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Does Aid Work for the Poor?*

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Abstract

This paper econometrically examines the impact of aid on the well-being of population sub-groups within 48 developing countries. This is a radical departure from previous empirical research of aid effectiveness at the country level, which has looked mainly at the relationship between aid and national aggregates, per capita GDP growth in particular. A specific concern of the paper is the impact of aid on the wealth, education and health of the poorest. Results indicate that while aid improves the well-being of the poorest groups, it is the richer groups that benefit the most.

JEL Codes: F35, I31, I32, C31.

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Does Aid Work for the Poor?

1. Introduction

Does aid work? This question has been extensively researched, with the economics literature on aid effectiveness dating back some 50 years. This literature has been dominated by applied studies that look at the impact of aid on GDP per capita in recipient countries. This research has come a long way in recent years owing to better theory, data and empirical techniques. Aid works, according to this research, if per capita GDP growth would have been lower in its absence. Most studies conducted over the last ten to 12 years conclude that aid has worked in this regard, including the well known and highly influential study of Burnside and Dollar (2000). Burnside and Dollar found, however, that the positive impact of aid on growth was contingent on the quality of recipient country economic policies. This specific finding has been challenged by many studies, including Easterly *et al.* (2004) Hansen and Tarp (2001). Others doubt whether aid has any positive impact on growth, irrespective of the quality of recipient country policies (Easterly, 2003 and Rajan and Subramanian, 2008).[1]

Debates over the impact of aid on economic growth in recipient countries will almost certainly continue. It is important that they be settled, not only because of the very large amounts of public funds allocated to foreign aid programs but also because

[1] For comprehensive and objective surveys of the aid-growth literature, see Clements *et al.* (2004), McGillivray *et al.* (2006) and Arndt *et al.* (2010). Roodman (2007) and Deaton (2009) provide critiques of the methods used by aid-growth studies. Deaton is heavily critical of this literature, commenting in the context of aid-growth studies that "econometric studies that use international evidence to examine aid effectiveness currently have low economic status" (Deaton, 2009, p.2). Deaton does not argue against econometric analysis of aid effectiveness *per se* as this is 'simply to abandon precise statements for loose and unconstrained histories of episodes selected to support the position of the speaker' (Deaton, 2009, p.2).

of the many important benefits that can growth provide for developing countries.[2] Yet many would argue that it is at least as important to consider whether aid works for the poor in recipient countries. The question is not whether aid works in terms of its impact on a national aggregate, such as per capita income growth, but whether it works for the poor. The proponents of this view argue that the main justification for striving for higher growth in aid-receiving countries is to enable poverty reduction. This is consistent with the stance taken by donor governments world-wide, which frequently seek to justify allocating public money to aid programs on the basis of the positive impact these funds have on the poor in recipient countries. It is also consistent with informed public support for these aid programs, which is premised on the belief that they actually or potentially have this impact, not only on the poor in general but also on the poorest of the poor.

The economics literature dealing with country-wide aid impacts is largely silent on whether this inflow does indeed work for the poor. We could seek to answer this question by drawing inferences from the expansive aid-growth literature, but this would be a highly speculative exercise. Not all people in aid-receiving countries are poor by international standards. Even if they were, what would matter most if public support for aid programs is important is whether aid works for the poorest within these countries. Higher per capita incomes might be necessary to benefit the poor, but are not sufficient to improve their well-being over time or relative to other groups.[3] It follows that even if we take the view that aid does indeed contribute to higher growth, casting aside evidence that it might not, we cannot necessarily assume that aid benefits the poor in recipient countries. A further reason for not making this assumption is that official donor agencies can have strong incentives to by-pass the poor, the very poorest

[2] Official development assistance from OECD countries increased in constant 2009 prices from $US78 billion in 2000 to just over $US128 billion in 2010, its highest level ever. It is expected to increase further over the next few years (OECD, 2011).

[3] See; for example, Kanbur (2001) on the complexity of links between growth and poverty reduction.

in particular, in recipient countries. These incentives arise from the donors' need to achieve observable positive outcomes, which are especially difficult to achieve with the very poor. Even if there were incentives to target the poor, it is widely believed that the modes of operation of official donor agencies will not enable them to do so effectively. Added to this is the greater ability of richer groups to take advantage of opportunities that aid might directly or indirectly provide.[4]

This paper investigates whether aid works for the poor using econometric estimates of the impact of aid on the living standards of population sub-groups within 48 developing countries. Sub-groups are delineated using data obtained from the World Bank's *Health, Nutrition and Poverty Data* (World Bank, 2004). Obtained from surveys conducted from the early 1990s to early 2000s, these data contain information on a wide range of achieved well-being indicators at the household level. The specific focus of our paper is on the impact of aid on the well-being levels of the poorest groups, defined as the bottom two wealth quintiles within each country. It seeks to establish

[4] Two other related streams of the economics literature on country-wide aid effectiveness are worth mentioning in the current context. The first is that which looks at the impact of aid on government expenditure and revenue. Better known studies of this type include Heller (1975), Pack and Pack (1990, 1993), Gang and Khan (1991), Franco-Rodriguez *et al.* (1992) and Feyzoglio *et al.* (1998). Inferring pro-poor outcomes from this research is fraught with difficulty, for it is well known that public expenditures in aid-receiving countries can have a pro-rich bias (World Bank, 2003). The second are studies that look at well-being outcomes, such as literacy and longevity. This literature is much smaller and includes studies such as Kosack (2003), Mosley *et al.* (2004) and Gomanee *et al.* (2005a, 2005b). While the main focus of this literature is on the impact of aid on national aggregates, meaning again that pro-poor outcomes are difficult to infer from the results they report, issues such as regressive public expenditures and links to aid are considered. Note that Mosley et al do their credit look at the impact of aid on income poverty headcount, but stop short of analysing the impact of aid on other population sub-groups.

whether these quintiles benefit from aid, and, if so, to what extent they benefits relative to the other quintiles. Well-being is identified using indicators of achievements in or outcomes with respect to wealth, fertility, health and education.

