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Halving poverty in Post-HIPC-MDRI economies by 2015: How much will it cost and is it achievable?

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Abstract

This article assesses the likelihood and costs of halving extreme poverty by 2015 from its 1990 levels in sixteen post-HIPC-MDRI countries. The projections indicate that, on average, this goal will be attained two years before the end date if they maintain an annual real per capita income growth rate of at least 3 percent over a six year period. An estimated total annual cost of between 16 and 18 percent of the recipient's GDPs from 2005 suggests that currently available aid funds are sufficient to finance the MDG poverty target, provided that they improve their equality of income distribution.

Introduction

In September 2000 the member countries of the United Nations set a goal of halving extreme poverty throughout the developing world from its 1990 level by 2015. The extent and depth of poverty in low-and-middle income countries (LMICs) was defined as the number of people living at under US$1.08 dollars a day measured in 1995 Purchasing Power Parity (PPP) terms. To achieve the UN Millennium Development Goals, estimates made by earlier studies, including Hanmer *et al* (1999), the World Bank (2000), Devarajan *et al* (2002) and the UN Millennium Project Task Force (UNDP, 2005), suggested that the least developed economies, particularly highly indebted poor African countries, would need to grow on average by 8 percent a year over the period 2000 to 2015. An argument in support of such a high growth rate target was justified on the grounds of Africa's widespread poverty, particularly in rural areas, as well as its relatively high Gini coefficients and associated elasticity of poverty with respect to income of less than unity. However, sustaining a steady 8 percent growth path over time would likely require a much faster rate of investment accumulation than many of these African countries would be able to finance from conventional sources. Thus, to ensure that the MDGs are successfully reached in the severely indebted poor states, appropriate resources need to be made available by their sponsors. This paper therefore assesses the total cost and likelihood that the goal of reducing by half the 1990 income poverty level in highly indebted countries will be achieved by 2015.

The discussion contributes to the literature on the subject in three important ways:

First, it focuses on sixteen out of the seventeen post-Highly Indebted Poor Countries (HIPCs) that have taken steps to reform their economic polices and institutions and which were provided with multilateral debt relief in January 2006[1]. These post-HIPC-Multilateral Debt Relief Initiative (MDRI) economies comprised: Benin, Bolivia, Burkina Faso, Ethiopia, Ghana, Honduras, Madagascar, Mali, Mozambique, Nicaragua, Niger, Rwanda, Senegal, Tanzania, Uganda and Zambia. Guyana was excluded because its exports plus imports were outlying at 180 percent of GDP averaged from 1980 to 2004.

Most existing financing-gap studies provide estimates for the total cost of attaining the MDG poverty reduction target for the different developing regions as a whole. This is despite the fact that the efficiency of application and amount of external finance required by an economy to reach the internationally agreed basic–needs level depends on a number of country specific characteristics. Besides, the Millennium Development Goals pair the eradication of extreme poverty throughout the developing world with a debt sustainability target. Thus, our choice of post-HIPC-MDRI economies which have already made considerable progress towards the last

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[1] See the World Bank website:www.worldbank.org for the key features of the HIPC and MDRI Programs.

of these development objectives provides an opportunity to integrate concerns for the external debt sustainability outlook into projections for accelerated growth and the foreign financing needs of severely indebted poor countries.

Second, it simulates future headcount poverty ratios in each of our sixteen post-HIPC-MDRI countries under different poverty reduction elasticities and economic growth scenarios. The estimated poverty elasticities cover the range of minus 0.3 to minus 1.5 commonly reported in the literature with respect to changes in poverty rates relative to mean income and its redistribution effects for developing countries over time. Our projections highlight the impact that alternative steady growth paths could have on poverty incidence. As such, they represent a further step towards a framework for assessing the feasibility of achieving the MDG income poverty targets under various government policy conditions.
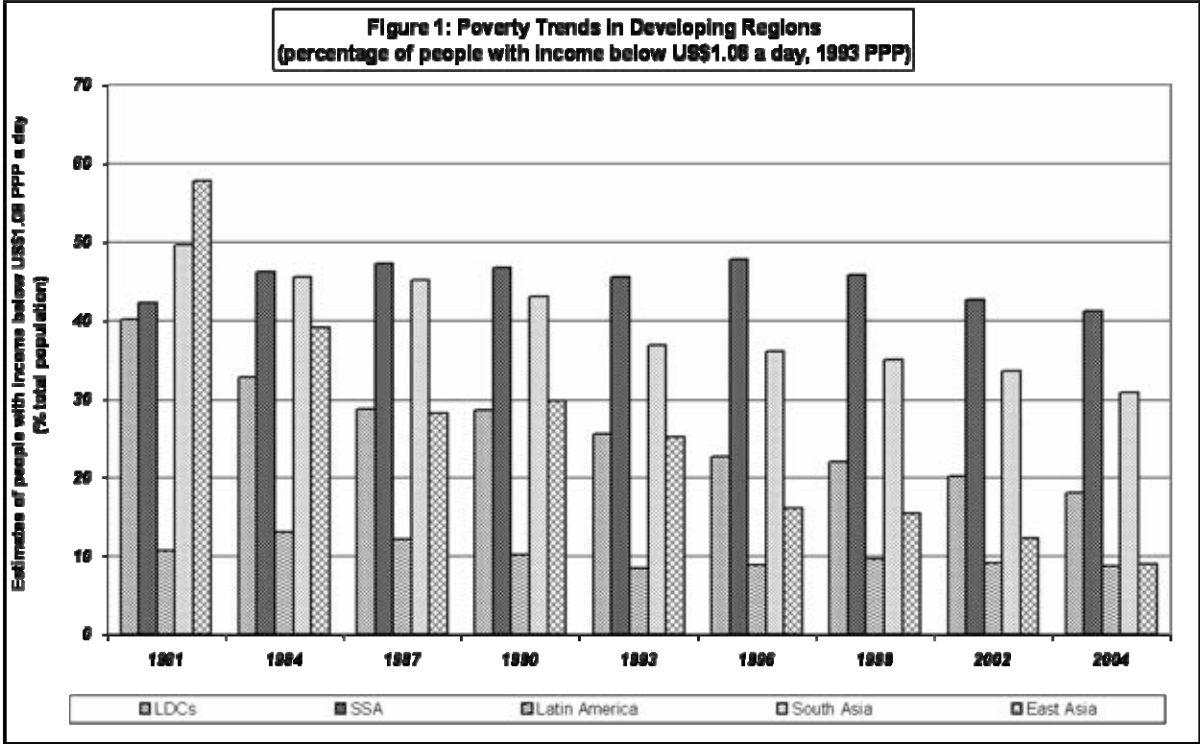
Third, it estimates the aggregate external finance requirements adjusted for total interest charges on the stock of outstanding foreign debt arising from a planned growth rate. The analysis uses five different estimates of income growth rates suggested by earlier researchers as necessary for meeting the MDG income poverty target in developing countries over the ten years 2005 to 2015. The implications for total net external finance requirements of government policies with respect to the distribution of income are then highlighted by comparing our projections under the different growth-inequality outlooks. Then too, most existing studies have tended to assume that the potential financing-gap will be covered entirely by non-debt creating flows, including official grants-in-aid. But data shows that the provision of most of the external finance to low-income states has been in the form of long-term official loans, both with and without concessions. This implies that the planned poverty-reducing growth targets envisaged by the organisers of the MDGs will almost inevitably be accompanied by further external indebtedness in many of the least developed countries.

