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The progressivity and regressivity of aid to the social sectors

Bob Baulch and Le Vi An Tam*

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Abstract

This paper analyses the distribution of total aid and aid to the social sectors between 2009 and 2011. Its key findings are four-fold. First, despite the stated objectives of donors, total aid disbursements are broadly neutral, favouring neither the most deprived nor relatively well-off countries. Second, the pattern of social sector aid disbursements follows those for total aid. Third, the aid allocation patterns of bilateral and multilateral donors differ, with multilateral donors generally being more focused on the poorest countries. Finally, the distribution of aid for health and population is more progressive than that for education or other social sectors.

Keywords: aid, social sectors, concentration curves, progressivity
JEL classification: F35, I15, I25, Z18

*Centre for Commerce and Management, RMIT University Vietnam. Corresponding author email: bob.baulch@rmit.edu.vn.

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UNU World Institute for Development Economics Research (UNU-WIDER)
Katajanokanlaituri 6 B, 00160 Helsinki, Finland

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1 Introduction

It is now twelve years since the Millennium Summit of 2000 and ten years since the Monterrey conference on the Financing of Development. Although the doubling of aid to Africa proposed by the Gleneagles Summit of 2005 has not materialized, aid volumes have risen by more than a half since then (OECD 2012). The share of aid directed to the social sectors has also risen substantially over time, and accounted for more than a third of total aid in recent years.

This paper analyses the extent to which aid to the social sectors is targeted to the poorest and most deprived countries. To do this we combine data on different categories of aid disbursements from the OECD's Development Assistance Committee for 2009–11 with data on poverty and deprivation from the World Bank, UNICEF and the World Health Organization to construct aid concentration curves. These curves, and their statistical counterpart, the Suits index, allow the progressivity and regressivity of aid to be analysed.

Section 1 provides a brief overview of trends in aid and aid to the social sectors over the past decades. This is followed by a description of the methodology used for measuring the progressivity of aid, and details of our data sources and main variables. Section 4 contains an analysis of our key finding concerning the progressivity or regressivity of overall aid (for bilateral and multilateral donors), while Section 5 examines the same question using aid to the social sectors. Section 6 concludes.

2 Trends in aid and aid to the social sectors

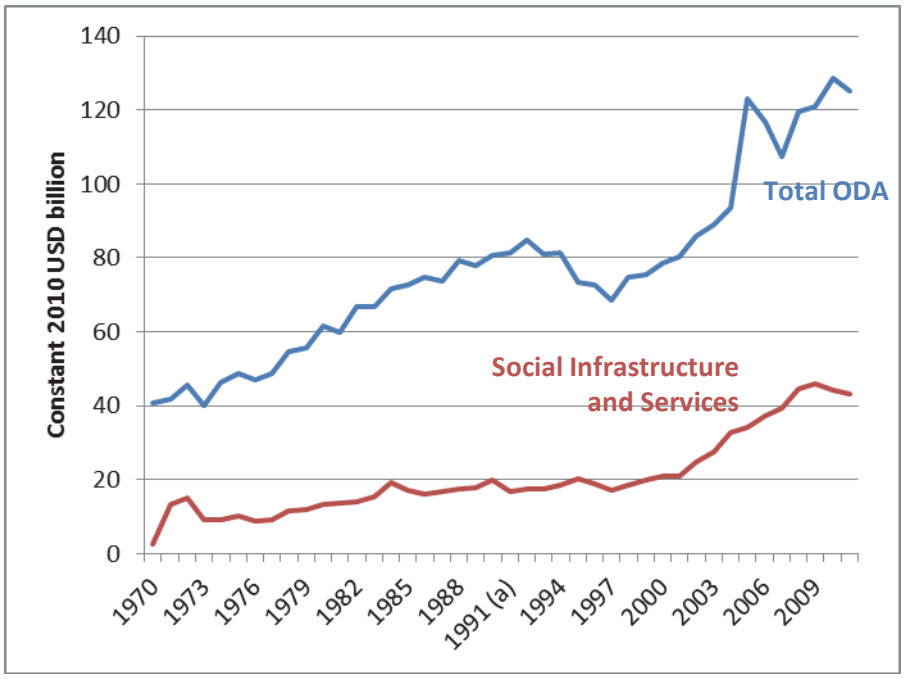
The volume of aid as measured by Official Development Assistance (ODA) in real 2010 terms has increased from US$41 billion in 1970 to US$128 billion in 2010, and then fell back to US$125 billion in 2011 (Figure 1). During the second half of the Cold War in the 1970s and 1980s, aid volumes more than doubled as bilateral donors jockeyed for influence in 'geopolitical hotspots'. Following the collapse of the Soviet Union, aid volumes decline sharply, reaching a nadir of $68 billion in 1997, although some commentators discern an increasing developmental focus to aid allocations (Akramov 2012; Riddell 2007). Then with the advent of the Millennium Development Goals, the War on Terror and the Monterrey Conference on Financing Development in the early 2000s, total ODA reached a historic high in 2010. Judged against the UN target of 0.7 per cent of Gross National Income, however, there was still an aid gap of around US$167 billion in 2011 (UN 2012). Furthermore, the OECD's Development Assistance Committee (DAC) expects growth of core ODA to stagnate between now and 2015 due to the delayed impact of the global economic crisis on most donors' aid budgets.

While total ODA and aid to the social sectors track each other closely (Figure 1), with a correlation coefficient of 0.94 between 1970 and 2011, the series do not move on a one-for-one basis.[1] The share of ODA accounted for by aid to the social sectors increased gradually from 1973 until 1984, and then hovered between US$16 and US$20 billion for the remainder

[1] For example, between 1994 and 1995, total ODA fell by US$8 billion while aid to the social sectors rose by almost US$2 billion. These contrasting trends are largely explained by a substantial drop in debt relief, which is included in ODA but not in aid to the social sectors, between 2004 and 2005.

of the century. Aid to the social sectors then rose sharply during the 2000s, driven in part by the renewed emphasis on poverty reduction and human development due to the Millennium Development Goals. Between 2001 and 2011, the share of total ODA accounted for by aid to the social sectors rose from 26 to 34.5 per cent (OECD 2012).

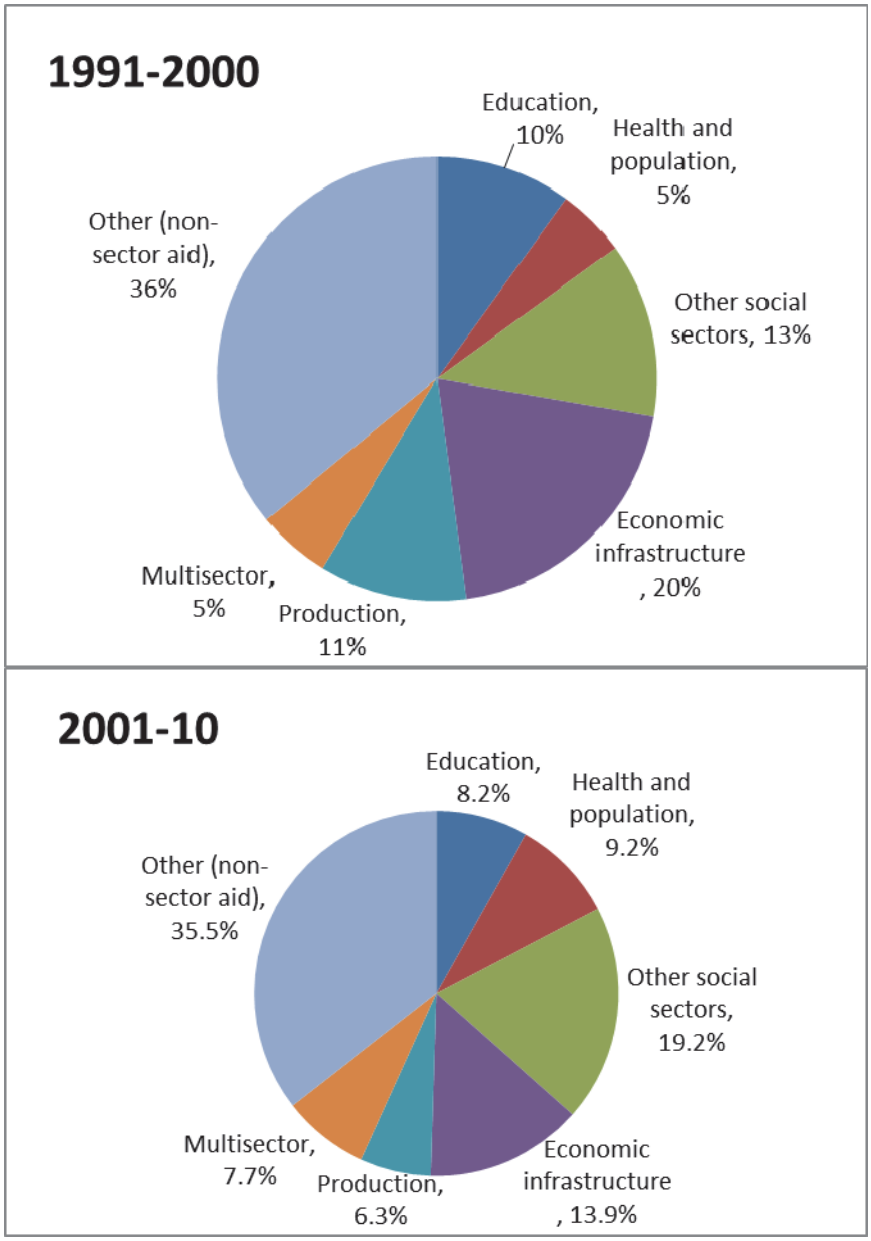
Figure 1: Total ODA and aid to the social sectors, 1970–2011



Source: OECD (2012).