The paper is an important contribution to the literature on foreign aid in two respects. First, and most fundamentally, it takes the literature on the country-level impact of aid in an entirely new direction by examining sub-national as opposed to national data. Like previous studies, it is concerned with the impact of aid at the country level, but quantifies this impact by looking at different sub-groups of a country's population. The move away from national aggregates is motivated by the comments above regarding the differential impacts of aid by income group. Second, the paper is one of very few to look at the impact of aid on non-monetary outcomes. Aid can benefit people in many ways in addition to increasing incomes. Some of these additional benefits are arguably more important. Achievements in wealth, education and health are not only directly constituent and facilitative of well-being, but are core and universally-valued well-being dimensions. Each is worth having in its own right, but also enables people to exercise their reasoned agency. In this context, growth in income is of lesser importance, being a means to an end rather than an end in its own right.[5] Our paper, by looking at impacts on wealth, health and education, seeks to steer the economics literature on aid effectiveness away from growth to measures that better capture well-being.[6]

The paper consists of five additional sections. The general form of our econometric model is outlined in Section 2. Section 3 outlines the well-being data and

[5] These points are well established in the literature and have been discussed in studies including Alkire (2002) Anand (2004), Sen (1999) and UNDP (1990).

[6] Our paper complements the rapidly expanding literature that uses randomized trials to look at the impacts on individuals or households targeted by external donor-funded projects or programmes in recipient countries. Duflo *et al.* (2008) provide details of this literature and Deaton (2009) provides a review of it.

identifies some econometric implications of the characteristics of these data. Section 4 outlines the specific form of our econometric model and estimation procedure. The results of fitting this model are reported and discussed in Section 5. Section 6 concludes, outlining some policy implications of the results reported in the paper.

2. A Structural Model of Well-being and Aid

Our starting point is the structural model of Fielding and Torres (2009), which analyses cross-country achievements in various economic and social dimensions of well-being. We augment this model with an aid variable, the general form of which is:

$$y_{jkn} = \alpha_{jk} + \Sigma_i \beta_{ij} y_{ikn} + \Sigma_p \varphi_{jp} x_{np} + \theta_j aid_{kn} + u_{jkn} \quad (1)$$

$$aid_{kn} = \pi + \Sigma_p \rho_p x_{np} + \lambda_q z_{nq} + \upsilon_{kn} \quad (2)$$

where y_{jkn} is jth endogenous well-being outcome indicator for the kth quintile in country n, x_{np} is the pth exogenous conditioning variable for the country in which k is located, u_{jkn} is a residual, aid_{kn} is official development aid to the country in which k resides, z_{knq} is the qth instrument for aid to the country in which k resides, υ_{kn} is a residual, and α_{jk}, π, β_{ij}, φ_{jp}, θ_j, ρ_p and λ_q are fixed parameters. Additional details about the model are provided in Section 4, where the specifications of (1) and (2) used for estimation are outlined, along with the restrictions placed on the φ_{jp} parameters in order to identify the β_{ij} parameters.

The model outlined in equations (1) and (2) is a major advance on those used to assess the country level impact of aid by distinguishing between impacts on different population sub-groups in recipient countries. It is also is not subject to some fundamental limitations of previous empirical research on well-being achievement. As noted in Fielding and Torres (2009), other empirical studies of relationships between different well-being achievements typically focus on a single link in the chain, looking, for example, at the links between income and health, between health and education, or between education and income, but not at the simultaneous determination of each of these variables. Yet it is widely accepted that well-being outcomes are determined

jointly, and as such their econometric analysis requires the simultaneous estimation of a system of equations. Previous studies do not do this, at best being limited to the application of instrumental variable econometric techniques. They are likely, therefore, suffer from specification bias. Policy relevance is also an issue. Previous studies do not shed light of which link might be strongest, or on which well-being achievement might primarily drive achievements in others. This information is crucial for policy makers wanting to achieve higher well-being levels across a range of dimension, guiding them as to the dimension that should be the prime focus of their efforts. The model embodied by equations (1) and (2), by allowing for the simultaneous determination of achievement in various well-being dimensions, avoids these limitations.

The addition of an aid equation to the Fielding-Torres model is justified on a number of grounds. Official development assistance to developing countries averaged in 2009 prices more than $US100 billion annually between 2000 and 2010 (OECD, 2011). While this represents only two to three percent of the combined GNIs of low income countries during the period, it is common for official development aid to constitute more than 15 percent of recipient GNI in individual years, and in some countries exceeding 30 percent (World Bank, 2009). Moreover, working with their donors, recipient governments augment externally funded expenditure on essential infrastructure (such as road, irrigation facilities, bridges and ports), improve governance and institutional performance, support expenditure on health, education, water and sanitation, deliver aid-funded projects that boost private incomes and support the provision of public goods and services and improve the productivity of all development-related expenditures through the provision of technical assistance and capacity building. Donor governments also attach conditions to aid inflows requiring recipients to pay more attention to health, education and water in their own policy agendas.

These efforts combined with the scale of aid lead one to posit that aid will have some impact on well-being outcomes in developing countries, either indirectly through

promoting growth, directly through the provision of more and better service delivery or a combination of both of these outcomes. Impacts will of course vary across and within recipient countries and in some might even be negative owing to the rent seeking, corruption, the promotion of perverse incentives, fungibility and other known problems related to aid delivery. The bottom line, however, is that one would realistically expect aid to have some impact on well-being outcomes in developing countries. And for reasons outlined, one would intuitively expect the impact to differ among population sub-groups within recipient countries.

3. Well-being Data

The well-being indicators used in our analysis are taken from the World Bank's *Health, Nutrition and Poverty Data* (World Bank, 2004). We refer to these data as the HNP dataset. This dataset combines household survey data for 55 countries. Forty-eight of these countries are included in our analysis and are listed in Appendix Table A1.[7] The year of measurement varies slightly from one country to another, and is noted in the table. The HNP dataset partitions households into quintiles using and assets index. This index is based on the presence or otherwise of various durable assets in the household, and of certain characteristics of the household's dwelling place. The household-specific assets index is the weighted sum of all these binary asset variables. The weights are the coefficients in the first principal component of the whole set of asset variables, scaled so as to sum to unity. Households are then ranked by the index and divided into quintiles, with average health, education and other statistics being reported for the households in each quintile.

Our first task is to construct a cross-country measure of wealth (or of material well-being) using the information on assets in the HNP dataset. The asset indices

[7] The seven countries excluded from our sample are Armenia, Eritrea, Kazakhstan, Kyrgyz Republic, U.S. Virgin Islands, Uzbekistan and Turkey. Turkey is by far the richest country in the HNP dataset and is excluded as an outlier. The other countries are excluded due to the absence of data on one or more of the conditioning variables in our regression equations.

reported in the HNP database are not appropriate for our current purpose, because they are based on country-specific sets of assets. There is, however, a subset of eight assets or attributes common to all countries in our sample: (i) the presence of an electricity supply; (ii) possession of a radio; (iii) possession of a television; (iv) possession of a refrigerator; (v) possession of a car; (vi) access to a flush toilet; (vii) use of a bush or field latrine (indicating a complete absence of sanitary facilities); and, (viii) the presence of a dirt or sand floor in the house. Using these eight attributes, we have a relatively narrow definition of wealth, ignoring such assets as deposits with financial institutions, and as a result our measure will understate the position of richer groups. Nevertheless, our definition focuses on material conditions relevant to the vast majority residents of in the countries that comprise our sample.

