MACROECONOMIC DETERMINANTS OF EXIT FROMAID-DEPENDENCE

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Abstract

This paper examines exit from aid-dependence. By 'exit from aid', we mean substantial and enduring decline over time in foreign aid as a share of national income. The relevant macroeconomic variables are identified by systematically comparing two groups of countries. These are countries that initially had similar and very high degrees of dependence on international aid but followed dramatically different trajectories of aid-dependence afterwards. This comparison was carried out over five decades since the 1960s using both non-parametric and parametric approaches. We find that the likelihood of exit from aid increases significantly with macroeconomic stability in the sense of maintaining moderate inflation, achieving high rate of investment; aggressive effort at domestic resource mobilisation; and structural change in favour of a growing manufacturing sector. If donors and recipients were to coordinate their aid efforts to support the above-mentioned policy objectives, aid could still be a development tool with diminishing importance.

JEL Classification: E2, F13, F35, O1, O11, O14

Keywords: Macroeconomic policy; foreign aid; ODA; aid dependence; aid exit; developing countries

1 INTRODUCTION

Initial thinking around external assistance focused on the role of aid in filling binding resource gaps that developing countries face. These are the saving–investment gap and the foreign exchange gap (Chenery and Strout, 1966). For instance, aid would bolster domestic investment which in the long run would raise income levels and hence domestic saving rates. In such an

environment, aid becomes increasingly less important as the economy achieves its domestic resource balance.

The literature on international aid has focused on three main areas. The first component of the literature deals with the relationship between foreign aid on the one hand and economic growth and poverty reduction on the other. Studies that examined the effectiveness of aid on economic growth and poverty reduction found largely inconclusive results. Burnside and Dollar (2000) found that while aid may not significantly promote economic growth in a typical recipient country, it has a positive effect under 'good policy' conditions. A number of subsequent studies questioned the validity of this claim by showing the sensitivity of the findings of Burnside and Dollar (2000) to changes in the sample period and the specification of the empirical model (see Easterly et al., 2000; Guillaumont and Chauvet, 2001).

The second body of work focuses on the determinant of aid allocation across recipients. This literature examines donors' motives for aid disbursements and the characteristics of recipients. Some clear conclusions seem to emerge showing that aid allocation is not entirely consistent with the underlying socioeconomic needs of recipients or with their policy directions. Bilateral aid is shown to be driven to a large extent by colonial history and geopolitical interests of donors, while multilateral aid is relatively more sensitive to the underlying socioeconomic conditions of recipients (see Berthélemy, 2006; Alesina and Dollar, 2000; Schraeder et al., 1998; Maizels and Nissanke, 1984). There are a few studies that suggest that even multilateral aid is influenced by the strategic interests of their main financial contributors (Kuziemko and Werker, 2006; Dreher et al., 2009).[i]

The third area of focus in the literature is on the ill effects of aid-dependence, with particular attention to governance issues, mainly the shift in government accountability to donors rather than to citizens in recipient nations. Opponents of aid argue that exiting from aid-dependence should be a top policy priority. McPherson and Gray (2000) highlight the debate on an aid-exit strategy where McPherson asserts that aid promotes irresponsible behaviour such as corruption and poor fiscal management while Gray argues that aid could still play a constructive role. Aid sceptics further claim that aid might lead to moral hazard undermining fiscal responsibility, promoting unproductive spending and reducing tax efforts and public savings (Moss et al., 2006). Opponents of aid further claim that aid creates a dependency mentality among citizens which erodes creativity and self-reliance. The critics aggressively advocate for a reduction of aid flows as rapidly as practically possible (Moyo, 2009; Glennie, 2011).

The call for exit from aid is gaining momentum. For instance, at the 2011 Fourth High Level Forum on Aid Effectiveness in Busan, the consensus and position on development effectiveness of the African Union and New Partnership for Africa's Development (*NEPAD*) stated that "The post-Busan Agenda for Africa is in essence a programme to reduce aid dependency and ultimately exit aid towards development effectiveness" (AU/NEPAD, 2011: 11).

However, despite the desire from many quarters to end aid-dependence, a lot more needs to be done in terms of defining the aid-exit strategy. The natural conclusion from the literature which finds a positive effect of aid on growth under 'good policy' conditions is that more aid—not less—should be given to countries that follow good policies. While this literature is silent about a strategy to reduce aid-dependence, the underlying assumption seems to be that once aid recipients reach a certain level of per capita income through aid-supported economic growth, they will naturally be weaned from aid-dependence.

Researchers who did not find any significant association between aid and growth and poverty reduction also do not seem to address directly the desirability of—or any strategies for—exiting from aid-dependence. There seems to be a tacit acceptance that at least aid is not having a negative impact on growth and hence no pressing reasons to reduce its flow. Rather, they argue for using aid for specific interventions. For instance, Easterly (2007: 331) recommends that:

> "Once freed from the delusion that it can accomplish development, foreign aid could finance piecemeal steps aimed at accomplishing particular tasks for which there is clearly a huge demand–to reduce malaria deaths, to provide more clean water, to build and maintain roads, to provide scholarships for talented but poor students, and so on."

The literature dealing with donors' decisions on aid allocation implicitly suggests that unless colonial ties and geopolitical interests of donors become irrelevant for aid allocation, the current patterns of aid disbursement and hence aid-dependence are bound to continue. The emphasis is on ensuring that aid is disbursed to countries that need it most and not much on how they could exit from aid dependence.

Some of the aid sceptics indeed argue for graduation from aid. According to them, resources equivalent to aid flows could be raised from global financial markets which entails productive and responsible use of resources. Large aid-dependence actually undermines the ability of developing countries to raise funds from international markets by sending negative signals about their creditworthiness. While this strand of the literature argues that aid can be supplanted by domestic resource mobilisation, innovative financing mechanisms and reversing capital flight (as well as curtailing illicit financial flows) the evidence to support it seems rather

sporadic. See for instance Franco-Rodriguez et al. (1998); Franc-Rodriguez (2000) and McGillivray and Ahmed (1999) on the rather mixed fiscal effects of aid. Apart from methodological challenges (noted in McGillivray and Morrissey, 2001) what is missing in this literature is a discussion of the institutional and infrastructural determinants of private capital flows, domestic revenue and their linkage with aid allocation. It is widely acknowledged that availability of infrastructure—for instance, electricity supply—determines significantly private investment in which aid could potentially play a positive role.