As shown in Figure 2, aid to the social sectors may be divided into three components: education, health and population, and the other social sectors. Comparing the 1990s with the 2000s, aid to education fell from 10 to 8 per cent of total ODA while aid to health and population (including reproductive health) almost doubled from 5 to 9 per cent. Aid to other social sectors (which includes water supply and sanitation, other social infrastructure and services, plus government and civil society) rose from 13 to 19 per cent over this period. In particular, it should be noted that assistance to government and civil society accounted for around 30 per cent of all aid to the social sectors in 2009 to 2011. Much of this was concentrated in post-conflict and fragile states.

Figure 2: Trends in sector specific aid



Source: OECD (2012).

3 Measuring the progressivity of aid

The methodology used to examine the progressivity (or regressivity) of aid in this paper is that of aid concentration curves and their statistical counterpart, the Suits index. Aid concentration curves are a graphical device for showing whether the distribution of aid is targeted toward or away from the poorest and most deprived countries. If most of a donor's aid goes to the poorest countries, then its aid concentration curve will lie above the diagonal (and vice versa).

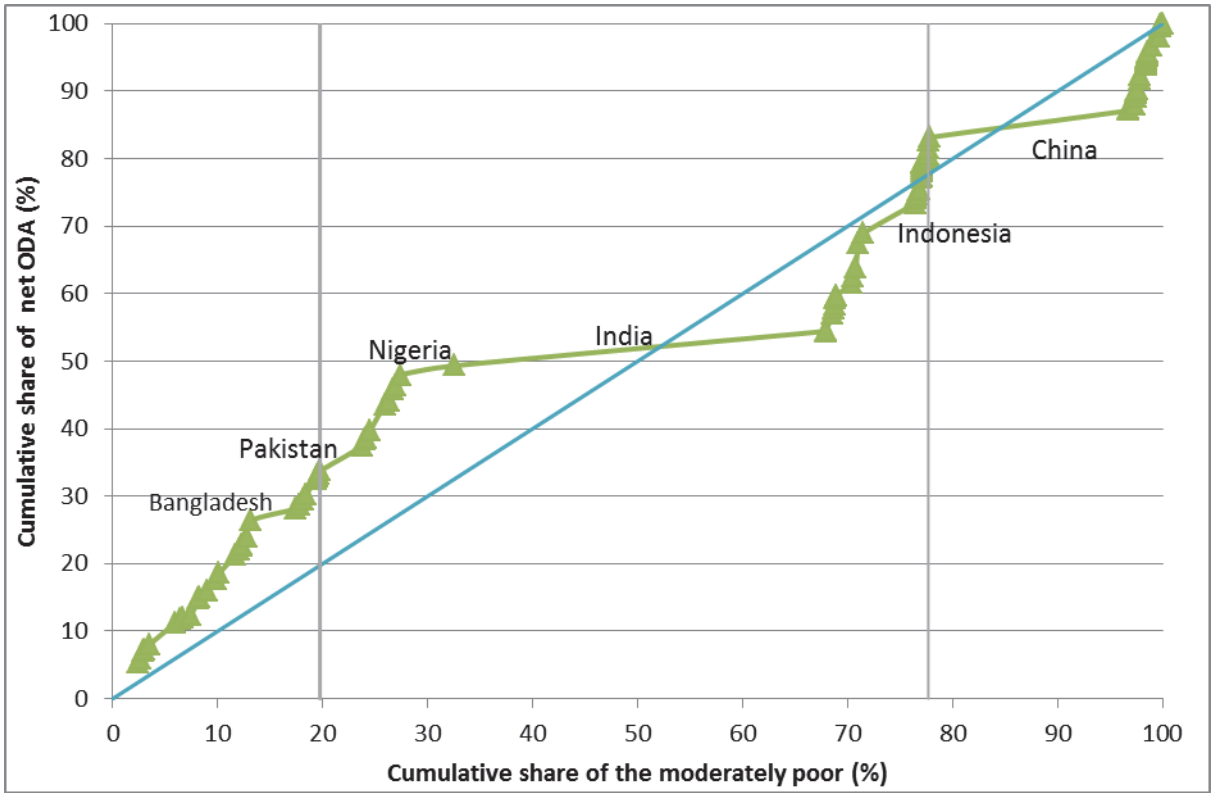
To be more precise, an aid concentration curve plots the cumulative percentage of some measure of aid against the cumulative percentage of a measure of the number of people who are poor or deprived. Aid can be measured in a number of different ways but we focus on the most commonly used measure, net ODA. For the poverty and deprivation variables, a number

of alternative measures exist including, *inter alia*, the cumulative percentage of the extreme or moderately poor and the cumulative numbers of people suffering some other kind of deprivation (for example, child malnutrition, child mortality, or lack of education).[2] Aid concentration curves resemble conventional Lorenz curves but with an additional variable (per capita incomes measured in terms of Atlas GNI) used to rank countries before the cumulative percentages are calculated. This additional ranking allows aid concentration curves to cross the leading diagonal (45 degree line) if aid is targeted towards the poorest countries.

To illustrate, consider the aid concentration curve for the 24 members of the DAC shown in Figure 3 for 2009–11. The horizontal axis plots the cumulative proportion of the population living on less than US$2 a day (in 2005 PPP terms) for the 106 countries for which we have data, while the vertical axis the cumulative proportion of net ODA received by these countries. The two vertical lines show the dividing lines between low-income and lower middle-income countries (US$1,005 per capita) and between lower and upper-middle-income countries (US$3,975 per capita) according the latest OECD classifications. The initial portion of the curve is slightly steeper than the diagonal (45 degree) line indicating that the 30 countries with per capita incomes of less than US$1,005 receive slightly more aid than their share of poverty. As indicated by the jagged nature of this curve, most of these countries have relatively small populations, although there is a flat segment between the 13th and 17th percentiles corresponding to Bangladesh. Then follows two relatively step segments, interspersed by Pakistan, corresponding to 17 countries which receive relatively generous aid with respect to their poor population. Between the 27th and 67th percentiles of the horizontal axis, there is a long relatively flat segment corresponding to Nigeria and India, the most populous countries in Africa and South Asia. India accounts for 35 per cent of extremely and moderately poor people in the world but receives just fewer than 5 per cent of total aid. Thereafter the curve rises again quite steeply, with the short jagged segment of the curve representing 32 relatively small lower-middle-income countries plus Indonesia, until the vertical line dividing lower- and upper-middle-income countries is reached. Just above this line, there is another flat segment between the 77th and 96th percentiles of the moderately poor. This segment of the curve represents China, which contained almost 19 per cent of the people in the world living on less than US$2/day in 2009. A final steep portion of the curve contains 29 relatively small countries with per capita incomes greater than China, most of whom receive relatively generous aid disbursements.

[2] When the cumulative percentage of aid is plotted against the cumulative percentage of the population of developing countries, aid concentration curves are also called 'aid Lorenz curves' as in White and McGillivray (1992, 1995). The term aid concentration curve seems more precise because a Lorenz curve should not cross the leading diagonal.

Figure 3: Aid concentration curve for net ODA, all DAC countries



Source: Authors, using data described in Appendix 2.

