *Namibia*
- *Niger*
- *Nigeria*
- *Rwanda*
- *Sao Tome and Principe*
- *Senegal*
- *Seychelles*
- *Sierra Leone*
- *South Africa*
- *Sudan*
- *Swaziland*
- *Tanzania*
- *Togo*
- *Uganda*
- *Zambia*
- *Zimbabwe*

Europe & Central Asia
- *Armenia*
- *Azerbaijan*
- *Belarus*
- *Bulgaria*
- *Croatia*
- *Czech Republic*
- *Estonia*
- *Georgia*
- *Hungary*
- *Kazakhstan*
- *Kyrgyz Republic*
- *Latvia*
- *Lithuania*
- *Macedonia*
- *Moldova*
- *Poland*
- *Romania*
- *Russian Federation*
- *Slovak Republic*
- *Turkey*
- *Ukraine*
- *Uzbekistan*

Latin America & The Caribbean
- *Argentina*
- *Belize*
- *Bolivia*
- *Brazil*
- *Chile*
- *Colombia*
- *Costa Rica*
- *Dominica*
- *Dominican Republic*
- *Ecuador*
- *El Salvador*
- *Guatemala*
- *Haiti*
- *Honduras*
- *Jamaica*
- *Mexico*
- *Paraguay*
- *Peru*
- *Trinidad and Tobago*
- *Uruguay*
- *Venezuela*

Appendix 2. The savings gap model and data sources

In order to estimate the net external financing needs of developing countries for 2004-2010 and 2004-2015, we use a savings gap model which draws on Lensink and Van Bergeijk (1991), and to a lesser extent, Selowsky and Van der Tak (1986). The model starts with a Harrod-Domar production function in which the investment rate required to meet a pre-determined growth rate is given by the incremental capital-output ratio.

$$i=y_tICOR \quad (2.1)$$

Where

ICOR = incremental capital-output ratio

i = investment rate

y_t = GDP growth

In the simulations we work with two scenarios, the first predicting growth rates drawn from current forecasts (base scenario) and the second based on the growth rates that it is believed would to be necessary to halve extreme poverty by 2015 in each developing region of the world.

ICOR is based on observed i and y of developing regions over the 1999-2002 period. For Middle East & North Africa, Sub-Saharan Africa and Europe & Central Asia, one time-lag is used to calculate ICOR. For Latin America, ICOR over the period 1993-97 is used.

Given growth and ICOR, we obtain the required level of investment. Investment can be financed from domestic and external resources. Regional domestic savings are obtained from weighted averages of savings rates over 1999-2001 from countries for which information was available. Savings minus investment rates correspond to the savings gap. But if we consider national savings instead, which are domestic savings minus interest payments on external debt plus current transfers, then investment minus national savings will roughly correspond to the countries' current account balance, CA. In addition, by assuming that international reserves are held constant over time, then CA equals net external financing needs. If to that we further add profit remittances, we have:

$$NEF_t = (i - s)Y_t + PR_t + raD_t - UT_t \qquad (2.2)$$

Where

NEF = Net external financing needs.

Y_t = country's real GDP.

PR = profit remittances on foreign direct investment (FDI).

D_t = net external debt (gross external debt minus international reserves).

UT = unilateral transfer.

s= domestic savings rate

r= real interest rates.

a = parameter that indicates the proportion of non-concessional debt to total debt.

Net external debt is in turn determined as follows:

$$Dt = D_{t-1} + bNEF_{t-1} \quad (2.3)$$

Where b is 1 minus the ratio of foreign direct investment (FDI) to total external financing.

The two scenarios we work with are: the ***base scenario*** and ***poverty-reduction target scenario***. In both scenarios:

- Y (base year) corresponds to GDP U$ 2002 values multiplied by 2003 growth rate.
- All figures are in US$ 2002 prices, except for workers' remittances and international reserves, which are in US$ 2003 prices, in which case inflation is ignored.
- a, the proportion of non-concessional debt to total debt, is set constant, according to the ratio of non-concessional debt to total debt stock in 2002. All non-concessional loans are assumed to bear market-based interest rates, whereas concessional loans bear no interest rates.
- b, the ratio of FDI to total net external financing, is set constant at 50% for all country groups and developing regions.
- PR in the base year corresponds to the ratio of profit remittance in 2002 to GDP 2002 multiplied by Y_t.
- UT is proxied by workers' remittances. It is obtained from Global Development Finance 2004.

Growth rates for developing regions vary according to the scenarios, and are displayed in Table 2 (see main text).

Real interest rates are set constant at 4%. Other 2002 values and parameters used in the simulations are displayed in Table 2.1.

Table 2.1. Values and parameters used in the simulations

	Y (base year) U$ billion 2002 values	ICOR	S	D (base year) U$ billion	PR (base year) % GDP	A	UT (base year) % GDP
EA&P	1974219.6	4.9	0.348	-29800.0	1.58	0.795	0.89
SA	691269.1	4.6	0.194	56900.0	0.15	0.485	2.63
ME&NA	704928.8	6.1	0.213	81500.0	0.74	0.721	1.84
SSA	326950.9	5.7	0.169	182300.0	1.88	0.582	1.25
E&CA	1195151.1	5.5	0.25	341800.0	0.53	0.953	0.87
LA&C	1690494.4	4.7	0.19	573300.0	1.14	0.96	1.75

EA&P: East Asia & Pacific; SA: South Asia; ME&NA: Middle East & North Africa; SSA: Sub-Saharan Africa; E&CA: Europe and Central Asia; LA&C: Latin America and The Caribbean.

As mentioned in the text, in the ***poverty-reduction target scenario***, for Sub-Saharan Africa and Latin America & The Caribbean, ICOR fall by 30% from the first year on. In addition, for these latter two regions savings rates are adjusted upwards. In the case of Sub-Saharan Africa, they initially move from 0.169 to 0.20 point of the GDP, and from the sixth year on, from 0.20 to 0.25. In the case of Latin America & The Caribbean, they initially move from 0.19 to 0.25 points of the GDP, and from the sixth year on, from 0.25 to 0.30. This upward adjustment is justified by the fact that savings are expected to pick up as investment increases to support higher growth.

Data sources:

Y (base year): World Development Indicators 2004 and Global Development Finance 2004.

Y growth rate: Global Development Finance 2004; DFID (1999), table 1, p. 16.

s: World Development Indicators CD-Rom 2003.

D and PR: Global Development Finance: Country Tables 2004.