The purpose of this paper is neither to make a fresh attempt at investigating the aid-growth nexus nor to evaluate the merits of the arguments in favour of or against aid allocations and delivery modalities. Its primary objective is to sketch broad outlines of a strategy for countries aspiring to graduate from dependence on external assistance. It is similar in spirit to the work by Knack, Rogers and Heckelman (2012) which shows the institutional developments and access to capital markets that underlie graduation from reliance on World Bank's IBRD funds. The range of donors and recipients in our paper is much wider than in Knack et al. (2012) and we examine developing countries that over the last few decades have managed to significantly reduce their degree of aid dependence and compare their performance with a group of countries which have seen their aid-dependence reinforced or increased in the meantime. Performance comparison is based on key macroeconomic and sectoral variables to determine what aid-exiters did differently from those who did not. The basis for our analysis is the simple observation that developing counties that started off with comparable degrees of reliance on international aid during the 1960s and 1970s have evolved quite differently over the ensuing decades to become either increasingly more aid-dependent or increasingly less aid dependent.

There is an apparent deadlock in the literature to conclusively resolve the debate on aid effectiveness, due essentially to methodological challenges to properly control for confounding factors. In view of this challenge, we believe that a closer analysis of large and lasting reductions in aid dependence vis-à-vis persistent and growing aid-dependence is a sensible and, hopefully, fruitful research endeavour. This approach recognises the heterogeneity among aid recipients better than existing efforts at estimating the average response of developing countries to aid flows or estimating the characteristics of a typical donor country or agency.

The paper is organised as follows. Section 2 presents a framework to analyse the changes over time in the degree of aid-dependence, identifying those countries that exited from aid-dependence and those that failed to do so. Section 3 uses a non-parametric technique to identify the variables that speed up graduation from aid-dependence. Section 4 conducts a formal econometric analysis to test the broad patterns observed in Section 3. Section 5 checks the sensitivity of the results to changes in the time period and composition of sample countries. Concluding remarks are provided in Section 6.

2 TRAJECTORIES OF AID-DEPENDENCE

We rank 132 aid-recipient countries based on their aid-to-GDP ratio.[ii] Table 1 shows the average aid-to-GDP ratio of countries by decile for the past five decades. It shows that countries whose average aid-to-GDP ratio has been below the 5th decile have had a very low and, most importantly, stable and even declining aid-dependence during the last five decades. Countries ranked at and above the 5th decile, however, have experienced a steady increase in aid-to-GDP ratio from the 1960s up until the end of the 1990s before experiencing a modest decline during 2000–2007. Perhaps more striking is the sharp increase in the aid-dependence of the 10th

decile, where the aid-to-GDP ratio increased from about 15 per cent of GDP in the 1960s to more than one-third of GDP from the 1980s onwards. Countries in the 8th and 9th deciles have also seen their average aid-to-GDP ratios more than double since the 1980s compared to the 1960s.

TABLE 1: TRENDS IN AID-DEPENDENCE: AVERAGE ODA-TO-GDP RATIO

Deciles of ODA-to-GDP Ratio	1960s	1970s	1980s	1990s	2000–2007	1960–2007
1	0.0	0.0	0.0	0.0	-0.8	-0.1
2	0.3	0.2	0.1	0.3	0.2	0.2
3	0.8	0.7	0.7	0.8	0.6	0.7
4	1.2	1.3	1.7	1.8	1.1	1.5
5	1.8	2.0	3.2	3.3	2.3	2.6
6	2.5	3.0	5.3	5.9	4.7	4.4
7	3.6	4.5	7.2	9.3	7.6	6.7
8	5.0	6.9	9.8	13.2	11.2	9.5
9	7.5	10.4	15.6	19.2	15.7	14.2
10	14.9	21.2	35.6	37.4	34.3	29.7
Average	3.7	5.0	7.9	9.1	7.7	6.9

Source: Authors' computation based on OECD data on ODA.

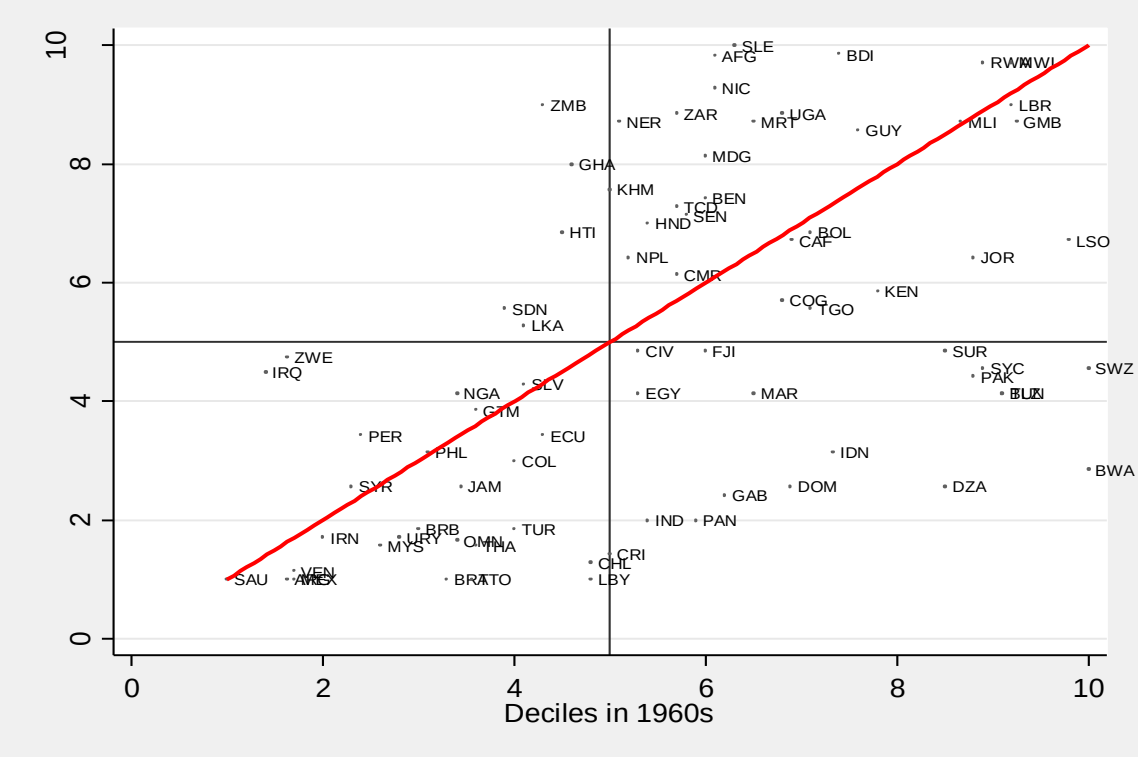
This pattern suggests a tendency for aid-dependence to be persistent particularly for countries located at the extremes of the aid distribution—a point that will be explored further in this paper. We recognise that the composition of countries in the various deciles can change over the decades. Therefore, we introduce a simple analytical tool to differentiate those countries which have significantly reduced their reliance on international aid from those countries that have become either more aid-dependent or remain persistently aid-dependent. To sharpen the analysis we distinguish countries that moved down the rank of aid-dependence

by transiting from above to below the 5th decile during the sample period, representing a significant shift in relative dependence on aid. Although the countries that were below the 5th decile at the beginning of the sample period are relatively of less interest for our analysis, as they have been less dependent on aid to begin with, we will use them as comparator countries at some stage.