The Suits index is a statistical counterpart to aid concentration curves, which summarizes the progressivity or regressivity of a distribution (Suits 1977).[3] Unlike the Gini coefficient, of which it is an analogue, the Suits index can vary between -1 and +1. A Suits index of -1 corresponds to the (not necessarily desirable) situation in which a donor gives all its aid to the poorest country in the world. In this admittedly extreme case, the aid concentration curve would coincide with the left-hand and top axes of Figure 1. A Suits index of +1 would correspond to the case when a donor gives all its aid to the richest developing country. Here the aid concentration curve would coincide with the bottom and right-hand axes of Figure 1. A Suits index of zero corresponds to the situation in which a donor distributes its aid in exact proportion to the number of moderately poor people. In this case, the aid concentration curve coincides with the leading diagonal of the aid concentration curve box. The aid concentration curve for the DAC in Figure 1 has a Suits index of -0.066 indicating a distribution of aid that is slightly progressive.

The use of aid concentration curves for the analysis of aid flows was originally suggested by Mosley (1987), and applied in the early and mid-1990s by Clark (1992) and White and McGillivray (1995). Baulch (2006) extended and updated White and McGillivray's analysis by constructing aid concentration curves for the cumulative percentage of the world's extreme poor, and three non-monetary indicators of poverty (malnutrition, non-enrolments in primary school, and under-five mortality). The analysis was conducted for the years 2000 to 2002. This paper updates Baulch's analysis to 2009–11 and considers the extent to which aid to the social sectors is more progressive than all official development assistance.

[3] See Appendix 1 for further information on the calculation and interpretation of the Suits index.

4 Data

4.1 Data on poverty and deprivation

Information on poverty is taken from the World Bank's online poverty analysis tool, PovcalNet.[4] The availability of internationally comparable poverty data has improved remarkably since the mid-2000s. PovcalNet now contains information on US$1.25 and US$2/day poverty in around 130 countries. While none of the five countries that have been created during the 2000s (Timor Leste, Montenegro, Serbia, Kosovo, and South Sudan) yet have international poverty estimates, in contrast to the early 2000s many of the countries of the former Soviet Union and former Yugoslavia can now have international poverty estimates. As many of these countries are middle-income countries with relatively small populations, this has the effect of pushing aid concentration curves down and to the left relatively to the curves in Baulch (2006) for the period 2000–02. Several poor and populous countries still do not, however, have estimates of US$1.25 and US$2/day poverty, most notably Afghanistan and Myanmar.[5] The World Bank estimates that in 2008, the latest year for which comprehensive data is available, there were 1.29 billion people in the world living on less than US$1.25/day (in 2005 PPP terms) and 2.47 billion people living on less than US$2/day (World Bank 2012).

Data on the percentage of underweight children were extracted from the World Bank's Health, Nutrition and Population Statistics database supplemented by the World Health Organisation (WHO)'s Global Database on Child Growth and Malnutrition. The number of underweight children in each country was then calculated by multiplying these percentages by the population of children under five years old from the UN's Revision of World Population Prospects 2010. UNICEF, WHO and the World Bank estimate that there were 102 million children under five who were underweight in 2010 (UNICEF et al. 2010).

Data on out-of-school children of primary age are mostly for 2010 and come from the World Bank's World Development Indicators education database, supplemented by information from UNICEF's Childinfo database. It is estimated that there were approximately 61 million children of primary school age not attending school in 2010 (UNESCO 2012). We focus on achieving universal primary school education, in line with Goal 2 of the MDGs. In addition, even though information on net secondary school enrolment rates are available for most countries, it is difficult to convert these into numbers of children not attending secondary school because of poor (or non-existent) information on the number of children who should be attending this level of education.

Data on under-five mortality comes from the World Development Indicators health database, which is itself based on the Interagency Group on Child Mortality Estimation (UNICEF et al. 2007). In 2008, it is estimated that 8.8 million children under the age of five died prematurely, thereby undermining the chances of the world achieving Goal 4 of the MDGs. Note that the data for child mortality cover 99 of the 106 countries for which we have data on the other measures of poverty and deprivation.

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[4] See Appendix 2 for further information on the indicators and data sources used.

[5] Other, less populous countries which do not have international poverty estimates are Cuba, Mongolia, Uzbekistan, and Zimbabwe, plus some small islands states in the Caribbean and the Pacific.

4.2 Data on aid flows

Data on aid disbursements have been extracted from the DAC's Creditor Reporting System for the years 2009, 2010, and 2011. The CRS's statistics are based on individual reports of both ODA and other official aid flows received directly from participating official agencies, including bilateral and multilateral aid agencies, development lending institutions, and export credit agencies. The data available within the CRS is more comprehensive than that provided by the questionnaires completed by donors for the DAC in April and September each year, although it typically does not become available until almost a full calendar year after the year it refers to.

For our overall aid variable, we use net ODA. ODA comprises official grants or loans on concessional terms to developing countries and territories on the DAC's list of aid recipients with promotion of economic development and welfare as the main objective and at concessional financial terms. To be regarded as official, the assistance must be provided by the official aid agencies or their executive agencies, so grants from private philanthropic agencies are excluded. So too is aid from non-DAC donors, although with the addition of the Republic of Korea to the ranks of the DAC in 2011, this is now mostly aid from richer to poorer Arab states. To be regarded as concessional, loans must contain a grant element of at least 25 per cent. Note that the multilateral donors, Japan and France typically give a much higher proportion of their aid in loans than the majority of bilateral donors, with some bilateral donors (such as Norway, Sweden, and the UK) now giving 100 per cent of their aid in grant form.

The DAC's Creditor Reporting System reports data on a composite 'Social Infrastructure and Services' category which includes education, health, population policies and programs and reproductive health, water supply and sanitation, government and civil society, and other social infrastructure and services. For the purposes of this paper, we focus on the composite category together with three sub-categories: (i) education, (ii) health, population and reproductive health, and (iii) the other sector sectors (comprising government and civil society, water and sanitation, plus other social infrastructure and services) for capturing aid to the social sectors. As there is often a substantial gap between commitments and disbursement, and also considerable volatility in individual donor's aid flows from year to year, we focus on gross disbursements to social infrastructure and services for the three year period between 2009 and 2011.[6]

When the data on aid flows are merged and combined with the data on poverty and deprivation, a dataset of 106 countries results for poverty, malnutrition, and primary education. For child mortality, where estimates do not exist for some countries in the Caribbean and the Pacific, our data contains 99 countries.

6 In contrast to overall ODA, statistics on net disbursement of aid to the social sectors are not available from the DAC's CRS.

5 Is aid targeted towards the poorest countries?

Poverty reduction (or alleviation) is one of the stated aims of most donors' aid programmes. However, a voluminous empirical literature has demonstrated conclusively that political and economic factors in donor countries affect aid allocation decisions significantly.[7] This accords with the accounts of aid disbursements by diplomats, journalists, international relations experts, and scholars in other fields (Werker 2012). In general left-leaning governments tend to allocate more funding to development aid than right-leaning governments, although the War on Terror has reversed this trend to some extend (Fleck and Kilby 2010). In addition, it is well known that geo-political and commercial interests dominate the aid allocation decisions of the two largest bilateral donors (the USA and Japan) while many European countries favour former colonies and major trading partners in their aid allocation decisions (Bertelemy et al. 2004; Synder 1993). Multilateral donors, in particular the European Union, are also strongly influenced by political and trade considerations (Ridell 2007) while the voting systems of the Bretton Woods institutions are heavily weighted towards the USA and Europe (Weker 2012). Despite recent initiatives to increase both the coordination and selectivity of aid, most donors' aid disbursements are both highly fragmented and show evidence of small country effects (Easterly 2007; OECD 2012).

