Development Effectiveness in Fragile States: Spillovers and Turnarounds

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1. The Agenda: Extending Aid Effectiveness

This paper attempts to quantify some neglected potential effects of aid, thereby improving overall guidance on aid effectiveness. It is thus in the tradition of the research on 'poverty efficient' uses of aid (Collier and Dollar, 2002). The core idea underlying 'poverty efficiency' is that since aid is scarce, donor agencies have a responsibility to use it as effectively as possible to reduce poverty. A characteristic of an effective aid program is that at the margin, the expected contribution of aid to poverty reduction should be the same across all components of the program. This is what it means for aid to be well-allocated. The Collier and Dollar analysis estimated what such an aid allocation would look like, based on a simple relationship between aid and poverty reduction, country-by-country, and compared it to actual aid allocations. It found that the big deviation of actual aid allocation from poverty efficiency was that far too much aid was provided to middle-income countries relative to low-income countries.

This poverty-efficient allocation was not meant to be a straightjacket for donors. After all, it is derived using less country-specific information than donors have available. Rather, it provides a useful benchmark from which to deviate in response to informed judgments. However, as the bias to middle-income countries demonstrates, often donor deviations from poverty-efficiency are not due to informed judgments but to political pressures. Aid allocation is highly political: ministers try to respond to concerns of the moment, sometimes humanitarian, sometimes commercial. Civil servants have a responsibility to protect program allocations from unwarranted influences. For such protection, the benchmark of a poverty-efficient allocation can be useful. In effect, the responsible civil servant faces the minister with the consequences of a proposed 'political' reallocation. The benchmark enables the civil servant to put a quantitative global estimate on how many more people will stay in poverty if the proposal is implemented. In short, quantitative norms are not meant to be a prison; they are meant to provide a defense for program integrity.

Revisiting the analysis of Collier and Dollar, it seems hard to quarrel with its principle conclusion that too much aid goes to middle-income countries. The main purpose of the present analysis is to explore an issue that Collier and Dollar did not address: namely whether aid can assist policies and institutions to improve in situations where they are particularly weak. Collier and Dollar did take a view on the larger question of whether aid can assist improvement in policies and institutions. Specifically, they treated policies and institutions as given, and thus unaltered by a change in the size of the aid program. This was consistent with the previous analysis of Dollar and Svensson (2000) which had found that there was no significant causal relationship from aid programs onto policy and institutional change. In turn, this result was consistent with the critiques of conditionality (for example, Collier, 1997), which suggested that it was more or less a charade. The incentive effect of aid on reform is indeed highly doubtful. In economic terms any 'substitution effect', making reform more attractive for a government, is offset by an 'income effect' making it less necessary. Perhaps more important, in psychological terms, the infringement of freedom associated with conditions induces 'reactance', whereby

governments attempt to reestablish their freedom by doing the opposite of what the conditions require.

However, the incentive effect of aid on reform is by no means the only way in which aid can influence policy and institutions. Aid can build capacity, directly or indirectly. It can expose governments to new ideas. It can free up governments from crisis management, enabling them to think about longer term strategies. Such effects might be particularly important at the very bottom of the economic spectrum. Chauvet and Guillaumont (2004) estimate economic policy regressions and indeed find that when policies are initially very poor, aid has a positive impact on them. While the general result of Dollar and Svensson is surely robust, it is therefore worth investigating whether aid promotes policy and institutional reform within the LICUS range. The present analysis is thus complementary to the Collier and Dollar analysis. That analysis enabled an estimate of the poverty efficiency of aid to LICUS *for given policies and institutions*. The present analysis investigates whether aid to LICUS in fact improves policies and institutions. To the extent that it does, the overall effect of aid on poverty reduction in a LICUS context is the sum of the two component effects.

We investigate the effect of aid on reform in LICUS contexts in two stages. First, we investigate whether aid prior to reform increases the probability that a sustained reform will take place. This is the agenda of Section 3. We then investigate whether, once a reform attempt has started, aid during its first few years enhances the chances that the reform will be sustained. This is the agenda of Section 4. First, however, we address the prior question of the costs of doing nothing: of letting LICUS 'stew in their own juice'. The issue that we address is whether LICUS generate spillover costs for their neighbours.

