An Equal-Opportunity Approach to the Allocation of International Aid

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Abstract

How should international aid be distributed? The most common view is according to some utilitarian formula: in order to maximize the average growth rate of aid recipients or the growth rate of income of the class of recipient countries.

Recently, the World Bank [7] has published a study demonstrating the importance of good economic management, within a recipient country, in transforming aid into economic growth. We identify good economic management with effort, and ask, how should aid be distributed to equalize opportunities [among recipient countries] for achieving growth, according to Roemer's [5] theory of equal opportunity. In addition, we calculate how aid should be distributed according to a utilitarian view.

Both the equal-opportunity and utilitarian recommendations are less compensatory than actual aid policy (they would give less to many African countries than present policy does). We discuss the results.

1 Introduction

From the viewpoint of justice, how should international aid be distributed? At present, considerations other than justice are perhaps primary in the determination of the distribution of aid, especially bilateral aid: rich countries, for example, predominantly give aid to countries which are important with

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regard to their international economic and military interests. Considerations of justice, however, are arguably more prominent in the decisions of multilateral agencies.

The question of how to distribute aid *efficiently*, as it is often posed, can be viewed as a form of the question we posed initially. Suppose there is a set of N countries, potential recipients for aid, and suppose the growth rate of country i's GNP is a function $g^i(x)$, where x is the fraction of its GNP that it receives as aid. A given budget, A, of international aid, will determine a feasible set, X, of aid allocations $\left(x^1, x^2, \cdots, x^N\right)$. Let $\left(Y^1, \cdots, Y^N\right)$ be the initial levels of GNP of the recipient countries, and let $Y = \sum Y^i$. There are several notions of efficiency used by researchers: to distribute aid to maximize $\frac{1}{N}\sum_{i=1}^{N} g^i\left(x^i\right)$, the average growth rate of recipient countries, or to maximize $\sum_{i=1}^{N} g^i\left(x^i\right) Y_i/Y$, or to produce a vector $\left(g^1\left(x^1\right), \cdots, g^N\left(x^N\right)\right)$ which is undominated as a point in $\mathbb{R}^N$. The first of these concepts corresponds to utilitarianism, where the utility function of a country is taken to be its growth rate; the second is equivalent to maximizing total income of the class of recipient countries, and corresponds to utilitarianism where the individuals are people rather than countries, and the utility function of an individual is taken to be his income; the third is Pareto efficiency across countries, where the utility function is taken to be the growth rate. The first two concepts must be motivated by utilitarianism as a political philosophy; the third, Paretianism, is the only measure which is traditionally viewed as being value-free (and, of course, it is not single-valued).

One could, moreover, adopt some other utility function for individual persons and countries than income or its rate of growth: alternative country measures could be the rate of infant survival (one minus the rate of infant mortality) or the non-poverty rate (one minus the poverty rate). Now let Y^i be the population of recipient country i, and let g^i be its rate of infant survival, and assume that the fertility rate is the same in all countries; then maximizing $\sum_{i=1}^{N} g^i\left(x^i\right) Y^i/Y$ means maximizing the fraction of live infants born in the class of recipient countries. (To transpose this social welfare function into one in terms of individual persons, we could give every pregnant woman a utility of one if she bears a live infant and a utility of zero if she bears one who dies. Then the latest formulation is utilitarianism with respect to the class of pregnant women in the universe of countries under consideration.)

But varying the interpertation of the functions g^i is only one possibility: the other is to vary the conception of justice from utilitarianism to some other

conception. In this article, we shall substitute for utilitarianism the objective of equal opportunity. In particular, we shall ask: How should international aid be distributed to equalize opportunities of recipient countries for growth? We could as well take as the objective of the equal-opportunity functional the rate of infant survival or the non- poverty rate of countries – and perhaps one of those kinds of 'utility' is better than the growth rate from a viewpoint of justice - but we take the growth rate for illustrative purposes, and because of the availability of a useful data set with which we can make the computation with growth rates.

2 The theory of equal opportunity

We use the equal opportunity theory of Roemer [5], which we here review briefly. Primary to the conception of equal opportunity is the distinction between two attributes of the 'individuals' among whom opportunities for some objective will be equalized - their 'circumstances' and their 'effort.' The circumstances of an individual (our individuals will be 'countries') are attributes which influence the degree to which it (or he) can achieve the objective in question (for us, a growth rate), and which are beyond its control, or are not changeable in the short run. In contrast, 'effort' refers to actions the individual takes, which also influence the degree to which it achieves the objective, but which are deemed to be 'within its (or his) control' or are changeable in the short run. The degree to which individual i achieves the objective in question is, then, a function of three arguments, denoted $u\left(C^i, e^i, x^i\right)$, where C^i denotes the circumstances of the individual, e^i denotes its effort, and x^i denotes the level of a resource which it receives, or more generally , the value of a policy, determined by the interventionist agency (in our case, x will be a measure of aid). The idea of equalizing opportunities for the acquisition of the objective u is to choose that policy which compensates individuals with low values of C, so that the levels of u finally achieved will be reflective only of their effort. In terms of a common metaphor, to equalize opportunities means to level the playing field, where the troughs and gulleys in the field are the disadvantages countries suffer with respect to achieving u due to poor circumstances. Once the playing field is leveled by application of a judicious policy (x), then the differences in outcomes (u^i) will be due only to differences in efforts (e^i). Equality of opportunity does not compensate individuals for differential outcomes ascribable to differential effort. In this

sense, it differs from an equal-outcome ethic.

We proceed to state, but not to derive, the manner in which the view just described is translated into the equal-opportunity social welfare functional , which can be optimized, given the appropriate data. We first partition the set of individuals into a set of types, where all individuals of a given type have (approximately) the same circumstances. Let the types be denoted $1, 2, \cdots, T$. The typology is such that there are many individuals in each type —we assume, in this paragraph, that there is a continuum of individuals in each type. Given a policy x , which in our application will be a distribution of aid, there will ensue a distribution of efforts among the individuals in each type. We define the indirect utility function $v^t(\pi, x)$ as the value $u\left(C^t, e^t(\pi), x\right)$, where $e^t(\pi)$ is the effort expended by the individual at the π^{th} quantile of the effort distribution of its type, and π is any number in the interval $[0, 1]$. We call π a *degree of effort*. The equal opportunity welfare functional is

$$\int_0^1 \min_t v^t(\pi, x)\ d\pi. \tag{2.1}$$

Thus, the problem is to choose the policy x from among a set of feasible policies which maximizes (2.1). We call the policy which solves this maximization the *EOp policy*.

Roughly speaking, (2.1) tries to equalize the value of the EOp objective (v) for all individuals who expend the same degree of effort, across types; further, it gives equal weight to doing this for every effort quantile of individuals in the population. Again, roughly speaking, (2.1) puts a premium on reducing differential outcomes in so far as they are due to differential circumstances (type), but does not try to reduce differential outcomes in so far as they are due to differential effort. It is 'Rawlsian' in its treatment of differential outcomes due to differential circumstances, and 'utilitarian' in its treatment of differential outcomes due to differential effort. A detailed justification of formula (2.1) is found in Roemer ([5], section 4).

The EOp functional is non-welfarist. A *welfarist* social welfare function has, as its arguments, only the individual welfare (or utility) levels of the individuals in question. (Thus, utilitarianism, in its simplest form, sums these levels; an equal-welfare ethic maximizes the minimum of these levels.) In contrast, one cannot compute the value of the EOp functional knowing only the welfare levels of the individuals in question - one must also know the

distribution of efforts within types. Thus, unlike welfarist social-choice theory, the equal-opportunity view recognizes as ethically significant the efforts expended by individuals, not just the outcomes they achieve.

3 Application to the problem of international aid: EOp

Our application is based upon the World Bank [7] study Assessing Aid , and the related work of Burnside and Dollar [1]. The main point of the former is that the effectiveness of aid in stimulating growth depends upon there being a set of practices, in the country, which the authors identify with good economic management. Economic management is the weighted average of three macroeconomic markers: budget surplus relative to GDP, inflation, and Sach and Warner's [6] trade openness variable.