Figure 1 compares deciles of aid-to-GDP ratio during the 1960s and 2000s (2000–2007). The figure has four quadrants defined by the additional horizontal and vertical lines corresponding to the 5th deciles of the two decades under consideration. The 45° line is simply the locus of countries that have experienced no change in their ranking of aid-dependence from the 1960s to the 2000s. These include a highly aid-dependent country such as Mali as well as relatively less aid-dependent countries such as Syria.

Countries below the 45° line have experienced a reduction in their aid-dependence by moving down the rank of aid-to-GDP ratio since the 1960s. A clear example is Botswana, which was almost in the 10th decile in the 1960s but significantly reduced its aid-to-GDP ratio to be ranked below the 3rd decile in the 2000s. Conversely, countries positioned above the 45° line have witnessed an increase in aid-dependence in the 2000s relative to their position in the 1960s. For instance, Ghana and Zambia were ranked below the 5th decile in the 1960s but became relatively aid-dependent, joining those countries ranked in the 8th and 9th deciles in the 2000s. Appendix 1 shows the changes in the rankings or aid-dependence in the 2000s relative to the 1970s and 1980s.

FIGURE 1: CHANGES IN AID-DEPENDENCE: DECILES OF AID-TO-GDP RATIO (2000S RELATIVE TO 1960S)



The countries in the upper right quadrant are countries which have remained above the 5th decile both during the 1960s and the 2000s, showing a highly persistent aid-dependence. It is interesting to notice that the overwhelming majority of countries in this quadrant (about 70 per cent) are located above the 45° line, meaning that they have become *more* aid-dependent since the 1960s. These include Afghanistan, Benin, Burundi, Cambodia, Cameroon, Chad, Guyana, Honduras, Madagascar, Malawi, Mali, Mauritius, Nepal, Nicaragua, Niger, Rwanda, Senegal, Sierra Leone, Congo (DRC) and Uganda. Other countries that fall into this category if we take the 1970s or 1980s as reference points include Ethiopia, Ghana, Liberia, Mozambique and Zambia. It is easy to notice that this group is overly represented by sub-Saharan African countries.

The above countries contrast with those in the opposite or lower left quadrant, which not only had very low aid-dependence to begin with but the overwhelming majority of which (about 70 per cent) have moved below the 45° line. This means that they have reduced whatever small aid-dependence they started with during the 1960s. They include Argentina, Barbados, Brazil, Chile, Colombia, Ecuador, Iran, Jamaica, Libya, Malaysia, Mexico, Oman, Thailand, Trinidad and Tobago, Turkey, Uruguay and Venezuela. Countries with a low initial aid-to-GDP ratio therefore seem very unlikely to become more aid-dependent. In contrast, those countries with high initial aid-dependence not only are more likely to remain aid-dependent but tend to become increasingly so.[iii]

However, there are a number of developing countries in our sample which started off with a very high degree of aid-dependence during the 1960s but significantly reduced it in the ensuing decades. These are countries in the lower right quadrant of Figure 1. Not only have these countries reduced their aid-dependence (as they lie below the 45° line), they have also moved from above the 5th decile during the 1960s to below it in the 2000s. They include Algeria, Belize, Botswana, Cote d'Ivoire, Dominican Republic, Egypt, Fiji, Gabon, India, Indonesia, Morocco, Pakistan, Panama, Seychelles, Suriname, Swaziland and Tunisia.[iv] These countries demonstrate that it is possible to break out of the persistent cycle of aid-dependence. The persistence in aid-dependence that we noticed earlier is, therefore, not a universal phenomenon. Therefore, we explore these countries in further detail in the following sections to characterise what an aid exit strategy would look like.

The reverse side of this story is the experience of countries in the upper left quadrant of Figure 1. These are countries whose aid-dependence in the 2000s is way above what it was in

the 1960s, as they cross the 5th decile from below. These include Ghana, Haiti, Sri Lanka, Sudan and Zambia.

3 MACROECONOMIC DETERMINANTS OF EXIT FROM AID

The literature that advocated for aid disbursements to fill the saving–investment and foreign exchange gaps underscores that aid plays a critical role by financing domestic investments that in turn raise the level of income and the rate of savings. Crucial aspects of such a growth strategy include coordinated fiscal, monetary and exchange rate policies which help countries achieve their growth potentials, maintain sustainable internal and external balances including price stability. Within such a policy framework, the average rate of return on investment depends on the structure of the domestic economy. Different sectors have different potentials for productivity growth, and historical experiences reveal that a growing manufacturing sector has long been associated with rapid productivity gains (Rodrik, 2005). Productivity growth in turn provides the basis for generating sufficient resources for sustainable and ultimately aid-independent economic growth.

To meet their growing demand for imported capital goods and technologies, developing countries need to boost their competitiveness and break into export markets. With a competitive export sector, counties are expected to become increasingly less dependent on aid. Further to export earnings, the ability to attract international finance including foreign direct investment (FDI) could accelerate the pace of reduction in aid-dependence, as it signals the viability of the domestic economy to the rest of the world.

With the above basic framework in mind, we compare the macroeconomic variables observed in the countries that managed to significantly reduce their aid-dependence with those that saw their aid-dependence increase over time. To sharpen the comparison we select countries which were in the same relative position during the 1960s—i.e. countries above the 5^{th} decile in the distribution of aid-to-GDP ratio in the 1960s. However, in the ensuing decades these countries followed opposite trajectories, with one group becoming increasingly aid-dependent while the other group showed clear evidence of exiting from aid-dependence. It is interesting to note that although both groups of countries were above the 5^{th} decile in the 1960s, the average initial aid-to-GDP ratio was slightly higher for the group of countries that subsequently reduced aid-dependence. This begs the question whether aid indeed has been used to facilitate exit from it. Table 2 compares the average values of key macroeconomic variables together with a t-test for means between the two groups of countries.

