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A Question of Consumption? An Analysis of the Relative Effectiveness of Multilateral and Bilateral Aid Receipts

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Over the past several decades, foreign aid has attracted a great deal of controversy both in the popular press and in academia. One important piece of this controversy has been the extraordinarily influential work by Craig Burnside and David Dollar (2000) (B&D). Their results have been hailed as evidence that, under the right conditions, aid can have a positive effect on GDP growth. As such, their results have been broadly cited as evidence supporting increasing flows of foreign aid through organizations like the World Bank.

In their paper, B&D address two, related questions. The first is whether or not aid has a positive effect on growth in a good policy environment and the second is if this good policy environment attracts foreign aid. Through the use of a policy index and interaction terms in their regression equations, B&D demonstrate that aid does have a significantly positive effect on GDP growth. In addition, they find that multilateral, as opposed to bilateral, aid is positively correlated with these good policies. As such, the resounding policy implication is that aid will be most effective in the presence of a good policy environment, and the most effective way to distribute this aid is through multilateral aid organizations. B&D even pose the hypothesis that the overall lack of correlation between aid and growth is the result of a glut of bilateral aid. Beyond the lack of a relationship between bilateral aid and good policies, they demonstrate that bilateral aid is prone to increased government consumption rather than investment.¹ While this conclusion is valid in light of the assumption that multilateral aid, if not used for consumption, is invested, and that this investment would encourage long-run GDP growth, they fail to directly support this claim. Rather, they rely on a number of assumptions to support their round-about reasoning.

To better test the relationship between multilateral aid and growth, it is also necessary to call into question another of Burnside and Dollar's assump-

¹It is important to note that there is not a single, unique method for determining what spending is included as government consumption

tions. The specification used by B&D combines multilateral and bilateral aid into one regressor—total aid. Implicitly, B&D assume that the coefficient on bilateral aid and the coefficient on multilateral aid are equal. While this assumption has been prominent throughout the aid/growth literature, it is not consistent with the underlying policy claim that one type of aid is fundamentally better than the other at producing GDP growth.

After reviewing the relevant literature and briefly reviewing the motivation, data, and model used for this research, I present results which directly contrast with this claim that multilateral aid is *ceteris paribus* more effective than bilateral aid at encouraging GDP growth. When B&D's model is altered to allow for separate values for the coefficients on multilateral and bilateral aid, it becomes apparent that not only does multilateral aid not outperform bilateral aid, but it actually has a negative effect on growth. While further research is needed to cement the implications of these results, they clearly show that this claim is not supported by the data presented by B&D.

It is important to make clear that my research's contribution is not to call into question B&D's general conclusions. Rather, this research specifically criticizes this secondary claim by demonstrating that not only is there evidence to reject the hypothesis that the coefficient on bilateral aid is less than the coefficient on multilateral aid, but also ample reason to doubt that multilateral aid has a positive effect on GDP per capita growth.

1 Related Literature

The literature on aid effectiveness has been described as a battlefield, with conflicting results and theoretical traps leading the conclusions of some of the best papers to be questioned (Fielding and Knowles 2007). A good sense of this conflict is demonstrated by Henrick Hansen and Fin Tarp (2000). They provide an overview of the evolution in the aid effectiveness literature since

the 1960s. In this review, Hansen and Tarp identify three phases in the development of the aid effectiveness literature. The first phase included the theoretical foundation and early empirics; the second primarily focused on the effect that aid has on investment; and the third is characterized by non-linear regressions of economic growth on aid. In the first two phases, authors were troubled by specification error and results difficult to interpret—as the theory would justify both negative and positive correlation between savings and aid as effective.

The most recent wave of the aid/growth literature draws its roots from the work of scholars like Craig Burnside and David Dollar (2000) and Peter Boone (1996). These studies utilize equations which incorporated a non-linear relationship between aid and growth. Despite the similarity, the conclusions of these two papers stand in opposition to each other.