We shall identify good economic management with 'high effort.' The Bank study presents a number of regressions, for a universe of 56 developing countries, of the growth rate against variables which, in our lingo, can either be characterized as 'circumstances' or 'effort.' Generically, we write such a regression equation as

$$u^i = \sum_{j=1}^{J} \beta_j c^{ji} + \alpha^1 e^i + \alpha^2 e^i x^i + \alpha^3 e^i \left(x^i\right)^2 + \alpha^4 x^i + \epsilon, \tag{3.1}$$

where there are J variables denoting the circumstances of a country, and c^{ji} is the value of the jth circumstance for country i. e^i is the value of the economic management (effort) variable for country i, and x^i is dollars of aid received as a fraction of the country's GDP. We take the regression (3.1) to define the function $u(C, e, x)$.

The formulation of the EOp functional (2.1) assumes a continuum of individuals, so that we can define π as a continuous variable ranging form 0 to 1. To create a discrete analog, we proceed as follows. We partition the sample of 55 countries into four types, based on their circumstances, with 13 or 14 countries in each type[1]. Within each type, we order the countries according to their effort levels, and we partition the type into four effort

[1]Because India makes reasonably good policy efforts and has a very large population (more than one half the population of all the other countries together), it would absorb basically all the available aid. We decide therefore to carry the analysis constraining India

quartiles, with two or three countries in each quartile. Define $e(t,q)$ to be the average effort expended by countries in quartile q of type t, for q and t each ranging from 1 to 4. Effectively, we will say that the variable π takes on four values, associated with the four effort quartiles, and we will replace the integral in (2.1) with a summation over these four quartiles. Thus, we identify countries with the same value of q, across types, as having expended the same *degree* of effort, π.

We next discuss the policy space. We have some discretion concerning the way we parameterize policies. We chose to make policy a linear function of the country's effort, as follows. A policy will be identified with an ordered pair (b,c), with $b \geq 0$, where a country that expends effort e will receive aid (as a fraction of its GDP) in amount $x = \max[0, be + c]$. Denote the total aid budget (the sum of all multilateral and bilateral aid) by A. Let Y^i be the GDP of country i. Let the vector of country efforts be $\left(e^1, \cdots, e^N\right)$: we enumerate countries so that this effort sequence is in ascending order. We shall assume throughout that the level of effort expended by a country is independent of the amount of aid it receives[2]. Under policy (b,c), country i will receive aid in the amount

$$A^i = \max[0, be^iY^i + cY^i].$$

Consequently, the budget constraint is

$$\sum_{i=1}^{N} \max[0, be^iY^i + cY^i] = A. \tag{3.2}$$

We next discuss how to characterize the policy space, given (3.2). Denote the set of countries by I. Were the '*max*' operator absent, then (3.2) would be a linear equation, and we could solve directly for c in terms of b. The complication is introduced by the 'Max' operator. We proceed as follows. Recall that the e^i are arranged from smallest to largest. (In our econometric specification, the smallest effort levels turn out to be negative numbers.) If $b = 0$, then c is given by $c^0 = \frac{A}{Y}$; that is, every country receives the same allocation (as a fraction of GDP). Now increase b. Define $c^1 = \frac{A}{Y} - b\sum_I e^i \frac{Y^i}{Y}$.

to its present level of aid. That is, we exclude India from the sample and reduce total aid by the amount that India currently receives.

[2]Although this assumption may be inaccurate, it is implicitly made in the World Bank study as well; otherwise, the regression structure would be incorrectly specified.

Then the policy (b, c^1) satisfies the budget constraint, as long as $be^1 + c^1 \geq 0$. This inequality holds as long as

$$0 \leq b \leq b^1, \text{ where } b^1 = \frac{A/Y}{\sum_I e^i \frac{Y^i}{Y} - e^1}.$$

For values of $b > b^1$, country 1 will receive zero aid. Define $I_1 = I \backslash \{1\}$, and $Y^1 = \sum_{I_1} Y^i$. Define $c^2 = \frac{A}{Y_1} - b \sum_{I_1} e^i \frac{Y^i}{Y_1}$. As b increases above b^1, the policy (b, c^2) satisfies the budget constraint; this policy works as long as $be^2 + c^2 \geq 0$, which is the case as long as $b^1 \leq b \leq b^2$, where b^2 is defined by:

$$b^2 = \frac{A/Y}{\sum_{I_1} e^i \frac{Y^i}{Y_1} - e^2}.$$

In general, we define $I_j = I \backslash \{1, 2, \cdots, j\}$, numbers b^j by

$$b^j = \frac{A/Y}{\sum_{I_{j-1}} e^i \frac{Y^i}{Y_{j-1}} - e^j},$$

and numbers c^j by

$$c^j = \frac{A}{Y_{j-1}} - b \sum_{I_{j-1}} e^i \frac{Y^i}{Y_{j-1}}.$$

Let $0 = b^0$. Then, if $b^j < b < b^j + 1$, the policy which satisfies the budget constraint is (b, c^j).

We have now expressed the boundary of the policy space (which is all that we need) as a function of a single parameter, b —given the data, which enable us to compute the numbers b^i. We now express a policy as $(b, c(b))$, where $c(b) = c^j$ when b lies in the interval $(b^j, b^j + 1)$. It is important to note that our policy space is *unidimensional*. It is this feature which makes it easy to calculate the EOp policy. Further comments follow in the conclusion.

We now describe the optimization procedure. Define

$$v^t(e, x) = u\left(C^t, e, x\right).$$

We first write the optimization problem, associated with maximizing the discrete analog of (2.1):

$$\max_{b \geq 0} \sum_{q=1}^{4} \alpha^q \min_t v^t\left(e(t, q), (b, c(b))\right). \tag{3.3}$$

In formulation (2.1), for every π, the function $\min_t v^t(\pi, x)$ carries the same weight in the social objective, which reflects the fact that every effort quantile consists of the same fraction of the total population. In (3.3), we have introduced the weights α^q for the various effort quartiles. The most literal translation of (2.1) would take α^q to be the fraction of countries (of the entire sample) in quartile q. We shall, however, in what follows, take α^q to be the fraction of the entire population who reside in countries in quartile q. That is, we choose to give each effort quartile of countries a weight in the social objective equal to its share in population among the class of recipient countries.

Problem (3.3) can be easily solved numerically, since the policy space is uni-dimensional. We simply graph the maximandum of (3.3) for b on the positive real line, and observe where the maximum is achieved.

4 International Aid Allocation: Utilitarianism

One conception of an 'efficient' aid allocation is that allocation which maximizes the rate of growth of GNP of the class of recipient countries. Indeed, when Collier and Dollar [3] refer to efficiency, they mean just this. Formally, this means we seek to maximize $\sum v(e^j, x^j) y^j$. As we pointed out in the introduction, this is really a utilitarian allocation among the entire class of Pareto efficient allocations.

We shall calculate this allocation below as well, and compare it to the EOp allocation.

5 Fitting the model

The empirical analysis uses the data from Burnside and Dollar [1]. The data base consists of panel data on 56 countries over six four-year time periods from 1970-73 through 1990-93. An observation is a country's performance averaged over a four-year period. Some countries are missing data in some time periods, so that we end up with a total of 272 observations.

We want to estimate equation (3.1), in which growth depends on: variables denoting the circumstances of a country, the economic management

variable, foreign aid, and aid interacted with economic management. The econometric analysis follows Burnside and Dollar [1].

First, we describe briefly the set of variables. Besides foreign aid and economic management (described bellow), Burnside and Dollar include six more variables in the regression of growth: initial income, ethnolinguistic fractionalization, assassinations (to capture civil unrest), ethnolinguistic fractionalization times assassinations, money supply (M2) as a fraction of GDP (as a proxy for distortions in the financial system), and institutional quality[3]. We will associate these variables with the circumstances of a country. For a detailed explanation and justification of the variables see Section 3.1 in Burnside and Dollar [1]. The inclusion of institutional quality among the circumstances of a country needs a little explanation. Institutional quality captures security of property rights and efficiency of the government bureaucracy, and it is measured using the 1980 international Country Risk Guide (ICRG) presented in Knack and Keefer [4]. Burnside and Dollar use each country's 1980 observation "on the assumption that institutional factors change slowly over time" (p.15), and thus they cannot be affected in the short run. We maintain the assumption and include institutional quality among a country's circumstances.