The article is organised as follows. Section 1 describes past trends in poverty rates and sources of finance for the major developing regions. Section 2 estimates the likely future extreme poverty rates arising from five different growth-inequality forecasts and compares the results with the MDG target of halving the proportion of people living below the international poverty line by 2015. Section 3 projects the aggregate net external financing needs of our sixteen post-HIPC-MDRI countries under five alternative poverty-reduction growth scenarios and Section 4 remarks on the policy initiatives for managing the macroeconomic challenges posed by a surge in foreign capital inflows to underdeveloped countries.

1.   Trends in Poverty and Development Financing

The decision to make poverty eradication the central objective of the development agenda at the UN summit in 2000 followed from the fact that at the turn of the 21st Century, more than a billion people (almost one in five of the world's population) continued to live below the internationally agreed poverty threshold with an average income of 77 cents per day. Such a high incidence of extreme hardship, particularly in Africa, emerged as the major cause of the region's unsatisfactory social and economic growth performance.

In 1981, the total population of low and middle-income countries (LMICs) was 3.66 billion people, of whom some 1.47 billion (or 40 percent) lived on incomes below the international poverty line of US$1.08 per day in 1993 PPP terms.

Figure 1: Poverty Trends in Developing Regions (percentage of people with income below US$1.08 a day, 1993 PPP)

By the end of that decade, the absolute number of extreme poor had declined slightly to around 1.2 billion; equivalent to 29 percent of the total population of the LMICs which stood at just over 4.27 billion people in 1989. World Bank estimates show that the number of people LMICs still mired by severe misery hardly changed between 1990 and 1993, persisting at 1.2 billion. The number of extreme poor later declined slightly to less than one billion, or 23 percent of total population by 1996. However, the incidence of absolute poverty rose again to just over a billion at the start of the 21st Century. In 2000, an estimated 1.12 billion people lived below the US$1.08 per day cut-off point, although this had later declined to 969 million people by the end of 2004 or to 18 percent of the total population of LMICs. This last figure suggests significant progress towards the MDG target of halving the share of population with income below the international poverty line by 2015 from it 1990 level of 29 percent.

Figure 1 shows that the evolution in average headcount poverty ratios for LMICs as a whole masks important disparities across the four major developing regions. In 1981, Sub-Saharan Africa, including South Africa (SSA or Africa hereafter), South Asia and East Asia all had more than 40 percent of their citizens living on less than the internationally agreed US$1.08 threshold. But while the proportion of poor people declined in South and East Asia over the subsequent years, it increased steadily from 46 percent of population in 1984 to a peak of 48 percent in 1996 in SSA. Although poverty rates declined to 41 percent in 2004, there were then still around

299 million people in SSA living in abject misery compared to 168 million in 1981. The rise in the absolute number of poor there was mainly because of continuing high population growth rate, but it was also due to civil unrest and a succession of natural disasters which pushed large numbers below the international poverty line.

As might be expected, these dismal trends in Africa's headcount poverty ratios mirror the general deterioration in the region's economic performance by comparison with the rest of the developing world. Most importantly, recent literature attributed Africa's relatively slow reduction in poverty to a fall in its per capita GDP of 0.22 percent a year averaged from 1980 to 2004 compared to the rise of 3.46 percent and 6.54 percent observed for South and East Asia respectively over the same period. Many authors, including Dollar and Kraay (2002), expressed concern about the rising income inequality in SSA and emphasised the importance of investments in human development for an improvement in the wellbeing of the poor. The presumption was that the income elasticity of poverty in SSA would be greatly improved if more resources were shifted towards efficient tradable-labour-intensive activities such as tourism and agro-processing in rural areas. It is noteworthy that after the signing of the Millennium Declaration, per capita GDP in SSA rose by an average of 2 percent a year from 2001 to 2005. However, this was largely a reflection of the rise in the prices of primary commodities rather than better economic policies. The challenge facing African governments, therefore, is how to ensure that this improved performance is sustained and that the distribution of the income benefits the poor regardless of movements in commodity prices.

Apart from Africa's decline in per capita GDPs and its rising income inequality, a number of explanations have been provided for the higher incidence of poverty in the region. They include papers by Easterly and Levine (1997), Sachs and Warner (1997), Collier and Gunning (1999), Elbadawi and Mwega (1998) and Hansen and Tarp (2000 and 2001). A common theme in these studies is the fact that Africa's development problems were related to the collapse in the region's savings rate from a peak of 25.92 percent of GDP in 1980 to a minimum of 14.62 percent in 1992. Although there was some recovery in the early 2000s, Africa's savings rate has remained low by comparison with the other developing regions. In 2005, gross domestic savings in Africa represented only 17.60 percent of GDP after a decade of reforms, compared with 23.96 in Latin America and the Caribbean, 25.98 percent in South Asia, 42.91 percent in East Asia and Pacific and 29.05 percent for LMICs as a whole. One of the consequences of the relatively low savings rate in Africa has been the growing reliance on external resources to finance their investment plans. Such dependency is reputed to have limited the rate of accumulation of capital stock in the region itself. Indeed, the gross capital formation to GDP ratio for Africa of 18.99 percent a year from 1980 to 2005 was well below the 34.86 percent invested by the group of East Asian states, the best performing region.

Moreover, since the early 1980s, many African economies have been marginalised in the global market, partly due to their continuing reliance on a limited number of primary commodities (Aryeetey, 2004). This has resulted in a decline in the region's share of world trade and an inability to earn the foreign exchange needed to scale-up the investment required for increase

output. The World Bank database (World Bank, 2007) showed that the resulting financing-gap was filled largely by official aid from international donors. In both nominal terms and as a percentage of GDP, the net flow of overseas development assistance (ODA) to SSA grew significantly between 1980 and 2005. In nominal terms, net ODA flows to SSA of US$7 billion in 1981 (or 2.74 percent of GDP) were the lowest level observed in the twenty-five years between 1980 and 2005. By the late 1990s, aid had doubled to US$15 billion, although it fell slightly to US$13 billion or 3.86 percent of GDP in 2000. However, in 2001, net ODA flows had recovered, rising from US$14 billion to US$26 billion in 2004. Foreign aid reached US$33 billion or 5.25 percent of GDP in 2005. By contrast, net ODA in the other developing regions declined by some 1 percent of their GDPs from 1980 to 2005.

Breaking down aid inflows by sectoral distribution indicates that since the mid 1990s, bi- and multilateral commitments to SSA have been increasingly concentrated on the provision of social services, in particular health and primary education. The share of net ODA to emergency aid in response to the frequent episodes of war, civil unrest and famine in SSA has also increased significantly. This has been at the expense of the proportion of aid going to investment in directly productive sectors. The question therefore arises as to the implications of such shifts away from immediately productive activities for the prospect of attaining and sustaining the high per capita income growth needed for halving poverty in SSA by 2015.