If we look at the relative importance of each of the eight characteristics in each country, we find very little variation from one country to another. Table 1 reports the cross-country means of the weights on the eight characteristics (scaled so that these mean weights sum to unity[8]), along with the ratios of each median and standard deviation to its respective mean. The table shows that the standard deviations are quite small, and that the medians are close to the means, indicating an approximately symmetrical distribution. We therefore construct a cross-country assets index for the k^{th} quintile of the n^{th} country as follows:

$$ast_{kn} = \Sigma_h \, s_h \cdot z_{hkn}$$

where $h = 1,\ldots,8$ indexes the assets, s_h is the weight on the h^{th} asset, taken from the first column of Table 1 ($\Sigma_h \, s_h = 1$), and z_{hkn} indicates the fraction of households in the quintile possessing the asset. In the case of bush latrines and dirt floors, z_{hkn} indicates the fraction of houses *without* the characteristic. As can be seen from Table 1, there is not a great deal of variation s_h, so results from an alternative definition of wealth with $\forall h \, s_h = 0.125$ yields results very similar to the ones reported below.

[8] The numbers in the table are subject to rounding error.

The assets index ast_{kn} is the first of our endogenous well-being indicators, y_{jkn}. Two other endogenous well-being indicators are selected from the HNP dataset. Representing achievements in education, the first is the fraction of adults in quintile k aged 15 to 49 who have completed grade five, denoted sch_{kn}. The second represents achievement in health and is the child mortality rate, and is the annual number of deaths in quintile k of children under five years of age per 1,000 live births. It is denoted mor_{kn}. These indicators were chosen partly on the basis of data coverage, being available for each quintile in each of our 48 countries.[9] Well-being is treated as an increasing function of each of the three endogenous variables. Achievements in each have intrinsic worth as they are indicative of people exercising their reasoned agency. They also have positive instrumental value with respect to each other and many additional well-being outcomes.

To these variables we add the fertility rate in quintile k, denoted fer_{kn}. Taken from the HNP database, this variable is defined as the average number of live births per women aged 15 to 49. We view this variable as an endogenous well-being outcome indicator and thus one of the y_{jkn}. On the one hand it could be argued that higher fertility represents higher intrinsic achievement in health, and is indicative of people exercising their reasoned agency with respect to well-being. On the other hand one can argue that higher fertility inhibits achievement in well-being by placing greater stress on household and other resources, and can lead to lower achievements in health, education and other well being outcomes. Donors tend to view fertility in this light, as evidenced by their support for family planning schemes in many developing countries. Yet whether well-being is an increasing or decreasing function of fertility will depend on the relative strengths of these properties. In absence of this information fertility

[9] We also considered alternative definitions of wealth, education and health, using: (i) uniform asset weights to define material well-being, (ii) the fraction of women reading a newspaper at least once a week to measure education and (iii) the mortality rate for children under 12 months to measure health. Using these measures produced very similar results to those reported below.

enters our econometric model as an endogenous control variable. While interactions between it and the other endogenous well-being variables play an important role in our model we draw no inferences about its overall impact on well-being. [10]

*** Table 1 about here ***

Table 2 provides data on the unconditional correlations of the well-being indicators, again disaggregating by quintile. The signs on individual correlation coefficients are unsurprising. Wealth and education are positively correlated. Wealth and child mortality are negatively correlation or, put differently, wealth and health positively correlated given that the latter is a decreasing function of child mortality. The same applies to education and health. Wealth, education and health are each negatively correlated with fertility. Note also that the correlations are generally highest for quintiles 3 to 5 and lowest for quintiles 1 and 2 (the poorest). This suggests that the variation in outcomes for richer households is more systematic, and may be more closely correlated with observable independent characteristics; the variation among poorer households may have a larger stochastic element. These characteristics indicate that in our econometric analysis it would be unwise to try to impose any *a priori* structure on the covariance matrix of residuals for each well-being indicator and each quintile. Variances and covariances are unlikely to be uniform across quintiles, let alone across indicators. Outcomes at the upper end of the assets distribution are likely to be somewhat more predictable than those at the lower end.

*** Table 2 about here ***

Another characteristic of the well-being indicators is that three of them are not normally distributed.[11] In the case of ast_{kn} there are observations close to both the

[10] A further comment on our selection of well-being variables is warranted. It should be acknowledged that we will be looking at relationships between what might be considered as stock variables (assets and schooling) and a flow variable (mortality), the difficulties of which are well-known.

upper and the lower theoretical bounds. At the former all of the households in the quintile possess all of the assets in the wealth index, while at the latter or none do. Likewise, in some quintiles, nearly all adults have completed schooling to grade five and in others none have. The distribution of mor_{kn} is left-skewed. We therefore use the following logistic transformations of these variables in our least-squares econometric analysis:

$$\lg ast_{kn} = \ln(ast_{min}\text{-}ast_{kn}) - \ln(ast_{max}\text{-}ast_{kn})$$

$$\lg sch_{kn} = \ln sch_{kn} - \ln(1\text{-}sch_{kn})$$

$$\lg mor_{kn} = \ln mor_{kn} - \ln(1\text{-}mor_{kn})$$

where ast_{min} and ast_{max} are, respectively, the minimum and minimum theoretical values of the assets index. We use a logarithmic transformation for the fertility rate, $\ln fer_{kn}$.