Foreign aid is measured by the Effective Development Assistance (EDA), "an aggregate measure of aid flows combining total grants and the grant equivalents of all official loans" (Chang, Fernandez-Arias and Serven, [2]). EDA aggregates annual flows from both bilateral and multilateral donors. More importantly, it does not include loans with a clear non-development purpose, namely military and defense-related loans (Chang, Fernandez-Arias and Serven, [2], p.10). The aid data are presented in constant 1985 dollars using the unit-value of import price index from the IFS[4]. To calculate aid as a fraction of GDP, the aid data figure is divided by real GDP in constant 1985 prices.

Finally, we define economic management as the weighted average of the following set of policy variables: budget surplus relative to GDP; inflation, as a measure of monetary policy; and Sach and Warner's [6] trade openness dummy variable. To determine the weights, we run a regression of growth against the circumstances and the policy variables (Table 1), and let the

[3]Time dummies to account for the world business cycle, and regional dummies for Sub-Saharan Africa and East-Asia are also included in the regression.

[4]In this way, we obtain a measure of aid that is constant in terms of its purchasing power over a representative bundle of world imports, as argued by Dollar and Burnside

coefficients of the policy variables determine their relative importance in the economic management index. Thus,

$$\textit{Eco.Management} = .0473\ \textit{Budget surplus} - .0156\ \textit{Inflation} + .0212\ \textit{Openness}.$$

We are now in the position to run regression (3.1) of the growth rate against 'effort', foreign aid (EDA), and the variables describing 'circumstances'. We perform a Hausman test to check for the endogeneity of aid, and accept the null hypothesis of consistent ordinary least square (OLS) estimates[5]. Table 2 reports the results of the OLS regression of growth.

Using the results from this last regression, define the index for the circumstances of country i (C^i) as the growth not explained by effort or aid. That is, for a country with growth rate g^i, effort e^i, and aid x^i, let $C^i = g^i - e^i\left(\alpha^1 + \alpha^2 x^i + \alpha^3 \left(x^i\right)^2\right) + \alpha^4 x^i$. In other words, C^i is the effect of country-specific circumstances on the rate of growth plus the country-specific error term: $C^i = \sum_{j=1}^{J} \beta^j c^{ji} + \epsilon$, see (3.1). We have decomposed then the growth rate into three components: circumstances (the sum of *observed* circumstances ($\hat{C}^i$ and the error term, i.e. $C^i = \hat{C}^i + \epsilon$.); the total effect of effort $e^i\left(\alpha^1 + \alpha^2 x^i + \alpha^3 \left(x^i\right)^2\right)$; and the direct explanatory power of aid $(\alpha^4 x^i)$. Plugging in the estimation from regression 2 (Table 2), we obtain:

$$g^i = C^i + e^i\left(.735 + 27.289 x^i - 290.487\left(x^i\right)^2\right) + .156 x^i.$$

We present in Table 3 the percentage of growth accounted by each component. Note that some components contribute negatively to growth. For example, the Dominican Republic average growth is 2.66%, although the observable circumstances report a higher growth rate. Namely, with neutral economic management and no foreign aid the country 's GNP would grow at a 2.88%. However, bad economic policies produce a one-quarter of a point negative growth, which is only partially compensated by the positive direct effect of aid (0.02%).

Figure 1 presents the relative importance of the different components in explaining growth. We have graphed in Figure 1a the percentage of each component in total growth. On the other hand, Figure 1b graphs the absolute values. The first observation to remark is the good fit of the regression:

[5]Collier and Dollar [3] reach the same conclusion and also regress growth against aid using OLS.

except for Costa Rica (and maybe Gambia), the error term shows very little participation in explaining growth. Second, circumstances account, in general, for a large piece of the rate of growth. Nevertheless, and more importantly, aid and effort do play a significant role in explaining growth.

Next we average the available observations, and assign to each country a value for its economic management level and its circumstances. Table 4 reports the level of economic management (column 4) and the circumstances (column 5) for each of the 55 countries[6]. We next proceed to partition the sample into types and effort quartiles, as described in Section 3. The classification of countries appears in Table 5a. Types are ordered from good to bad circumstances, where countries of type 1 enjoy the best circumstances. The first effort quartile includes countries with good effort levels within its type, while the lowest effort within a type is exerted by countries in the fourth quartile. The matrices of average effort and average circumstances for each type and quartile are represented in Tables 4b and 4c, respectively.

6 Optimization

In this section we calculate the allocation of foreign aid recommended by both EOp and utilitarian theories. The methodology has already being described in Sections 3 and 4.

The first task is to define the set of feasible linear policies (b, c). We have shown that it is sufficient to calculate its boundary $\left(b^1, ..., b^N\right)$. We have programmed *Mathematica* to calculate the feasible policy space and the EOp recommended policy $\left(b^{EOp}, c^{EOp}\right)$ for a given level of total aid[7]. Recall that b^{EOp} is the value of b that solves the optimization problem (3.3):

$$\max_{b \geq 0} \sum_{q=1}^{4} \alpha^q \min_t v^t \left(e(t,q), (b, c(b))\right),$$

where α^q is the fraction of the total population which resides in countries in quartile q, and $(b, c(b))$ is a feasible policy.

Next we find the EOp allocation of aid and compare it with the actual allocation. We take total aid to be equal to its actual level ($ 14.6 billion). The actual allocation and the EOp allocation are presented in Table 6 and

[6]Once India is excluded. See footnote 1

[7]The Mathematica program can be obtained by writing to humberto@ucdavis.edu

Figure 2. We re-run the experiment again, but now with double the amount of total aid ($ 29.2 billion). To compare the EOp allocation with the 'observed' allocation, we assume that, if the total aid budget were to double, then every country would receive exactly twice the aid it receives now. Table 7 and Figure 3 present the results.

Finally, we calculate the utilitarian allocation at these two levels of aid. See Tables 6 and 7, and Figures 2b and 3b for the utilitarian and EOp allocations, respectively.

The main observations from these tables and figures appear to be the following:

1. There is a sizeable number of countries, which are mainly in Africa, which receive more aid than is recommended by either the EOp or the utilitarian allocation.

2. Malaysia, Turkey, Korea, Thailand, and Indonesia receive much less aid than is recommended by either the EOp or the utilitarian allocation.

3. At A=$ 14.6 billion, the utilitarian allocation gives zero aid to many countries, while the EOp allocation gives aid to almost all countries.

4. When A=$ 29.2 billion, both allocations give aid to almost all countries.

5. The EOp allocation is more egalitarian (smaller variance) than the utilitarian allocation when A=$ 14.6 billion, but that relationship is reversed at A=$ 29.2 billion.

We comment on the fact that the EOp and utilitarian allocation are both monotone increasing with respect to countries in the same order. This is a tautology in our model, for the aid allocation (as a percentage of GDP) is rank-correlated with the efforts of countries, regardless of what objective function is optimized. (If aid is not zero, it is $be^i + c$, where $b > 0$. This is monotone increasing in e^i.) It is important to underscore the fact that *our choice of the policy space precludes offering aid which is not an increasing function of countries' efforts, cross-sectionally.*

Observations 1 and 2 are both aspects of the meta-observation that the actual pattern of aid is in a sense far more compensatory than either the EOp or utilitarian rules recommend, because in actuality, African countries get (far) more than they 'should,' and the East Asian tigers get less than they 'should.' Does this mean that the African countries are receiving too

much aid and the East Asian tigers too little? Not necessarily. For there are other possible objectives, even within the rubric of equal opportunity.

Suppose our objective were not to equalize opportunities for *growth*, but rather to equalize opportunities for *GDP per capita*. This means we would allocate aid to try, roughly speaking, to equalize the distribution of GDP per capita across different types of country. (Within each type of country, there will be a distribution of GDP per capita, due to differential effort. We would allocate aid to try to equalize those *distributions* across types.) One must first ask: Over what time horizon do we wish to equalize opportunities for GDP per capita? If the time horizon were long, then present GDP per capita has almost no influence —differences across countries in GDP per capita in the long run will be determined entirely by differentials in their rates of growth, and then equalizing opportunities for GDP per capita is equivalent to equalizing opportunities for growth. Therefore, the objective we have studied above is indeed equivalent to equalizing opportunities for GDP per capita in the long run. If, however, we adopt a short time horizon, then the overwhelming determinant of cross-country differences in GDP per capita is present GDP per capita, not the growth rate, and we would equalize opportunities for GDP per capita by spending aid primarily on the low GDP-per-capita countries. Then EOp allocation would give substantially more to the African countries, and substantially less to the Asian tigers than the EOp-for-growth allocation.