2.   Will Extreme poverty be halved in Post-HIPC-MDRI economies by 2015?

Debates about the likely future rates of poverty in developing countries are common, although views differ on how poverty lines should be set and what measures of poverty should be used. In this section, therefore, we simulate the impact on the headcount poverty ratio of changes in mean per capita income growth rates and income inequality for each of our sixteen countries. Unlike previous studies, our assessment of future poverty incidence will involve five alternative scenarios of per capita income growth with associated poverty elasticities in order to account for the influence of policy reforms on the poor. These are:

(1) Pro-poor growth which reflects the trend in the headcount poverty ratio that will materialise if our post-HIPCs achieve a per capita GDP growth rate of 2.96 percent per year in the ten year between 2005 and 2015 and an average income poverty elasticity of minus 1.5.
(2) Improved-inequality which assumes that an average per capita GDP growth rate of 3.70 percent a year will be combined with a modest reduction in income inequality. The anticipated average income poverty elasticity is minus 1.
(3) Unchanged-inequality with an annual average per capita income growth rate of 4.19 percent and a poverty elasticity of minus 0.7.
(4) Slight widening-inequality with an average per capita income growth of 4.37 per cent a year. It is also expected that a marginal worsening in income distribution will cause a fall in the average poverty elasticity to minus 0.5.

(5) Anti-poor growth which assumes that an average per capita income growth rate of 4.38 percent a year will be accompanied by a considerable deterioration in income distribution leading to a low average poverty elasticity of minus 0.3.

Figure 2: Projected Incidence of Extreme Poverty in 16HIPCs Under Different Growth Scenarios (unweighted average from 2004 to 2050)
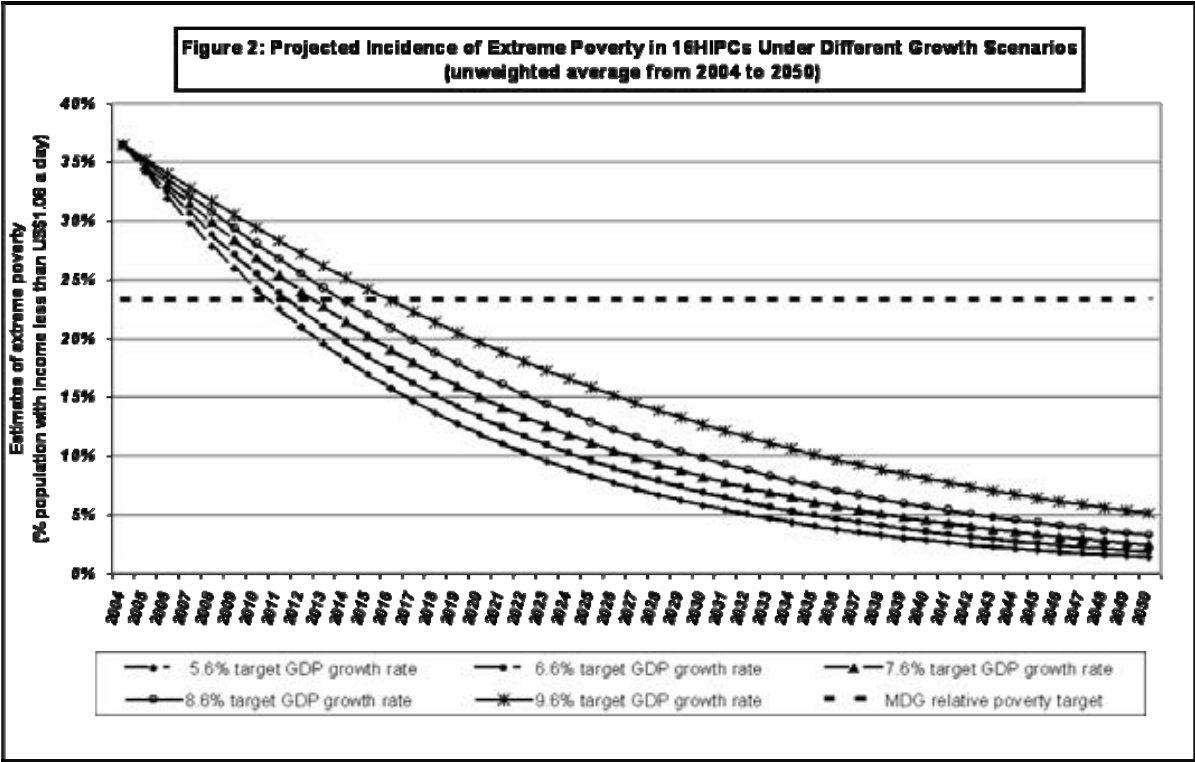
Figure 2 depicts our alternative estimates of the unweighted prospective mean of the percentage of people living below the internationally agreed poverty line at a given time period t for our sixteen post-HIPC-MDRI economies as a whole[2]. For all these projections, we have taken the initial headcount poverty ratio in 1990 as the baseline level in line with the original MDG poverty reduction targets. For brevity, the comparative analysis here is confined to two extremes — the pro- and anti- poor growth scenarios. The reader may infer the changes in poverty observed under the other three alternative growth forecasts in-between.

Comparing the end points, 2015 and 1990, headcount poverty ratios declined significantly under each of our growth-inequality propositions. Such emphasises the importance for poverty reduction of high per capita income growth rates sustained over the medium to long-term. But the MDG target of halving the percentage of population in severe hardship is reached at different dates. For instance, when the additional income is more equally distributed as is subsumed under our optimistic pro-poor growth strategy, the number of poor people in our 16 HIPCs is cut in half by 2011 from 46.66 percent in 1990, and it later fell to 16.97 percent of population in 2015. Nonetheless, this last is still equivalent to 3.9 million people living in abject misery by this target date. It is not until 2023 that the absolute headcount poverty is expected to decline to half of its initial figure of 5.6 million in 1990. Such conflicting evidence in the outlook of

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[2] The corresponding year-on-year projections for *each* country of study are available on request at the e-mail address: Jacinta.nwachukwu@ manchester.ac.uk.

relative and absolute poverty incidence underlines the sensitivity of the MDG target to the choice of poverty line, initial poverty rate, mean income and its distribution (Chen *et al*, 1994; Ravallion and Sen, 1996; Hanmer *et al*, 1999).

The likelihood for achieving the goal of halving the proportion of people living in extreme poverty ahead of the target date of 2015 is equally good under our growth scenarios 2 to 4. Relative poverty is projected to fall by half in 2012 under our improved-inequality prescriptions. This year is the same as that projected by the Ghanaian Minister for Finance for his country in 2006 (The Statesman, 2006). But projections for our 16 HIPCs as a whole, suggest that the year for halving the percentage of their extreme poor is likely to be 2013 if the policy choices underlying our scenario 3 are achieved and to be 2014 for scenario 4.

By contrast, the prospect for reaching the MDG target under our anti-poor growth trajectory is bleak. It is estimated that the headcount poverty ratio will fall to 24.20 percent in 2015, just slightly above the 23.33 percent needed to halve the baseline level in 1990 if the inequality of income worsens considerably. The proportion of the extreme poor will then be cut in half by 2016. The inference is that policy initiatives that focus on achieving high per capita income growth rates *per se* without a corresponding improvement in the equality of income distribution are unlikely to fulfill the MDG poverty goal by the target date of 2015. To be sure, such relatively high income growth rates sustained over the medium to long-term will lead to a greater reduction in the proportion of the population living below the poverty line, other things being equal. However, any associated widening in income inequality will greatly diminish the rate of poverty reduction and so prolong the time taken for the additional wealth to trickle down to the poor. The trade-off between high per capita income growth rates and its equitable distribution is likely to delay the achievement of the MDG poverty goal by as much as five years in those post-HIPCs where the expected growth rate is accompanied by widening inequality. The halving of absolute headcount poverty will not then be achieved during the projection period, unlike with the other growth-inequality scenarios.