2. Spillovers and the Costs arising from a LICUS

The main purpose of this section is to get some order of magnitude on the costs generated by a LICUS. Obviously, the core of the cost is what LICUS status does to a country's own population. Poor policies, institutions and governance increase poverty and worsen the other dimensions of the MDGs. One simple indicator is the loss of growth associated with LICUS status. Although all LICUS are beset by poor policies, institutions and governance, an important distinction is between those beset by violent conflict – civil war – and those that are not. That civil war damages economic performance is unsurprising. Typical estimates are that growth is reduced during war by between two and three percentage points (Collier, 1998). Here, our focus is on the economic damage done by LICUS-level policies, institutions and governance, even if the country is at peace.

We estimate this cost by introducing a LICUS dummy into a standard growth regression. The results are reported in full in Appendix 1. We find that LICUS status typically reduces the annual growth rate of peacetime economies by 2.3 percentage points relative to other developing economies. This is clearly a very large effect, implying that turnaround from LICUS status, where it is possible, is cumulatively highly beneficial.

The cost of LICUS status evidently mounts with its persistence. As we will see in the next section, once a country is in the LICUS state, the condition is highly persistent: the annual chance of commencing a sustained turnaround is only 1.8%. So, the typical LICUS is likely to stay in that state for decades. The growth loss is thus not just a temporary phenomenon, but something which cumulates into a huge divergence in income from non-LICUS countries. To get some quantitative sense of the cost of LICUS status, we consider a long term horizon and estimate the expected loss as a percentage of initial GDP, over the future, of starting out as a LICUS country, compared with a country that avoids LICUS status. The country that starts out as a LICUS sees its GDP decline, relative to the comparator country, by 2.3% for each year that it stays a LICUS, while having a chance of sustained turnaround of only 1.8% per year. We assume that once a country does have a turnaround, it gradually recovers onto the non-LICUS growth path, the time taken to regain the growth path being the same as the number of years that the country has been a LICUS. Thus, for example, a country that turns around after only two years, will lose 2.3% of initial GDP in the first year and 4.6% in the second year. In the third year it starts to recover, so that its loss relative to the counterfactual of not having been a LICUS is only 2.3%. In the fourth year it regains the level of income that it would have had as a non-LICUS. We then discount these three losses back to the opening period, using a discount rate of 5%. We make such a calculation for each possible future scenario and sum them, weighted by the probability that each scenario will occur. The result is the expected cost to a country of starting out as a LICUS, given the likely prospects of turnaround. We estimate a cost of 4.6 times the initial GDP.

However, even this seriously underestimates the extent of the development problem posed by LICUS because it ignores the spillovers across the neighbourhood. There are already quantitative estimates of such spillovers for the case of civil wars. Both Murdoch and Sandler (2002) and Collier and Hoeffler (2004) find significant effects. Here we focus on the spillovers of a LICUS at peace. Using the same econometric approach as previously, we find that the typical neighbour loses 1.6 percentage points of their growth rate if their neighbour is a LICUS (see Appendix 1). We should note that although we find surprisingly large spillover effect, we have not taken into account the non-economic consequences of such potential spillovers as violence, organised crime, communicable diseases and refugees.

The loss for the typical neighbour is then calculated in the same way as the loss to the country itself, with the growth rate loss of 1.6% replacing the previous loss of 2.3%. The rest of the calculation, which rests upon the probability of a turnaround in the LICUS country, follows precisely the same approach. Following this procedure, we estimate the cost to the typical neighbour as 3.41 times its initial GDP. While this is unsurprisingly a smaller loss than that for the country itself, we have yet to allow for the fact that the typical LICUS country has around three neighbours and so inflicts spillover effects on three countries. The loss-to-neighbours is therefore triple 341%.