4. Econometric Approach

Equations (1) and (2) will take the following specific form. All variables are for the current period, unless otherwise indicated.

$$\lg y_{jkn} = F(\alpha_{jk} + \Sigma_{i \neq j}\, \beta^{m}_{ij} \cdot y_{ikn} + \Sigma_{p}\, \varphi^{m}_{jp} \cdot x_{knp} + \theta^{m}_{j} \ln aid_{kn}) + u_{jkn} \qquad (3a)$$

for $j = (ast_{kn}, sch_{kn}, mor_{kn})$ and

$$\ln y_{jkn} = \alpha_{jk} + \Sigma_{i \neq j}\, \beta^{m}_{ij} \cdot y_{ikn} + \Sigma_{p} \varphi^{m}_{jp} \cdot x_{knp} + \theta^{m}_{j} \ln aid_{kn} + u_{jkn} \qquad (3b)$$

for $j = (fer_{kn})$. F(.) is the Normal cumulative density function. x_{knp} is the value of the p^{th} exogenous conditioning variable for the n^{th} country in which quintile k resides and u_{jkn} is a residual. The superscript m will be defined below. We identify and discuss these variables below. Our aid equation is

$$\ln aid_{kn} = \pi + \Sigma_{p}\, \rho_{p}\, x_{knp} + \lambda_{q} \ln z_{knq} + \upsilon_{kn} \qquad (4)$$

where $\ln aid_{kn}$ is the natural logarithm of aid disbursed relative to the population of the n^{th} country.

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[11] Further details about the distributions of all four variables are available on request from the authors.

The exogenous conditioning variables in equations (3a) and (3b), x_{knp}, capture national characteristics that vary across countries but not across quintiles within a country. We will include in our model variables to capture factors relating to geography, history and culture. Given significance in previous related studies (for example, Easterly and Levine, 1997), we will include a dummies for countries in Africa (*africa*) and Hispanic America (*hisp*). The geographic variables also include a binary dummy variable for whether or not the country in question has a maritime coastline (*coast*), mean annual temperature in 0.1 degrees centigrade (*temp*),a logarithmic measure of the capital value of natural resources in US Dollars (*natres*), surface area in square kilometres (*size*) and the fraction of the population at risk from malarial infection (*mal*). The history variables are binary dummies indicating whether or not the country was colonised by Great Britain (*british*) or by France (*french*). The culture variables are the fractions of the population that is Christian (*chrsp*), Roman Catholic (*rcap*), Muslim (*musp*). Full definitions of these variables are provided in Table 3. Data on them was obtained from CIA (1997), Dixon and Hamilton (1996), Hoare (2005), Krain (1997), La Porta *et al.* (1998) and McArthur and Sachs (2001).[12]

Special consideration was given to the choice of aid instruments in equation (4), z_{nq}. Our dataset limits the number of such variables that can be included in this equation. We consider two alternative sets of conditioning variables. By using two alternative sets of conditioning variables we can make judgements about the robustness of the interpretations of our results to choosing one set over another. The first instrument set contains three distance variables, each expressed as a natural logarithm. These variables are the distance in kilometres from each country's national capital to Paris, Tokyo and Washington, respectively. They are denoted as *paris*, *tokyo* and *wash*. The amount of aid a country receives is likely to be a decreasing function of the distance

[12] A number of other exogenous conditioning variables were employed in preliminary econometric testing, including the ethno-linguistic fractionalization index (Krain, 1997) and the Sachs-Warner index of trade openness (Sachs and Warner, 1995).

to these cities, which are the national capitals of some of the largest aid donor nations in terms of the volume of aid provided globally. Data on the distance variables were obtained from WorldAtlas (2009). The second instrument set contains one variable only, which is the ratio of ODA disbursements to ODA commitments over the five years prior to the first year of measurement of the aid variable, $\ln aid_{kn}$. An ODA commitment is the amount of funds donors make available to recipients for disbursement. A failure to disburse the full amount of aid made available by donors in any particular year is can be attributed to a lack of capacity on the part of the recipient to allocate aid funds. It can also be attributed to a lack of will on the part of the recipient to disburse aid funds or even a lack of knowledge of the level of funds made available to it. Donors in these circumstances can reduce the aid committed in the next year to the recipient in question to such an extent that the amount disbursed would also decline. The amount of aid disbursed in period t would on these grounds be expected to be an increasing function of the ODA disbursement to commitment ratio in period t-1. All data required to calculate this variable were taken from OECD (2009).

A priori restrictions on the φ^m_{jp} coefficients will allow us to identify (most of) the β^m_{ij} coefficients that capture the interactions between the four well-being indicators. These restrictions are summarised in Table 3. We allow the conditional cross-country mean of each well-being indicator, α_{jk}, to vary across quintiles, so we are in effect fitting a fixed effects model. We have $4 \times 5 \times 48$ observations of y_{jkn}, and hence 960 observations of the residuals u_{jkn}. We do not wish to assume any restriction on the correlation of residuals across indicators or across quintiles, so the model is fitted by stacking 21 regression equations – one for each j and each k, plus one for aid – and estimating the coefficients in each equation simultaneously using the efficient three stage least squares method. Note that all of the φ^m_{jp} coefficients appear in the aid equation, so the impact of the different development indicators on donor aid choices is not identified. The aid equation is in reduced form, and modelling donor choices is an exercise for a future paper.

*** Table 3 about here ***

With only 48 countries, we do not have enough degrees of freedom to allow each of slope coefficients, β_{ij}, φ_{jp} and θ_i, to vary across quintiles. We do, however, have enough data to allow these coefficients to vary for two groups of quintiles. We will obtain coefficients for quintiles 1 and 2 and 3 to 5, thus in equations (3a) and (3b) m = if $k \in \{1, 2\}$ or $m = 2$ if $k \in \{3, 4, 5\}$. It follows that these coefficients should be interpreted as representing the mean effects of the corresponding explanatory variables across all countries and all quintiles. Quintiles 1 and 2 contain the poorest people surveyed in each of the countries in our dataset, and almost all of them are will be

poor by any reasonable international standard. Identifying the impact of aid on these people is the objective of this paper, and this guides our aggregation of quintiles. We acknowledge, however, that in a number of countries in our sample, quintile 3 could also contain people who are poor according to international standards.[13]

Our conclusions regarding aid effectiveness will be based primarily on the impacts that apply in equilibrium, having solved out the four equations for the well-being indicators. We have no firm *a priori* expectations regarding the relative impact of aid on each population sub-group. One might expect that the primary beneficiaries of aid are the poorest quintiles. Given, however, the complexity of aid effects, difficulties in reaching the very poorest communities, incentives for donors to by -pass the poorest

[13] In partial recognition of this issue, an earlier version of this paper reported results for the impact of aid on groups quintiles not formed according to the country in they are located but according to absolute poverty lines. Low, middle and high groups were formed according to each well-being indicator. For child mortality, for example, the low group consisted of quintiles with less than 100 deaths per 1000 live births, the middle group consisted of those with 100 to 200 deaths and the high group consisted of those with more than 200 deaths per 1000 live births. Results obtained were very similar to those reported later in this paper, with aid having the greatest beneficial impacts on the middle group for all well-being variables. The high poverty group benefited more than the low poverty group only in terms of the impact on child mortality. Further details are available on request from the authors.

and the greater ability of richer groups to take advantage of the opportunities that aid can general, it remains uncertain whether these groups will benefit most from aid. We cannot rule out an impact on the poorest groups even if donors cannot and do not attempt to reach them. There could well be indirect impacts, such as those on economic growth, employment or business activity that might affect the poor in one way or another. These impacts could also benefit the rich. Donors often support health and education programmes in developing countries. Rich groups can access the services provided by these programmes, and can therefore benefit from them. We leave it to the data to help detect and disentangle these various aid impacts.