Now turn to the utilitarian rule. Here, the story is different. The allocation of aid that maximizes the growth rate of GDP per capita of the class of developing countries is exactly the same as the allocation that maximizes the GDP per capita of the class of developing countries one year from now[8]! So changing the equalisandum from growth rates to levels makes all the difference in the short run in the EOp formulation, but no difference in the utilitarian formulation. Formally speaking, this is because the utilitarian objective function pays attention only to rates of change and not to levels, whereas EOp pays attention both to levels and rates of change. Finally, maximizing total GDP of the class of (present-day) developing countries in the long run means choosing that policy x that maximizes $\sum \left(1+g^i(x)\right)^r Y^i$, for r large. This implies using the policy that maximizes the maximum rate of growth (maximax) across the class of countries, a policy that most would

[8]Just observe that maximizing over x the expresion $\sum \left(1+g^i(x)\right) \frac{Y^i}{Y}$ is equivalent to maximizing $\sum\ g^i(x)\frac{Y^i}{Y}$.

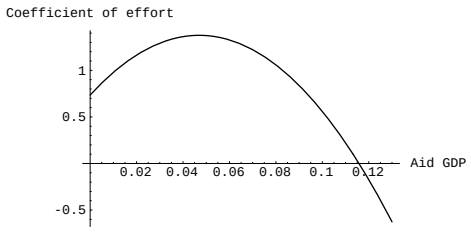

Figure 3: Coefficient of Effort

find abhorrent. (A philosophical question: Why isn't utilitarianism in the short run as abhorrent?)

Observations 3 and 4 are not surprising. When the total aid budget is 'small,' the utilitarian social planner will not waste aid on countries which inefficiently process it into growth, while the EOp planner is more forgiving to countries of disadvantaged types. When the aid budget is larger, *decreasing returns* come into play, and the utilitarian planner will allocate aid to more countries.

Those decreasing returns are evident if we graph the coefficient on the 'e' term in our regression equation, which is $\alpha^1 + \alpha^2 x + \alpha^3 x^2 = 0.735 + 27.30\ x - 290.6\ x^2$. Figure 3 graphs this function:

Thus we see that the contribution of effort to growth increases as x (Aid/GDP) increases from zero to 5%, but then decreases, reaching zero before x = 12%.

Observation 5 is somewhat of a surprise, and we have no simple explanation of it.

7 Conclusion

We review our main points, both theoretical and empirical.

1. What is often called *efficient* aid policy[9] is in fact *utilitarian* aid policy. The distinction is important, because 'efficiency' bears the connation of value-freeness, whereas utilitarianism, a political philosophy, is embedded with a view about distribution —namely that that distribution is

[9]Most prominently, see World Bank [7]

most desirable which maximizes the sum of utilities. The nomenclature 'efficiency' is better reserved for Pareto efficiency.

2. We introduce equal-opportunity policy, which differs in two ways from utilitarian policy in conception —it is non-welfarist, and it does not seek to maximize total income or the average growth rate. EOp seeks to equalize across types of country, but maximize averages across effort quartiles of country.

3. We compute both the EOp policy for growth, and the utilitarian-growth policy. These policies differ; notably, at present levels of world aid, the utilitarian policy would deny aid to many countries, while the EOp policy would deny aid to fewer countries. The EOp policy is more egalitarian than the utilitarian policy, at present levels of world aid.

4. Both policies differ substantially from actual aid policy, which allocates more to African countries and less to the East Asian tigers, than either of the policies in 3.

5. Is there a way of 'rationalizing' observed policy, that is, of explaining it as the outcome of maximization of a (social welfare) function? We suggest that the observed policy might resemble a policy that equalizes opportunities for *per capita GDP*, rather than for growth. We explained that this can be interpreted as a concern with average consumption (per capita GDP) in the short run, as opposed to the long run.

6. In addition, the observed policy differs from the policies in 3 because it is (obviously) not drawn from a unidimensional policy space. That is, our optimization exercise, with a unidimensional policy space, precludes the variation in policy among countries that one observes in reality, and that one might like to have. (Introducing more dimensions into our policy space is possible, but complicates the analysis substantially.)

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TABLE 1: Regression 1

Dependent Variable: REAL GDP PER CAPITA (RGDPPC) growth rate
Method: Least Squares
Sample: 1 272
Included observations: 272

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.014981	0.011237	-1.333179	0.1837
INITIAL RGDPPC	-0.000003	0.0000013	-2.313779	0.0215
ETHNIC FRACT.	-0.0000615	0.0000807	-0.762549	0.4464
ASSASSINATIONS	-0.00375	0.003056	-1.227164	0.2209
ETHNFxASSASIN	0.0000669	0.0000631	1.060532	0.2899
ICRGE	0.007046	0.001749	4.029801	0.0001
M2/GDP	0.000231	0.000174	1.325242	0.1863
Sub-Saharan Africa	-0.012306	0.006478	-1.899679	0.0586
East-Asia	0.007674	0.007169	1.070442	0.2854
GOV. CONSUMP	-0.060126	0.048085	-1.250402	0.2123
Time Dummy 2	0.025043	0.007808	3.207354	0.0015
Time Dummy 3	0.024852	0.007286	3.41081	0.0008
Time Dummy 4	0.011871	0.007171	1.655535	0.0991
Time Dummy 5	-0.008731	0.007106	-1.228748	0.2203
Time Dummy 6	0.005403	0.006454	0.837183	0.4033
BUDGET SURPLUS	0.04727	0.034418	1.37339	0.1708
INFLATION	-0.015644	0.00525	-2.979774	0.0032
SACH-WARNER	0.021225	0.006003	3.535518	0.0005

R-squared	0.402077	Mean dependent var	0.011841
Adjusted R-squared	0.362059	S.D. dependent var	0.036042
S.E. of regression	0.028787	Akaike info criterion	-4.193911
Sum squared resid	0.210485	Schwarz criterion	-3.955292
Log likelihood	588.3719	F-statistic	10.0473
Durbin-Watson stat	1.918205	Prob(F-statistic)	0

TABLE 2: Regression 2

Dependent Variable: REAL GDP PER CAPITA (RGDPPC) growth rate
Method: Least Squares
Sample: 1 272
Included observations: 272

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.018794	0.011005	-1.707725	0.0889
INITIAL RGDPPC	-2.73E-06	1.33E-06	-2.06319	0.0401
ETHNIC FRACT.	-5.25E-05	7.96E-05	-0.659548	0.5101
ASSASSINATIONS	-0.003733	0.003005	-1.242567	0.2152
ETHNFxASSASIN	6.32E-05	6.22E-05	1.015539	0.3108
ICRGE	0.007206	0.001729	4.168394	0
M2/GDP	0.00026	0.000169	1.542401	0.1242
Sub-Saharan Africa	-0.014887	0.006451	-2.307548	0.0218
East-Asia	0.011065	0.00737	1.501476	0.1345
GOV. CONSUMP	-0.069848	0.047679	-1.464963	0.1442
Time Dummy 2	0.02678	0.007196	3.721453	0.0002
Time Dummy 3	0.026442	0.006821	3.876406	0.0001
Time Dummy 4	0.013169	0.006681	1.971114	0.0498
Time Dummy 5	-0.007718	0.006712	-1.149896	0.2513
Time Dummy 6	0.006087	0.00635	0.958553	0.3387
EFFORT	0.735303	0.270262	2.720701	0.007
EDAGDP	0.156103	0.13035	1.197571	0.2322
EFFORTxEDAGDP	27.29746	17.11182	1.595241	0.1119
EFFORTxEDAGDP^2	-290.5692	177.7658	-1.634562	0.1034

R-squared	0.409862	Mean dependent var	0.011841
Adjusted R-squared	0.367875	S.D. dependent var	0.036042
S.E. of regression	0.028655	Akaike info criterion	-4.199663
Sum squared resid	0.207745	Schwarz criterion	-3.947787
Log likelihood	590.1541	F-statistic	9.761833
Durbin-Watson stat	1.948429	Prob(F-statistic)	0