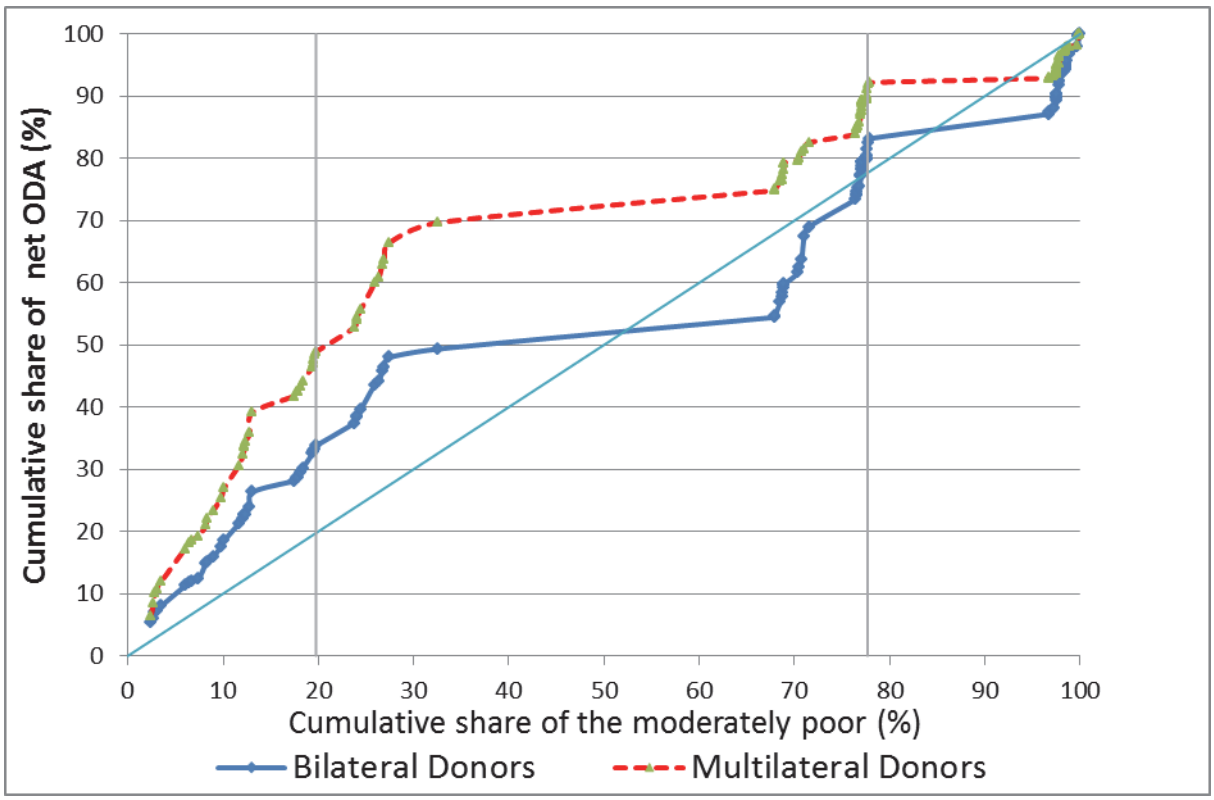
Given this background, this section asks to what extent aid is targeted towards the poorest countries, and whether the poverty focus of aid differs between overall aid and aid to the social sectors. To do this we construct aid concentration curves for the bilateral and multilateral donors who are members of the DAC using the US$2/day line for moderate poverty.[8] As Figure 4 shows clearly, net ODA from the multilateral donors is more focused on the poorest countries than aid from bilateral donors. As shown by the position and slope of the curves in the bottom left-hand corner of this diagram, both bilateral and multilateral donors are relatively generous in their total aid disbursements to low-income countries. Both bilateral and multilateral donors also give relatively little aid to large populous countries such as India and China, which account for 36 and 19 per cent of the world's moderately poor, respectively. However, the poorest developing countries generally receive higher shares of multilateral aid than better-off developing countries. Between 2009 and 2011, the ratio of multilateral-to-total DAC aid was 0.443 for low-income countries, 0.327 for lower-middle-income countries, and 0.220 for upper-middle-income countries. As a consequence, the aid concentration curve for multilateral donors in the bottom left-hand corner of Figure 3 rises much more steeply than that for the multilaterals. Furthermore, multilateral aid tends to focus on the poorest low-income countries. The 21 countries in our analysis with per capita incomes of less than US$700 (that is, poorer than Bangladesh) received 39 per cent of multilateral aid compared to 26 per cent of bilateral disbursements. Notice also, in the top right hand corner of the diagram, that the aid concentration curve for bilateral doors is both longer and steeper than that for the multilaterals. This reflects the well-known small country bias of many bilateral donors, which is driven partly by aid disbursements to former colonies, partly by trade patterns, and partly by disbursements to countries (such as Iraq, Pakistan, and Palestine) considered to be of geopolitical importance. 14 of the 37 upper-middle-income

[7] For overviews of this literature, see Alesina and Dollar (2000), Berthelemy and Tichit (2004), and Riddell (2007).

[8] Analysis for extreme poverty using the US$1.25/day standard reveals a similar though less progressive ranking of multilateral and bilateral aid.

countries in our analysis have populations of less than 5 million people compared to just six countries among the 32 low-income countries. Bilateral donors' aid disbursements to upper-middle-income countries, especially small upper-middle-income countries, therefore offset the aid that is targeted to the poorest countries. As a consequence the Suits index for net ODA for the bilateral donors is a neutral -0.066 while that for the multilateral donors is a progressive -0.344.

Figure 4: Aid concentration curves for bilateral and multilateral donors using moderate poverty, 2009–11



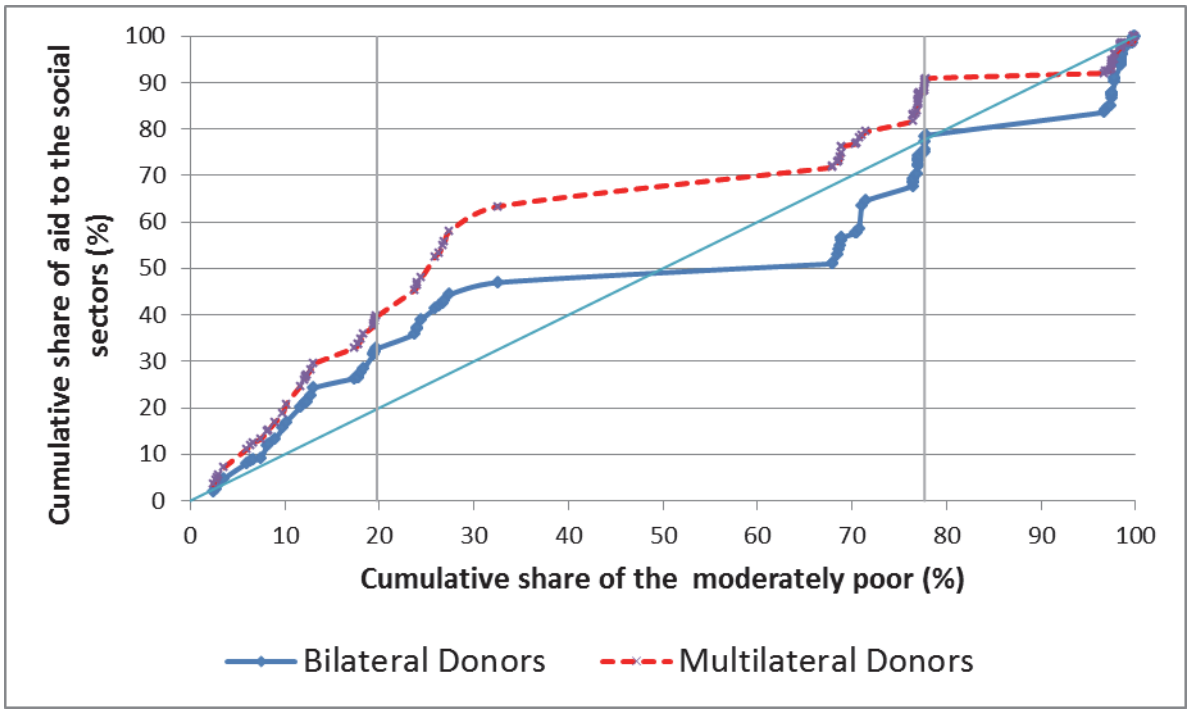
Source: Authors, using data described in Appendix 2.

Turning to aid to the social sectors, a similar though less stark contrast between the pattern of disbursements by the bilateral and multilateral donors is observed (Figure 5). The concentration curve for aid to the social sectors by multilateral donors lies everywhere above the one for bilateral donors. However, for the poorest countries in the bottom right-hand corner of the diagram, the concentration curve for the multilateral donors rises only slightly more steeply than for the bilateral donors. The portion of the multilateral aid concentration curve for the social sectors corresponding to India also rises a little more steeply than the portion for the bilaterals. Between 2009 and 2011, social sector aid to India from the multilateral donors was larger in both absolute and percentage terms than social sector aid from the bilateral donors. This reflects many bilateral donors' desire to concentrate their aid on low-income countries (India became a middle-income country in 2007) together with the Government of India's efforts to rationalize the number of donors it deals with. Multilateral social sector aid is also larger than bilateral social sector aid in Vietnam, Nigeria, and six countries in West Africa with lower levels of per capita income than India.[9] As a result, the Suits index for multilateral aid to the social sectors is -0.256, indicating that social sector aid

[9] These are Burkina Faso, the Central African Republic, Chad, Guinea-Bissau, Niger, and Togo.

is moderately progressive, while the Suits index for bilateral aid to the social sectors is very close to zero.[10]

Figure 5: Aid concentration curves for aid to the social sectors by bilateral and multilateral donors, 2009–11



Source: Authors, using data described in Appendix 2.