Boone's research focused on the use of aid by different political/economic regimes. Boone distinguishes among three types of regimes (egalitarian, elitist, and laissez-faire) and attempts to identify how each of these regimes utilize the aid their countries receive. In his research, he finds no significant difference in the handling of aid and that this aid does not significantly increase either investment/growth or benefit the poor. His only caveat is that in liberal democracies, it appears that the poor have slightly greater access to social services, but this is not increased as a result of aid. No matter the regime, Boone finds that the vast majority of aid receipts end up being distributed for the benefit of the politically powerful within the developing countries.

Burnside and Dollars primary innovation is the inclusion of an aid interacted with policy variable in their regressions. B&D experiment with both quadratic and non-quadratic interaction terms. The main conclusion of their paper is that there is a significant, positive relationship between aid and growth (in a good policy environment). In addition, they found that

good policies are able to attract multilateral aid, but have little effect on bilateral aid.

The results shown by Burnside and Dollar sparked a renewed policy discussion and, as would be expected, a flurry of scholarly comments and critiques. A few articles are particularly relevant to this discussion. One example is the work by Carl-Johan Dalgaard, Henrik Hansen, and Finn Tarp (2002). These authors respond to both Boone and B&D. Dalgaard, Hansen, and Tarp conclude that, contrary to the results of Boone and B&D, aid does positively affect growth no matter the policy environment. By surveying a vast range of empirical literature, these three authors find problems with the models, specification, and conclusions of the few papers with results that indicate a negative relationship.

In their comment on the work of B&D, David Fielding and Stephen Knowles (2007) argue that there are serious theoretical concerns with the method being used in the modern aid effectiveness literature. They argue that the growth theory does not indicate a non-linear starting point for these models (as is incorporated through the $aid \times policy$ and $aid^2 \times policy$ variables). This is especially true of the $aid \times policy$ variable used by B&D which may simply derive its significant coefficient from other non-linearities within the observed relationship. Fielding and Knowles argue that if such non-linearities do exist, that the model should be able to use both aid as a proportion of GDP as well as aid per capita and produce consistent results.

William Easterly is one of the most adamant critics of the conclusions drawn from the work of B&D. The heart of Easterly's dissent is the almost immediate acceptance and implementation of B&D's results, without the benefit of further studies to test their robustness. In a response with Ross Levine and David Roodman (2004), Easterly demonstrates that in fact these results are not robust to variation in time. In yet another article, Easterly (2003) demonstrates that the B&D results are also contingent on their

specific definition of aid and policy. In addition to these two comments on sensitivity to time period, variations on aid definitions, there have been criticisms of the specification used by B&D (Collier and Dehn 2001). This sensitivity of results has been demonstrated across the aid/growth literature (Roodman 2007).

Burnside and Dollar have responded directly to Easterly, et. al's attack in Burnside and Dollar (2004a). In addition, they respond to a number of their other critics, as well as reassert their claim that aid has a positive effect on growth in a good policy environment (Burnside and Dollar 2004b).

While unnecessary to summarize here, it is also important to understand that a vast literature exists on this and related questions beyond those directly addressing the work by B&D. Specifically, work on the motivations and impact of multilateral donors (Reynaud and Vauday (2009), Harrigan, Wang, and El-Said (2006), Butkiewicz and Yanikkaya (2005), and Easterly (2005)) and bilateral donors (Fleck and Kilby (2010), Balla and Reinhardt (2008), Birdsall, Claessens, and Diwan (2003)) as well as comparisons between the two (Dollar and Levin 2006). The standard procedure for defining aid effectiveness in terms of GDP growth has been challenged by many as showing an incomplete picture as to the impacts that foreign aid has in the developing world (de Ree and Nillesen (2009), Dreher, Nunnenkamp, and Thiele (2008), Gomanee, Morrissey, Mosley, and Verschoor (2005), and Kosack (2003)). In addition, alternative variables have been argued to impact the ability for aid to impact growth within a country including level of colonization (Angeles and Neanidis 2009), aid predictability (Arellano, Bulir, Lane, and Lipschitz 2009), corruption (Rajkumar and Swaroop 2008), exogenous shocks (Raddatz 2007), and aid conditionality (Svensson 2003).