TABLE 3: Growth Decomposition

COUNTRY	RGDPPCgw (g)		CIRCUMST. C		EFFORT e ($\alpha 1 + \alpha 2x + \alpha 3x^2$)		AID $\alpha 4$ x		Error term ε
Algeria	2.81%	=	2.87%	+	-0.16%	+	0.12%	+	-0.01%
Argentina	0.55%	=	1.54%	+	-0.99%	+	0.00%	+	0.00%
Bolivia	-0.04%	=	-0.68%	+	0.31%	+	0.28%	+	0.04%
Botswana	7.48%	=	3.65%	+	3.07%	+	0.80%	+	-0.03%
Brazil	2.39%	=	3.55%	+	-1.17%	+	0.00%	+	0.00%
Cameroon	0.84%	=	0.66%	+	-0.12%	+	0.29%	+	0.01%
Chile	2.09%	=	1.44%	+	0.65%	+	0.02%	+	-0.02%
Colombia	2.13%	=	1.86%	+	0.26%	+	0.02%	+	-0.01%
Costa Rica	0.01%	=	1.02%	+	0.26%	+	0.02%	+	-1.30%
Cote d'Ivore	-2.59%	=	-2.10%	+	-0.62%	+	0.13%	+	0.00%
Dominican Rep	2.66%	=	2.82%	+	-0.25%	+	0.09%	+	0.00%
Ecuador	2.63%	=	1.76%	+	0.82%	+	0.05%	+	-0.01%
Egypt	3.76%	=	4.25%	+	-0.87%	+	0.37%	+	0.02%
El Salvador	-0.31%	=	-0.84%	+	0.17%	+	0.29%	+	0.06%
Ethiopia	-4.74%	=	-4.86%	+	-0.46%	+	0.58%	+	0.01%
Gabon	1.26%	=	1.30%	+	-0.34%	+	0.30%	+	0.00%
Gambia	0.25%	=	-0.65%	+	0.46%	+	1.11%	+	-0.67%
Ghana	-0.74%	=	-1.35%	+	0.15%	+	0.30%	+	0.16%
Guatemala	0.58%	=	0.24%	+	0.22%	+	0.08%	+	0.03%
Guyana	-0.36%	=	0.28%	+	-1.01%	+	0.58%	+	-0.22%
Haiti	0.10%	=	0.07%	+	-0.26%	+	0.28%	+	0.00%
Honduras	0.87%	=	0.51%	+	-0.02%	+	0.34%	+	0.03%
India	2.07%	=	2.35%	+	-0.33%	+	0.04%	+	0.00%
Indonesia	4.90%	=	3.29%	+	1.56%	+	0.06%	+	0.00%
Jamaica	-2.92%	=	-2.19%	+	-0.97%	+	0.22%	+	0.02%
Kenya	1.33%	=	1.36%	+	-0.40%	+	0.36%	+	0.01%
Korea	6.99%	=	5.45%	+	1.51%	+	0.03%	+	-0.01%
Madagascar	-1.74%	=	-1.78%	+	-0.37%	+	0.42%	+	0.00%
Malawi	-1.10%	=	-1.27%	+	-0.74%	+	0.88%	+	0.04%
Malaysia	4.35%	=	3.00%	+	1.32%	+	0.03%	+	0.00%
Mali	4.64%	=	2.58%	+	0.87%	+	1.19%	+	0.00%
Mexico	1.40%	=	1.38%	+	0.01%	+	0.00%	+	0.00%
Morocco	1.74%	=	1.18%	+	0.44%	+	0.15%	+	-0.02%
Nicaragua	-3.45%	=	-1.38%	+	-2.80%	+	0.49%	+	0.24%
Niger	1.46%	=	1.07%	+	-0.44%	+	0.84%	+	0.00%
Nigeria	0.78%	=	1.07%	+	-0.31%	+	0.02%	+	0.00%
Pakistan	2.79%	=	3.12%	+	-0.45%	+	0.12%	+	0.00%
Paraguay	2.19%	=	1.88%	+	0.19%	+	0.11%	+	0.01%
Peru	-0.72%	=	0.24%	+	-1.01%	+	0.06%	+	-0.01%
Philippines	0.88%	=	0.59%	+	0.20%	+	0.07%	+	0.03%
Senegal	-0.18%	=	-0.39%	+	-0.36%	+	0.57%	+	0.00%
Sierra Leone	-0.39%	=	0.32%	+	-0.95%	+	0.27%	+	-0.02%
Somalia	0.60%	=	0.74%	+	-0.83%	+	0.69%	+	0.00%
Sri Lanka	2.86%	=	2.53%	+	0.13%	+	0.18%	+	0.02%
Syria	3.13%	=	3.31%	+	-0.47%	+	0.29%	+	0.00%
Tanzania	0.26%	=	0.37%	+	-1.02%	+	0.91%	+	0.00%
Thailand	5.18%	=	3.60%	+	1.55%	+	0.04%	+	0.00%
Togo	-0.24%	=	-0.31%	+	-0.77%	+	0.84%	+	0.00%
Trinidad y Tobago	0.59%	=	0.74%	+	-0.15%	+	0.01%	+	0.00%
Tunisia	1.26%	=	0.60%	+	0.52%	+	0.14%	+	0.00%
Turkey	3.78%	=	2.83%	+	0.91%	+	0.05%	+	0.00%
Uruguay	1.24%	=	1.60%	+	-0.38%	+	0.02%	+	0.01%
Venezuela	-0.52%	=	-0.65%	+	0.12%	+	0.00%	+	0.00%
Zaire	-1.94%	=	-1.59%	+	-0.72%	+	0.37%	+	-0.01%
Zambia	-2.04%	=	-1.64%	+	-1.35%	+	0.75%	+	0.20%
Zimbabwe	-0.70%	=	-0.29%	+	-0.77%	+	0.36%	+	0.00%

FIGURE 1a: Decomposition of the Rate of Growth
(% of total growth)

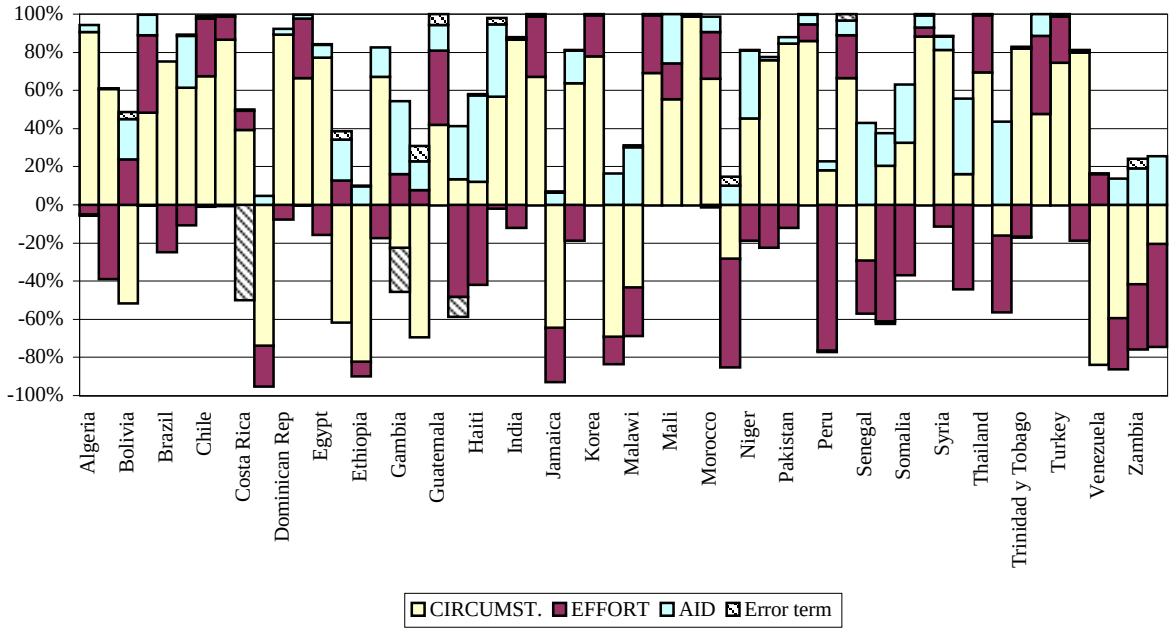

FIGURE 1b: Relative Importance of the Components of Growth
(in absolute values)