Overall, projections in Figure 2 are broadly similar to the results of a simulation exercise by Hanmer *et al* in1999. These show that the higher the baseline level of poverty headcount ratio, the greater will be the income elasticity of poverty required to meet the MDG target in the developing world by 2015. For our group of post-HIPCs, the implied equitable income distribution will also need to be combined with a real per capita income growth rate of at least 3 percent a year over a six-year period. Nevertheless, it is not until the early to mid-2020s before the absolute headcount of poverty is projected to fall to half of the initial level in 1990 even under our optimistic pro-poor growth-inequality forecasts.

3. The total cost of halving poverty in the Post-HIPCs: alternative propositions

Since the signing of the UN Millennium Declaration, a number of researchers have evaluated the total costs and benefits of alternative policy strategies for achieving the goals and the sharing of costs among national governments, private investors and official donors. Although

their estimates differ, the studies provide evidence that the total cost of halving the poverty incidence is likely to be much higher in those severely indebted countries with high initial poverty levels, income inequality, poor infrastructure and social services.

Consequently, the purpose of this section is to project the aggregate external financing requirements (adjusted for interest payments) of our group of sixteen post-HIPC-MDRI economies under the five different poverty-reducing growth scenarios described in Section 2. The basic framework chosen is the original Chenery-Strout (1966) dual-gap theoretical model, which, despite its dated assumptions of fixed parameter values, has been the basis of much projection work in multilateral organisations (Easterly 1999).

An application of the dual-gap model involves three steps:

First, it requires a calculation of the excess of the *ex ante* gross domestic investment over savings (gap 1) using estimates of the incremental capital-output ratio (ICOR) and marginal gross domestic savings rate.

Second, the excess of the *ex ante* "minimum" required imports over exports (gap 2) is calculated using estimates of the marginal propensity to import and the expected real rate of growth of exports.

Third, estimates of *ex ante* foreign exchange gaps are then compared with those for the anticipated gross domestic savings gaps. The larger of these two gaps at any given time period t determines the total financing-gap associated with the proposed target growth rate in gross domestic product. This resource gap must be filled through foreign financing on an annual basis if the target GDP growth rate is to be achieved.

The discussion in this section on the external financing needs of our post-HIPC-MDRI economies is developed under (3.1) the model's assumptions, (3.2) gross external financing needs, (3.3) the residual interest-financing gap and (3.4) aggregate net foreign capital requirements. As we noted earlier, the arguments here are confined to two extremes — the pro- and anti- poor growth scenarios described in Section 2. Once again, the reader may infer the financing-gap consequences of our other three alternative growth choices in-between. Absolute dollar estimates are measured in constant 2000 prices in order to eliminate the effect of inflation and a dollar exchange rate depreciation in the future. As in Section 2, the reported estimates are the unweighted annual averages for our sixteen post-HIPCs as a whole.

3.1 The model's assumptions

The dual-gap projections of external financing requirements are normally made using estimates of four crucial parameters. They are: (1) the incremental capital-to-output ratio (ICOR), (2) the marginal propensity to save, (3) the marginal propensity to import and (4) the expected real rate of growth of exports. To remain consistent with the relatively high per capita income target growth rate needed to halve poverty under our five alternative inequality scenarios, the parameters underlying our simulations here have been arbitrarily selected. This procedure was chosen after regression analysis proved unable to identify stable underlying relationships in the

highly volatile macroeconomic environment of our severely indebted poor countries. Thus, given that the objective of the originators of the MDGs was to move to a path of sustained growth and poverty reduction, our choice of optimistic performance parameters merely indicates where and in what direction policy reforms must be introduced if our post-HIPCs are to lessen their dependence on international aid over the medium to long-term. These parameter adjustments are essentially fourfold[3].

First, in an attempt to find a "representative" marginal rate of savings, we assume that our post-HIPCs would achieve a steady rise in their savings propensity. This is projected to increase from an unweighted annual average of 6 percent of GDP in the early years of the development process to a constant figure of between 24 percent and 38 percent by the year 2030. This peak ratio of savings to GDP is comparable to the level obtained by the more rapidly advancing countries of East Asia in the mid-1990s.

Second, we presume that the marginal import propensity would first rise slowly from a projected annual average ratio of 16 percent of GDP and that it will level off at 34 percent in the year 2030 and beyond. Once again, the estimated peak marginal import rate is analogous to that obtained in the group of East Asian countries in the mid-1990s to early 2000s, reflecting the comparatively high import dependence of many developing economies. Nevertheless, the implicit assumption here is that domestic firms should be producing some of what is currently being imported, such as food and other consumer items like clothing and shoes by the year 2030. It is further assumed that this will result in a one-to-one relationship between aggregate output growth and imports beginning from this target year.

Third, the real rate of growth of the value of export of goods and non-factor services is expected to rise from an expected annual average figure of 4 percent and to reach a peak rate of between 8.75 and 13.84 percent by the year 2030. Export growth is then expected to decline slowly from 2031 and to level off at a constant figure equal to the target growth rate in GDP of 5.6 percent under the pro-poor scenario and 9.6 percent under our anti-poor growth outlook. Although these relatively high export growth rates may seem overly optimistic, their use in the projections here is necessary if the potential external financing-gap is to decline over time. Recognising the dual gap assumption of structural rigidities in small-sized agricultural economies such as Benin, Burkina Faso, Madagascar and Mali, the projected rapid increase in exports may well require a difficult diversification in the direction of manufacturing and the production of nontraditional agricultural products like medicinal plants and flowers and other horticultural items. However, with recent rises in commodity prices, nearly all the countries in our sample came close to achieving this 13.4 percent peak export growth rate. Mineral exporters, such as Bolivia, Ethiopia, Mozambique, Nicaragua and Zambia, achieved export growth rates in excess of the 13.4 percent target in 2004, although, of course, the resulting export levels may not be sustained over the medium to long-term. It is against such ambitious parameter values that the authenticity of the results of our projections for the aggregate cost of halving poverty in our post-HIPCs will need to be judged.

Fourth, while the extent of improvement in economic performance implied by our set of underlying parameters must raise doubts about the feasibility of achieving the UN millennium

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[3] Discussion on the method of estimation and modification of the ICOR is available from the author on request.

targets, yet another central assumption is necessary to bring them within reach. In the original Chenery and Strout formulation, skill or managerial constraints on the ability to invest in productive activities in the early stages of development were recognised. They used a capital absorption limit of ten-percent a year based on historical observation of developing country data and attributed it partly to a shortage of skilled labour. For this reason, we modify our estimates of net foreign flows to allow for a ten-percent build-up of absorptive capacity for investment until the achievement of the target annual rate of GDP growth is reached. Indeed, with past investment rates well below those necessary to sustain the MDG targets in most HIPCs, such a modification exercise provides for a steady increase in the ratio of investment spending to GDP. But it delays the point at which the target growth rates are reached and also limits somewhat the external capital requirements over this interval.

3.2 The Gross External Financing-Gap

Based on our optimistic average performance parameters, we estimated the aggregate resource gap which needs to be covered year-on-year by foreign donors if the goal of halving the 1990 baseline poverty headcount ratio is to be attained. Figure 3 presents the results of the estimated unweighted annual average gross external financing need for our 16 HIPCs as a whole under the five alternative growth-cum-income inequality scenarios described earlier in Section 2.