2 Motivation, Data, & Model

The driving force behind this paper is the belief indicated by B&D that their result of “no significant tendency for total aid or bilateral aid to favor good policy[and] that bilateral aid is strongly positively correlated with government consumption, may help to explain why the impact of foreign aid on growth is not more broadly positive” (Burnside and Dollar 864). The resulting policy proposal is that to encourage growth, more aid should be given multilaterally (based on good policies), rather than bilaterally. This is the conclusion that has, arguably, had the greatest impact on policy makers over the past decade.

Despite the already discussed problems of robustness, this claim is not even directly supported by B&D’s data. They base it on their results that bilateral aid is not only associated with greater consumption (not investment) but also is not correlated with good policies of the recipient country. Conversely, they find that good policies have a significant, positive correlation with multilateral aid in general, as well as aid which is given specifically by the World Bank

Both of the assumptions implicit to this argument—(1) that aid (at least the multilateral variety) leads to investment and (2) investment leads to growth—have been demonstrated to be highly questionable (Easterly 2001). Despite this, the basic model (built off of the financing gap theories popular in the mid-twentieth century) is what has continued to prevail in the policy world. It is precisely the lack of a clear, alternative explanation in academia that has allowed this approach to continue. The literature has not adequately addressed this question precisely because of the types of round about methods used by B&D which leave no room to challenge these assumptions.

While this paper is not the first to do so, one of the contributions is to further strengthen the rationale for distinguishing between the various

types of aid within the regression equation. This is especially the case when arguing that the motive, implementation, and effect of these various forms of foreign aid are dramatically different. This method of using regressors for each aid type has been shown to be technically sound (Ratti Ram 2003), and, as this paper will demonstrate, calls into question some of the basic assumptions that much of the aid literature is built on.

Despite this shared logical strand, my work is differentiated by remaining committed to the same basic specification as B&D. The only deviation in my model is the separation of the two aid regressors—multilateral and bilateral.

2.1 Data, Model, and Variables

To illustrate this point most clearly, I turn to the same set of panel data covering 56 middle- and low-income countries over six, four-year periods from 1970-1973 to 1990-1993 provided by Burnside and Dollar. In addition to their initial specification and sample, I will demonstrate that my results are robust to all of their various specifications including a sample restricted to low-income countries (46 countries using their definition of initial per capital GDP of \$1,000 or less) as well as the exclusion of outliers.

One of the implicit assumptions of not only the specification used in Burnside and Dollar (2000) but also the vast majority of the aid/growth literature is that the coefficients on the various types of aid are equal. To remedy this apparent misspecification, as well as directly test the claims made by B&D about the relative effectiveness of multilateral and bilateral aid, I have specified the following regression equation where i denotes the country and t the time period.

$$g_{it} = \alpha + \beta_1 Y_{it} + \beta_2 Maid_{it} + \beta_3 Baid_{it} + \beta_4 Policy_{it} + \beta_5 Maid \times Pol_{it} + \beta_6 Baid \times Pol_{it} + \mathbf{E}'_{it} \beta_7 + \beta_8 Region_i + \gamma_t + \epsilon_{it} \quad (1)$$

The primary independent variables of concern are the aid variables, multilateral aid ($Maid$) and bilateral aid ($Baid$), as well as the aid/policy in-

teraction terms $Maid \times Pol_{it}$ and $Baid \times Pol_{it}$. The aid variables consist of both outright grants and the grant portion of concessional loans made to recipient countries. These figures are used in standardized 1985 US dollars. The policy index (Pol) used by B&D was formed by running the growth regression in equation 1 excluding the aid terms and including three policy variables to determine the respective weights for these indicators: government budget balance, inflation rate, and the Sachs-Warner openness index (Sachs, et. al. 1995).²

To control for exogenous shocks that may affect growth, four variables are included by B&D in the vector of explanatory variables (\mathbf{E}). The first of these four variables is the International Country Risk Guide Economics (ICRGE) indicator as a proxy for institutional quality and security of property rights within a country. As a result of limited access, data from 1980 are used for each country based upon the assumption that institutions are slow to change. The second is an assassinations per capita variable to account for political instability within each country. The third is a ethno-linguistic fractionalization index created by Easterly and Levine (1997). This term, like the proxy for institutional quality, does not change with time and is included to reflect “long-term characteristics of countries that affect both policies and growth” (Burnside and Dollar 850). The final shock variable is M_2 divided by GDP and lagged one period as a proxy for financial institution development.³

In addition to these variables, the natural logarithm of initial GDP of the country (Y) and regional dummies ($Region$) are also included in the regression equation. Finally, γ_t denotes fixed time effects and ϵ_{it} is the random error term.