We start by comparing domestic saving and investment rates (expressed as ratios to GDP). Exiters from aid-dependence already started in the 1960s with an average domestic saving rate about 7 percentage points higher than the group of countries which became increasingly aid-dependent. However, the crucial point is that in the subsequent decades the countries that exited from aid increased their average saving rate to more than 20 per cent of GDP. In contrast, aid-dependent countries had a saving rate which slipped below 10 per cent of GDP. While this does not constitute a causal relation, it seems consistent with the claim by the opponents of international aid that more aid may undermine the incentive for domestic saving, particularly of the public sector.

TABLE 2: COMPARISON OF SELECTED MACROECONOMIC VARIABLES FOR COUNTRIES WITH DIFFERENT PATHS OF AID-DEPENDENCE DURING 1960–2007

Countries	1960s	1970s	1980s	1990s	2000–2007
With Persistent aid-dependence					
Aid-to-GDP ratio	4.34	7.09	11.13	15.24	13.34
Domestic saving rate	10.62	9.52	5.52	6.07	6.82
Investment rate	14.19	17.74	18.49	18.77	21.32
GDP growth	3.52	3.44	1.97	1.93	4.14
Inflation	3.26	12.01	137.67	52.98	6.95
Export-to-GDP ratio	17.76	19.92	18.53	26.60	23.11
Manufacturing-to-GDP ratio	8.43	9.22	9.92	10.66	10.22
FDI-to-GDP ratio (net inflow)	1.19	1.03	2.67	5.04	1.19
Exiting from aid-dependence					
Aid-to-GDP ratio	6.85***	6.01*	3.81***	3.23***	1.19***
Domestic saving rate	17.33***	24.10***	21.48***	21.36***	23.59***
Investment rate	19.67***	27.95***	25.04***	22.97***	22.91*
GDP growth	5.24***	6.87***	3.56***	3.71**	3.49
Inflation	24.13*	10.31	9.45*	13.12*	5.82
Export-to-GDP ratio	23.74***	27.24***	29.55***	31.32	33.78***
Manufacturing-to-GDP ratio	12.95***	12.60***	12.90***	13.70***	13.16***
FDI-to-GDP ratio (net inflow)	2.21**	1.27**	1.55	2.96	2.21***

Source: Authors' computation based on data from WDI 2009.

Note: Asterisks in the lower panel of Table 4 indicate statistically significant differences from the corresponding number in the top panel using the t-test for mean differences. Where ***, ** and * stand respectively for 1%, 5% and 10% level of significance.

In terms of investment efforts, countries with a significant reduction in aid-dependence experienced a sharp increase in the investment-to-GDP ratio during the 1970s and 1980s, when it amounted on average to more than a quarter of GDP, and these countries continued to invest at a respectable rate of about 23 per cent in the 1990s and 2000s. While the investment rate also increased in the countries with rising aid-dependence, it remained around 18 per cent

of GDP for three decades in a row, reaching above 20 per cent only in the 2000s. A key observation is that the steady rise in the relative importance of international aid for the latter groups of countries does not seem to translate into a higher rate of capital accumulation. On the other hand, the decline in the relative importance of aid among the countries that exited from aid does not seem to be accompanied by a slowdown in their capital accumulation rate.

Table 2 also shows that economies with persistent and growing aid-dependence experienced a steady decline in annual GDP growth up until the beginning of the 2000s, when growth started to recover strongly. GDP growth fell below 2 per cent during the 1980s and 1990s. In the meantime, the countries that exited from aid registered relatively strong economic growth (above 5 per cent) during the 1960s and 1970s. Although economic growth slowed down during the 1980s and 1990s, it stayed above 3 per cent on average for this group of countries. Even after the recovery in the 2000s, growth in the increasingly aid-dependent countries only marginally exceeded that of the countries that exited from aid. The significant reduction in the aid-to-GDP ratio among aid exiters, therefore, does not appear to be a result of their outstanding growth performance during the 2000s but rather a cumulative effect of their performance since the 1970s.

Although inflation was lower in the 1960s for countries which became increasingly aid-dependent, their macroeconomic environment became very volatile in the subsequent decades, with very high inflation rates—sometimes reaching three digits. On the contrary, inflation was measured and relatively stable in countries that reduced their aid-dependence. Although one cannot draw causal relations from these patterns, macroeconomic stability seems to be a very important attribute of an aid exit strategy, but not necessarily low inflation rates as

often recommended under inflation targeting (which is often less than 5 per cent). In fact, the inflation rate among the countries that exited from aid can be said to be moderate and not low.

Not only have the countries which gradually exited from aid-dependence managed to grow faster over the last five decades, their economies were also becoming increasingly export oriented. The share of exports increased steadily for this group of countries from about a quarter of GDP on average in the 1960s to about one-third of GDP in the 2000s. In countries with growing aid-dependence, however, the export-to-GDP ratio stayed just below 20 per cent from the 1960s to the 1980s, before increasing in the 1990s and 2000s to reach a level of export ratio already attained by the countries that exited from aid in the 1960s and 1970s. Increased participation in export markets, therefore, seems to be a key covariate of potential exit from aid-dependence.

Countries which slashed their reliance on aid have a slightly higher share of manufacturing in GDP than aid-dependent countries, but in both cases the increase in the share of manufacturing over time is relatively slow. Table 2 does not show large differences in the average net inflow of FDI to both groups of countries, although the t-test suggests that these differences are statistically significant.

4 THE PROBABILITY OF EXITING FROM AID-DEPENDENCE

In this section we consolidate the discussion in Section 3 by estimating the probability of exit from aid-dependence. We use the logit model to estimate the likelihood of a sizable decent in aid-dependence which is assumed to occur when an underlying latent index of macroeconomic conditions in a country crosses a certain threshold. Table 3 provides the results of this estimation

showing both the logit coefficients as well as their marginal effects. The dependent variable is a binary variable which takes the value 1 if a country reduced its relative aid-dependence from above the 5^{th} decile during the 1960s to below it during the period 2000–2007, and takes the value 0 if a country stays above the 5^{th} decile in both decades. The explanatory variables are the logarithms of the variables discussed in the preceding section except for GDP growth rate. The objective is to find out if aid-exiter counties differ systematically from persistently aid-dependent countries along a set of key macroeconomic variables.