6 Is aid to the social sectors targeted to the poorest and most deprived countries?

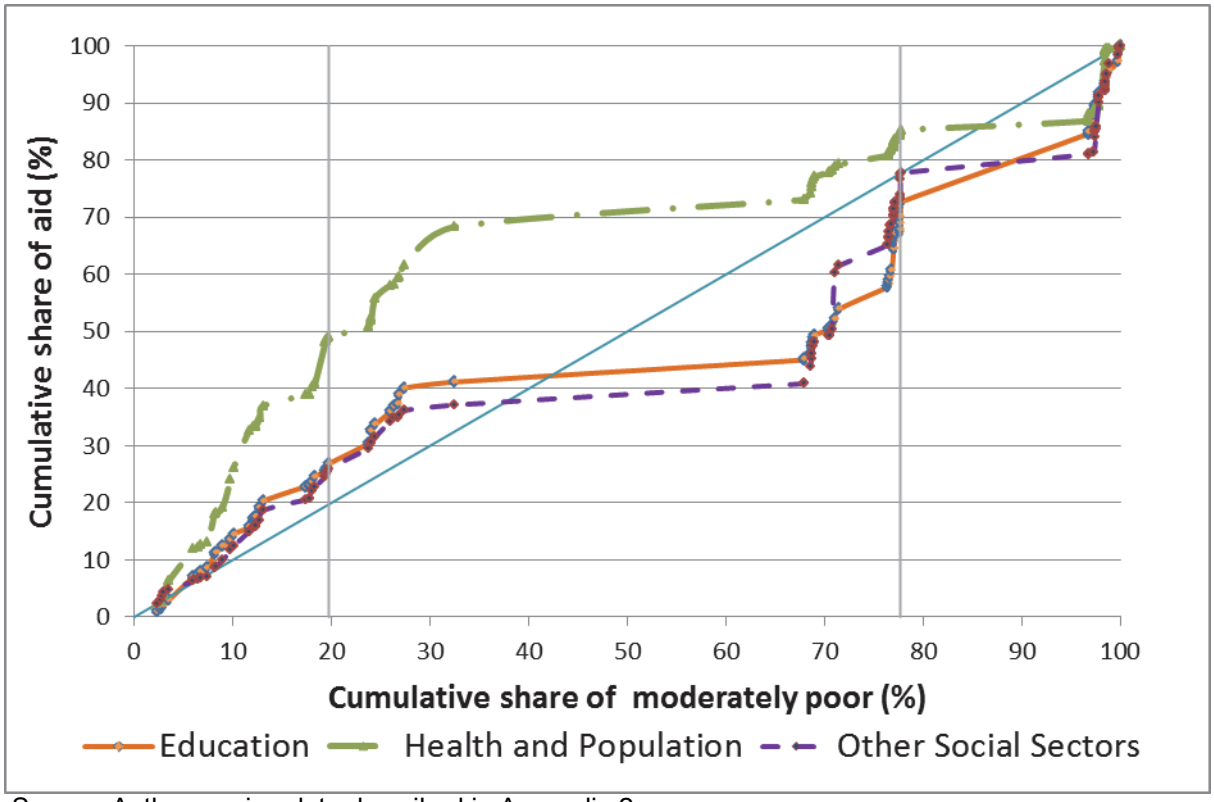
Even if aid to the social sectors is not focused on the poorest countries, it could be that aid to particular social sectors is targeted towards those countries. In addition, it might be objected that using the international poverty line of US$2/day is a problematic indicator of deprivation. This section aims to address these concerns by disaggregating aid to the social sectors into three main components and constructing aid concentration curves for other indicators of deprivation.

As mentioned above, aid to the social sectors can be disaggregated into three main components: aid to education, aid to health and population, and aid to the other social sectors. As shown in Figure 6, aid to education is less poverty focused than all aid to the social sectors, while aid to health and population is more poverty focused. This is primarily the result of official development assistance for health and population being more heavily concentrated in low-income countries (defined as countries with GNI per capita incomes below US$1006 in 2010), while education aid is more concentrated in lower and upper-middle-income countries. Almost half of aid to health and population in 2009–11 was disbursed to low-income countries, compared to a third of aid to the social sectors as a whole. Furthermore, if a slightly higher cut-off is used, two-thirds of aid to health and population went to countries with per capita incomes of US$1,250 per person or less, compared to two-

[10] Note that the Suits index for multilateral aid to the social sectors is considerably lower than the Suits index of 0.396 for multilateral net ODA.

fifths of aid to the social sectors.[11] As a consequence, the aid concentration curve for health and population does not cross the diagonal until the 84th percentile of the moderately poor, while the concentration curve for education crosses it at the 40th percentile. This is reflected in Suits indices of -0.281 for aid to health compared to 0.092 for education. Other aid to the social sectors (which include governance and water and sanitation) has a Suits index of 0.131 and has an aid concentration curve that is similar to the one for education.

Figure 6: Aid concentration curves for aid to education, health and population, and other social sectors, all DAC donors 2009–11



Source: Authors, using data described in Appendix 2.

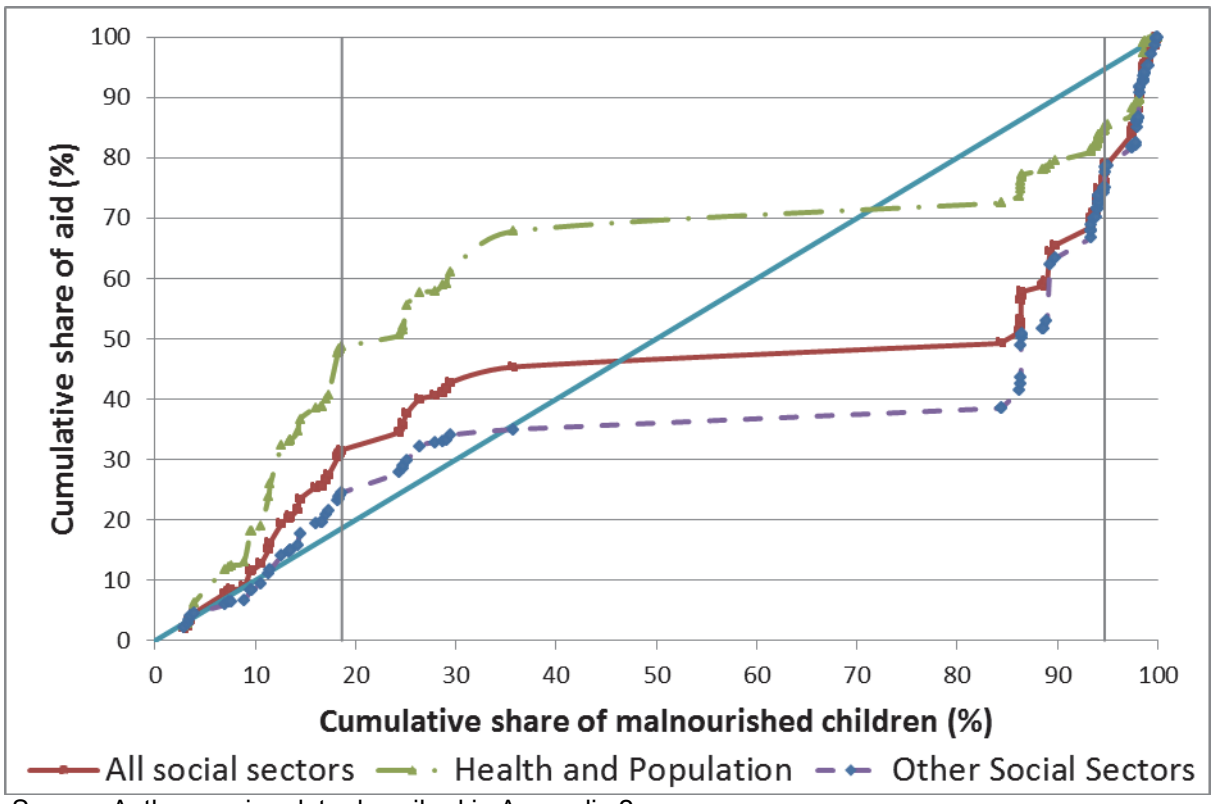
A similar pattern of more progressive aid to health than other social sectors is observed if other measures of cumulative deprivation are used instead of the cumulative share of the moderately poor. These measures considered here are the numbers of children under five years of age who are underweight, the number of children of primary school age not attending primary school, and the number of children who die before five years of age. These three indicators are used to track progress towards MDGs 1c, 2, and 4. In addition, they are likely to be variables which health and education experts use in assessing both the need and effectiveness of aid to the social sectors.