Beyond the added specification of aid type, equation 1 is identical to that

²For a more detailed discussion on the construction of the policy index see Burnside and Dollar (2000).

³These dummies are identical to those used in B&D’s specification.

used by B&D. The equation (1) is augmented, along with sample restrictions, to follow the series of specifications utilized by Burnside and Dollar in their original paper. I demonstrate that my results are robust to multiple specifications of this model.

It is important to emphasize at this point that the purpose of this research is to test the claims of B&D by using their own data set and only changing the aid variable in their regression equation. The remaining variables and techniques remain identical to those used by B&D in their own research.

2.2 Hypotheses and Method

My primary goal is to directly test the claim made by B&D that the lack of positive correlation between growth and total aid can be attributed to the lack of correlation or negative correlation between growth and bilateral aid. Their conclusion is based on two implicit assumptions which I test explicitly. The first is that the coefficient on multilateral aid should be positive ($\beta_2 > 0$) indicating the positive relationship between multilateral aid receipts and GDP growth and the coefficient on bilateral aid is not statistically different from zero ($\beta_3 = 0$). The second hypothesis tests B&D's claim that multilateral aid is more effective than bilateral aid at stimulating economic growth ($\beta_2 > \beta_3$).

While the endogeneity of aid may seem to be an issue, a number of studies have demonstrated that ordinary least-squared estimates (OLS) do not produce significantly different coefficients than estimates generated using simultaneous equation techniques including two-stage least squares. As a result of the series of papers which confirm this result (Burnside and Dollar (2000), Ram (2003) and Hansen and Tarp (2001)) this research has been limited to OLS regressions.⁴

⁴As is done by B&D, I use heteroskedasticity-consistent standard errors as proposed by White (1980).

Table 1: *Summary Statistics*

Variable Name	Mean	Median	Standard Deviation
Multilateral Aid	0.43	0.15	0.68
Bilateral Aid	1.00	0.58	1.10
Policy Index	1.16	0.94	1.16

3 Results

By using the same data and methodology as Burnside and Dollar, the results presented in Section 4.1 below demonstrate that the data do not support the claim that multilateral aid is more effective than bilateral aid at increasing GDP growth in low- and middle-income countries. After these results have been demonstrated to be robust to all of the various subsamples and specifications used by B&D, I examine implications of these results by identifying the marginal effect of multilateral aid on economic growth at several policy levels.

3.1 Differentiating Aid Types

The data provided by Burnside and Dollar do not support either of the hypotheses outlined in Section 3.2. As can be seen in *Table 2 (1)*, the initial results indicate the exact opposite. Using the standard regression equation 1, the coefficient on multilateral aid (β_2) is significantly negative and the coefficient on bilateral aid (β_3) is significantly positive. For comparison, I have reproduced and provide B&D's results along side my own.

This result is maintained when the quadratic interaction terms are added to the equation (as seen in *Table 2 (2)*). In this regression, β_2 is -0.92 while the coefficient on bilateral aid (β_3) is 0.44. Both of these results call into question Burnside and Dollar's conclusion that the positive correlation between aid and GDP growth was watered down by the roughly $\frac{2}{3}$ of total aid that was given bilaterally. It appears, from these results, that the positive

correlation between total aid and growth is actually being diminished by the presence of multilateral aid.