5. Results

Regression results obtained from estimating equations (3a), (3b) and (4) for the four well-being indicators are reported in Table 4. These results have been obtained with the quintiles 1 to 2 and 3 to 5 groupings, and using the distance variable instruments in the aid equation, equation (4). Results obtained an alternative grouping (into quintiles 1 to 3 and 4 to 5), and results using the aid instrument *discom*, are similar to those shown in Table 4, and yield the same overall conclusions. Our conclusions would appear, therefore, to be robust with respect to the choice of quintile groups and aid equation instrument. For this reason and also for the sake of brevity we do not provide a detailed reporting of these results. We first discuss the results relating to the interaction of the four well-being variables, and hence the estimates of β^m_{ij}, which as mentioned are estimates of the partial derivatives among these variables, and then turn to the primary interest of this paper, which is the impact of aid on well-being across the population sub-groups.

*** Table 4 about here ***

Most of the estimated β^m_{ij} coefficients are significantly different from zero at the 95 percent level or higher. Greater wealth is associated higher schooling in quintiles 1 and 2, higher fertility in quintiles 1 and 2 and 3 to 5 and lower mortality in quintiles 1 and 2 and 3 to 5. Higher schooling is associated with higher wealth and lower mortality

in both groups of quintiles. Higher mortality is associated with lower wealth and education and higher fertility in both quintile groups. Higher fertility is associated with higher mortality in both quintile groups and higher and lower wealth in quintiles 1 and 2 but lower wealth in quintiles 3 to 5.

These results are largely consistent with *a priori* expectations, in that higher wealth and better education and health are all positively associated. They also suggest a negative relationship between fertility and some other dimensions of well-being: higher fertility is strongly associated with higher mortality, that is, poorer health. Higher fertility is associated with higher wealth in the poorer quintiles, which might reflect a need to accumulate more basic household assets to support larger families. Higherfertility is associated with lower wealth in richer quintiles, which might be due to a reallocation of household expenditure away from basic assets to items such as food and clothing owing to larger family sizes. These interactions are not, however, the prime focus of our study.

We now consider the impact of official development aid on well-being levels on the two groups of quintiles in our sample of 48 developing countries. We first consider the immediate or partial impact of aid, as revealed by the estimated θ^{m}_{j} coefficients in Table 4, Table 4 shows that aid appears to have no statistically significant immediate impact on the wealth of the poorest quintiles, 1 and 2, but a positive and statistically significant impact on the wealth of the richer quintiles, 3 to 5. The reverse is true for health, with in the sense that aid has a significant immediate beneficial impact on mortality of the poorest quintiles, but no impact on mortality of the richer quintiles. The immediate impact of aid on education is more uniform across the two quintile groups, being statistically significant and positive for both well-being variables. These results suggest that aid is in general effective in promoting well-being levels by population sub-groups within developing countries.[14]

[14] Not that aid is associated with higher fertility in all groups. For this to be considered an improvement in well-being one would have to show that any intrinsic benefits of increased

More revealing are equilibrium or total impacts of aid, those which take into account the simultaneous interactions between the endogenous variables in our system of equations. Equilibrium impacts, obtained using the estimates of the β^{m}_{ij} coefficients reported in Table 4, are summarized in Table 5. The impacts are those which result from exogenous shocks to each endogenous variable. Owing to the forms in which the endogenous variables appear in our system of equations, shocks were imposed, one at a time, on $(ast_{min}\text{-}ast_{kn})$ - $(ast_{max}\text{-}ast_{kn})$ $sch_{kn}/(1\text{-}sch_{kn})$, $mor_{kn}/(1\text{-}mor_{kn})$ and aid_{kn}. The impacts are measured as percentage changes in these variables. We introduce a shock to the wealth equation that induces a ten percent increase in $(ast_{min}\text{-}ast_{kn})$ - $(ast_{max}\text{-}ast_{kn})$ relative to its initial equilibrium level, and calculate the impacts on all of the well-being variables in the subsequent equilibrium. We do the same for the education and aid equations, imposing a ten percent increases in $sch_{kn}/(1\text{-}sch_{kn})$ and $aid_{n.}$ For the health equation we model ten percent decreases in $mor_{kn}/(1\text{-}mor_{kn})$. The resulting impacts are those that apply on average for each quintile group in each country. We report bootstrapped *t*-ratios to judge whether these impacts are statistically significant. Particular emphasis is given to overall gains from each shock, which are obtained by summing the absolute values of statistically significant impacts. These statistics are the "sum of impacts" statistics shown at the bottom of Table 5.

*** Table 5 about here ***

The impacts of exogenous ten percent changes provide some interesting insights into the interactions between wealth, health and education. Increases in health are associated with the largest overall improvements in the well-being variables in equilibrium. We base these conclusions on the sum of impacts statistics in Table 5. Improvements in health also result in the largest well-being gains for both the quintile groups under consideration. For the richer quintiles, this outcome is due to the impact of health on education, but also due to reductions and subsequent multiplier impacts

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fertility outweigh its negative instrumental impacts. This is an interesting result given donor programs aimed at lowering fertility in many developing countries.

on health. For the poorer quintiles it is due to further improvements in health. That the largest well-being gains are due to improvements in health would suggest that donors should attempt to increase the impact of aid on mortality, alongside continuing totarget increases in education. It should be acknowledged that from a well-being perspective what matters is the weight attached to each outcome under consideration in a well-being production function. In absence of such information, one is tempted to attach equal weights to health, wealth and education. If this is accepted, our results suggest that donors should target health. If we assume that what ultimately matters to donors is the well-being levels of residents of countries to which they provide aid, then this would provide additional justification for targeting health.