These aggregate external financial flows were frequently derived from the dominant gross domestic investment minus savings gap which was persistently the key constraint limiting accelerated growth in output in many of our post-HIPC economies. This outcome is to be expected given that our post-HIPCs are projected to experience a rapid and sustained growth in their export revenues coupled with a gradual decline in their marginal import propensities. Such provides additional support for the decision of many authors, including those in the UN Millennium Task Force (UNDP, 2005), to estimate the external financing needs of developing countries using the savings-gap approach rather than the two-gap (with foreign exchange) or three-gap (with fiscal gap) models. However, the external resource flows estimated by financing-gap models are not equivalent to the countries' expected current account deficit as they exclude profit remittances, interest charges on the stock of loans and unilateral transfers. Thus, these estimated gross external financing requirements should be interpreted with caution. The manner in which they are adjusted for interest payments is discussed in Section 3.4 below.

Figure 3: Potential Gross External Financing Requirements Under Different Growth Scenarios (unweighted mean 16 HIPCs)
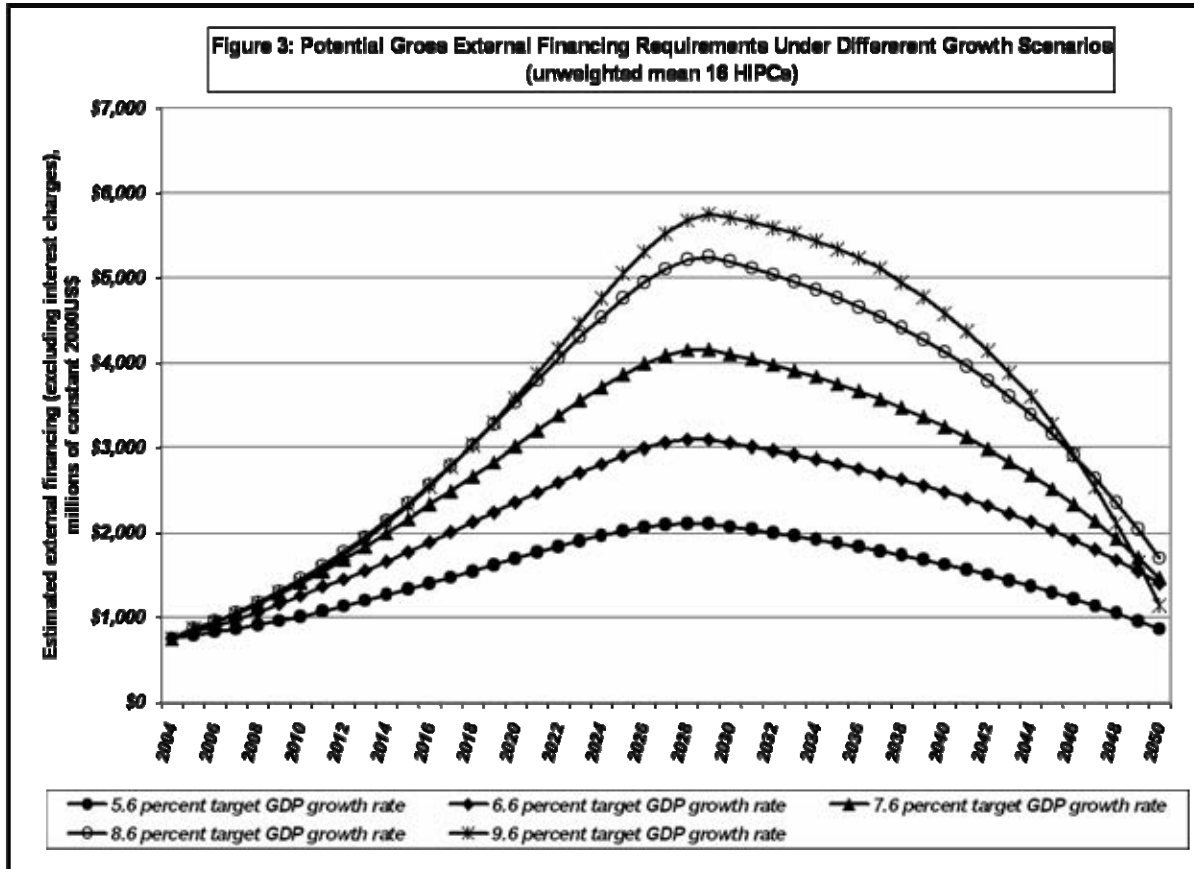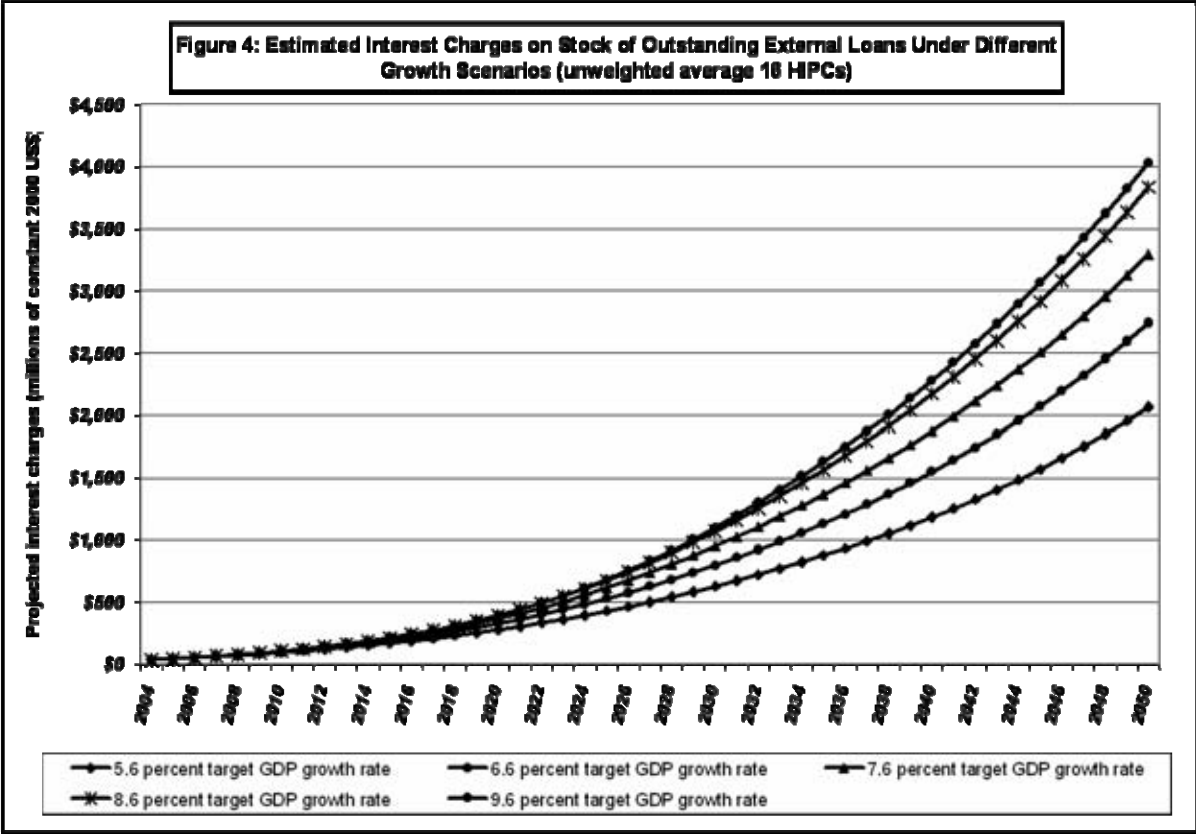
It is noteworthy that the estimated aggregate external financial flows remain persistently positive throughout the projection period. We may therefore infer that none of our post-HIPC-MDRI economies is likely to graduate from the need for donor assistance in the foreseeable future despite our assumption of favourable adjustments in underlying performance parameters. On the whole, the results of our simulation exercises indicate that the gross external financing needed to halve poverty in our 16 HIPCs is around US$922 million a year (or 14.22 percent of their GDPs) averaged from 2005 to 2011 under our pro-poor growth scenario. This annual average external financing requirement is projected to rise to US$1.13 billion, (16.19 percent of their GDPs) from 2005 to 2012 under our assumption that an anticipated growth in per capita GDP will be accompanied by a modest reduction in income inequality in scenario 2. With unchanged income-inequality conditions in scenario 3, the goal of halving the headcount poverty ratio is likely to require an annual inflow of foreign capital of US$1.31 billion, (17.75 percent of their GDPs) averaged from 2005 to 2013. This projected annual average external financing requirement is likely to rise to US$1.43 billion, (18.42 percent of their GDPs) from 2005 to 2014 if our assumption of a slight deterioration in income distribution in scenario 4 is fulfilled. At the extreme, our post-HIPCs face a challenge to fill an estimated annual average aggregate resource-gap (excluding interest charges) of roughly US$1.58 billion, (18.64 percent of their GDPs), to halve relative income poverty by 2016 under our anti-poor growth proposals.