Suppose, for purposes of illustration, that the neighbours have economies of a similar size to that of the LICUS itself. Then the total loss of income to neighbours is more than double the loss to the country itself: two thirds of the economic damage done by LICUS

status are externalities accruing to neighbours rather than costs to the country itself. These large externalities imply that the internal pressure for reform will be considerably less than is warranted by the costs of the failure to reform. They therefore warrant a substantial donor effort to promote reform, conditional, of course, upon such an effort having a reasonable prospect of success.

Based on the above numbers, it is possible to make a lower-bound estimate of the 'cost' of a LICUS. This is the NPV of the growth losses to the country itself and to its neighbours. Taking the conservative assumption that the GDP of neighbours is on average the same as that of the typical LICUS, the total cost is the sum of the two costs estimated above, multiplied by the initial GDP of the average LICUS. That is:

[(458% + 3x341%)/100].AVERAGE LICUS GDP ($5.56bn) = $82.4bn.

Although this figure of the expected economic cost of a LICUS is very approximate, it can provide some guidance when we come to the potential benefits from aid interventions. In effect, if there were some intervention that overnight transformed a single LICUS into a typical non-LICUS low-income country, the benefit would be of the order of $80bn. This staggeringly large sum – more than the annual global aid budget – is the foundation for a cost-benefit analysis of aid intervention to promote sustainable turnarounds in LICUS contexts.

3. Aid to Promote Sustainable Turnaround

The agenda for this section is to investigate whether aid is significantly effective in promoting policy and institutional improvements that take a country out of LICUS status. There are two critical steps in the analysis: a proper specification of what we mean by a LICUS turnaround, and a satisfactory approach to the problem that aid is allocated purposively, and so is likely to be endogenous to outcomes.

In general terms the phenomenon we wish to analyze is clear enough. However, considerable care is needed to avoid the inclusion of situations which only meet some of the criteria of the events we wish to include. To specify a turnaround we need to answer the questions 'from what?' and 'to what?'.

What starting position is necessary before a country can possibly be a LICUS turnaround? Evidently, it must start out as a LICUS. This, in turn requires that it have not more than a certain level of income - in other words it must meet the criterion of being a low-income country, and it must start from weakness in its policies, institutions and governance. We use as an income cut-off that the country should have been classified as a LIC for at least one year by the World Bank (World Development Reports, 1977-2002). As a cut-off for weakness in policy, institutions and governance, a level of the CPIA no better than 2.5.

However, many countries occasionally meet these criteria and yet are not appropriate for the category of turnaround. This is because their period of difficulty reflects only a

temporary crisis into which they plunge and from which they rapidly bounce back. A LICUS is not simply a country in a brief spell of crisis. In particular, a country facing a crash in its policies, institutions and governance may be able to recover rapidly because expectations are not set, and because those political groups that benefit from the new situation have not yet mustered the power to prevent change. The concept of a LICUS includes some notion that the problem of weak policies, institutions and governance is not just of the moment, but has some persistence. We therefore add the requirement that policies, institutions and governance should have been under the threshold of 2.5 for at least four consecutive years. Countries that meet the other criteria but not this one we refer to as 'recoveries' rather than LICUS.

Thus defined, we have the pool of all country episodes from which a LICUS turnaround might potentially happen. From within this pool we now define what we mean by a turnaround.

Evidently, to be a turnaround, policies, institutions and governance must improve above LICUS status. However, this alone is clearly insufficient. A country whose CPIA improved from four consecutive years of being 2.49 to reach 2.51 would meet the letter of such a condition but would not have had a significant improvement. We introduce the additional requirement that the CPIA should not only rise above the threshold of 3.0, but that it improve by at least 1.4 relative to its nadir. By this we do not mean that the improvement should be abrupt, achieved within a single year. If any year subsequent to four years of consecutive CPIA scores low enough to qualify for the status of potential turnaround is at least 1.4 above the nadir, then that will satisfy our criterion.