We now turn to the main interest of our paper - the impact of aid. As shown in the last two columns of Table 5, aid has statistically significant equilibrium impacts on all well-being variables. It results in significant improvements for both quintile groups in all well-being variables, with the exception of the wealth of the poorer quintiles. For all well-being variables, it is the richer quintiles that benefit most from aid. With respect to education, for example, a ten percent increase in aid increases schooling by among the richer quintiles by 7.28 percent, compared to 4.75 percent for the poorer quintiles. For health, it results in declines in mortality of 3.51 percent and 2.61 percent, respectively, for these groups.[15]

That the richer households in the 48 developing countries under consideration benefit more from aid than their poorer counterparts is further emphasised by the sum of impacts results shown in the bottom rows of Table 5. While both groups benefit on average from aid, these results indicate that it is the richer group of quintiles that is the principal beneficiary of aid in terms of its overall impact on levels of wealth, health and education. These results will be both good and bad news for many with an interest in official aid. The good news is that they provide evidence of aid working for the poor will

[15] In equilibrium, exogenous increases in aid are also associated with statistically significant declines in fertility, but only for quintiles 3 to 5.

be good news to many observers of aid. The bad news is that they provide evidence of it working least for this group.

The results in Table 5 are based on a model that fits the data well, but embodies a functional form that does not necessarily provide the most intuitive results for policy-makers. For this reason, we now translate the results for (ast_{min}-ast_{kn}) - (ast_{max}-ast_{kn}), sch_{kn}/(1-sch_{kn}) and mor_{kn}/(1-mor_{kn}) into results for ast_{kn}, sch_{kn} and mor_{kn}. These results are presented in Table 6. It shows the impact of a doubling of aid, from the actual levels allocated these countries. A doubling of aid is chosen given the public pressure placed on donors to increase aid by this margin in order to enhance progress towards the Millennium Development Goals adopted by the United Nations (United NationsMillennium Project, 2005), and a willingness of a number of donors achieve such an increase. Individual quintile specific impacts are shown in Table 6, but bear in mind that the differences between quintiles 1 and 2 and between quintiles 3 to 5 are a consequence of the non-linear functional form of the model. [16] The largest impacts are either on education or wealth. Among individual quintiles, it is the middle quintile, quintile 3, that tends to do best from a doubling of aid. The predicted increase in the number of adults within this quintile with schooling is 12.9 percentage points, while the child mortality within it falls by 2.5 percentage points. In this sense aid seems to have its greatest benefit for the average person within recipient countries. The poorest and richest quintiles tend to do worst. The poorest, quintile 1, benefits least of a doubling of

[16] The differences in the impacts of aid between quintiles shown in Table 6 are a function of different mean values in a non-linear model, and are therefore slightly artificial. The quintiles most affected by this will be those at either ends of the logistic function, quintiles 1 and 5. One way to control for this is to apply the model parameters for quintiles 1 and 2 to the data for quintile 5 and those for quintiles 3 to 5 to the data for quintile 1. Applying this method yields larger impacts of the doubling of aid for quintile 1 and the reverse for quintile 5, but does not alter the conclusion that the middle quintiles benefit most from this exogenous increase in aid.

aid in terms of its impact on wealth. It benefits by roughly the same margins as the richest quintiles, 4 and 5, with respect to the impact on education and health.

*** Table 6 about here ***

6. Conclusion

This paper models the impact of official foreign aid on the well-being levels of population sub-groups in 48 developing countries. Well-being is defined in terms of achievement with respect to wealth, health and education. Population sub-groups are delineated on the basis of asset ownership, which was interpreted as a measure of wealth. The special interest of the paper was on the impact of aid on the well-being of the poorest sub-group, defined as the bottom two quintiles of households, in absolute terms and relative to other sub-groups the countries under consideration.

It was found that aid is associated with improvements in most of the well-being variables under examination. To this extent the findings of the paper are consistent with the majority finding of the recent aid-growth literature, which is that growth would on average be lower in the absence of aid. Aid seems to have the largest beneficial impact on education. The paper also found, however, find that the poorest quintiles benefit on average the least from aid. While many observers will be heartened by evidence that the poorest groups might at least benefit from aid, evidence of them benefitting least will be of significant concern. It should also be of concern to donors since popular support for aid programs is premised on the assumption or at least hope that these programs primarily benefit the poorest groups in recipient countries.

That the poorer groups in developing countries benefit least from aid is a critical finding and if supported by subsequent research findings has enormous implications for aid delivery, especially in light of the expected scaling-up of world aid flows. One obvious implication is that while aid might increase overall living standards in developing countries, this could be at the cost of the living standards of the poor falling further behind those of the rich in these countries. Whether such an outcome is

observed will depend on other drivers of living standards gaps between these groups, but the results of this paper would suggest that aid might make these gaps larger than would be the case such external assistance. If donor governments are concerned about this outcome then they clearly need to strive harder to ensure that the interventions they fund, now and in the future, better serve the poorest people in recipient countries. One means of achieving this is for donors to more effectively target health, given the findings of this paper. Alternatively, donor governments could allocate more funds to agencies that can be shown to better reach the poorest people in developing countries.

Appendix

*** Table A1 about here***

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Table 1: Descriptive Statistics for the Asset Weights

Asset	Mean	Ratio of Median to Mean	Ratio of Standard Deviation to Mean
Electricity	0.149	1.03	0.18
Radio	0.095	1.01	0.27
Television	0.144	1.04	0.11
Refrigerator	0.146	1.00	0.16
Car	0.090	1.07	0.26
Flush toilet	0.097	0.99	0.38
Bush or field latrine (–)	0.128	1.02	0.43
Dirt or sand floor (–)	0.149	1.07	0.31

Table 2: Unconditional Correlations between Well-being Variables

	Wealth (ast_{kn})	Education (sch_{kn})	Health (mor_{kn})
Quintile 1			
sch_{kn}	0.48		
mor_{kn}	-0.51	-0.55	
fer_{kn}	-0.36	-0.25	0.43
Quintile 2			
sch_{kn}	0.65		
mor_{kn}	-0.67	-0.67	
fer_{kn}	-0.55	-0.48	0.67
Quintile 3			
sch_{kn}	0.72		
mor_{kn}	-0.74	-0.74	
fer_{kn}	-0.69	-0.66	0.81
Quintile 4			
sch_{kn}	0.75		
mor_{kn}	-0.79	-0.79	
fer_{kn}	-0.75	-0.76	0.87
Quintile 5			
sch_{kn}	0.71		
mor_{kn}	-0.83	-0.83	
fer_{kn}	-0.65	-0.73	0.86