Interestingly, our projections for the average resource-gap, which range from 14 percent under our pro-poor growth policies to 19 percent of recipient's GDPs under our anti-poor growth forecasts, are within the MDG financing-gap of 10 to 20 percent of GDP reported by the UN Millennium Project for typical highly indebted poor countries such as Ghana, Uganda and Tanzania. According to the UN Task Force, this potential financing-gap must be covered by foreign aid if the MDG poverty goal is to be reached and maintained in these impoverished states. Thus, given an average ratio of aid to GDP of around 18 percent in 2004, our post-HIPCs will need a mere 1 percent of their GDPs per annum in further financial assistance from their sponsors under our worst-case scenario of a considerable deterioration in income inequality.

3.3. The residual interest financing-gap

Statistics from the World Bank database (World Bank, 2007) suggest that in addition to the need to finance the dominant resource-gap, most developing countries also require further external transfers in order to cover interest charges on both their new disbursements and outstanding stock of loans. The most problematic countries are the group of severely indebted poor countries. This is largely because of their lower rate of domestic savings and greater requirement for investment in the basic infrastructure and public services needed to support the higher desired per capita income growth rate of more than 3 percent a year. Such implies a larger residual financing-gap than that reported in Section 3.2 to be filled by donor aid in order to pay interest on debt that has accumulated in the planned growth process.

Figure 4: Estimated Interest Charges on Stock of Outstanding External Loans Under Different Growth Scenarios (unweighted average 18 HIPCs)
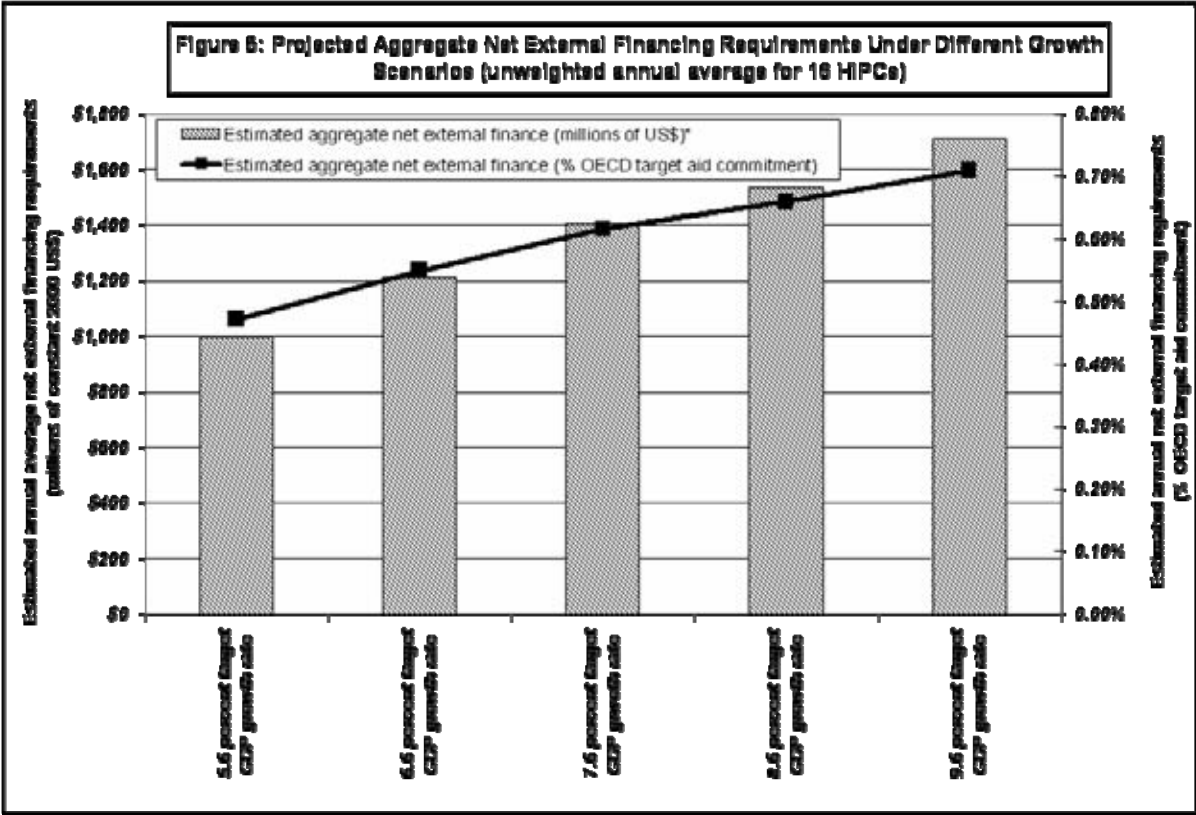
Consequently, Figure 4 presents the projected residual finance gap which corresponds to the unweighted annual average interest payments on the stock of external loans which will be needed to halve poverty for our 16 HIPCs under our five alternative growth-inequality proposals. Nwachukwu (2008a) describes the supporting assumptions and identity equations used in the simulation of the underlying growth-cum-debt model. For example, to maintain long-term debt sustainability, it is important that the estimated growth of external debt and interest payments are continuously lower than the real rate of growth of exports and income. Also, the marginal product of foreign capital is assumed to be greater than the cost of borrowing. Further, a successful progression through the external debt-cycle model requires that the projected marginal domestic savings rate should exceed the fixed investment ratio required by the target rate of growth (Avramovic, 1964; McDonald, 1982 and Nissanke and Ferrarini 2001). These adjustments ensure that our projected residual interest financing-gap will eventually decline.

As can be seen from Figure 4, the alleviation of extreme income poverty in our post-HIPCs is likely to require an increasing amount of additional external capital to fill a widening residual interest financing-gap in the foreseeable future. For example, it is estimated that over the period 2005 to 2015, an additional sum of US$101 million a year (or 1.32 percent of recipient's GDPs) will be needed to cover interest charges on loans accumulated during the development process assuming that our pro-poor pattern of growth is achieved. This is expected to almost quadruple to an annual average of US$380 million (2.38 percent of their GDPs) between the years 2016 and 2030. At the other extreme, our 16 HIPCs will confront a residual interest financing-gap of US$116 million (1.39 percent of their GDPs) which needs to be covered on an annual basis from 2005 to 2015 if extreme hardship is to be significantly reduced under our anti-poor growth conditions. This residual interest financing-gap is projected to rise by fivefold to reach US$596 million a year (2.53 percent of their GDPs) averaged from 2016 to 2030 with any significant deterioration in income inequality.