However, momentary improvements, however large, are evidently not what donors are hoping to achieve. Rather, the objective is to promote sustained turnaround. We therefore need criteria for sustainability. It may seem obvious that the criterion for sustainability is simply that the reform should have persisted to the present. However, this would be a poor criterion. To quote a famous African saying, 'no condition is permanent'. Taking a specific example, Indonesia had a dramatic turnaround from the late 1960s, at which time it was a classic LICUS, to become a star performer of the 1980s. Yet, during the late 1990s it suffered a collapse along with much of East Asia. It seems to us unreasonable to see this crisis of the late 1990s as being the result of failures in the design of the turnaround. It is surely more reasonable to think of the turnaround as having been successful in producing sustained improvement, with the crisis of the late 1990s being attributable to some intervening event or process subsequent to the turnaround. By 'unsustained', we wish to capture only those turnarounds where the subsequent relapse was sufficiently close to the turnaround that the reasons for it could sensibly be attributed in large part to weaknesses in the turnaround itself. We therefore deem a turnaround to have been sustained if the CPIA remains above 3.0 for at least five years after the turnaround is achieved. A further reason for setting such a limit to the requirement of sustainability is that otherwise relatively recent turnarounds look much more successful than earlier turnarounds which have simply had more time to be reversed. Imposing no limit on the period required for sustainability would be a sure way of generating the happy illusion that sustained turnarounds are becoming more common.

We now have precise criteria for both a country in a position potentially to have a LICUS turnaround and for a sustained LICUS turnaround. The question we wish to investigate is whether donor actions can make such sustained turnarounds more likely. Our approach is going to be to estimate the probability of a turnaround, year by year, among all potential turnaround countries. Technically, this is done through logit regressions. There is, however, one major problem we need to surmount.

Aid is allocated purposively. Donors seek out information so as to direct aid to those situations where it stands the best chance of being helpful. To the extent that donors get this right, aid will tend to be targeted to situations which are ripe for improvement, and hence which subsequently indeed improve. With such behaviour it is intrinsically difficult to determine the direction of causality. If we regress the probability of a turnaround on aid, it is indeed likely to appear that aid raises the chances of turnaround, but this is only because we have forced this version of causality on the regression. We might equally have regressed aid upon the probability of reform, in which case we would have found that a good prospect of reform causes aid to go up.

The way to overcome this problem of causation is to 'instrument' for aid. That is, to find a component of aid that can be predicted country by country, year by year, and which is devoid of any influence of policy, institutions and governance. We adopt a set of instruments now common in the academic literature. Essentially, the idea is that a substantial component of a country's aid receipts is determined not by its own current circumstances but by the characteristics of donors. For example, Ethiopia is likely to get relatively a lot of aid from Italy, and Cote d'Ivoire is likely to get relatively a lot of aid from France. If the Italian aid budget goes up and the French aid budget goes down, Ethiopia is likely to get an increase in its aid receipts relative to Cote d'Ivoire. The details of our instrumentation regression are given in Appendix 2. The purpose of our 'instrumentation' is to investigate the effect on LICUS turnarounds of this component of aid that is unrelated to policy conditions in the LICUS country. Thus, to continue our example, from time to time Ethiopia, or Cote d'Ivoire 'strike lucky' or unlucky with their configuration of aid donors, and we investigate whether these lucky and unlucky strikes have any effect on the chances of a sustained turnaround.

Our logit regression investigates the chances of a sustained turnaround from LICUS status. Our observations are annual: each year that a country starts out as a LICUS it has some probability of starting an improvement in policies, institutions and governance that culminates in a sustained exit from LICUS status. We estimate the probability of such a turnaround starting, conditional upon the country starting the year in LICUS status. Once it has started on a sustained turnaround it drops from our sample since it cannot have a further turnaround. We control for three characteristics of the LICUS country: its level of income, its level of democratic rights, and the proportion of its population with secondary education. We then introduce aid, instrumented as discussed above, in the year in question. We are able to distinguish between two components of aid: technical assistance, and other aid. The detailed results are reported in Appendix 2.

