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Christina Bjerg, Christian Bjørnskov and Anne Holm

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Department of Economics

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Growth, Debt Burdens and Alleviating Effects of Foreign Aid in Least Developed Countries

Christina Bjerg, Christian Bjørnskov* and Anne Holm

Abstract: In this paper, we explore the potential growth effects of foreign aid when in conjunction with severe debt problems. We first argue that aid, when used to finance debt repayments, does not lead to Dutch Disease while still alleviating an economic problem. A set of empirical estimates show that while inflows of foreign aid in general are not associated with growth in a sample of 38 Least Developed Countries, an interaction term with the level of external debt is significant. We take this as suggestive evidence of an alleviating effect of aid in these countries and offer some tentative thoughts on the implications for future aid policies.

Keywords: Economic growth, foreign aid, external debt

JEL codes: O40, F34, F35

* Corresponding author: Department of Economics, Aarhus School of Business, Prismet, Silkeborgvej 2, DK-8000 Aarhus C, Denmark. Phone: +45 89 48 61 81; e-mail: ChBj@asb.dk. This work originally arose as part of Bjerg and Holm's undergraduate thesis, which was supervised by Bjørnskov. We are grateful for comments from Martin Paldam, Kim Sønderskov and participants at the 2007 Danish Public Choice workshop. The usual disclaimer naturally applies.

1. Introduction

One of the most severe problems in the world is the widespread poverty in developing countries. While the Western world has grown remarkable affluent and a number of South East Asian countries have followed suit in recent years, large parts of the world's population do not share the wealth. Consequently, one of the major questions in economics is how to foster development in developing countries, in particular since the depth of the problem calls for urgent measures. Developed countries have therefore in post-war years provided foreign aid to these countries as a means to further economic development on the assumption that this aid would be used to finance investments and the provision of vital public goods and infrastructure. Consensus in economics and political discussions was for a long time that this was a fair and efficient way of helping developing countries, despite early criticism of e.g. Friedman (1958) and Bauer (1971) that foreign aid could have such adverse economic and political consequences as to negate any beneficial effects. At the time, these arguments were broadly dismissed as extremist conservative and libertarian ramblings.

However, in the mid-1980s, one of the first large-scale empirical studies showed that the data seemed to support Bauer's most unpopular hypothesis (Mosley et al., 1987). Since then, most studies have shown that foreign aid is not robustly associated with economic growth rates as the beneficial effects are either counteracted by adverse political and economic effects or do not arise when foreign aid is used to finance idle government consumption (cf. Boone, 1996; Remmer, 2004). While certain studies have argued that foreign aid works regardless of the conditions (Hansen and Tarp, 2000), other studies argue for a significantly negative effect (Ovaska, 2003). Yet, by applying

meta-analytical tools Doucougliagos and Paldam (2006, in press) summarize the findings of the entire aid effectiveness literature by showing that foreign aid is associated with neither growth nor increasing investment rates.

The international community nevertheless continues to rely on foreign aid as its primary means of advancing development in the Third World. Most recently, the United Nations Millennium Development Goals, that include a number of aspects such as economic growth, poverty alleviation, schooling, gender equality, and governance, are meant to be achieved primarily by means of providing foreign aid to poor countries' governments. Existing economic research nevertheless gives only limited reason to believe that these worthy goals can be reached through simply disbursing more resources to developing countries.

Instead, in recent years the focus of the aid effectiveness literature has shifted towards exploring economic, institutional or political conditions under which foreign aid can have beneficial effects. Within this strand of the literature different studies argue for the necessity of having sound macroeconomic policies (Burnside and Dollar, 2000), a functioning democracy (Svensson, 1999), good governance (Burnside and Dollar, 2004) and socio-economic stability (Chauvet, 2001). This paper extends the conditionality literature by exploring the conditional effects of debt burdens in least developed countries, which theoretically could be alleviated by inflows of foreign aid without the country experiencing some of the adverse effects of this aid. We restrict our attention to a sample of Least Developed Countries (LDCs) as these countries both experience the relatively worst problems and for technical reasons provide potentially more clear-cut results of our main hypothesis.