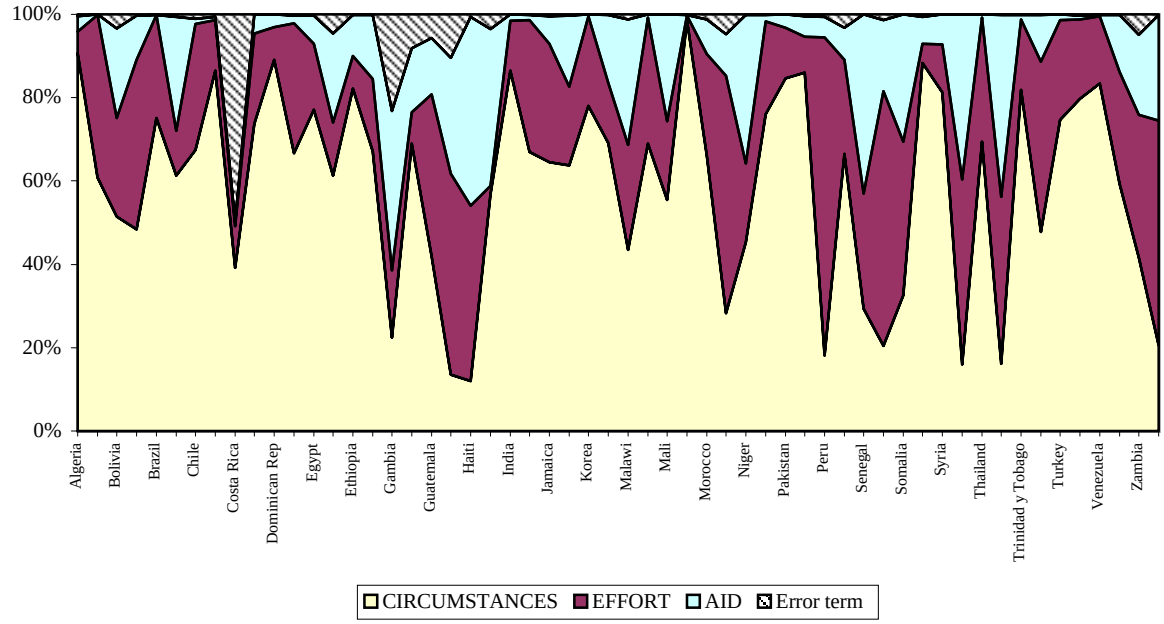

TABLE 4: Effort and Circumstances (average over observations)

COUNTRY	*#obs*	Aid (%GDP) (x)	Eco. Manag. (e)	Circumst. (C)
Algeria	2	0.767%	-0.0018	0.0287
Argentina	3	0.020%	-0.0133	0.0154
Bolivia	6	1.800%	0.0027	-0.0068
Botswana	3	5.121%	0.0224	0.0365
Brazil	6	0.026%	-0.0158	0.0355
Cameroon	5	1.876%	-0.0010	0.0066
Chile	6	0.156%	0.0083	0.0144
Colombia	6	0.122%	0.0034	0.0186
Costa Rica	6	0.153%	0.0034	0.0102
Cote d'Ivore	1	0.845%	-0.0066	-0.0210
Dominican Rep	6	0.600%	-0.0028	0.0282
Ecuador	6	0.323%	0.0100	0.0176
Egypt	5	2.392%	-0.0071	0.0425
El Salvador	6	1.865%	0.0015	-0.0084
Ethiopia	2	3.745%	-0.0034	-0.0486
Gabon	6	1.909%	-0.0029	0.0130
Gambia	6	7.081%	0.0038	-0.0065
Ghana	6	1.921%	0.0013	-0.0135
Guatemala	6	0.494%	0.0026	0.0024
Guyana	6	3.737%	-0.0075	0.0028
Haiti	5	1.771%	-0.0023	0.0007
Honduras	6	2.189%	-0.0002	0.0051
India	6	0.259%	-0.0040	0.0235
Indonesia	6	0.392%	0.0186	0.0329
Jamaica	3	1.416%	-0.0091	-0.0219
Kenya	6	2.338%	-0.0033	0.0136
Korea	6	0.201%	0.0191	0.0545
Madagascar	4	2.704%	-0.0030	-0.0178
Malawi	4	5.647%	-0.0055	-0.0127
Malaysia	6	0.201%	0.0167	0.0300
Mali	1	7.649%	0.0078	0.0258
Mexico	6	0.016%	0.0002	0.0138
Morocco	6	0.941%	0.0045	0.0118
Nicaragua	6	3.145%	-0.0214	-0.0138
Niger	2	5.381%	-0.0033	0.0107
Nigeria	6	0.138%	-0.0041	0.0107
Pakistan	6	0.765%	-0.0048	0.0312
Paraguay	6	0.686%	0.0021	0.0188
Peru	6	0.411%	-0.0120	0.0024
Philippines	6	0.439%	0.0023	0.0059
Senegal	4	3.631%	-0.0027	-0.0039
Sierra Leone	6	1.698%	-0.0085	0.0032
Somalia	2	4.441%	-0.0061	0.0074
Sri Lanka	6	1.169%	0.0013	0.0253
Syria	5	1.856%	-0.0041	0.0331
Tanzania	2	5.857%	-0.0077	0.0037
Thailand	6	0.243%	0.0193	0.0360
Togo	4	5.359%	-0.0056	-0.0031
Trinidad y Tobago	5	0.066%	-0.0020	0.0074
Tunisia	3	0.907%	0.0054	0.0060
Turkey	1	0.328%	0.0111	0.0283
Uruguay	6	0.126%	-0.0049	0.0160
Venezuela	6	0.015%	0.0017	-0.0065
Zaire	5	2.350%	-0.0059	-0.0159
Zambia	6	4.805%	-0.0098	-0.0164
Zimbabwe	3	2.335%	-0.0064	-0.0029

TABLE 5a: Classification of Countries in Types and Effort Quartiles

	Quartile 1	Quartile 2	Quartile 3	Quartile 4
Type 1	Korea Thailand Indonesia Botswana	Malaysia Turkey Mali	Dominican Rep. Syria Algeria	Brazil Pakistan Egypt
Type 2	Costa Chile Ecuador Morocco	Mexico Colombia Paraguay Sri Lanka	Gabon Kenya Niger	Argentina Uruguay Nigeria
Type 3	Philippines Guatemala Honduras Tunisia	Trinidad & Tobago Haiti Cameroon Togo	Zimbabwe Somalia Guyana	Peru Sierra Leone Tanzania
Type 4	Venezuela Bolivia El Salvador Gambia	Ghana Madagascar Senegal Ethiopia	Cote d'Ivore Zaire Malawi	Jamaica Nicaragua Zambia

TABLE 5b: Matrix of Average Effort Labels

EFFORT	Quartile 1	Quartile 2	Quartile 3	Quartile 4
Type 1	0.0198	0.0118	-0.0029	-0.0092
Type 2	0.0066	0.0017	-0.0032	-0.0074
Type 3	0.0025	-0.0027	-0.0066	-0.0094
Type 4	0.0024	-0.0020	0.0060	-0.0134

TABLE 5c: Matrix of Average Index of Circumstances

CIRCUM.	Quartile 1	Quartile 2	Quartile 3	Quartile 4
Type 1	0.0400	0.0280	0.0300	0.0364
Type 2	0.0135	0.0191	0.0124	0.0140
Type 3	0.0049	0.0029	0.0024	0.0031
Type 4	-0.0070	-0.0209	-0.0165	-0.0174