Overall, we find that the probability of a sustained turnaround starting in any year is very low, at 1.79%. Countries are therefore likely to stay in LICUS status a long time. Indeed, given the probability, the mathematical expectation of the duration of LICUS status is 56 years. Note that this may slightly exaggerate the duration because it considers only exits due to improvement in policies, institutions and governance. A country can also exit LICUS status because of a rise in income that takes it above the low-income threshold. While on average, very poor policies, institutions and governance makes such a rise in income unlikely, sometimes countries have good fortune. For example, Equatorial Guinea has exited LICUS status because oil discoveries have taken average income above the low-income threshold despite poor policies, institutions and governance: it has passed from LICUS to MICUS. While our estimate of the high persistence of LICUS abstracts from such occurrences, growth in the presence of LICUS-level policies, institutions and governance is unlikely to be significantly poverty-reducing, as indeed is indicated by Equatorial Guinea.

We find that our country characteristics are not very important. The chances of a sustained turnaround are not significantly different depending upon the country's level of income, nor upon its level of democracy. Hence, the modest trend towards democratization in LICUS, even if coupled with some growth in income, would not significantly shorten the expected duration of LICUS status. We should note, however, that all LICUS countries are low-income, so that we are only looking at income variation among this group. Countries with a higher proportion of their people who have secondary education, and to a lesser extent, countries with larger populations, are significantly more likely to achieve sustained reform. Hence, an expansion in secondary education in a LICUS is an investment in reform. We are able to quantify this effect: increasing the proportion of the population with secondary education from the mean found in LICUS countries, 7.791%, to 8.791%, would raise the probability of reform from 1.79% per year to 1.93% per year. If the proportion with secondary education were raised to 8.791% and then maintained at that level, we can then simulate the economic benefit in terms of the enhanced probability of sustained turnaround. We therefore return to our estimate of the overall cost of a LICUS of $82.4bn and repeat the cost assuming that the expansion in secondary education happens in the first year of a long-term horizon, so that the annual chance of turnaround is increased from 1.79% to 1.93%. The expected cost of the initial LICUS status now falls to $80bn. Hence, the pay-off of expanded secondary education in a typical LICUS, in terms of enhanced prospects of reform is worth approximately $2.4bn. This would have to be compared against the costs of such an expansion, although we should note that we have not taken into account any of the normal returns to education in terms of raising incomes. The reform effect is purely additional to conventional calculations. Evidently, on this estimate, donor investment in what might be thought of as the social preconditions for turnaround has a high expected pay-off.

We now turn to the effects of aid. Recall that here we are only investigating the effect of aid prior to turnaround. We investigate the effect of aid post-turnaround in the next section. We find that technical assistance aid prior to turnaround has no significant effect on the prospect of turnaround. Indeed, in one variant of our analysis, technical assistance has significantly adverse effects on the chances of sustained turnaround. In the variant

which we regard as being most reliable, the effect of technical assistance, though adverse, is statistically insignificant. This is surely a surprising result, since to the extent that there was a conventional strategy for LICUS countries it was to provide 'advice'. Our results suggest that on average such advice has not been well received.

We now consider the effect of all aid other than technical assistance. We find that this component of aid has significantly favourable effects on the chances of a sustained turnaround. This result is robust across our variants in specification. As with education, we now estimate the benefits of this aid. Further, since unlike with education, the cost of aid is straightforward, we are able to compare the benefits of aid against its costs. This enables us to perform two calculations of potential interest. The first is a simulation of a small increase in aid, in the neighbourhood of mean aid receipts for a LICUS, that is maintained for a period of five years. That is, we investigate what would be the pay-off to such an increase in non-TA aid for a LICUS, purely in terms of enhanced chances of turnaround. On average, LICUS have received aid other than technical assistance equal to 6.8 percent of their GDP. We therefore simulate the effect of increasing this by one percentage point to 7.8%. One advantage of considering a small increase of this kind is that it is well within the observed range of the data, thereby increasing the reliability of our results. The effect on the change of reform is to raise it from 1.79% per year to 2.5% per year. In proportionate terms this is a large effect: we are increasing the chance of escape from LICUS status by around a half. To estimate the benefit relative to the cost we return to our calculation of the costs of starting out as a LICUS, but now raise the probability of sustained turnaround to 2.5% for the first five years of our long-term horizon. The cost of starting out as a LICUS now falls from $82.4bn to $79.5bn. This difference of almost $3bn is the present value of the benefits from the investment in temporarily enhanced aid. The costs of the enhanced aid are simply one percent of GDP - $55.6 millions – each year for five years, discounted back to the present at the 5% discount rate. The resulting present value of the cost is $240.8 millions. The investment of an incremental aid program to a typical LICUS of $240.8 millions thus results in a payoff of around $3bn. Since, as noted, this considers only one component of the payoff to aid, namely the enhanced prospect of sustained reform, it suggests that expanded aid would be well worth while.