The rest of the paper is structured as follows. Section 2 outlines a simple theoretical explanation for the potential effects of foreign aid. Section 3 describes the data used in section 4 that presents the empirical evidence. Section 5 discusses the findings while section 6 concludes.

2. Theory

To illustrate the potential interaction between foreign aid and external debt, we devote this section to describing a small macroeconomic growth model. Our model includes the phenomenon of Dutch Disease (cf. Corden, 1984, Rajan and Subramanian, 2005). The model structure is illustrated in Figure 1. It should be stressed that for clarity, we keep the structure and the argument as simple as possible.

Insert Figure 1 about here

As a first possibility, foreign aid may be used as originally intended to finance productive investments although the extent to which this occurs is disputed. Since Friedman's (1958) suggestion that foreign aid may be used to finance idle government consumption when aid enters the government budget constraint and is thus fungible, a number of studies have shown that a substantial part of foreign aid given to developing countries in general tends to finance government consumption instead of investments (cf. Boone, 1996, Remmer, 2004). Overall, the metaanalysis in Doucougliagos and Paldam (2006) sums up the empirical literature on the aid-investment association by concluding that increasing inflows of foreign aid in general do not lead to increased investment rates. However, it remains uncertain whether this conclusion also holds for

LDCs that are arguably more severely budgetary constrained. It therefore remains an open question how effective aid is in this particular sphere of the economy in the group of countries considered in this paper. To the extent that aid actually results in productive investments, it will tend to be positively associated with economic growth through this link.

An accompanying possibility is depicted in the lower flows of Figure 1. One of the problems of foreign aid disbursements is that they need to be exchanged before being used in the economy of a developing country. As such, increased aid inflows have the effect of increasing the demand for the local currency, which in a country with a floating exchange rate regime will result in an appreciation. In countries with fixed exchange rate regimes, the exchange rate will in general be defended by increasing the supply of local currency, which in the longer run tends to lead to inflation, all other things being equal. In both cases, the international competitiveness of the country therefore suffers and tends to result in a relatively smaller export sector and a possible balance of payments problem (cf. Corden, 1984). Rajan and Subramanian (2005) presents concrete evidence of this effect, known as Dutch Disease, arguing that it may provide an important part of the explanation for the absence of growth effects of foreign aid in most empirical studies.

As the final possibility to be particularly stressed in this paper, inflows of foreign aid may alternatively be used by governments to meet interest payments or cover part of the principal of their external debt. Many developing countries suffer from rather heavy debt burdens, which theoretically both limits governments' ability to invest in productive public capital such as infrastructure and public institutions, may place a heavier tax burden on domestic firms to finance debt payments and thus drive some

economic activity underground, and potentially also harm exporters' reputation to the extent that the debt burden lowers the international credit ratings of the country. Given the extent to which foreign aid is used to finance debt payments, it arguably alleviates the negative growth effects of having a heavy debt burden.

However, in the context of using aid to finance the repayment of external debt, an additional complication is worth mentioning, which is the crux of the argument to be tested in this paper: external debt is most often denoted in US dollars or Euros. Any part of the inflow of foreign aid devoted to debt repayment in the end only temporarily enters the currency reserve of the country, but *is not exchanged* as it is necessary to use the foreign currency for debt repayment purposes. Logically, this means that only the part of aid inflows actually entering the economy can induce Dutch Disease while the part used to repay debts is free from this negative side effect of aid.

This possibility comes out of simple national accounting as in Equation 1.¹ The equation states that the inflows of currency from goods and capital, exports x and amount of foreign aid entering the country θa , has to equal the outflows of currency as imports m at import prices p^* and debt instalments $erd + (1 - \theta)a$, if the reserves of foreign currency are held constant. In the absence of sufficient flows of private capital, which seems a reasonable assumption in the present context of LDCs, this necessarily holds in the medium-to-long run. The mechanism for equating inflows and outflows is the exchange rate, e , thereby opening up for the possibility of Dutch Disease, as inflows of foreign aid a lead to an excess demand for the domestic currency and thus an appreciation.