TABLE 6a: EOp and Efficient Aid Allocation (Total Aid = $14.6 billions)

country	*(t,q)*	Aid/GDP	*EOp Aid/GDP*	*Efficient Aid/GDP*
Algeria	E13	0.767%	1.086%	0.088%
Argentina	E24	0.020%	0.620%	0.000%
Bolivia	E41	1.800%	1.634%	1.168%
Botswana	E11	5.121%	3.433%	4.712%
Brazil	E14	0.026%	0.434%	0.000%
Cameroon	E32	1.876%	1.107%	0.129%
Chile	E21	0.156%	2.068%	2.023%
Colombia	E22	0.122%	1.562%	1.025%
Costa Rica	E21	0.153%	2.068%	2.023%
Cote d'Ivore	E43	0.845%	0.765%	0.000%
Dominican Rep	E13	0.600%	1.086%	0.088%
Ecuador	E21	0.323%	2.068%	2.023%
Egypt	E14	2.392%	0.434%	0.000%
El Salvador	E41	1.865%	1.634%	1.168%
Ethiopia	E42	3.745%	1.179%	0.272%
Gabon	E23	1.909%	1.055%	0.027%
Gambia	E41	7.081%	1.634%	1.168%
Ghana	E42	1.921%	1.179%	0.272%
Guatemala	E31	0.494%	1.644%	1.188%
Guyana	E33	3.737%	0.703%	0.000%
Haiti	E32	1.771%	1.107%	0.129%
Honduras	E31	2.189%	1.644%	1.188%
Indonesia	E11	0.392%	3.433%	4.712%
Jamaica	E44	1.416%	0.000%	0.000%
Kenya	E23	2.338%	1.055%	0.027%
Korea	E11	0.201%	3.433%	4.712%
Madagascar	E42	2.704%	1.179%	0.272%
Malawi	E43	5.647%	0.765%	0.000%
Malaysia	E12	0.201%	2.606%	3.083%
Mali	E12	7.649%	2.606%	3.083%
Mexico	E22	0.016%	1.562%	1.025%
Morocco	E21	0.941%	2.068%	2.023%
Nicaragua	E44	3.145%	0.000%	0.000%
Niger	E23	5.381%	1.055%	0.027%
Nigeria	E24	0.138%	0.620%	0.000%
Pakistan	E14	0.765%	0.434%	0.000%
Paraguay	E22	0.686%	1.562%	1.025%
Peru	E34	0.411%	0.414%	0.000%
Philippines	E31	0.439%	1.644%	1.188%
Senegal	E42	3.631%	1.179%	0.272%
Sierra Leone	E34	1.698%	0.414%	0.000%
Somalia	E33	4.441%	0.703%	0.000%
Sri Lanka	E22	1.169%	1.562%	1.025%
Syria	E13	1.856%	1.086%	0.088%
Tanzania	E34	5.857%	0.414%	0.000%
Thailand	E11	0.243%	3.433%	4.712%
Togo	E32	5.359%	1.107%	0.129%
Trinidad y Tobago	E32	0.066%	1.107%	0.129%
Tunisia	E31	0.907%	1.644%	1.188%
Turkey	E12	0.328%	2.606%	3.083%
Uruguay	E24	0.126%	0.620%	0.000%
Venezuela	E41	0.015%	1.634%	1.168%
Zaire	E43	2.350%	0.765%	0.000%
Zambia	E44	4.805%	0.000%	0.000%
Zimbabwe	E33	2.335%	0.703%	0.000%

TABLE 6b: EOp Aid/GDP Allocation

	Quartile 1	Quartile 2	Quartile 3	Quartile 4
Type 1	3.433%	2.606%	1.086%	0.434%
Type 2	2.068%	1.562%	1.055%	0.620%
Type 3	1.644%	1.107%	0.703%	0.414%
Type 4	1.634%	1.179%	0.765%	0.000%

TABLE 6c: Efficient Aid/GDP Allocation

	Quartile 1	Quartile 2	Quartile 3	Quartile 4
Type 1	4.712%	3.083%	0.088%	0.000%
Type 2	2.023%	1.025%	0.027%	0.000%
Type 3	1.188%	0.129%	0.000%	0.000%
Type 4	1.168%	0.272%	0.000%	0.000%

FIGURE 2a: Actual and EOp Aid Allocations (Total Aid = $14.6 billion)

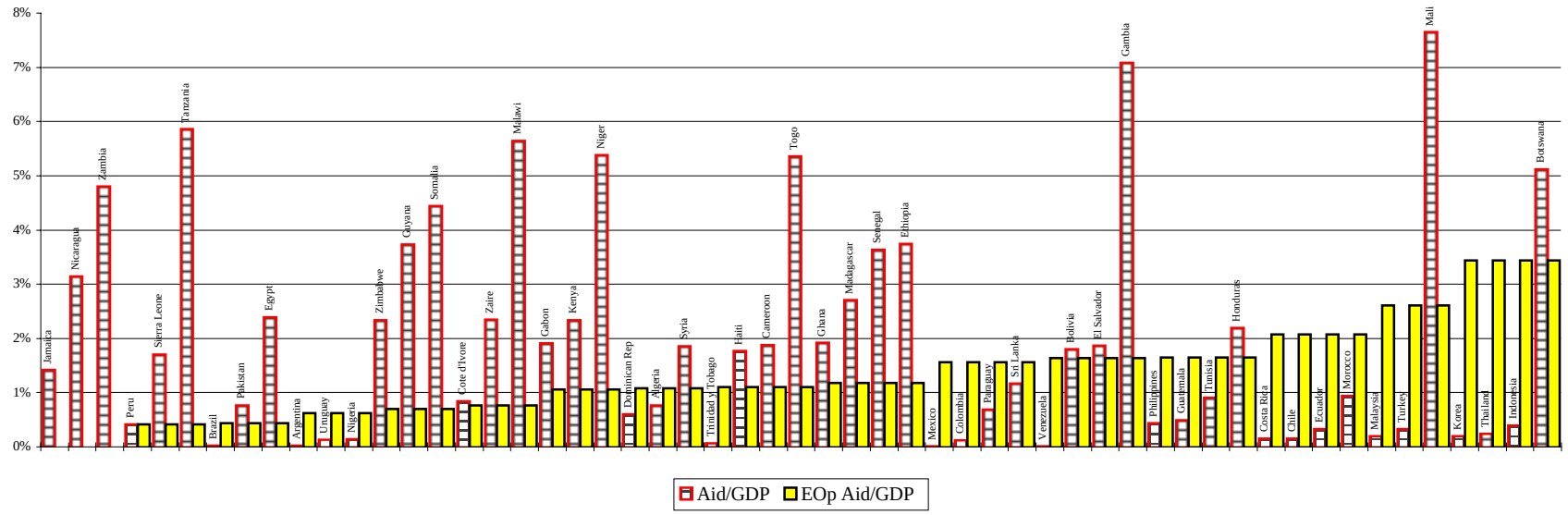

FIGURE 2b: Actual, EOp, and Efficient Aid Allocations (Total Aid = $14.6 billion)

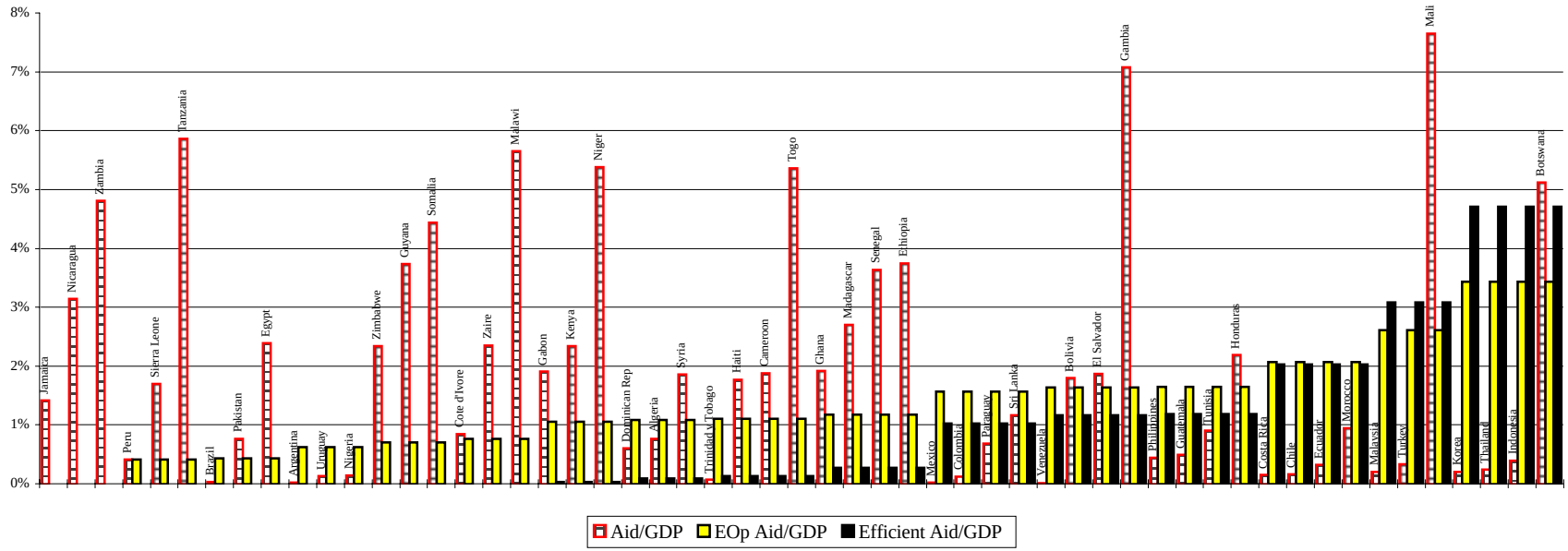

TABLE 7a: EOp and Efficient Aid Allocation (Total Aid = $29.2 billions)