A major concern with our model is the possibility that aid flow is large enough to drive the macroeconomic outcomes in the sample countries. The other concern is whether omitted variables that increase aid flows to a country also undermine its macroeconomic and sectoral performance. While we don't claim to resolve these endogeneity problems, we believe that the manner in which we defined the dependent variable and the timing of the explanatory variables will minimize the problem. The dependent variable captures only a large shift in the relative position (ranking) of countries nearly four decades apart rather the actual flow of aid-to-GDP ratio. Therefore, the dependent variable it is less likely to have a co-movement with the continuous variables on macroeconomic and sectoral performance in the ensuing decades. Moreover, we exclude contemporaneous values of the explanatory variables when estimating the conditional probability of transition. In other words the model analyses change in the relative position of aid dependence in the 2000s relative to the 1960s based on economic conditions that prevailed during 1970 to 1999.

If, for instance, countries that significantly reduced aid-dependence did so because of the strong growth performance during 2000–2007 or because of better macroeconomic conditions since 2000, then according to our model specification, none of the lagged

explanatory variables should be significantly associated with the change in the relative degree of aid-dependence. If, on the other hand, past macroeconomic management is a crucial aspect of an aid exit strategy, then we would expect the lagged values to have statistically significant coefficients. These coefficients carry no useful information if the macroeconomic developments since 1970 are driven largely by the aid-to-GDP ratio of a country in the 1960s. However, our sample is comprised of countries which started off with comparable ranking of aid-dependence in the 1960s but ended up in completely different positions during 2000-2007. Similarly, if aid-dependence in our sample persisted or increased over the years due to an exogenous increase in aid that is unrelated to domestic macroeconomic conditions, such as aid flows to Afghanistan after 2001, then the lagged values of the variables in our model should not be significant.

As both saving and investment rates are positively associated with the probability of exiting from aid-dependence, the probability model features the investment rate and the saving–investment gap. This specification allows us to distinguish the effects of increasing the investment rate from that of the way in which the investment is financed. Since the explanatory variables in our model are likely to be correlated with GDP growth, Table 3 also reports the results of an alternative specification where we exclude GDP growth from the model. The standard errors are clustered at the country level to take into account country-specific idiosyncrasies.

The results obtained from the regression model are consistent with the descriptive analysis we discussed in Section 3. The investment-to-GDP ratio has a positive and highly significant coefficient in, suggesting that it is an important precursor of exiting aid-dependence. The marginal effect indicates that a one percent increase in the investment rate would increase the

likelihood of aid-exit by 0.58 percentage points. Investment is thus not only an indicator of the contemporaneous health a country's socioeconomic institutions but also a dynamic source of self-reliance in the future.

TABLE 3: PROBABILITY OF EXITING AID-DEPENDENCE - (1960-20007)

VARIABLES	Logit	Marginal Effects	Logit	Marginal Effects
Ln(Investment/GDP)	2.5869***	0.5835***	2.6463***	0.5904***
	(0.8033)	(0.184)	(0.8061)	(0.182)
Ln(Saving–investment gap)	-1.2558	-0.2833**	-1.2688**	-0.2831**
	(0.6242)**	(0.137)	(0.6467)	(0.139)
Ln(Inflation)	-0.5193	-0.1171***	-0.5142***	-0.1147***
	(0.1919)***	(0.043)	(0.1911)	(0.042)
GDP growth			2.5431	0.5674
			(3.4289)	(0.787)
Ln(Export/GDP)	0.3577	0.0807	0.3314	0.0739
	(0.6211)	(0.141)	(0.6171)	(0.138)
Ln(Manufacturing/GDP)	2.2649	0.5109**	2.2882***	0.5105**
	(0.8286)***	(0.203)	(0.8190)	(0.201)
Ln(FDI/GDP)	0.0995	0.0225	0.0879	0.0196
	(0.1582)	(0.035)	(0.1593)	(0.035)
Constant	-1.0225		-1.3279	
	(2.7949)		(2.7889)	
Observations	700	700	696	696

Robust standard errors in parentheses

Source: Authors' estimation results based on OECD and WDI data.

This is consistent with the notion that public investments in infrastructure are particularly vital. For instance, in sub-Saharan Africa, only about 10 per cent of the population is said to have access to electricity[v]. As Burnside and Dollar (2000: 847) noted: "To the extent that it is invested, aid will be effective." As shown in Section 2 above, the countries with growing aid-dependence, most of which are African countries, did not manage to increase their investment rate. The report of the Commission for Africa (2005: 25, emphasis added) also argued that:

> "despite its clear benefits, African governments and development partners sharply reduced, over the 1990s, the share of resources allocated to infrastructure. In retrospect, this was a *serious policy mistake.* Another implication is that aid utilisation must focus on sustaining investment."

It is also interesting to note that countries with a growing saving–investment gap are less likely to reduce their aid-dependence compared to countries which finance most of their investment through domestic saving. In other words, two countries with the same investment rate will stand different chances of exiting from aid-dependence conditional on the source of investment finance. As was evident in Section 3, the countries which slashed their aid-dependence during the sample period have not only increased their investment rate but they did so through higher domestic saving rates. The results in Table 3 suggest that narrowing the saving-investment gap by one percent would increase the chances of exiting aid-dependence by 0.28 percentage points.

The above results could alternatively be interpreted as obvious cases of reverse causality where an increase in aid permits investment rates to exceed domestic savings just as aid was supposed to do. However, the average investment rate in countries with growing aid-dependence has been stagnant, as indicated in Table 2, while their domestic saving rate was declining for most of the sample period. In other words, the saving–investment gap was not the result of increasing rates of investment fuelled by aid but rather due to decreasing rates of saving. Moreover, if indeed aid augmented domestic investment, it would have led to a reduction in aid-dependence in the long run as just discussed above, with only a short-term increase in the saving–investment gap.

Table 3 also shows that economic growth is positively associated with the likelihood of graduation from aid-dependence, but the coefficient is not statistically significant. This finding is consistent with the wider literature on aid, which fails to find a statistically significant long-term relationship between aid and economic growth in developing countries. To see if this lack of significance is due to collinearity with growth determinants such as investment, we run the

model without GDP growth. As can be seen in the third column of Table 3, this did not lead to any change in the sign, size and significance of other coefficients.

Another important result from the regression analysis is the statistically significant negative effect of inflation on the chances of overcoming aid-dependence. After taking into account the effects of investment and the domestic resource gap, countries with rising inflation will find it more difficult to break away from reliance on foreign aid. This suggests that tackling high inflation and maintaining moderate levels is crucial for healthy economies that in the long run can reduce aid-dependence.