Figure 7 constructs aid concentration curves using the cumulative share of children under five who are underweight. The concentration curve for aid to health and population is again much more progressive than that for all aid to the social sectors, while that for aid to the other social sectors is more regressive. The main explanation for this is targeting of aid for health and population to countries in sub-Saharan Africa with relatively small populations. Nine of the ten countries which received more than half a billion dollars in aid to health and

[11] In 2010, eleven countries had GNIs per capita between US$1,005 and US$1,250. These countries include Pakistan, Nigeria and Vietnam, which each received about three per cent of all aid to the social sectors.

population between 2009 and 2011 were in sub-Saharan Africa, and six of these had populations of less than 50 million people. Notice also that all three aid concentration curves contain a long flat portion between the 36th and 84th percentiles on the x-axis corresponding to India. Between 2009 and 2011, India accounted for almost half (48.7 per cent) of underweight children in our sample but received just 5 per cent of all aid disbursement and 4 per cent of aid to health and population. Substantial underinvestment in nutrition in India, both nationally and internationally, is the major reason why the MDG of halving child malnutrition is unlikely to be achieved.

Figure 7: Aid concentration curves for education, health and population, and other social sectors using child malnutrition, all DAC donors 2009–11



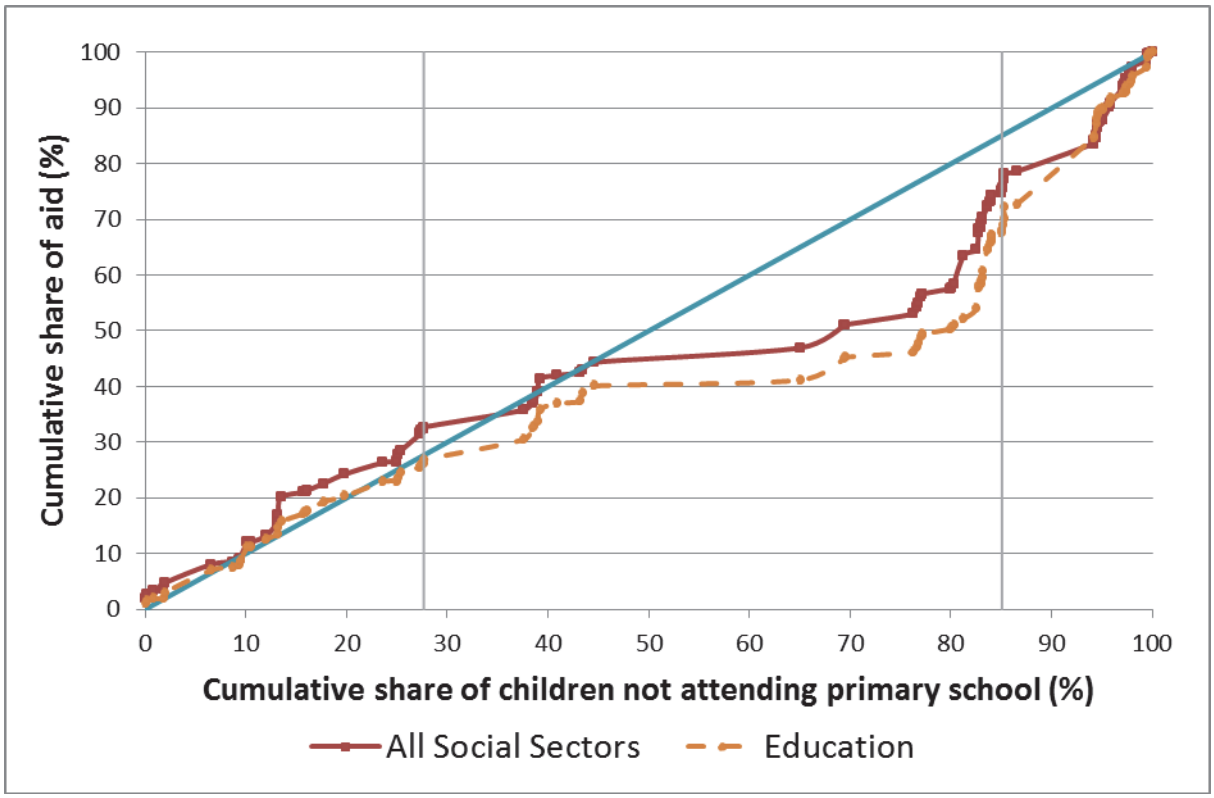
Source: Authors, using data described in Appendix 2.

Goal 2 of the MDGs is to achieve universal primary education. For aid to education, we therefore examine how aid flows from the DAC vary with the number of children who are not attending primary school. As shown in Figure 8, even when the deprivation variable used is directly linked to education, the distribution of aid to education is more regressive than all aid to the social sectors. Only a small portion of the aid concentration curves in this figure lie above the leading diagonal, and as a result the Suits index for aid to education (which is slightly more regressive than overall social sector aid) is 0.209. There are several reasons for the regressivity of aid to education. First, there is a heavy concentration of out-of-school children in large middle-income countries, which tend to receive proportionately less aid. Nigeria alone accounts for a fifth of all the children not attending primary school in our data, with Pakistan comprising about a tenth and China about a twelfth. In contrast, India—which accounts for a large share of deprivation for all other measures of poverty and deprivation—does relatively well in terms of primary school enrolments.[12] Second, there are a group of

[12] Sudan and Ethiopia each account for a larger absolute number of out-of-school children than the whole of India.

upper-middle-income countries, such as Algeria, Malaysia, Peru, and Tunisia, which receive relatively large amounts of aid for education given their small population sizes. Third, a good deal of educational aid goes to secondary and tertiary education, and therefore has a small impact on increasing primary schooling.

Figure 8: Aid concentration curves for education and children not attending primary school, all DAC donors, 2009–11



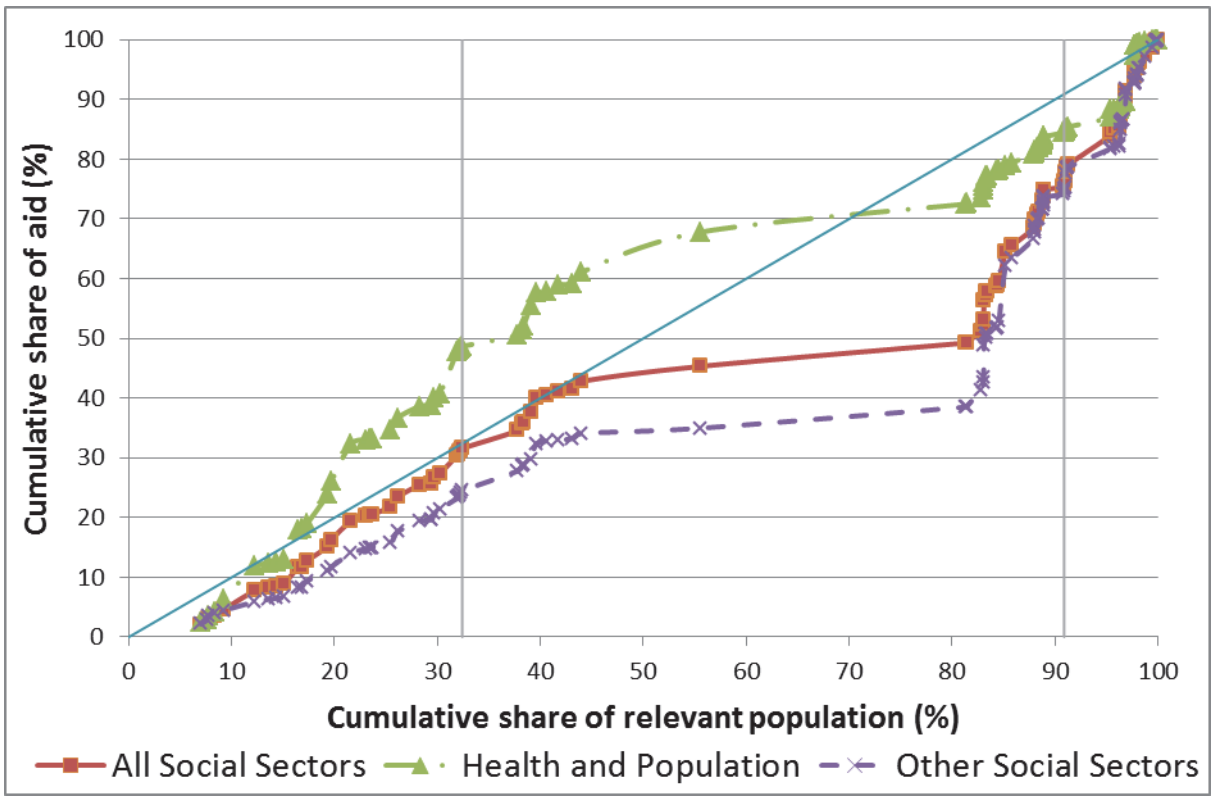
Source: Authors, using data described in Appendix 2.