Table 3: Variable Definitions and Model Structure

Endogenous Variables	Definition
lgast_{kn}	logistic transformation of the assets index for quintile k of country n
lgsch_{kn}	logistic transformation of the fraction of adults aged 15 to 49 that has completed primary education in quintile k of country n
lgmor_{kn}	child mortality rate in quintile k of country n
lnfer_{kn}	natural logarithm of the average number of live births per woman aged 15 to 49 in quintile k of country n
lnaid_{kn}	natural logarithm of net official development assistance disbursed to the country n, as a ratio of its population, in which quintile k resides

Exogenous Variables	Definition	Appearing in Equation for				
$africa_{kn}$	dummy variable taking the value of one if for quintile k if n is an African country or zero if otherwise	lgast_{kn}	lgsch_{kn}	lnfer_{kn}	lgmor_{kn}	lnaid_{kn}
$hispa_{kn}$	dummy variable taking the value of one if for quintile k if n is a Hispanic country or zero if otherwise	lgast_{kn}	lgsch_{kn}	lnfer_{kn}	lgmor_{kn}	lnaid_{kn}
$coast_{kn}$	dummy variable taking the value of one if the country n in which quintile k resides has a coastline	lgast_{kn}			lgmor_{kn}	lnaid_{kn}
$temp_{kn}$	temperature in Celsius of the country n in which quintile k resides	lgast_{kn}			lgmor_{kn}	lnaid_{kn}
$temp^2_{kn}$	temperature-squared in Celsius of the country n in which quintile k resides	lgast_{kn}			lgmor_{kn}	lnaid_{kn}
$natres_{kn}$	natural resource capital value of the country n in which quintile k resides	lgast_{kn}				lnaid_{kn}
$size_{kn}$	size of country n in which quintile k resides	lgast_{kn}				lnaid_{kn}
mal_{kn}	fraction of the population at risk from malaria in country n in which quintile k resides					lnaid_{kn}
$british_{kn}$	dummy variable taking the value of one if for quintile k if n is a former British colony country or zero if otherwise	lgast_{kn}	lgsch_{kn}	lnfer_{kn}	lgmor_{kn}	lnaid_{kn}
$french_{kn}$	dummy variable taking the value of one if for quintile k if n is a former French colony or zero if otherwise	lgast_{kn}	lgsch_{kn}	lnfer_{kn}	lgmor_{kn}	lnaid_{kn}
$chrsp_{kn}$	fraction of the population that is Christian in country n in which quintile k resides		lgsch_{kn}	lnfer_{kn}		lnaid_{kn}
$rcap_{kn}$	fraction of the population that is Roman Catholic in country n in which quintile k resides		lgsch_{kn}	lnfer_{kn}		lnaid_{kn}
$musp_{kn}$	fraction of the population that is Muslim in country n in which quintile k resides		lgsch_{kn}	lnfer_{kn}		lnaid_{kn}
$discom_{kn}$	ratio of per capita ODA disbursements to ODA commitments to the country n in which k resides, over the five years prior to the first year of measurement of our aid variable					lnaid_{kn}
$paris_{kn}$	distance in kilometres to Paris from national capital of the country n in which quintile k resides					lnaid_{kn}
$tokyo_{kn}$	distance in kilometres to Paris from national capital of the country n in which quintile k resides					lnaid_{kn}
$wash_{kn}$	distance in kilometres to Washington from national capital of the country n in which quintile k resides					lnaid_{kn}

Table 4: Regression Results

	Dependent Variables															
	Wealth ($\lg ast_{kn}$)				Education ($\lg sch_{kn}$)				Health ($\lg mor_{kn}$)				Fertility ($\ln fer_{kn}$)				Aid ($\ln aid_{kn}$)	
	k={1,2}		k={3,4,5}		k={1,2}		k={3,4,5}		k={1,2}		k={3,4,5}		k={1,2}		k={3,4,5}			
	$\hat{\beta}^m_{ij}$,$\hat{\phi}^m_{jp}$ or $\hat{\theta}^m_j$	t-ratio	$\hat{\beta}^m_{ij}$,$\hat{\phi}^m_{jp}$ or $\hat{\theta}^m_j$	t-ratio	$\hat{\beta}^m_{ij}$,$\hat{\phi}^m_{jp}$ or $\hat{\theta}^n_j$	t-ratio	$\hat{\beta}^m_{ij}$,$\hat{\phi}^m_{jp}$ or $\hat{\theta}^m_j$	t-ratio	$\hat{\beta}^m_{ij}$,$\hat{\phi}^m_{jp}$ or $\hat{\theta}^n_j$	t-ratio	$\hat{\beta}^m_{ij}$,$\hat{\phi}^m_{jp}$ or $\hat{\theta}^m_j$	t-ratio	$\hat{\beta}^m_{ij}$,$\hat{\phi}^m_{jp}$ or $\hat{\theta}^r_j$	t-ratio	$\hat{\beta}^m_{ij}$,$\hat{\phi}^m_{jp}$ or $\hat{\theta}^r_j$	t-ratio	$\hat{\rho}_p$ or $\hat{\lambda}_q$	t-ratio
$\lg ast_{kn}$					**0.24**	**5.58**	**0.23**	**4.47**	**-0.06**	**-2.00**	**-0.08**	**-2.33**	**0.05**	**2.44**	**-0.18**	**-4.57**		
$\lg sch_{kn}$	**0.30**	**2.20**	0.02	0.19					**-0.08**	**-2.19**	**-0.18**	**-4.00**						
$\lg mor_{kn}$	**-1.20**	**-2.85**	**-1.74**	**-7.50**	**-0.70**	**-4.48**	**-0.82**	**-6.38**					**0.65**	**13.79**	**0.30**	**3.46**		
$\ln fer_{kn}$	**2.16**	**3.63**	**1.80**	**3.78**					**0.93**	**9.05**	**0.76**	**4.78**						
$\ln aid_{kn}$	-0.16	-0.60	**0.53**	**2.60**	**0.26**	**4.46**	**0.28**	**5.43**	**-0.17**	**-4.14**	-0.001	-0.03	**0.11**	**4.16**	**0.04**	**1.22**		
$africa_{kn}$	**-0.88**	**-2.37**	-0.42	-1.18	-0.14	-0.60	-0.04	-0.18	0.04	0.34	-0.04	-0.35	-0.08	-1.28	-0.11	-1.07	-0.58	-1.25
$hispa_{kn}$	-0.32	-0.66	-0.19	-0.52	**-1.03**	**-2.54**	**-1.10**	**-2.71**	**-0.30**	**-2.15**	-0.21	-1.52	**0.20**	**1.95**	-0.07	-0.50	**-2.63**	**-2.55**
$coast_{kn}$	**0.36**	**1.96**	**0.36**	**1.72**					**-0.09**	**-2.27**	-0.07	-1.04					**-0.32**	**-1.69**
$temp_{kn}$	**2.11**	**1.63**	0.40	0.29					-0.05	-0.16	0.292	0.66					0.81	0.41
$temp^2_{kn}$	**-0.54**	**-1.71**	-0.10	-0.29					-0.003	-0.04	-0.10	-0.90					-0.38	-0.75
$natcap_{kn}$	0.19	1.25	0.04	0.36													**0.45**	**5.13**
$size_{kn}$	-0.01	-0.40	0.15	1.33													**-0.44**	**-5.84**
mal_{kn}									**0.35**	**2.17**	**0.55**	**2.94**					-0.22	-0.25
$british_{kn}$	-0.11	-0.32	0.39	1.36	**0.53**	**2.29**	0.36	1.57	-0.09	-0.82	0.03	0.34	**0.18**	**2.50**	**0.32**	**3.5**	-0.46	-1.46
$french_{kn}$	0.15	0.44	0.19	0.65	-0.37	-1.65	-0.50	-2.24	0.02	0.18	-0.08	-0.84	0.05	0.72	**0.24**	**2.65**		
$chrsp_{kn}$					**0.90**	**1.90**	0.54	1.15					**0.28**	**3.18**	**0.53**	**3.16**	0.11	0.22
$rcap_{kn}$					-0.22	-0.37	0.08	0.14					0.07	0.64	**0.50**	**2.56**	0.79	1.07
$musp_{kn}$					**-0.65**	**-2.55**	**-0.65**	**-2.64**					**0.20**	**4.23**	**0.52**	**5.66**	0.27	0.87
$paris_{kn}$																	1.19	1.11
$tokyo_{kn}$																	0.27	0.33
$wash_{kn}$																	**-2.37**	**3.03**
R^2	0.62		0.68		0.53		0.72		0.82		0.89		0.52		0.49		0.89	
s.e.	0.09		0.21		0.14		0.23		0.19		0.32		0.27		0.18		0.32	