The widening in the estimated residual interest financing-gap is to be expected irrespective of which growth-cum-inequality scenario is to be achieved. This follows from our supposition that the burden of servicing the stock of foreign loans is continuously rolled over. Consequently, a country is expected to borrow not only to finance part of its investment, but also to pay interest on the external debt that has accumulated in the planned growth process. In this way, it will experience a rise in its interest obligations since debt that will occur from postponement will be serviced out of new borrowing which also carries interest. However, if an adequate proportion of additional income can be saved in a manner akin to our optimistic marginal rates, the country will, over time, meet an increasing share of its investment requirements from its own resources. The economy's new external borrowing requirements with associated interest charges will be correspondingly reduced.

3.4. Aggregate Net External Capital Requirement

The aggregate net external capital requirement of our post-HIPCs is represented here by the sum of the total amount of foreign finance needed to fill both the dominant resource-gap and the residual interest financing-gap over the projection period. Figure 5 charts the results of our simulation for the unweighted mean aggregate net external finance in constant 2000 US$ on the left vertical scale. This amount will be required to support the higher desired growth rate needed to halve poverty and cover the residual interest charges on external loan commitments under our five alternative growth-cum-inequality policy prescriptions. To assess the financial implications of the poverty alleviation goal for donors, we depict on the right hand vertical axis of Figure 5, the estimated total net external finance requirements expressed as a percentage of the preceding three-year average of the group of OECD-DAC countries' GDPs that have been promised in official development assistance to developing economies. These estimates assume that each donor nation will raise its ODA commitment to the target ratio of 0.7 percent of its gross domestic product a year starting from 2005.

Figure 5: Projected Aggregate Net External Financing Requirements Under Different Growth Scenarios (unweighted annual average for 16 HIPCs)

As expected, the potential aggregate net external capital needed to halve poverty in our 16 HIPCs varies considerably across the different growth-cum-inequality trajectories. It is projected to range from an average of US$997 million a year from 2005 to 2011 if all our post-HIPCs are successful in raising the responsiveness of poverty-to-income growth to the more than unitary elasticity subsumed in our pro-poor growth scenario. This amount corresponds to 0.47 percent of the estimated OECD countries' target aid commitment of US$200 billion on an annual basis. The estimated aggregate net external finance is likely to double to US$1.71 billion a year in the

eleven years between 2005 and 2016 if income-inequality conditions worsen considerably as predicted under our anti-poor growth scenario. This would absorb around 0.71 percent of the anticipated target donor target aid of US$214 billion per annum averaged over the same period.

To make sense of how our estimates compare with those of previous studies, we adopt the approach outlined by the UN Millennium Project Task Force and express our results in terms of total net capital requirements per person per year. To halve the share of extreme poor in total population, a typical post-HIPC in our sample will require an aggregate net foreign capital transfer of US$67 per capita per year from 2005 to 2011 if they adopt our more equitable growth prescriptions. This estimate is slightly higher than theUS$65 per person per year reported by the UN Millennium Task Force in 2005, but it is the same if one assumes that the anticipated donor assistance does not include interest charges on both new and outstanding debt. Nevertheless, our results show that the projected annual per capita foreign capital requirement net of interest charges will double to US$108 from 2005 to 2016 under our anti-poor growth path.

Thus, with an estimated 969 million people living in extreme poverty in the low and middle-income countries, a rough extrapolation from our results suggests that the desire to halve the percentage of their severely impoverished citizens will require an aggregate net foreign resource transfer of US$54 billion in each of the six years between 2005 to 2011 if the expected additions to their incomes are more equitably distributed. This amount is equivalent to 27.02 percent of the estimated OECD target aid commitment of US$200 billion a year averaged over the same period. The requirement for total external finance net of interest payments is expected to almost double to US$95 billion per annum if future growth patterns are accompanied by a considerable deterioration in income inequality as predicted under our anti-poor scenario. This represents approximately 44.60 percent a year of the projected US$214 billion a year aid commitment by the OECD countries averaged from 2005 to 2016.

Notably, our estimated annual aggregate net external transfer of US$54 billion under the pro-poor growth conditions is comparable to the US$50 billion a year reported by the Zedillo panel (UN, 2001) as the total external finance needed to achieve the MDG goals throughout the developing world. Our estimate is also well within the range of US$40 billion to US$70 billion a year estimated by Devarajan *et al* (2002). But it is significantly lower than estimated figures of around US$70 to US$80 billion reported by the UN Millennium Project Task Force reflecting in part differences in constant price levels and the lower number of the extreme poor underlying our projections. For instance, our simulations are based on constant 2000 US dollars as opposed to the constant 2003 prices underlying the study by the UN Millennium Task Force. Moreover, we assumed that the headcount poverty would fall from the 1.1 billion in 2001 used by the UN Millennium Task Force to 709 million in 2011 and to 589 million by 2015 with a more equitable income distribution across the developing world. Such discrepancies underscore the limitations of straightforward comparisons of the cost of meeting specific development goals across studies. It also reinforces the importance of a detailed country-by-country assessment in establishing their aggregate external requirements as opposed to estimates on a global scale.

Interestingly, our estimates for the total cost of cutting in half the proportion of people living in extreme poverty worldwide of between US$54 billion and US$95 billion a year from 2005 is less than half the amount of funds already promised in aid by the rich donor nations. This augurs well for the efforts of the organisers of the MDGs to lobby donors to increase aid to the world's poorest states from the current 0.24 percent of their gross national product to the full 0.7 percent commitment. Moreover, countries like China and India are on track to achieve the poverty reduction goal ahead of the end date of 2015 with little or no assistance from donors. Together, they would release large additional amounts for the support of the MDG programmes in our very poor post-HIPCs. However, such increased aid flows must be carefully monitored and supported by sound economic policies, good governance and the rule of law in the beneficiary nations. The heart of attaining the MDG poverty reduction target in our post-HIPCs therefore lies in the implementation of strategies aimed at ensuring that an increasing share of the extra funds is channeled either directly or indirectly into those sectors where the majority of the disadvantaged live and work.

4. Policy Recommendations

Calculations in Section 3 indicate that shortfalls in domestic savings will be the dominant constraint on the efforts of our post-HIPCs to achieve the expected gains in economic activity and human development in the foreseeable future. While the projected high rate of growth in per capita income by itself should enable governments to raise their revenues, the Monterrey Consensus on the challenges of financing for development (UN, 2002) did identify two broad areas of policy action for encouraging domestic resource mobilisation and its effective use in underdeveloped economies.

First, the mobilisation of domestic resources needed to achieve the MDGs will necessitate further reforms in tax administration to broaden its base, increase the efficiency of its collection and diversify its sources away from export duties, customs and tariffs on imports. Moreover, simplification of income tax documents and schedules for customs and excise duties could save time, improve transparency and accountability and help increase investor confidence in the revenue collection authorities. Then too, many reforming African countries, such as Uganda, have increased recurrent revenues by replacing taxes on imports with a domestic value added tax (VAT) and by establishing an independent agency charged with the collection and administration of taxes and other public sector revenues. The Monterrey Consensus further identified corruption, inefficiency, embezzlement and smuggling as major barriers to effective resource mobilisation and allocation in many developing countries. Good governance, along with an equitable tax system and its management is essential for financial intermediation and requires the rule of law, gender equality, respect for human rights and civil liberties, market-orientated policies, transparent regulatory frameworks and prudential supervisory systems.