¹ This is, of course, assuming that there is no net inflow of foreign direct investments, an assumption that seems reasonable given that the empirical evidence in the following comes from a sample of LDCs.

$$x_t + \theta a_t + e(d_t - d_{t-1}) = ep^* m_t + erd_t + (1 - \theta)a_t \quad (1)$$

This leaves the slightly absurd theoretical possibility to be tested in this paper: that foreign aid only has positive growth effects to the extent that it is used to alleviate external problems and thus does not enter the economy. In other words, it is possible that aid could have positive growth effects when it is used contrary to its intended purpose. For a developing country with no or only little external debt, foreign aid inflows would result fully in Dutch Disease problems and thus lead to an ambiguous relation with economic growth. In developing countries with high levels of external debt, on the other hand, foreign aid would provide much-needed foreign currency to meet debt payments. In the latter situation, a substantial part of the aid would therefore not enter the economy, leaving less severe Dutch Disease and alleviating debt problems, and thereby making a positive growth-aid association more likely. The specific hypothesis to be tested in the following is therefore:

Hypothesis: The association between foreign aid inflows and economic growth rates depends positively on the country's level of external debt.

3. Data

To be able to test this proposition, we employ data from different sources. The data to be employed in the next section all derive from the Center for Global Development database (CGD, 2006), the Penn World Tables Mark 6.1 (Heston et al., 2002) and the World Bank's (2005) World Development Indicators database. Our dependent variable in the following set of Barro-type regressions is the average annual growth rate across

each five-year period between 1960 and 2000 for which full data are available. To explain these growth rates, we employ a fairly simple baseline specification including the logarithm to initial GDP per capita in PPP-adjusted US dollars, the investment rate as percent of GDP and government consumption as percent of GDP, all from the Penn World Tables. In a set of investment regressions, we also include openness to trade and the relative investment price (capital goods prices as a ratio of the overall price level) from the same source. The specifications also include our variables of interest, foreign aid as percent of GDP, taken from the Center for Global Development database, and the external debt as percent of GDP, taken from World Development Indicators and averaged across each five-year period, as well as period fixed effects to account for global business cycles. In half of the regressions below, we also include an interaction term between aid and external debt, based on the centred values of the variables. As such, the size and significance of the interaction term is evaluated around the sample mean (cf. Brambor et al., 2006). Table 1 gives descriptive statistics of the data; all countries included are reported in the appendix.

Insert Table 1 about here

We estimate Barro-type regressions using generalized least squares with country fixed effects as Hausmann tests strongly favour fixed over random effects.² We present results in two different samples. First, we use the largest possible sample for which

² Using the full sample and specification, the Hausmann test statistics of the growth regression and investment regression are $\text{Chi}^2 = 19.12$ ($p < .004$), and $\text{Chi}^2 = 24.92$ ($p < .009$), respectively. Without the interaction term between aid and debt, the test is marginally stronger for the investment regression and somewhat stronger for the growth regression.

there are full data, consisting of 199 observations from 38 of the 49 countries currently categorized as LDCs. As noted above, we restrict our attention to LDCs as these countries both have large debt problems as well as very limited inflows of foreign direct investments. However, the possibility exists that these results may be biased as countries may tend to enter international datasets after periods of relatively good performance, which could bias coefficients on both foreign aid and external debts upwards.³ Second, by restricting the sample to those countries for which there are data for at least half of the period 1960-2000, an alternative sample comes to consist of 156 observations from 27 countries. We also run separate analyses excluding either the top performers or bottom performers at any time in the LDC group.

4. Empirical results

Before turning to the formal empirical results, it can be informative to look at some simple statistics. First, the data from the 38 LDCs show the same picture as the overall data from developing countries, as the simple correlation between economic growth and foreign aid is far from being significant at $-.02$. On the other hand, the correlation between growth and the ratio of external debt to GDP is $-.13$ and significant at $p < .10$. At first sight, then, it would seem that the raw data indicates that outflows of interest payments on debt could be more important than inflows of foreign aid. Whether this is the case is further explored in Table 2 that reports the results of estimating growth rates for the LDCs.

³ That this is not merely a potential problem within this sample is indicated by some simple sample statistics. In the first period that countries enter, the sample average growth rate is $.64$ percent while in the following period, average growth is $-.71$ percent and $-.10$ on average for all subsequent periods.