Finally, we consider under-five mortality as the deprivation variable. This is the main indicator used to track Goal 4 of the MDGs, and one which is recognized as not falling quickly enough for the target of reducing child mortality by two-thirds by 2015 to be achieved. Particular concern focuses on the inability of some countries in sub-Saharan Africa to reduce their child mortality rates. Figure 9 plots the cumulative share of under-five mortality against the cumulative share of the three categories of aid to the social sectors for all DAC donors.[13] Between the 18th and 70th percentiles, the concentration curve for aid disbursements to health and population (which includes reproductive health services) lie above the diagonal, resulting in a Suits index of -0.0708. The main factors that contribute to the progressivity of aid to health with respect to under-five mortality are: (i) the high proportion of child deaths accounted for by sub-Saharan African countries, and (ii) the large amounts that are spent on health and population services in Africa. Sub-Saharan Africa contains around one-fifth of the world's children under the age of five, but accounted for half of the 9 million child deaths in 2010. Under nutrition combined with diarrhoea, HIV/AIDS,

[13] Note that this is based on data from 99 countries, so it not strictly comparable with previous figures. However, the eleven countries for which data on under-five mortality is not available are all small, mostly island, states in the Caribbean and Pacific and are unlikely to make a major difference to the shape of the aid concentration curves and Suits indices presented.

malaria, and pneumonia explain the majority of these deaths (UN 2010). There are seven African countries (Ethiopia, Kenya, Nigeria, Mozambique, Uganda, Tanzania, and South Africa) which received more than US$1 billion of aid for health and population between 2009 and 2011. Kenya alone received US$1.5 billion in aid for heath and population compared to just over US$1 billion for India, where almost 2 million children below the age of five died in 2010.

Figure 9: Aid concentration curves for aid to all social sectors, health and other social sectors, all DAC donors, 2009–11



Source: Authors, using data described in Appendix 2

In contrast, the concentration curves for assistance to all social sectors and the other social sectors in Figure 9 lie almost entirely below the diagonal, resulting in regressive Suits indices of 0.206 and 0.329, respectively. This is partly the result of the fairly regressive pattern on aid to education noted previously, although one would not expect there to be a strong connection between this and under-five mortality. Limited spending on aid to the other social sectors in low-income African countries also helps explain the regressive shape of the all social sectors curve.

To conclude this section, we present a summary table of the Suits indices for the five different types of aid using the five different indicators of deprivation considered above. In interpreting this table, recall that a Suits index that is positive shows a pattern of aid allocation that is regressive while a negative Suits index shows a pattern of aid that is progressive.[14] Most of the Suits indices in Table 1 are positive but close to zero, indicating a

[14] It should also be remembered that, like Lorenz curves and Gini coefficients, when the concentration curves for two variables cross, their Suits indices do not allow an unambiguous ranking of the progressivity or regressivity of aid. Fortunately, as can be observed from the preceding figures, the crossing of aid concentration curves is relatively rare.

slightly regressive distribution of aid disbursements by DAC donors as a whole. This is particularly notable for aid to education and the other social sectors. As discussed above, this reflects high disbursement of aid for these sectors in relatively well-off middle-income countries. The Suits indices for aid to health and population, in contrast, are always negative and—except for the case of under-five mortality—significantly so. This reflects high disbursements of aid for health and population, especially by the multilateral donors and USA (see next section), in the poorest and most deprived African countries.

Table 1: Suits index for different categories of bilateral aid disbursements, all DAC donors, 2009–11

	Extreme poverty (US$1.25/day)	Moderate poverty (US$2/day)	Underweight children	Under 5 mortality	Children not attending primary school
All ODA	0.003	-0.066	0.060	0.151	0.060
of which:					
Aid to the social sectors	0.061	0.006	0.116	0.206	0.114
of which:					
Aid for education	0.150	0.086	0.218	0.283	0.201
Aid for health and population	-0.220	-0.285	-0.218	-0.078	-0.155
Aid for other social sectors	0.183	0.114	0.262	0.329	0.230
Number of countries	106	106	106	99	106

Source: Authors' calculations.

7 Aid disbursements by individual donors

The bilateral aid concentration curves presented above represent the sum of the behaviour of the 23 donors belonging to the DAC. In this section, we analyse the pattern of disbursements of the four largest bilateral donors (which, in descending order are, the USA, Japan, Germany, and the UK) and who together account for more than three-fifths of aid disbursements between 2009 and 2011. With five different indicators of poverty and deprivation and five categories of aid to consider, the number of aid concentrations curves generated by this analysis rapidly becomes unmanageable. So we rely on radar graphs constructed using the Suits index to compare and contrast donor's aid disbursements. These are shown for the four main bilateral donors together with all bilateral and all multilateral donors in Figure 10. Each pentagon in these graphs shows a different category of aid with the vertices showing the value of the Suits index scaled on the -0.5 to +0.5 interval for the five indicators of poverty and deprivation. Thus, rather like a dartboard, the closer to the centre of the radar graph the pentagons are, the more targeted is that category of aid towards the poorest and most deprived countries.

Several of the stylized facts about the progressivity and regressivity of bilateral and multilateral aid are confirmed by the first two graphs in Figure 10. The greater size of the aid pentagons for the bilateral donors relative to the multilateral donors confirms that aid from the multilateral donors is more focused on the poorest and deprived countries than is aid from bilateral donors. Furthermore, the position of the pentagons for aid for education and aid to the other social sectors towards the outer rim of the graphs, confirms that these aid categories are generally less well targeted than aid for health and population.

The relative sizes of the aid pentagons for the four leading bilateral donors show that the UK's aid programme is the most targeted to the poorest and deprived countries, while that of Japan is the least targeted, with Germany and the USA occupying intermediate positions. The USA's foreign aid programme, which accounts for almost a third of all bilateral aid, is generally neutral, with Suits indices that are close to zero with the exception of aid for health and population, and aid to the other social sectors. US aid to health and population, which accounts for almost half (49 per cent) of its aid disbursements between 2009 and 2011, has remained focused on the poorest countries despite the impact of the War on Terror on both aid flows and poverty selectively (Dreher and Fuchs 2011; Fleck and Kilby 2010). In contrast, the US aid to the other social sectors is relatively regressive. In both cases, the importance of special interest groups and annual legislative votes required on foreign aid (Milner and Tingley 2010) can help to explain the pattern of disbursements: the health, population, and infrastructure lobbies are all strong in Washington DC. Nonetheless, the primary purpose of US foreign assistance is one of 'expanding democracy and free markets while improving the lives of the citizens of the developing world' (Werker 2012). Japan, the second largest bilateral donor, has Suits indices that are positive (and targeted away from countries with high levels of poverty and deprivation) for all categories of aid except health and education. Like the USA, Japanese aid to the other social sectors (which includes many infrastructure projects) is the most regressive. This is also consistent with the stated aims of the Japanese aid, which tends to be motivated by economic and trade interests and attaches relatively little importance to poverty reduction (Werker 2012; Riddell 2007).[15] The fragmentation of Japan's aid programme between 10 different agencies (Riddell 2007) and 140 countries (OECD 2012) also helps to explain this pattern of aid disbursements.

Germany's aid programme is modestly regressive despite the various initiatives taken to improve the poverty and Africa focus of its aid programme in the early 2000s. This is primarily due to the large number of countries to which Germany gives aid and the two-step nature of its annual aid allocation decisions (Riddell 2007). In addition, there is a group of middle-income countries in Central Asia whose geographic proximity is considered sufficiently important to qualify them as aid receipients. It should, however, be remembered that Germany has a policy of channelling a third of its aid to multilateral agencies (principally the European Union) and that about a quarter of its bilateral aid is not allocated to specific countries (OECD 2012).