If, starting from present levels, a marginal increase in aid is highly beneficial, this raises the further question of how far could an expansion usefully go? At what point would the marginal benefits in terms of enhanced prospects of turnaround broadly equal their marginal cost. Note, that again we will abstract from any effects of aid on income or social outcomes prior to turnaround: the only effect of aid we allow for is the effect on the chance of turnaround. This is conservative, but as such it provides a lower-bound, and acknowledges the difficulty of using aid to promote growth in LICUS conditions. However, we should further qualify the subsequent analysis by noting that any really large increase in aid will take us outside the range of the observed data. Our logit analysis ensures that we will eventually encounter diminishing returns to aid, simply because the probability of reform must asymptote, implying diminishing returns to everything; but we

are not using an explicitly observed diminishing return to aid[1]. We use the same long-term horizon as in our previous calculations. With these caveats, the 'optimal' amount of aid, at which the marginal benefits in terms of enhanced prospects of reform equal the marginal costs, occurs when aid is around 22% of GDP.

We have thus found that two forms of aid – support that achieves an expansion in secondary education, and aid in general other that technical assistance – both have very substantial expected pay-offs relative to their cost. However, two caveats need to be borne in mind. First, even if our results are entirely correct, they reflect the expected pay-off from strategies that are very high risk. Usually, enhanced aid for five years will not achieve a turnaround. The high pay-off is because the small increase in the prospect of a sustained turnaround is very valuable because of the enormous value of a sustained turnaround. Donors are not used to making investments with such a high risk of failure: this sort of investment is more analogous to venture capital funds specializing in start-ups than to bank lending. In the case of sustained investment in secondary education, the risk is somewhat lower, but even more than with normal investments in education, the prospective pay-off is likely to be far in the future. Secondly, our results may be wrong. We are, of course, able to estimate the risk that, conditional upon our chosen specification, the result is merely a statistical fluke. This risk is modest. There is a more serious risk that our chosen specification is inappropriate, so that the results are not robust. In practice, this is best determined by the accumulation of research by other scholars. This second caveat adds a further risk to aid-for-turnaround. In the end, the case for such aid is partly that on current analysis its expected pay-off is so much higher than its cost that it can withstand a hefty discount for risk, and partly that in the absence of external intervention the expected duration of LICUS status exceeds the expected remaining lifetime of anyone currently working in an aid agency. Without some strategy for external stimulus we are waiting for Godot.

4. Aid to Sustain Incipient Turnarounds

In Section 3 we considered aid for LICUS prior to reform in order to enhance the chances that a sustained reform would take place. We now turn to the question of aid policy *during* the early stages of a reform. The objective that we analyze is again not enhanced growth or poverty reduction as such, but rather whether the turnaround is sustained as measured by the quality of policies, institutions and governance.