Insert Table 2 about here

First, the table throughout shows a strong conditional convergence as the initial GDP per capita exerts a strongly negative effect. As is to be expected, the investment rate also remains significant and with a considerable effect although this appears mainly to be the influence of a number of well-performing countries. When those observations are excluded, the overall investment rate is not significant (columns 7 and 8), consistent with the findings in Easterly (1999). As the last of the control variables, government consumption is only significant in one case but has a positive sign in all but one case.

Turning to the variables of interest in this paper, odd-numbered columns report the results of the baseline specification while even-numbered columns add an interaction between foreign aid and debt. The results rather clearly show that having a debt burden significantly lowers the growth rate. Foreign aid, on the other hand, does not exert any robust effect on its own. Even though it is significant in three out of the four odd-numbered columns, excluding the worst performing countries (column 5) in a group of LDCs that are already characterized by having slow or no economic development indicates that the beneficial effects of aid per se only pertain in truly deep crisis.

However, when adding an interaction term in the even-numbered columns of Table 2, the picture changes somewhat. The interaction term between foreign aid and external debt is individually significant in all but one case, and aid and the interaction term are strongly jointly significant in all cases (cf. the bottom line of the table). Moreover, the interaction term is substantially larger in the sample that restricts countries to have at least four observations and thereby minimizes the potential problem

of spurious effects when countries enter the sample. This set of estimates, which is arguably the most reliable, points to a rather considerable growth suppressing effect of debt burdens in LDCs. This effect is roughly halved if the inflow of foreign aid increases by 30 percentage points. For the typical country in the sample, this would nevertheless imply that aid would have to be tripled. As such, the table both shows considerable support for the theoretical conjecture in this paper as well as indicating that the alleviating effects should not be overstated.⁴ We return to discussing this point later.

Insert Table 3 about here

Table 3 instead explores whether there also is an interaction effect on the investment rate. To explain the investment rate, we include a baseline specification consisting of the logarithm to initial GDP per capita and the government consumption, which both were part of the baseline model in the growth regression in table 2. Further we expand the basic regression by including the openness to trade and the real investment price, which must necessarily be considered an important determinant of the investment rate.

⁴ With respect to the estimates in Table 2, it is often the case that the inclusion of government consumption in growth specifications has a tendency to bias aid coefficients upwards, as the positive effects of aid on consumption are controlled for. Yet, a series of additional regressions without government consumption reveals that this is not a serious concern in the present sample of LDCs. In the full sample, the coefficient on the interaction term is somewhat reduced but remains significant at $p < .10$ while the sample in columns 3-4 shows no significant difference with and without government consumption. As such, our conjecture in section 2 that fungibility may not be an important issue in LDCs receives some support.

First, economic development as measured by GDP per capita shows a significant and positive association with the investment rate in three out of four odd-numbered columns. Yet, this association becomes insignificant when the analysis is limited to only countries with investment figures for at least four periods. The variables for openness to trade and government consumption both enter the regression with significant and positive coefficients, implying that openness affects the investment rate positively as is the standard conclusion (cf. Levine and Renelt, 1992), while the government consumption most likely picks up the fact captured in the theoretical model of this paper, that public investments constitute a substantial share of total investments in many LDCs. On the other hand, the real investment price not surprisingly affects the investment rate in the opposite direction, having a rather large negative and significant coefficient in all regressions.

Turning to the variables of interest in this paper, the table shows that neither the debt burden nor inflows of foreign aid significantly affect the investment rate as they are insignificant in all odd-numbered columns. Adding the interaction term between foreign aid and the debt burden in the even-numbered columns does not imply that the two interesting variables turning significant, but they switch sign to becoming negatively insignificant. The interaction term, on the other hand, enters the regressions with significant positive coefficients in three out of four regressions, meaning that foreign aid in conjunction with large debt burdens has a positive impact on the investment rate. The only deviation from this conclusion is that the interaction term, like GDP, turns insignificant when the regression only contains the countries with investment figures for at least four periods. However, the inclusion of debt, aid and the interaction term are jointly significant in all four regressions.