country	*(t,q)*	*Aid/GDP x 2*	*EOp Aid/GDP*	*Efficient Aid/GDP*
Algeria	E13	1.533%	2.172%	2.450%
Argentina	E24	0.040%	1.241%	1.706%
Bolivia	E41	3.600%	3.268%	3.326%
Botswana	E11	10.243%	6.867%	6.203%
Brazil	E14	0.053%	0.869%	1.409%
Cameroon	E32	3.751%	2.213%	2.483%
Chile	E21	0.312%	4.136%	4.021%
Colombia	E22	0.244%	3.123%	3.211%
Costa Rica	E21	0.307%	4.136%	4.021%
Cote d'Ivore	E43	1.691%	1.531%	1.938%
Dominican Rep	E13	1.201%	2.172%	2.450%
Ecuador	E21	0.647%	4.136%	4.021%
Egypt	E14	4.783%	0.869%	1.409%
El Salvador	E41	3.730%	3.268%	3.326%
Ethiopia	E42	7.491%	2.358%	2.599%
Gabon	E23	3.817%	2.110%	2.401%
Gambia	E41	14.161%	3.268%	3.326%
Ghana	E42	3.841%	2.358%	2.599%
Guatemala	E31	0.989%	3.289%	3.343%
Guyana	E33	7.474%	1.406%	1.838%
Haiti	E32	3.542%	2.213%	2.483%
Honduras	E31	4.378%	3.289%	3.343%
Indonesia	E11	0.784%	6.867%	6.203%
Jamaica	E44	2.832%	0.000%	0.714%
Kenya	E23	4.676%	2.110%	2.401%
Korea	E11	0.402%	6.867%	6.203%
Madagascar	E42	5.407%	2.358%	2.599%
Malawi	E43	11.294%	1.531%	1.938%
Malaysia	E12	0.402%	5.212%	4.881%
Mali	E12	15.299%	5.212%	4.881%
Mexico	E22	0.031%	3.123%	3.211%
Morocco	E21	1.882%	4.136%	4.021%
Nicaragua	E44	6.289%	0.000%	0.714%
Niger	E23	10.762%	2.110%	2.401%
Nigeria	E24	0.275%	1.241%	1.706%
Pakistan	E14	1.530%	0.869%	1.409%
Paraguay	E22	1.372%	3.123%	3.211%
Peru	E34	0.823%	0.827%	1.375%
Philippines	E31	0.877%	3.289%	3.343%
Senegal	E42	7.263%	2.358%	2.599%
Sierra Leone	E34	3.396%	0.827%	1.375%
Somalia	E33	8.881%	1.406%	1.838%
Sri Lanka	E22	2.337%	3.123%	3.211%
Syria	E13	3.711%	2.172%	2.450%
Tanzania	E34	11.715%	0.827%	1.375%
Thailand	E11	0.486%	6.867%	6.203%
Togo	E32	10.719%	2.213%	2.483%
Trinidad y Tobago	E32	0.133%	2.213%	2.483%
Tunisia	E31	1.814%	3.289%	3.343%
Turkey	E12	0.656%	5.212%	4.881%
Uruguay	E24	0.252%	1.241%	1.706%
Venezuela	E41	0.029%	3.268%	3.326%
Zaire	E43	4.700%	1.531%	1.938%
Zambia	E44	9.611%	0.000%	0.714%
Zimbabwe	E33	4.671%	1.406%	1.838%

TABLE 7b: EOp Aid/GDP Allocation

	Quartile 1	**Quartile 2**	**Quartile 3**	**Quartile 4**
Type 1	6.867%	5.212%	2.172%	0.869%
Type 2	4.136%	3.123%	2.110%	1.241%
Type 3	3.289%	2.213%	1.406%	0.827%
Type 4	3.268%	2.358%	1.531%	0.000%

TABLE 7c: Efficient Aid/GDP Allocation

	Quartile 1	**Quartile 2**	**Quartile 3**	**Quartile 4**
Type 1	6.203%	4.881%	2.450%	1.409%
Type 2	4.021%	3.211%	2.401%	1.706%
Type 3	3.343%	2.483%	1.838%	1.375%
Type 4	3.326%	2.599%	1.938%	0.714%

FIGURE 3a: Actual and EOp Aid Allocations (Total Aid = $29.2 billion)

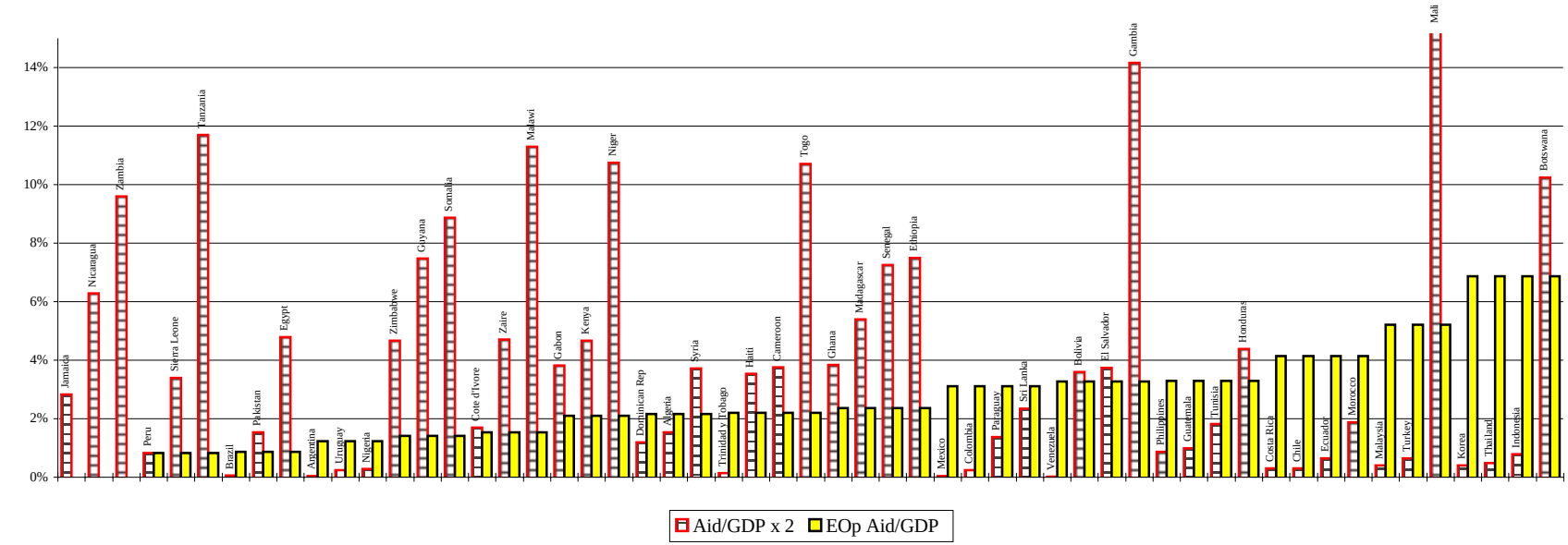

FIGURE 3b: Actual, EOp, and Efficient Aid Allocations (Total Aid = $29.2 billion)