For this analysis we need a definition of 'incipient' reform. Our previous definition of sustained reform included the criterion of durability – the CPIA had to remain above 3 for at least five consecutive years. One possibility in distinguishing between sustained and unsustained reforms is therefore simply to determine whether a turnaround that meets our other criteria does, or does not meet this criterion of five-year persistence. However, this categorization of unsustained reforms turns out to be far too strict – only six of the 29

[1] A quadratic relationship between aid and the probability of turnaround has been explicitely tested in the regressions but it proved to be not significant (as for technical assistance).

reforms that meet our other criteria fail to meet the five-year criterion. This is because one of our other criteria is an improvement in the CPIA of 1.4 points. Once a country has achieved such a large increase in its CPIA it seldom reverts to LICUS status. However, this is not very helpful for donors: agencies need to know whether it is a good use of resources to back a reform program well before it has achieved such a major improvement in policies, institutions and governance. We therefore radically lower the threshold of CPIA improvement to define what constitutes an 'incipient turnaround'. At the same time, since the CPIA is a subjective judgment call, it would be unreasonable to consider *any* improvement in the CPIA of a LICUS, however, small, as something that should potentially trigger a rethink of aid policy: that route would lead into the problem of aid volatility. The reasonable position is surely to try to determine thresholds which trigger changes in aid policy and which are sufficiently sizable that they occur relatively infrequently. In this spirit, we investigate a range of thresholds. A low threshold of CPIA improvement will imply not only more volatility but also more false dawns: a higher proportion of 'incipient turnarounds' will revert back into clear LICUS status. Specifically, we consider threshold levels of CPIA improvement of 0.25, 0.5, 0.75, and 1.0. In Table 1 we report for the typical LICUS the frequency with which the threshold would have been triggered, and the proportion of 'incipient turnarounds' that become 'sustained turnarounds' on our previous definition.

Table 1: Volatility and Error under different Triggers for Aid Policy

Triggering threshold	Frequency of policy change (times per LICUS)	Rate of error {(incipient-sustained)/incipient}
0,25	1,76	0,78
0,5	1,53	0,75
0,75	1,28	0,70
1	0,97	0,61
1,4	0,62	0,39

Table 1 illustrates the fundamental donor problem in supporting signs of reform in LICUS contexts. Mostly, the donor will end up 'backing losers'. Even if the donor waits until the CPIA has already improved by a full point (1.0) before supporting the reform effort, six times out of ten the support will not lead to sustained turnaround: the incipient reform will either get stuck or collapse altogether. In principle, it is possible to estimate the optimal decision rule for donor intervention, balancing the costs of errors of commission against the costs of errors of omission. At this stage in our research we undertake only the more limited task of estimating the consequences of adopting one particular threshold for triggering intervention, namely an improvement in the CPIA of 0.5. That is, we explore the consequences of a strategy in which the donor waits until the CPIA has improved from its low-point by 0.5 points and then intervenes with supporting aid.

Thus, we take as our sample those LICUS countries that embarked upon 'incipient turnarounds', defined as having at least a 0.5 improvement in the CPIA. We then attempt

to explain which of these incipient turnarounds matured into a sustained turnaround (on our previous definition). Various methodologies are available for such a question. The one we use, which we regard as the most appropriate, involves a switch from the logit regressions used for our previous question of the pre-conditions for a sustained turnaround, to hazard functions. A hazard function models the period-by-period 'hazard' that a process will end. For example, it is commonly used to analyze the duration of unemployment, and has also been used to analyze the duration of civil war. We focus on the process of incipient reform. We track these processes, investigating in turn the factors which lead to success – the attainment of a 'sustained turnaround' – or complete failure – the collapse of the incipient reform and reversion to the initial LICUS state.The detailed methodology and results being reported in Appendix 3.

Again we control for some basic characteristics of the country such as its income and population. With respect to aid, we again distinguish between technical assistance and other aid. Both forms of aid are again 'instrumented'. This is particularly important because presumably donors tend to respond most strongly to the most promising of the incipient reforms: the scale of actual aid is thus likely to be endogenous to the prospects of its success. By 'instrumenting', we control for this effect, considering only that component of aid which is truly exogenous.

Time is continuous and the 'units' into which it is divided – months, years or whatever – are a matter of choice in research design. When sample sizes are relatively small, as in analysis of LICUS countries, there is a trade-off between a high frequency of observation – choosing short time periods – and statistical significance. Our highest frequency analysis considers two-year periods. Thus, our first observation is the first two years of an incipient turnaround – that is, the first two years after the CPIA has crossed the threshold of a 0.5 point improvement. The second observation is the third and fourth years after the threshold has been crossed and so forth. We supplement this with four-year periodization.

