

What Type of Economic Growth Does Foreign Aid Support?

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Abstract

This paper contributes to the aid effectiveness literature by investigating the type of economic growth that foreign aid spurs. Results are encouraging with evidence to suggest that foreign aid is effective at increasing agricultural growth in recipient countries.

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Key words: Foreign aid, Growth, Gross Domestic Product

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I. Introduction

The consensus of the recent aid effectiveness research is that foreign aid is effective at spurring economic growth in recipient countries (see for example, Burnside and Dollar, 2000, 2004, Hansen and Tarp, 2000, 2001, Dalgaard and Hansen, 2001, Guillaumont and Chauvet, 2001, Lensink and White, 2001, Lu and Ram, 2001, Collier and Dehn, 2001, Collier and Hoeffler, 2002, Dalgaard *et al*, 2004).¹ Some of this research finds that foreign aid effectiveness is contingent upon a number of recipient characteristics, most notably a recipient's macroeconomic policy environment. The search for the factors important for aid effectiveness and the debate over the significance of a recipient's policy environment continues.

All of these recent studies concerned with aid effectiveness treat economic growth (or growth in GDP per capita) as a homogenous variable. However, changes in economic growth are driven by a wide range of activities within an economy. Some are more pro-poor in nature than others. This paper contributes to the aid effectiveness literature by examining the impact of aid on different types of economic growth. Given that poverty reduction is arguably the main objective of foreign aid programs, examining the type of economic growth that aid spurs is crucial in evaluating aid effectiveness.

There is widespread agreement that economic growth benefits the poor (Ravallion and Chen, 1997, Dollar and Kraay, 2000). However, growth's impact on poverty will largely depend on which particular sectors of the economy are driving economic activity. Although some sectors of an economy might be booming, driving overall economic growth, other sectors might be in recession. The type of economic growth determines the poverty elasticity of growth. Since the vast majority of the poor in developing countries are located in rural areas, reliant on agriculture for their livelihoods, it is growth in the agricultural sector that will be of most benefit in terms of poverty reduction. For economic growth to assist in long-term development and the achievement of the Millennium Development Goals (MDGs) it is vital that it is pro-poor in nature.

¹ A few studies have been inconclusive in their findings (Easterly, 2003, Easterly *et al*, 2003). McGillivray *et al*, 2005 provide an extensive review of the literature.

The remainder of this paper is organised as follows. Section II discusses the data and methodology used in the empirical analysis of this paper. Section III summarises the main findings. Finally, Section IV concludes.

II. Data and Methodology

Rather than focus on aggregate economic (GDP) growth, this paper disaggregates GDP into its various components. The dataset of Roodman (2004) is augmented with sectoral GDP data from the World Bank (2005). Data availability allows for an examination of the impact of aid on real per capita agricultural and industrial GDP growth. The data consist of a panel with variables averaged over four-year periods between 1970 and 2001.

Agricultural GDP consists of forestry and fishing as well as the cultivation of crops and livestock production. It includes the contribution of subsistence agriculture. Since the majority of the world's poor are located in rural areas, reliant on agriculture for their livelihood, increases in agricultural GDP per capita are very likely to be associated with improvements in their well-being. Industry GDP comprises value added in mining, manufacturing, construction, electricity, water, and gas.

There has been considerable discussion and debate in the aid effectiveness literature regarding the robustness of core results and the correct model specification and estimation technique. In an effort to remove itself from such controversies, this paper adopts the same model specifications used in the most influential aid effectiveness studies. These studies include Burnside and Dollar (BD) (2000), Hansen and Tarp (HT) (2001) and Dalgaard *et al* (DHT) (2004)².

Explanatory variables include the log of the initial (sectoral) GDP per capita, the number of assassinations, an ethnic diversity and assassinations interaction variable, institutional quality, money supply (M2), and regional dummies. Policy variables include the budget surplus, inflation and a measure of trade openness. In the Burnside and Dollar (2000) specifications, a policy index was constructed following their methodology.

² Roodman (2004) finds that the Daalgard *et al.* (2004) specification appears to be the most robust. The Hansen and Tarp (2001) specification also performed well, overall.

Hansen and Tarp (2001) point out that some of these explanatory variables are likely to be endogenous. In particular, it can be argued that even if *AID* itself is contemporaneously pre-determined with regard to growth, it may still be endogenous simply by its construction into time averages (Daalgard *et al.* (2004)). Therefore, to avoid inconsistent parameter estimates we follow Hansen and Tarp (2001) by adopting a GMM technique. Our preferred GMM technique is GMM-System approach proposed by Blundell, Bond and Windmeijer (2000).³ All time invariant variables are purged since under our estimator the data are first differenced. Results from all models pass the Hansen test for overidentifying restrictions and the Arellano-Bond test for second order autocorrelation.

III. Results and Interpretation

The results relating to per capita agricultural income growth are provided in Table 1 in the appendix. Columns (1) and (2) represent results relating to BD model specifications. Results from Column (1) show that foreign aid has a positive and statistically significant association with per capita agricultural GDP growth. In Column (2) a policy term and an aid-policy interaction term are included but results indicate that foreign aid is no longer associated with agricultural growth. This is possibly due to the high correlation between the aid variable and the aid-policy interaction term. Results from the HT and DHT specifications are provided in Columns (3) (OLS) and (4). Both sets of results provide evidence that aid is positively associated with growth in per capita agricultural GDP growth. Results from the HT specification indicate diminishing returns to aid while results from the DHT specification indicate that foreign aid has virtually no impact in countries in the tropics. However, little attention should be paid to the size of the actual size of the coefficients since this paper does not subject the results to changes in time period, specification and estimation technique.