Finally, the UK's aid is particularly targeted toward countries with high levels of poverty and malnutrition, with uniformly negative Suits indices for all indicators of poverty and deprivation. This is consistent with the poverty focus of the UK aid programme since the White Paper on Eliminating World Poverty in 1997, and its focus on providing aid to 28 priority countries in sub-Saharan Africa together with 14 other 'significant' countries (OECD 2012). This has resulted in the UK having the lowest level of fragmentation of all the major bilateral donors except for Denmark (Nunnenkamp and Theile 2013). The UK is also one of only four donors to have committed to increasing its aid to 0.7 per cent of GNI by 2013, and despite contractions in 2007 and 2011, is on track to achieve this target.[16]

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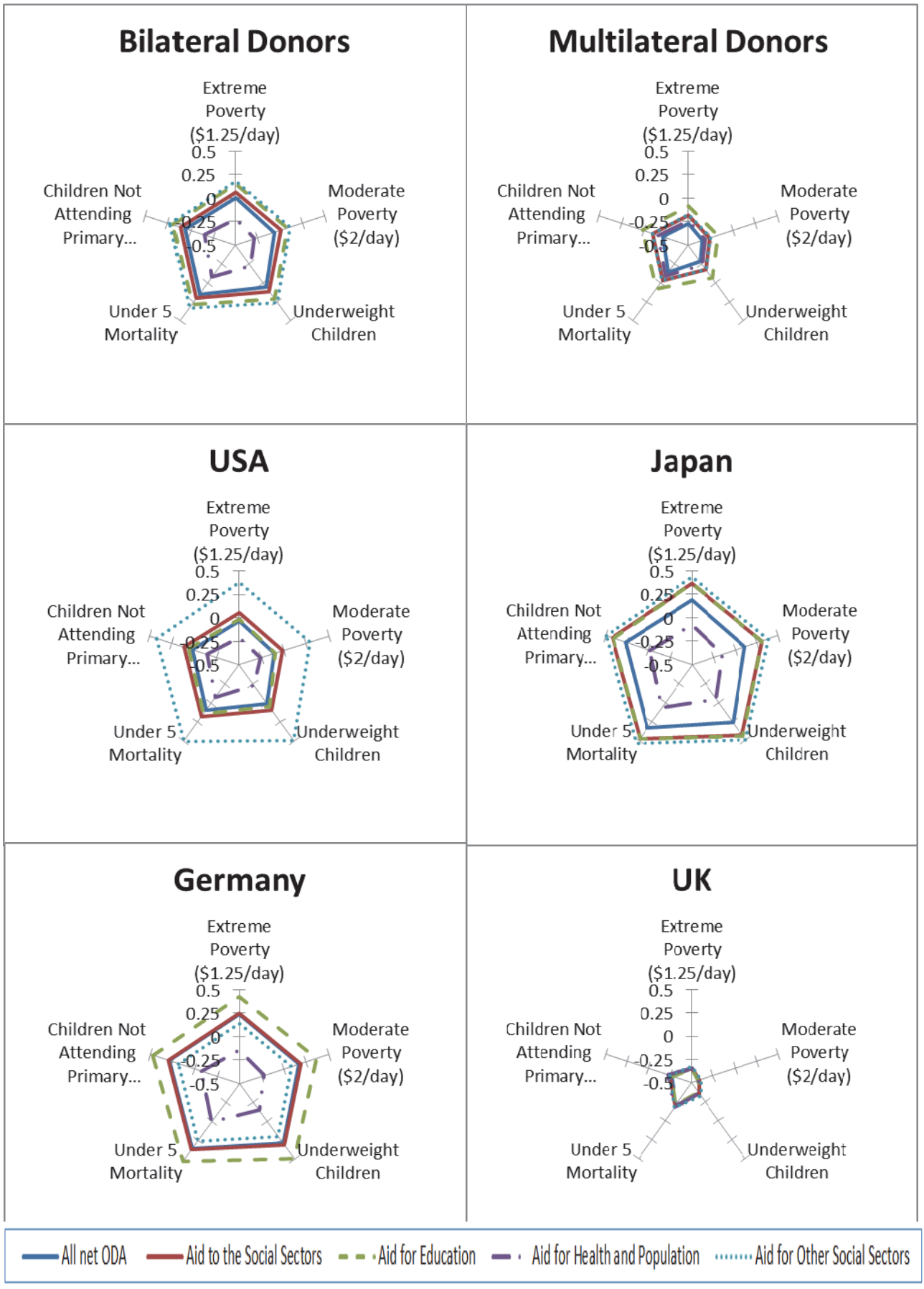
15 The stated aim of Japanese aid is to 'contribute to the peace and security of the international community, and thereby help to ensure Japan's own security and prosperity' (Japanese Ministry of Foreign Affairs, quoted in Riddell 2007).

16 The four Nordic countries and the Netherlands are the only countries to have surpassed the 0.7 per cent of GNI target (OECD 2012).

Figure 10: Comparison of Suits indices by donor



Source: Authors, using data described in Appendix 2.

8 Conclusions

This paper has analysed the distribution of aid and social sector aid to developing countries in the 2009–2011 period. Its key findings are four-fold. First, despite the rhetoric of aid donors, the allocation of total aid (as measured by net ODA) is broadly neutral, favouring neither the most deprived nor relatively well-off developing countries. This is consistent with the findings of the empirical literature on donor countries' aid allocation decisions. Second, the pattern of aid disbursements to the social sectors follows that for total aid, suggesting that donors do not allocate social sector aid in markedly different ways from total aid. Third, there is a significant contrast between the aid allocation patterns of the bilateral and multilateral donors, with both total and social sector aid from the multilaterals being more focused on the poorest countries than aid from the bilateral donors. Amongst the four leading bilateral donors, across all categories of aid, the UK's aid programme is the most targeted to the poorest and deprived countries, while that of Japan is the least targeted, with Germany and the USA occupying intermediate positions. Fourth, whatever the measure of poverty or deprivation used, the distribution of aid for health and population is more progressive than aid for education or the other social sectors.

It is important to mention some caveats with these findings. First, there are some important recipients of aid (in particular Afghanistan and Myanmar) which could not be included in the analysis because of missing data. Second, non-country specific aid and aid from non-DAC donors is not included in the analysis. Third, and most importantly, the pattern of aid disbursements tells us very little about the absorptive capacity of recipient countries. Nonetheless, it is hoped that this analysis highlights some stark contracts and inconsistencies in the way aid to the social sectors is currently disbursed.

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Appendix 1: Calculation of the Suits index

For a continuous distribution, the Suits index may be calculated using the following expression:

$$S_d = 1 - \frac{1}{K}\int_0^{100} A_i(y)dy$$

where S_d is the Suits index for donor d, A_i is the cumulative distribution of aid ranked in terms of their per capita incomes, y, and K is the area of right angle triangle bounded by the bottom and right-hand side axes of the aid concentration curve box and the leading diagonal.

For a discrete distribution (of which the distribution of development assistance across developing countries would be an example) the Suits index can be calculated using the following trapezoid approximation:

$$S_d = 1 - \frac{.5p_1CA_1 + .5p_2(CA_2 - CA_1) + p_2CA_1 + ... + .5p_n(CA_n - CA_{n-1}) + p_nCA_{n-1}}{.5}$$

$$= 1 - p_1CA_1 + p_2(CA_2 + CA_1) + ... + p_n(CA_n + CA_{n-1})$$

$$= 1 - \sum p_i(CA_i + CA_{i-1})$$

where p_i is the population share of country i and CA_i is the cumulative aid share of country i and all poorer countries. Note that in contrast to some previous papers that have calculated the Suits' index (White and McGillivray 1995) using the trapezoid formula involving ranks, this formula allows for the population shares of different countries to differ substantially.

Like the Gini coefficient, the Suits index can be a problematic summary measure of distribution. It is well known that when two Lorenz curves cross, the Gini coefficient is an ambigious measure of the distribution of income. Similarly, when two aid concentration curves cross, the Suits index is an ambigious measure of the progressivity or regressivity of the distribution of aid. Nonetheless, just like the Gini coefficient, the Suits index also provides a useful way of summarizing a great deal of distributional information into a single summary statistic.

Appendix 2: Indicators, reference populations and data sources

Indicator and reference population	Data source
GNI per capita, Atlas method (current US$), 2010	World Development Indicators http://databank.worldbank.org ('World Development Indicators/GNI per capita- Atlas method, current US$)
US$1.25 and US$2 a day poverty headcount (%), 2010.	PovcalNet, World Bank http://iresearch.worldbank.org/PovcalNet
Total population, 2010	Health Nutrition and Population Statistics, World Bank http://databank.worldbank.org
Malnutrition prevalence (% of children under age 5), 2008–11	Health Databank, World Bank http://databank.worldbank.org , supplemented by World Health Organisation's Global Database on Child Growth and Malnutrition http://www.who.int/nutgrowthdb
Population aged 0 to 4, 2010	2010 Revision of World Population Prospects http://data.un.org Note: data for Tanzania and Seychelles are from World Bank database of Health Nutrition and Population Statistics (http://databank.worldbank.org)
Number of out of school children of primary school age , 2010	World Development Indicators http://databank.worldbank.org ('World Development Indicators/ Education/Out of school, primary age'), supplemented by UNICEF's ChildInfo database http://www.childinfo.org/education.
Number of under-five deaths, 2010	World Development Indicators http://databank.worldbank.org ('World Development Indicators/ Health/Mortality')