As can be seen in *Table 3*, these results are robust to a limited sample size of low-income countries. In all of these regressions, the coefficient on multilateral aid remains negative and the coefficient on bilateral aid is positive. Also, for every regression except for (3), these results are statistically significant. In addition, *Table 4* demonstrates that these results are even robust to the removal of five outlying observations.⁵ Regressions (5) and (6) have excluded outlying observations, while (7) and (8) also exclude middle-income countries. In all specifications the coefficient on multilateral aid remains significantly negative, while the sign on bilateral aid is positive (and significant in the regression which includes both low and middle-income countries).

To be sure that the inclusion of two different regressors for aid is appropriate, I ran an F-test to gauge for statistical equality. I find that in every instance there is reason to doubt that the two coefficients are statistically identical. In almost all instances, the F-test indicates significant reason to reject the hypothesis that the coefficient on multilateral aid is equal to the coefficient on bilateral aid.⁶

3.2 Policy Levels

While the results presented in the previous section provide a fairly compelling case that, on average, multilateral aid has a directly negative impact on GDP growth in the recipient country, this section will provide greater insight into how the interaction between policy and multilateral aid affects the growth prospects for a receiving country. B&D's central thesis emphasises the importance of what they define as 'good' policies in determining

⁵The following outlying observations identified by B&D are excluded in regressions 5-8: Gambia (1986-89), (1990-93), Guyana (1990-93), Nicaragua (1986-89), and (1990-93)

⁶The results for regression 8 indicate likely difference, but are not statistically significant

Table 2: The Impact of Differentiated Aid Variables

$$g_{it} = \alpha + \beta_1 Y_{it} + \beta_2 Maid_{it} + \beta_3 Baid_{it} + \beta_4 Policy_{it} + \beta_5 Maid \times Pol_{it} + \beta_6 Baid \times Pol_{it} + \mathbf{E}'_{it} \beta_7 + \beta_8 Region_i + \beta_9 Maid^2 \times Pol_{it} + \beta_{10} Baid^2 \times Pol_{it} + \gamma_t + \epsilon_{it}$$

Variable Name	(1)		(2)	
	B&D	-Author-	B&D	-Author-
Initial GDP	-0.60 (0.57)	-0.73 (0.57)	-0.56 (0.56)	-0.83 (0.57)
Ethnic fractionalization	-0.42 (0.72)	-0.48 (0.74)	-0.42 (0.73)	-0.54 (0.74)
Assassinations	-0.45* (0.26)	-0.49* (.27)	-0.45* (0.26)	-0.50* (0.27)
Ethnic fractionalization x Assassinations	0.79* (0.44)	0.87** (0.45)	0.80* (0.44)	0.90** (0.45)
Institutional Quality	0.69** (0.17)	0.67** (0.18)	0.67** (0.17)	0.71** (0.18)
M2/GDP (Lagged)	0.012 (0.014)	0.013 (0.015)	0.016 (0.014)	0.003 (0.015)
Sub-Saharan Africa	-1.87** (0.75)	-1.82** (0.76)	-1.84** (0.74)	-1.81** (0.77)
East Asia	1.31** (0.58)	1.05* (0.60)	1.20** (0.58)	1.10* (0.60)
Policy Index	0.71** (0.19)	0.88** (0.20)	0.78** (0.20)	0.80** (0.21)
Aid/GDP	-0.021 (0.16)		0.49 (0.12)	
(Aid/GDP) x Policy	0.19** (0.07)		0.20** (0.09)	
(Aid/GDP) ² x Policy			-0.019** (0.0084)	
MAid/GDP		-0.80* (0.41)		-0.92** (0.41)
(MAid/GDP) x Policy		0.11 (0.23)		-0.46 (0.38)
BAid/GDP		0.42* (0.23)		0.44** (0.22)
(BAid/GDP) x Policy		0.05 (0.10)		0.39** (0.20)
(MAid/GDP) ² x Policy				0.08* (0.05)
(BAid/GDP) ² x Policy				-0.04 (0.03)
Observations	270	275	275	275
R ²	0.36	0.41	0.36	0.41

Statistical Significance: **=.05 and *=.10

The number of observations in the two results shown in (1) differ because B&D exclude five outlying observations. These same observations are excluded in Table 4 (5). Results correspond to B&D (2000) Table 4