Results regarding the impact of foreign aid on per capita industrial income growth are provided in Table 2. The evidence that aid impacts favourably on growth in this sector is weaker. Although results again indicate a positive association with growth in the HT specifications (albeit with diminishing returns), none of the coefficients attached to the aid variables in the BD specifications are statistically significant. The same is true

³ Hansen and Tarp (2001) used the GMM estimator suggested by Arellano and Bond (1991). The GMM systems estimator is preferred here as it has been shown to perform better for small samples; see Blundell, Bond and Windmeijer (2000).

in the DHT specification, at the five per cent level of confidence although the coefficients are deemed statistically significant at the 10 per cent level.

IV. Conclusion

Given that poverty reduction is arguably the main objective of foreign aid programs, examining the type of economic growth that aid spurs is crucial in evaluating aid effectiveness. Findings from this paper suggest that foreign aid exerts a positive and statistically significant impact on the growth of per capita agricultural income. The evidence to suggest that aid impacts favourably on industrial GDP per capita is weaker. Arguably, these findings are encouraging. The implication is that the majority of the world's poor living in rural areas reliant on agriculture for a living are benefiting from foreign assistance. Scaling up foreign aid will therefore help contribute to the achievement of the Millennium Development Goals (MDGs) by 2015. However, it is also important for donors to support growth in industry sectors, particularly during periods of trade liberalisation. Sectors to which foreign aid should be directed in order to be pro-poor will be specific to each recipient. However, agriculture will often need to be targeted.

Further research is required. There are still ongoing debates regarding the factors that are most important for aid effectiveness, and the most appropriate model specification. Future investigations examining the impact of aid on different economy sectors should address these issues.

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Appendix

Table 1: Agricultural per Capita Growth

	(1)	(2)	(3)	(4)
	BD	BD	HT	DHT
Log initial real agricultural GDP/capita	3.679 (1.14)	1.372 (1.86)	-13.276 (15.38)***	3.969 (1.94)*
Assassination	-0.822 (0.91)	-0.845 (2.22)**	0.002 (0.01)	
Ethno-linguistic fractionalisation*Assassination	1.501 (0.72)	1.614 (2.25)**	0.079 (0.14)	
M2/GDP	0.052 (2.16)**	0.001 (0.05)		
Policy	0.767 (1.11)	0.313 (0.68)		
Agri/capita growth, lagged			-0.126 (5.40)***	
Log(1+inflation)			-0.783 (0.45)	1.472 (1.16)
Sachs-Warner			-0.303 (0.49)	0.491 (0.53)
Budget surplus/GDP				-0.016 (0.21)
Aid	0.235 (2.04)**	1.131 (0.86)	0.661 (6.14)***	0.662 (6.12)***
Aid*Policy		0.058 (0.79)		
Aid ²			-0.009 (3.51)***	
Δaid			-0.276 (4.40)***	
Δ Aid ²			0.004 (3.48)***	
Aid*tropical area fraction				-0.562 (4.91)***
Constant	-4.968 (0.20)	-1.397 (0.23)		-26.671 (1.72)
<i>Observations</i>	<i>435</i>	<i>435</i>	<i>418</i>	<i>461</i>
<i>Arellano-Bond test for AR(1) (p value)</i>	<i>0.000</i>	<i>0.000</i>	<i>0.000</i>	<i>0.000</i>
<i>Arellano-Bond test for AR(2) (p value)</i>	<i>0.837</i>	<i>0.981</i>	<i>0.408</i>	<i>0.908</i>
<i>Hansen J (p value)</i>	<i>0.983</i>	<i>1.000</i>	<i>0.308</i>	<i>0.841</i>

*Robust t statistics in parentheses; ** significant at 5%; *** significant at 1%*

Table 2 Industrial per Capita Growth (GMM-SYS Results)

	(1)	(2)	(3)	(4)
	BD	BD	HT	DHT
Log initial real agricultural GDP/capita	2.717 (0.45)	2.409 (1.08)	-3.715 (3.75)***	-3.568 (1.84)*
Assassination	-0.343 (0.20)	-0.570 (0.41)	-0.671 (1.13)	
Ethno-linguistic fractionalisation*Assassination	-0.336 (0.19)	0.005 (0.00)	0.615 (0.58)	
M2/GDP	0.027 (0.12)	0.024 (0.16)		
Policy	5.669 (6.56)***	6.455 (4.65)***		
Industrial/capita growth, lagged			-0.108 (1.99)*	
Log(1+inflation)			-5.190 (1.89)*	-5.807 (1.85)*
Sachs-Warner			3.168 (6.15)***	3.450 (2.40)**
Budget surplus/GDP				0.340 (2.02)**
Aid	0.111 (0.22)	-2.240 (0.61)	0.966 (5.61)***	1.424 (1.97)*
Aid*Policy		-0.134 (0.71)		
Aid ²			-0.015 (4.23)***	
ΔAid			-0.604 (4.09)***	
Δ Aid ²			0.008 (2.96)***	
Aid*tropical area fraction				-1.444 (1.82)*
Constant	90.791 (3.01)***	107.980 (3.93)***		47.626 (1.95)*
<i>Observations</i>	<i>430</i>	<i>430</i>	<i>412</i>	<i>455</i>
<i>Arellano-Bond test for AR(1) (p value)</i>	<i>0.003</i>	<i>0.001</i>	<i>0.000</i>	<i>0.001</i>
<i>Arellano-Bond test for AR(2) (p value)</i>	<i>0.497</i>	<i>0.580</i>	<i>0.743</i>	<i>0.183</i>
<i>Hansen J (p value)</i>	<i>0.578</i>	<i>0.674</i>	<i>0.418</i>	<i>0.334</i>

*Robust t statistics in parentheses; ** significant at 5%; *** significant at 1%*