Overall, a comparison of the point estimates thus indicates that the most effective way of raising the growth rate of the LDCs in this sample is to increase trade volumes, i.e. to liberalize trade policy. A one standard deviation shock to openness produces an increase in the investment rate of roughly 56 percent of a standard deviation, which in turn raises the growth rate by approximately a fourth of a standard deviation. As such, the sizes of the marginal effects are fairly standard. For equivalent changes, no other variable has comparable effects. The estimates nevertheless also reveal an alleviating effect of foreign aid given to heavily indebted countries, which we discuss in the next section.

5. Discussion

Many developing countries today face the consequences of past debt accumulated over decades through the burden of persistently high interest payments. This burden, it is often argued, prevents poor countries from making potentially beneficial public investments with a longer time perspective. Instead, countries' scarce public resources flow back to developed countries and global financial institutions in the form of interest payments.

In the situation when foreign aid is given to heavily indebted countries, part of the amounts actually never cross the borders but is sent more or less directly back to international lenders. The result of this limited cash inflow to the developing countries is that Dutch Disease problems never become an important topic, because there is no real currency transfer. Thus, no appreciation of the real exchange rate occurs, and no off-putting macroeconomic effects arise from this particular share of the development aid. All other things being equal, development aid can therefore indirectly affect the

growth performance of LDCs by buying them financial leeway even if inflows of aid could potentially also cause governments to postpone taking action to reduce the debt or the financial problems causing the debt.⁵ Yet, we need to emphasize that our estimates do not provide information on whether increasing aid can cause governments to ignore debt problems or even cause countries to take up new loans, thus prolonging their debt problems (cf. Easterly, 2002).

On the other hand, one can imagine a number of additional beneficial effects that more likely occur in the longer run. When, for example, LDCs experience lower external debt due to the cancellation of debt from Western countries or their own efforts at reducing their external debt, the country credit ratings might be re-evaluated on the basis of the debt reduction, given that the lower debt levels are taken to be a signal of lower risk. For this to happen, it is nevertheless necessary that international creditors gain some credible assurance that the political and institutional failures leading to the debt in the first place have been or will be corrected in the near future, which need not be the case (Easterly, 2002). Yet, if this happens, the newly gained confidence in the particular developing country may attract attention from foreign investors who will be willing to invest in the country. Placing investments in property, plants, equipment, participation in joint ventures and other FDI activities will probably strengthen the economy in the long run due to inflows of not only capital but technology and

⁵ In a series of additional fixed effects estimates, we find that the trend in real exchange rates as given by the Penn World Tables depend on the initial level, i.e. persistent trends as would be caused by high inflation rates (coefficient 10.711; standard error .728), the initial debt level (12.986; 10.866), initial foreign aid (-34.307; 40.106) and an interaction term (-.297; .119). These simple estimates therefore provide tentative support for our conjecture in equation 1 that aid inflows to highly indebted countries can counteract Dutch Disease.

management science as well. As it is today, a virtually negligible share of worldwide FDI goes to LDCs, potentially preventing highly beneficial technology transfers.

The bottom line of the recent literature on aid effectiveness is that foreign aid is not associated with growth in general, but may be so under specific conditions, which the literature explores. The present findings can be taken to illustrate how inflows of aid may serve to alleviate other problems limiting the growth performance of LDCs. Most of the literature has investigated theoretically valid conditions under which aid works as intended. However, the present findings reveal that foreign aid can have beneficial growth effects when used *against* the stated intentions. Indeed, the set of simple theoretical considerations indicate that the positive growth effects of aid in LDCs occur when it is used to alleviate debt problems and thereby does not enter the economy. As such, inflows of foreign aid will be deemed a failure if donors attempt to evaluate the volume of the intended project output in a given country, but can paradoxically have beneficial effects above the project level precisely when aid is not used according to donor intentions. This and other apparent inconsistencies should probably be reconsidered in other studies on the elusive growth-aid nexus.

6. Conclusions

This paper has explored whether foreign aid can alleviate the detrimental effects of large debt burdens in least developed countries. Based on the existing literature, we first argue that part of the potentially positive effects of foreign aid may be undermined by Dutch Disease – when inflows of foreign aid cause the international competitiveness of developing countries to deteriorate. However, we note that when aid disbursements are used to repay external debt, it serves not only to alleviate the growth-depressing effects

of heavy debt burdens but also circumvents the problem of Dutch Disease as the inflows are not exchanged to a local currency and thus do not 'enter' the domestic economy. This leads to the theoretical possibility that foreign aid is stronger associated with economic growth when the recipient country suffers from an external debt burden.