Boldface indicates that the coefficient is significantly different from zero at the 95% confidence level or greater. s.e. denotes standard error of the regression

Table 5: Equilibrium Impacts of Shocks in Endogenous Variables

		10 Percentage Changes in							
		Wealth		Education		Health		Aid	
		Estimate	*t*-ratio	Estimate	*t*-ratio	Estimate	*t*-ratio	Estimate	*t*-ratio
Impacts on									
Wealth	k=1,2	**11.67**	**2.56**	3.53	0.50	0.42	0.02	1.87	0.35
	k=3,4,5	**11.67**	**2.37**	4.42	1.06	22.78	1.32	**7.63**	**2.16**
Education	k=1,2	3.46	1.06	**12.02**	**2.68**	19.26	1.50	**4.75**	**2.74**
	k=3,4,5	**6.63**	**2.17**	**14.35**	**4.57**	**25.58**	**2.11**	**7.28**	**3.21**
Health	k=1,2	-0.96	-0.48	-2.36	-0.85	**-27.42**	**-2.56**	**-2.61**	**-2.02**
	k=3,4,5	**-4.82**	**-1.94**	**-4.63**	**-2.23**	**-24.78**	**-2.78**	**-3.51**	**-1.65**
Fertility	k=1,2	-0.02	-0.01	-1.34	-0.88	**-17.68**	**-1.67**	-0.53	-0.65
	k=3,4,5	**-3.55**	**-1.97**	-2.19	-1.47	**-11.57**	**-1.96**	**-2.07**	**-1.77**
Sum of Impacts	k=1, 2	11.67		12.02		27.42		7.36	
	k=3, 4, 5	26.67		18.98		50.36		18.42	
	k=1, ..., 5	38.34		31.00		77.78		25.78	

The respective wealth, health and aid variables are $(ast_{min}\text{-}ast_{kn})$ - $(ast_{max}\text{-}ast_{kn})$, $sch_{kn}/(1\text{-}sch_{kn})$, $mor_{kn}/(1\text{-}mor_{kn})$ and aid_{kn}. Boldface indicates that the estimated impact is significantly different from zero at the 95% confidence level or greater. All impacts represented as percentage changes. Sum of Impacts statistics are obtained by summing the absolute values of significant changes.

Table 6: Equilibrium Impacts of Doubling Aid

Quintile (k)	Wealth (ast_{kn})			Education (sch_{kn})			Health (mor_{kn})		
	Before	After	Change	Before	After	Change	Before	After	Change
1	13.3	14.9	1.6	30.8	38.6	7.8	14.6	12.4	-2.2
2	21.2	23.5	2.3	40.9	49.4	8.5	13.8	11.7	-2.1
3	30.4	43.2	12.8	49.8	62.7	12.9	12.8	10.3	-2.5
4	43.1	56.9	13.8	61.1	72.7	11.6	10.9	8.7	-2.2
5	66.9	77.9	11.0	78.5	86.1	7.6	7.8	6.2	-1.6

All changes are in percentage points.

Table A1: Countries Included in the Analysis

Country	Survey Year	Country	Survey Year
Bangladesh	2000	Madagascar	1997
Benin	2001	Malawi	2000
Bolivia	1998	Mali	2001
Brazil	1996	Mauritania	2001
Burkina Faso	1999	Morocco	1992
Cambodia	2000	Mozambique	1997
Cameroon	1998	Namibia	2000
Central Afr. Rep.	1995	Nepal	2001
Chad	1997	Nicaragua	2001
Colombia	2000	Niger	1998
Comoros	1996	Nigeria	1990
Cote d'Ivoire	1994	Pakistan	1990
Dominican Rep.	1996	Paraguay	1990
Egypt	2000	Peru	2000
Ethiopia	2000	Philippines	1998
Gabon	2000	Rwanda	2000
Ghana	1998	South Africa	1998
Guatemala	1999	Tanzania	1999
Guinea	1999	Togo	1998
Haiti	2000	Uganda	2001
India	1999	Vietnam	2000
Indonesia	1997	Yemen	1997
Jordan	1997	Zambia	2002
Kenya	1998	Zimbabwe	1999