Table 3 also shows that it is not the export orientation of countries as such that affects the likelihood of exit from aid but rather the structure of the economy in terms of the share of manufacturing value added in GDP. This is quite different from the story emerging from the simple bivariate description in the previous section, where the countries with different trajectories of aid-dependence seem to have widely different performance in exports rather than in the share of manufacturing in national income. Policies that support and facilitate manufacturing industries are therefore likely to contribute to long term reduction in aid-dependence. This is likely to work through faster economic transformation, better job opportunities and higher productivity growth.

5 SENSITIVITY ANALYSIS

In this section we check the robustness of the preceding results. Specifically, we examine the extent to which our findings could have been driven by the composition of countries and by the

starting period of the analysis. Thus, we consider another initial point for the empirical analysis and select countries which were above the 5th decile in the global distribution of aid-to-GDP ratio in the 1970s (instead of 1960s). This exercise increased the sample size by nine countries. They include Bangladesh, Dominica, Grenada, Guineas-Bissau, Kiribati and Tonga, which became more aid-dependent over the years, as well as Chile, Costa Rica and Libya, which, although they were just below the 5th decile initially, have managed to move down to the 1st decile of the aid-to-GDP ranking in the 2000s, representing an unmistakable exit from aid-dependence.

The comparison of the sample means of variables with this new composition of countries are presented in Table 4. The different macroeconomic trends we observed earlier between the group of countries that did and did not reduce their aid-dependence are intact. This is regardless of a different starting point for our analysis as well as a change in the composition of countries. This suggests that the key aspects of reducing aid-dependence are not driven by the fixed effects that are unique to individual countries at a particular point in time.

In Tables 5 and 6 we re-estimate the logit model with two different specifications. Table 5 reports the likelihood of exiting from aid-dependence for groups of countries that had similar ranking of aid-dependence during the 1970s. The dependent variable takes the value 1 for countries positioned above the 5th decile during the 1970s but moved below the 5th decile in the 2000s, and takes the value 0 for any country that stays at or above the 5th decile both in the 1970s and 2000s.

TABLE 4: COMPARISON OF SELECTED MACROECONOMIC VARIABLES FOR COUNTRIES WITH DIFFERENT PATHS OF AID-DEPENDENCE (1970–2007)

Countries	1970s	1980s	1990s	2000–2007
With persistent and growing aid-dependence				
Aid-to-GDP ratio	7.85	13.75	16.25	13.39
Domestic saving rate	8.95	3.63	5.78	6.63
Investment rate	17.60	20.86	20.16	21.73
GDP growth	3.30	2.03	2.11	3.95
Inflation	12.10	122.89	46.73	6.59
Export-to-GDP ratio	20.20	18.13	24.44	21.67
Manufacturing-to-GDP ratio	9.21	9.73	10.32	10.08
FDI-to-GDP ratio (net inflow)	1.13	1.16	2.99	5.38
Exiting from aid-dependence				
Aid-to-GDP ratio	7.21*	4.49***	3.68***	1.32***
Domestic saving rate	25.57***	21.26***	20.61***	23.26***
Investment rate	27.93***	25.06***	22.02*	21.70
GDP growth	7.01***	4.11***	3.84**	3.37
Inflation	11.11	10.10**	13.34*	5.42
Export-to-GDP ratio	30.29***	32.47***	34.16**	37.18***
Manufacturing-to-GDP ratio	11.37***	12.27***	13.38***	13.05***
FDI-to-GDP ratio (net inflow)	2.26**	1.48	1.29**	2.75***

Source: Authors' computation based on data from WDI 2009.

Note: Asterisks in the lower panel of Table 4 indicate statistically significant differences from the corresponding number in the top panel using the t-test for mean differences. Here ***, ** and * stand respectively for 1%, 5% and 10% level of significance.

In Table 6 we carry out another sensitivity analysis by considering a reduction in aid-dependence without limiting the sample only to countries that were highly aid-dependent in the initial period. The dependent variable in Table 6 is, therefore, a dummy variable distinguishing between countries that reduced their aid-dependence by any amount, even if they did not cross the 5th decile from above (in which case the dummy variable will take the value 1). We also included those countries whose aid-dependence has increased in the 2000s regardless of where

they were in the initial period (in which case the dummy variable will take the value 0). In essence we are considering countries that are below and above the 45° line in Figure 1.

The investment rate and the saving–investment gap in Table 5 have the same sign and significance as in Table 3, although the coefficients are a bit lower. Inflation retains its negative and statistically significant association with the likelihood of exiting from aid. The manufacturing share of GDP is an important driver of graduation from aid-dependence for this sample of countries as it was for the previous sample, while exports and FDI are not statistically significant.

TABLE 5: PROBABILITY OF EXITING AID-DEPENDENCE - (1970-2007)

	(1)		(2)	
VARIABLES	Logit Estimates	Marginal Effects	Logit Estimates	Marginal Effects
Ln(Investment/GDP)	1.9258**	0.3415**	1.9677**	0.3411**
	(0.9153)	(0.1705)	(0.9055)	(0.1636)
Ln(Saving–investment gap)	-1.2452*	-0.2208	-1.2581*	-0.2181
	(0.6521)	(0.1143)	(0.6723)	(0.1140)
Ln(Inflation)	-0.4032*	-0.0715**	-0.4074**	-0.0706**
	(0.2071)	(0.0361)	(0.1992)	(0.0342)
GDP growth			5.9781	1.0364
			(5.1420)	(0.9467)
Ln(Export/GDP)	0.7603	0.1348	0.7356	0.1275
	(0.7254)	(0.1290)	(0.7176)	(0.1254)
Ln(Manufacturing/GDP)	2.4788***	0.4395**	2.5244***	0.4377**
	(0.8834)	(0.1865)	(0.8628)	(0.1828)
Ln(FDI/GDP)	0.1687	0.0299	0.1534	0.0266
	(0.1845)	(0.0338)	(0.1839)	(0.0329)
Constant	1.5332		1.2305	
	(3.1150)		(3.0952)	
Observations	575	575	572	572

Source: Authors' estimation results based on OECD and WDI data.
Robust standard errors in parentheses

If we make the distinction among countries less stringent by including even those countries that reduced aid-dependence without necessarily crossing the 5th decile, as we did in Table 6, the results remain similar.