We test this proposition in panel data from up to 38 Least Developed Countries. A series of fixed effects estimates show that inflows of foreign aid indeed tend to alleviate the strongly detrimental effect of heavy debt burdens, a finding that is robust to excluding relevant subgroups of observations. We also report supplementary evidence that foreign aid is also associated with higher investment rates when debt burdens are sufficiently heavy, a finding that is equally robust.

Our results should in no way be taken as conclusive of this question. Instead, we simply point towards a hitherto uncharted possibility in the growing literature on conditional aid effects for which we provide a simple, theoretically consistent explanation. However, our findings hold potentially important implications for, for example, future aid policies as well as the current popular drive towards the cancellation of Third World debts.

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Table 1. Descriptive statistics

	Mean	Minimum	Maximum	Std. deviation	Observations
Growth rate	.062	-11.925	22.934	3.905	199
Log GDP per capita (GDP per capita)	6.968 (1167.9)	5.774 (321.8)	8.285 (3965.2)	.429 (558.8)	199
Investment rate	8.753	1.027	50.208	7.356	199
Government consumption	27.605	3.453	150.711	16.091	199
External debt	77.175	.335	616.509	78.947	199
Foreign aid	14.972	.940	113.821	14.654	199
Openness	65.380	3.462	281.177	43.097	199
Real investment price	2.500	1.062	6.432	1.065	189

Note: 8 % of the observations are from Asia, the remaining 82% are from Sub-Saharan Africa.

Table 2. Aid, debt and economic growth

	Full sample		Minimum four periods		No poor performance		No good performance	
	1	2	3	4	5	6	7	8
Log GDP per capita	-625.745*** (128.739)	-715.502*** (132.115)	-651.199*** (147.834)	-801.623*** (158.077)	-484.049*** (122.917)	-531.051*** (123.283)	-258.923** (125.869)	-319.083** (139.193)
Investment rate	19.977*** (4.839)	16.776*** (4.946)	22.664*** (5.991)	18.228*** (6.162)	15.799*** (4.048)	13.285*** (4.166)	7.411 (4.848)	6.833 (4.881)
Government consumption	2.309 (2.852)	5.024* (3.026)	2.447 (4.423)	3.506 (4.361)	-.917 (2.475)	1.003 (2.604)	2.976 (2.418)	4.045 (2.638)
External debt	-3.452*** (.866)	-4.819*** (1.025)	-3.127*** (1.037)	-5.698*** (1.481)	-2.923*** (.822)	-4.096*** (.979)	-2.073*** (.783)	-2.771*** (1.003)
Foreign aid	12.484*** (4.372)	7.477 (4.781)	9.334* (5.549)	4.087 (5.869)	4.179 (4.208)	.316 (4.532)	8.739** (3.867)	6.744 (4.339)
Debt*aid		.033** (.014)		.091** (.038)		.025** (.012)		.013 (.013)
Observations	199	199	156	156	179	179	178	178
Countries	38	38	27	27	38	38	36	36
R squared between	.049	.025	.284	.286	.019	.006	.087	.067
R squared within	.379	.403	.399	.426	.418	.438	.192	.199
F statistic	8.35	8.38	7.88	7.97	8.50	8.38	2.84	2.69
F-test joint sign.		12.169***		8.109***		4.327***		2.905***

Note: fixed effects estimates; all regressions time dummies; standard errors in parenthesis. *** (**) [*] denote significance at $p < .01$ ($p < .05$) [$p < .10$]. Poor performance is defined as observations with a growth rate below -4.67%; good performance is defined as observations with growth rates above +3.68%. The F-test in the bottom row is of joint significance of foreign aid and the interaction term.