Table 3: *Low-Income Country Subsample*

$$g_{it} = \alpha + \beta_1 Y_{it} + \beta_2 Maid_{it} + \beta_3 Baid_{it} + \beta_4 Policy_{it} + \beta_5 Maid \times Pol_{it} + \beta_6 Baid \times Pol_{it} + \mathbf{E}'_{it} \beta_7 + \beta_8 Region_i + \beta_9 Maid^2 \times Pol_{it} + \beta_{10} Baid^2 \times Pol_{it} + \gamma_t + \epsilon_{it}$$

Variable Name	(3)		(4)	
	B&D	-Author-	B&D	-Author-
Initial GDP	-0.72 (0.81)	-0.93 (0.84)	-0.60 (0.79)	-0.97 (0.85)
Ethnic fractionalization	-0.58 (0.80)	-0.79 (0.84)	-0.56 (0.80)	-0.83 (0.85)
Assassinations	-0.79* (0.44)	-0.88** (0.45)	-0.84* (0.43)	-0.94** (0.42)
Ethnic fractionalization x Assassinations	0.69 (0.91)	1.08 (0.92)	0.88 (0.90)	1.05 (0.92)
Institutional Quality	0.84** (0.20)	0.75** (0.21)	0.80** (0.20)	0.82** (0.21)
M2/GDP (Lagged)	0.024 (0.017)	0.03* (0.02)	0.031* (0.017)	0.02 (0.02)
Sub-Saharan Africa	-2.24** (0.67)	-2.02** (0.69)	-2.20** (0.67)	-2.13** (0.70)
East Asia	1.54** (0.67)	0.86 (0.71)	1.33* (0.71)	1.20 (0.78)
Policy Index	0.56* (0.31)	1.06** (0.33)	0.74** (0.35)	0.76* (0.40)
Aid/GDP	-0.18 (0.17)		-0.013 (0.13)	
(Aid/GDP) x Policy	0.26** (0.08)		0.27** (0.12)	
(Aid/GDP) ² x Policy			-0.024** (0.0093)	
MAid/GDP		-0.62 (0.43)		-0.78* (0.43)
(MAid/GDP) x Policy		0.07 (0.22)		-0.29 (0.37)
BAid/GDP		0.26 (0.23)		0.25 (0.21)
(BAid/GDP) x Policy		0.035 (0.11)		0.51** (0.22)
(MAid/GDP) ² x Policy				0.06 (0.04)
(BAid/GDP) ² x Policy				-0.07** (0.03)
Observations	189	189	189	189
R ²	0.42	0.47	0.42	0.48

Statistical Significance: **=.05 and *=.10
 Results correspond to B&D (2000) Table 5

Table 4: *Excluding Outliers*

$$g_{it} = \alpha + \beta_1 Y_{it} + \beta_2 Maid_{it} + \beta_3 Baid_{it} + \beta_4 Policy_{it} + \beta_5 Maid \times Pol_{it} + \beta_6 Baid \times Pol_{it} + E'_{it} \beta_7 + \beta_8 Region_i + \beta_9 Maid^2 \times Pol_{it} + \beta_{10} Baid^2 \times Pol_{it} + \gamma_t + \epsilon_{it}$$