TABLE 6: PROBABILITY OF REDUCING AID-DEPENDENCE - (1960-2007)

		(1)		(2)
VARIABLES	Logit Estimates	Marginal Effects	Logit Estimates	Marginal Effects
Ln(Investment/GDP)	1.6999** (0.7716)	0.3817** (0.1711)	1.7127** (0.7731)	0.3815** (0.1689)
Ln(Saving–investment gap)	-1.3395** (0.5836)	-0.3008** (0.1254)	-1.3505** (0.5916)	-0.3008** (0.1254)
Ln(Inflation)	-0.3551** (0.1561)	-0.0798** (0.0349)	-0.3410** (0.1572)	-0.0760** (0.0346)
GDP growth			4.4651 (4.0434)	0.9945 (0.9197)
Ln(Export/GDP)	0.5710 (0.5177)	0.1282 (0.1188)	0.5495 (0.5084)	0.1224 (0.1158)
Ln(Manufacturing/GDP)	2.8109*** (0.7315)	0.6312*** (0.1811)	2.8383*** (0.7130)	0.6322*** (0.1783)
Ln(FDI/GDP)	0.0291 (0.1410)	0.0065 (0.0317)	0.0234 (0.1438)	0.0052 (0.0320)
Constant	2.9299 (2.6996)		2.7099 (2.6947)	
Observations	756	756	752	752

The exercise in this section shows that there is a clear pattern in macroeconomic variables that distinguish countries which exited from aid-dependence (also countries on their way out of aid-dependence) from those countries that have become increasingly aid-dependent. These differences are robust to different starting points for analysis as well as changes in the composition of the sample.

6 CONCLUSION

This paper shows that countries with a low initial degree of aid-dependence are more likely to remain less aid-dependent and further reduce their aid-to-GDP ratio. Countries with a high initial aid-dependence are more likely to remain highly aid-dependent or even become

increasingly so. While this shows a certain degree of path dependence in reliance on aid, this is not a universal phenomenon. There are developing countries that significantly reduced their initial high degree of reliance on international aid. The paper investigates the attributes of this group of countries which initially were heavily aid-dependent but managed to exit from it as compared to countries with persistent aid-dependence.

The analysis shows that the likelihood of exiting from heavy reliance on aid increases with the rate of investment. Strengthening policies and institutions that promote public and private investment seems a reliable path to exiting from aid-dependence. Unfortunately, evidence shows that a declining share of aid is being allocated to infrastructure development. Increasing the flow of aid alone, therefore, does not in itself lead countries out of aid-dependence if it is not accompanied by aggressive capital accumulation.

A functional and well-developed financial system that could support high levels of investment is also equally important, as a widening saving–investment gap is more than likely to delay graduation from aid-dependence. Donors and recipient countries should, therefore, watch out for aid flows not to inadvertently stifle domestic savings even when levels of investment are high.

Consistent with this observation is the critical role of managing inflation, which has been shown to reinforce persistent aid-dependence if it remains unchecked. This calls for fiscal and monetary policies that will avoid high and destabilising inflation rates.

We also found that even a small increase in the share of manufacturing in GDP has a potential to facilitate an exit from aid-dependence. While the exact nature of policies will obviously differ across countries, a clear industrial policy is a key prerequisite for an aid exit strategy.

The paper did not set out to show that aid undermines macroeconomic management or stifles growth. However, the paper provides systematic evidence that aid-dependence tends to be tenacious especially when it is initially high. In as much as it is desirable to reduce aid-dependence, countries should pay attention to key macroeconomic variables including investment, domestic resource mobilisation, absence of rampant inflation and a growing manufacturing sector. If donors and recipients could collaborate and tailor aid allocation so that it bolsters the above-mentioned policy objectives or at least does not undermine them, then aid could be a development tool with diminishing importance.

APPENDIX 1

FIGURE A1: DECILES OF AID-TO-GDP RATIO DURING THE 2000S RELATIVE TO THE 1970S

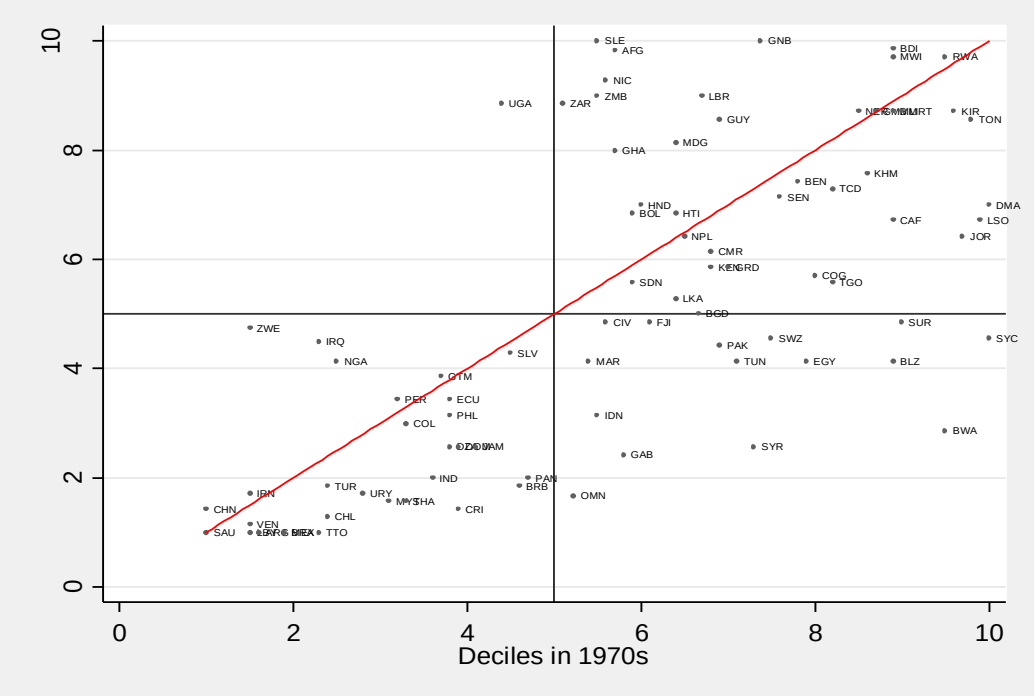
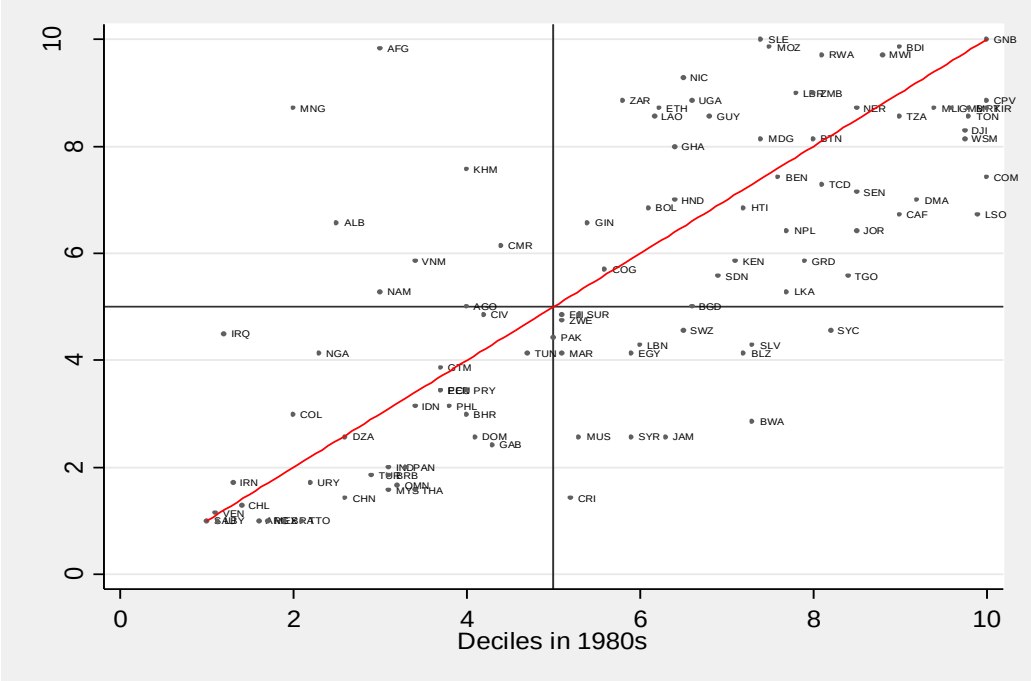