Second, the diversification of micro-finance services to include savings schemes to fund small and medium scale enterprises (SMEs), particularly for those in households in rural areas and for women, is important for raising private savings rates. Savings facilities provided by commercial

banks and other formal financial institutions are seldom adapted to the needs of rural households and SMEs. Moreover, given low-population density and poor infrastructure, rural services for the saving, payment and transfer of funds are often limited. As a result, the very few household and SME investors that save do so by stockpiling goods, by investing in commodities like gold and by hoarding cash. Such non-financial forms of savings are sub-optimal in the sense that they are subject to greater fluctuations in prices, destruction by pests, fire and theft as compared to deposits in formal banks which may re-lend them for further investment. More important still, perhaps, is the raising of auto-finance opportunities through training and the provision of agricultural extension services. The household savings needed to finance improved seeds, fertiliser and small-scale irrigation appeared as if by magic in Asia's self-evidently profitable green revolution.

Undoubtedly, for many of our post-HIPCs with their underdeveloped infrastructures and limited supply of skilled workers, the anticipated surge in external resources may well be associated with an upward pressure on their relative price of non-traded goods and services, in particular health and education (UNDP, 2005, Vos *et al* 2007). According to the UN Millennium Task Force a twenty percent appreciation in the real exchange rates, would raise our projected cost of meeting the MDG targets by between 7 to 8 percent over the ten years from 2006 to 2015. Such *real* rate overvaluation will erode the competitiveness of import-competing and export firms with consequent reduction in domestic savings therefrom. What is more, if any resulting deterioration in the trade deficit is covered by further external borrowing, then the anticipated spending on MDG-related programmes will exacerbate the debt problems of our post-HIPCs.

Therefore, a key priority for achieving and sustaining the MDGs in our severely indebted poor countries is to implement policies aimed at relieving the constraint posed by the expected real exchange rate appreciation effect of foreign capital inflows. Vos *et al* (2007) outlined the importance of enhancing the absorptive capacity of beneficiary countries through investment in supply side activities, including the provision of infrastructure, agricultural support, extension workers, teachers, nurses and doctors. Such investments will help remove a bottleneck on domestic production and so should be made a precondition of additional assistance to our-post HIPCs. Then too, evidence suggests that government spending in many LDCs is dominated by a demand for non-tradables largely arising from public sector wages in administration, the army and the police. Thus, another way of ameliorating the harmful effect of large capital inflows may be for public spending on such "non-productive" activities to be cut, although the decision to retrench civil servants may be politically difficult to implement and there is a case for raising the salaries of those who remain in the hope of reducing corruption. Nwachukwu (2008b) discusses further policy initiatives to contain the real rate appreciation effects of external finance. They include the adoption of a more flexible exchange rate regime and the easing of import tariffs, quotas and licensing procedures. However, any trade-off between public revenue and these reforms may undermine the attempt of our post-HIPCs to achieve the MDGs unless donors provide bridging finance to cushion them from the political and economic shocks inherent in such liberalisation policies.

Conclusions

The Millennium Development Goals (MDGs) have become the yardstick upon which the performance of developing countries and the donor community will ultimately be judged at the end of the target year in 2015. In this paper we looked at whether the income poverty goals are likely to met across a group of sixteen post-HIPC-MDRI economies and how much it will cost under five alternative growth-cum-income inequality outlooks. Unlike many of the previous studies, our projections are applied on a country-by-country basis rather than through regional average figures. The main findings may be summarised as follows:

First, our estimates paint a similar picture to those of earlier researchers with respect to the likelihood of halving the share of population living below the poverty line of US$1.08 per day in 1993 PPP terms. They show that the most likely route for our 16 HIPCs to achieve the MDG target is for their real per capita incomes to grow year-on-year by a minimum of 3 percent for at least six years in a more equitable income redistribution pattern. With roughly 5.6 million people, equivalent to 46.66 percent of population living in extreme hardship in the base year 1990, our forecasts of a reduction to 23.33 percent under our equitable growth scenarios 1 and 2 suggest that their headcount poverty ratio will be halved by the end of 2013. But the absolute number of poor is expected to persist at around 4 million by the MDG end date in 2015. Poverty incidence in our post-HIPCs is projected to decline to a target of 2.8 million people (50 percent of initial headcount in 1990) by the early to mid 2020s despite our assumption that the anticipated additions to their per capita incomes will be more equitably distributed in favour of the most disadvantaged people. Such ambiguity on the attainment of relative and absolute poverty reducing objectives underscores the importance of the choice of poverty line and its measurement in promoting human development in the coming years when claims are made by the sponsors of the MDGs with respect to target fulfillment.

Second, our estimates show that the challenge of halving the headcount poverty ratio by 2015 is generally confronted by the problem of income inequality. Examples of redistribution policies that could make a more effective contribution to poverty reduction may include the development of family-orientated small-scale enterprises with, perhaps the provision of micro-finance services including savings, credit, and insurance as an enabling factor. Then too, agricultural extension services, irrigation, farm-to-market roads, rural electricity and water supply, village paramedical services and universal primary education are all self-evident contributors to the well-being of the indigent. But where the provision of subsidised services are concerned, their welfare effects over and above those of allocating the same finance to directly productive investments should always be carefully considered.

Third, based on a persistent gross domestic savings gap, the aggregate net external finance needed to halve poverty in our 16 HIPCs is likely range from US$997 million to US$2 billion per annum from 2005 depending on whether the growth trajectory is pro- or anti- poor. This is

equivalent to between 16 percent and 21 percent of the recipient's annual average GDPs. Thus, given that our group of HIPCs obtained an average ratio of foreign aid to GDP of 18 percent in 2004, our projections suggest that even under our worst-case growth-income inequality scenario, the MDG poverty-reduction target would only require that donors provide a further 3 percent of the beneficiary countries' GDPs per year in additional aid. This extra funding will cover both their potential MDG-financing gaps and the interest payments on new and outstanding debt stock. Our post-HIPCs, for their part, should take steps to improve their policies particularly with respect to opportunities for increased absorptive capacity and more efficient domestic savings mobilisation. These policy initiatives will also help increase the availability of goods and services in the domestic market and help ameliorate any real exchange rate appreciation effects of external finance.

Fourth, the impact of MDG-related expenditure on economic performance indicators is highly complex and cannot be predicted *a priori*. It depends on the institutional features of the beneficiary nations, including their availability of skilled labour and its flexibility of supply. While these interaction effects are subsumed under our optimistic parameters, our basic dual-gap projections may, of course, mislead if the varying supply of external capital and the associated behaviour of government and private economic agents are treated as being simultaneously determined. This will be particularly true of small-sized agrarian states where the liberalisation of international trade taxes in order to contain any expected real exchange rate appreciation could reduce government revenue. The need to relieve such a budgetary trade-off and a number of other political and domestic financing constraints on the MDG-related programmes may raise our estimated cost of attaining the income poverty target in those post-HIPCs where foreign exchange earnings are concentrated in primary commodity exports. For these countries in particular, a more generous financial support over a longer time horizon may be required.

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