Table 3. Aid, debt and investments

	Full sample		Minimum four periods		No poor performance		No good performance	
	1	2	3	4	5	6	7	8
Log GDP per capita	2.829* (1.654)	1.715 (1.721)	1.939 (1.815)	.976 (1.908)	3.652* (1.910)	2.413 (1.982)	3.727** (1.824)	1.828 (1.933)
Openness	.124*** (.012)	.116*** (.013)	.119*** (.015)	.115*** (.015)	.124*** (.013)	.115*** (.014)	.110*** (.016)	.107*** (.015)
Real investment price	-2.721*** (.489)	-2.679*** (.484)	-3.197*** (.522)	-3.072*** (.525)	-2.864*** (.550)	-2.858*** (.543)	-2.779*** (.496)	-2.809*** (.486)
Government consumption	.129*** (.034)	.164*** (.037)	.208*** (.046)	.211*** (.046)	.118*** (.038)	.158*** (.042)	.129*** (.033)	.177*** (.038)
External debt	.008 (.012)	-.006 (.014)	.012 (.012)	-.010 (.019)	.007 (.015)	-.006 (.016)	.004 (.013)	-.016 (.015)
Foreign aid	.056 (.054)	-.016 (.064)	.009 (.063)	-.024 (.067)	.031 (.065)	-.058 (.078)	.044 (.056)	-.052 (.066)
Debt*aid/100		.049** (.024)		.069 (.044)		.055** (.027)		.064** (.025)
Observations	189	189	154	154	170	170	173	173
Countries	33	33	27	27	33	33	33	33
R squared between	.555	.566	.529	.593	.592	.605	.507	.535
R squared within	.608	.619	.664	.671	.619	.631	.509	.533
F statistic	18.63	17.93	20.87	19.56	16.89	16.31	11.04	11.14
F-test joint sign.		6.156***		8.101***		6.040***		7.673***

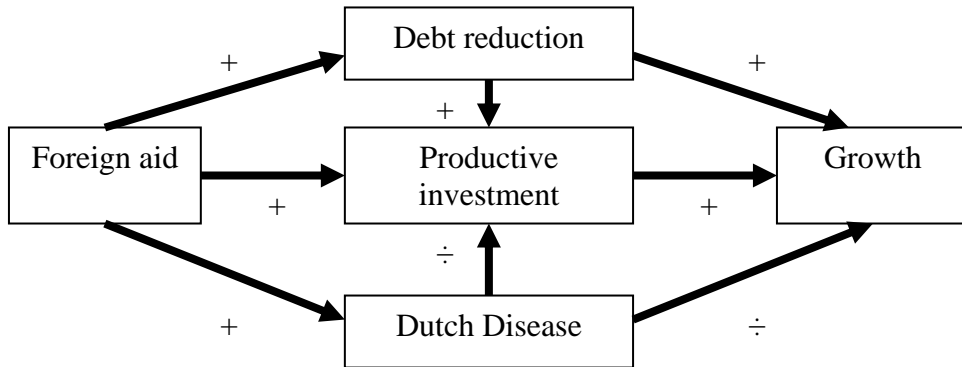
Note: fixed effects estimates; all regressions time dummies; standard errors in parenthesis. *** (**) [*] denote significance at $p < .01$ ($p < .05$) [$p < .10$]. The interaction term is given as aid/100 to make coefficients of a size to fit the format of the table. Poor performance is defined as observations with a growth rate below -4.67%; good performance is defined as observations with growth rates above +3.68%. The F-test in the bottom row is of joint significance of foreign aid and the interaction term.

Table A1. Countries in sample

Country	Obs.		Obs.		Obs.
Angola	2	Equatorial Guinea	5	Mozambique	4
Bangladesh	6	Eritrea	1	Nepal	6
Benin	6	Ethiopia	4	Niger	6
Bhutan	1	Gambia	6	Rwanda	6
Burkina Faso	6	Guinea	3	Sao Tomé and Príncipe	3
Burundi	6	Guinea-Bissau	6	Senegal	6
Cambodia	1	Haiti	5	Sierra Leone	6
Cape Verde	3	Laos	1	Sudan	1
Central African Republic	6	Lesotho	6	Tanzania	3
Chad	6	Madagascar	6	Togo	6
Comoros	4	Malawi	6	Uganda	6
Congo, Democratic Rep.	6	Mali	6	Zambia	6
Djibouti	1	Mauretania	6		

Note: countries with more than three observations are included in both samples.

Figure 1. Model structure



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