FIGURE A2: DECILES OF AID-TO-GDP RATIO DURING THE 2000S RELATIVE TO THE 1980S



APPENDIX 2:

TABLE A2: **LIST OF COUNTRIES INCLUDED IN THE ANALYSES AND CODES**

1	AFG	Afghanistan	31	CHN	China	61	HUN	Hungary	91	NAM	Namibia	121	TON	Tonga
2	ALB	Albania	32	COL	Colombia	62	IND	India	92	NPL	Nepal	122	TTO	Trinidad and Tobago
3	DZA	Algeria	33	COM	Comoros	63	IDN	Indonesia	93	NIC	Nicaragua	123	TUN	Tunisia
4	AGO	Angola	34	ZAR	Congo, Dem. Rep.	64	IRN	Iran	94	NER	Niger	124	TUR	Turkey
5	ARG	Argentina	35	COG	Congo, Rep.	65	IRQ	Iraq	95	NGA	Nigeria	125	UGA	Uganda
6	ARM	Armenia	36	CRI	Costa Rica	66	ISR	Israel	96	OMN	Oman	126	ARE	United Arab Emirates
7	ABW	Aruba	37	CIV	Cote d'Ivoire	67	JAM	Jamaica	97	PAK	Pakistan	127	URY	Uruguay
8	AZE	Azerbaijan	38	HRV	Croatia	68	JOR	Jordan	98	PAN	Panama	128	VEN	Venezuela
9	BHS	Bahamas	39	CUB	Cuba	69	KAZ	Kazakhstan	99	PRY	Paraguay	129	VNM	Vietnam
10	BHR	Bahrain	40	DJI	Djibouti	70	KEN	Kenya	100	PER	Peru	130	YEM	Yemen
11	BGD	Bangladesh	41	DMA	Dominica	71	KIR	Kiribati	101	PHL	Philippines	131	ZMB	Zambia
12	BRB	Barbados	42	DOM	Dominican Republic	72	PRK	Korea, Dem. Rep.	102	QAT	Qatar	132	ZWE	Zimbabwe
13	BLR	Belarus	43	ECU	Ecuador	73	KWT	Kuwait	103	RWA	Rwanda			
14	BLZ	Belize	44	EGY	Egypt	74	LAO	Laos, Dem. Rep.	104	WSM	Samoa			
15	BEN	Benin	45	SLV	El Salvador	75	LBN	Lebanon	105	SAU	Saudi Arabia			
16	BMU	Bermuda	46	ERI	Eritrea	76	LSO	Lesotho	106	SEN	Senegal			
17	BTN	Bhutan	47	EST	Estonia	77	LBR	Liberia	107	SYC	Seychelles			
18	BOL	Bolivia	48	ETH	Ethiopia	78	LBY	Libya	108	SLE	Sierra Leone			
19	BIH	Bosnia and Herzegovina	49	FJI	Fiji	79	MDG	Madagascar	109	SOM	Somalia			
20	BWA	Botswana	50	GAB	Gabon	80	MWI	Malawi	110	ZAF	South Africa			
21	BRA	Brazil	51	GMB	Gambia	81	MYS	Malaysia	111	LKA	Sri Lanka			
22	BRN	Brunei	52	GEO	Georgia	82	MLI	Mali	112	SDN	Sudan			
23	BFA	Burkina Faso	53	GHA	Ghana	83	MRT	Mauritania	113	SUR	Suriname			
24	BDI	Burundi	54	GRD	Grenada	84	MUS	Mauritius	114	SWZ	Swaziland			
25	KHM	Cambodia	55	GTM	Guatemala	85	MEX	Mexico	115	SYR	Syria			
26	CMR	Cameroon	56	GIN	Guinea	86	MDA	Moldova	116	TWN	Taiwan			
27	CPV	Cape Verde	57	GNB	Guinea-Bissau	87	MNG	Mongolia	117	TZA	Tanzania			
28	CAF	Central African Republic	58	GUY	Guyana	88	MAR	Morocco	118	THA	Thailand			
29	TCD	Chad	59	HTI	Haiti	89	MOZ	Mozambique	119	TMP	Timor-Leste			
30	CHL	Chile	60	HND	Honduras	90	MMR	Myanmar	120	TGO	Togo			

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NOTES

[i]. Recent evidence shows that aid allocation has become relatively sensitive to the Millennium Development Goals (MDGs) in the past decade (see Hailu and Tsukada, 2011).

[ii]. There are alternative ways to measuring aid-dependence including ratios to government revenue or export earnings. However, we believe that the aid-to-GDP ratio is relatively easy to calculate for a larger sample of countries, and less sensitive to differences in government structure and export orientation of countries.

[iii]. One reason for this pattern is that large flows of aid relative to the size of the domestic economy tend to divert government effort toward activities that ensure the continuous flow of aid (McPherson and Gray, 2000).

[iv]. Except for Cote d'Ivoire and Egypt, and to some extent Fiji, the shift in the ranking of these countries from the 1960s to the 2000s is very significant.

[v] Investment climate surveys indicate that inadequate electricity supply is a major constraint to private enterprise development (Shiferaw, 2009).