Variable Name	(5)	(6)	(7)	(8)
Initial GDP	-0.78 (0.57)	-0.98 (0.57)	-0.91 (0.86)	-1.21 (0.85)
Ethnic fractionalization	-0.44 (0.74)	-0.57 (0.72)	-0.68 (0.83)	-0.87 (0.81)
Assassinations	-0.50* (0.27)	-0.52** (0.27)	-0.91** (0.42)	-0.81* (0.45)
Ethnic fractionalization x Assassinations	0.89** (0.44)	0.92** (0.44)	0.90 (0.93)	0.90 (0.91)
Institutional Quality	0.75** (0.17)	0.67** (0.17)	0.86** (0.21)	0.78** (0.21)
M2/GDP (Lagged)	0.002 (0.01)	0.0002 (0.01)	0.017 (0.02)	0.016 (0.02)
Sub-Saharan Africa	-2.05** (0.77)	-1.88** (0.75)	-2.37** (0.70)	-2.20** (0.69)
East Asia	1.34** (0.60)	1.02** (0.58)	1.60** (0.72)	0.90 (0.74)
Policy Index	0.69** (0.19)	0.98** (0.21)	0.56** (0.32)	1.05** (0.39)
MAid/GDP	-1.34** (0.41)	-1.86** (0.50)	-1.16** (0.41)	-1.53** (0.50)
(MAid/GDP) x Policy	0.41* (0.23)	0.12 (0.40)	0.50* (0.27)	0.27 (0.44)
BAid/GDP	0.68** (0.30)	0.75** (0.30)	0.37 (0.30)	0.45 (0.30)
(BAid/GDP) x Policy	0.06 (0.12)	-0.65** (0.33)	0.14 (0.13)	-0.61 (0.44)
(MAid/GDP) ² x Policy		0.22 (0.14)		0.16 (0.14)
(BAid/GDP) ² x Policy		0.18** (0.06)		0.17** (0.08)
Observations	270	270	184	184
R ²	0.41	0.43	0.49	0.50

Statistical Significance: **=.05 and *=.10

Table 5: *Impact of Multilateral Aid on Growth with Given Policy*

Regression Equation	Policy = 1.2	Policy = 2.4	Minimum Policy for Positive Relationship
(1) Full Sample	-0.67	-0.54	7.27
(3) Low-Income	-0.54	-0.46	8.86
(5) Outliers Excluded	-0.85	-0.36	3.27
(7) Low-Income Outliers Excluded	-0.56	0.05	2.32

not only the effectiveness of aid, but also the distribution of aid. They find that multilateral aid is more likely to be distributed to countries with good policies, while bilateral aid is not. This is just one of the pieces of evidence they invoke in order to make their claim that multilateral aid is better at spurring growth than bilateral aid.

While B&D's policy index does make it somewhat difficult to assess what the policy requirements are for aid to be effective, they define one standard deviation above the mean (a policy index of 2.4) as the threshold for a 'good' policy level. With this in mind, *Table 5* gives further context to the earlier regression results demonstrating the marginal effect of multilateral aid at the average level of policy (see *Table 1* for summary statistics), at the threshold for a 'good' policy environment, as well as what level of policy would be necessary for multilateral aid to have a positive effect on GDP growth. These results demonstrate the practical significance of the negative coefficient on multilateral aid in all eight regressions. The median value for policy in this data set is 0.94 with a maximum value of 3.61. It is clear that in almost every case, the multilateral aid included in this data set has a negative effect on GDP growth.

4 Conclusions

These results demonstrate that the data used by B&D do not support all of their claims. The inclusion of differentiated aid regressors reveals that multilateral aid is not only less effective, but also has a negative direct effect on GDP growth. These results are robust to both the exclusion of outliers as well as a limited, low-income subsample.

While further research is necessary to provide a solid explanation as to why these results exist, there are several possibilities. One possibility posed by Easterly (2003) is that there is a fundamental flaw in the assumptions on which the growth models are built. This is plausible, but would require a much more thorough investigation into the nature of economic growth in developing economies. A second possibility is that multilateral aid is effective over a longer period of time. While this hypothesis provides a foundation for future research, the data set used for this paper already accounts for potential lags by averaging growth over four-year periods. A third, connected explanation is that the policy changes that are enforced by multilateral aid agencies actually constrict growth in the short to medium-term. This explanation seems best supported by the negative coefficient on multilateral aid and the positive coefficient on the interaction term (*multilateral* \times *policy*). In a country with already ‘good’ policies, there are less severe contingencies placed on the multilateral aid.

While there are a number of possible explanations for these results, there is one clear conclusion that can be drawn—these results do not support the claim made by Burnside and Dollar (2000) that multilateral aid is more effective at producing GDP growth than bilateral aid. From these results, bilateral aid, despite its connection with increased consumption, appears to be the most effective of the two forms of aid at producing GDP growth in the short- to medium-term.

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