Our first analysis focuses on the factors which make the incipient turnaround more or less likely to achieve the criteria for a sustained turnaround. Potentially, the hazard function approach enables us to analyze this period-by-period. This is attractive: for example, it can in principle show when during an incipient reform aid of various types is most effective. However, for small samples the most robust results are likely to come from pooling all the observations, and this is how we start. In Appendix 3. Model 1, we report the resulting hazard function including both technical assistance and all other aid.

Both technical assistance and other aid have significant effects on the time which an incipient turnaround takes to become a sustained turnaround. For both the relationship is non-linear (the quadratic term is significant). Technical assistance is subject to diminishing returns: an implication is that there is an optimal amount. This is around 4% of GDP. Much above this and the marginal effects of technical assistance become adverse. The non-linearity for other aid is, however, dramatically different. Small amounts of aid (excluding TA) actually slow down the process of turnaround: only big aid works. The threshold above which the net effect of aid becomes positive, accelerating the attainment of a sustained turnaround is quite high – around 12% of GDP.

We will shortly refine these results by investigating when during incipient reform different types of aid are most effective. However, first we turn to the complementary issue of preventing the collapse of an incipient reform. That is, we switch the focus from whether aid helps to press an incipient reform on to the attainment of 'sustained turnaround', to whether it helps to reduce the risk that the incipient reform will fall apart altogether, taking the country back to where it had started. These results are shown in Appendix 3 under Model 2. Technical assistance has a precisely complementary effect: just as it accelerates progress to sustained turnaround, it significantly reduces the risk of reform collapse. Other aid has no significant effect on whether an incipient reform collapses. This suggests that we can be somewhat more confident in the deployment of technical assistance during the incipient stages of a turnaround than of other forms of aid. 'Big aid' may well help achieve a sustained turnaround, but the results are less consistent across the range of risks.

We now take the analysis further by distinguishing the two-year and four-year periods separately. As noted, this has the potential to show when during an incipient turnaround support is most useful. The results hold up well to the difficulties posed by small sample size. We revert to the prospects of attaining a sustained turnaround (Model 1). The coefficient on technical assistance in the first four-year period is much larger and more significant than subsequent technical assistance. Hence, the implication is that donors should react rapidly with technical support for 'incipient turnarounds'. We then break down this first four-year period into its two shorter sub-periods. Technical assistance is significant in both these shorter periods, but it has a larger effect in the first two years than in the second. This reinforces the result that technical assistance should be provided early. Further, technical assistance should not continue indefinitely. For the next eight years – that is from the fifth to the thirteenth year of an incipient turnaround – the effect of technical assistance is insignificant and indeed negative. These results are partly complemented by the effect of technical assistance on the risk that the reform will collapse (Model 2). Technical assistance in the first four years significantly reduces the risk that the reform will collapse, but this is also true in the subsequent eight years. In effect, if technical assistance is prolonged it helps to keep the country in a limbo world between reform and collapse but does not help to take reform forward.

Taken together with our results on the ineffectiveness of technical assistance as a precondition for turnaround (Section 3), these results have profound implications for the organization of technical assistance. We return to this in the concluding Section.

We now turn to the other forms of aid. As with technical assistance, once the process of incipient reform is disaggregated into its component time periods a clear pattern emerges. Aid (excluding technical assistance) is not effective in the first four years of incipient reform. Indeed, in the first two years it has large and significantly adverse effects. Beyond the twelfth year such aid again becomes highly counter-productive, significantly reducing the prospect that the reform will press on to a successful conclusion. There is a relatively brief period, between the fifth and the eighth year of the incipient turnaround when aid is significantly helpful. The importance of aid in the middle-period of the first

decade of incipient reform strikingly corresponds to the research on aid effectiveness post-conflict (Collier and Hoeffler, 2004). That research directly looked at the effect of aid on growth, rather than on the CPIA. It found that in the first few years of post-conflict peace aid was not particularly effective, but that there was a period of high effectiveness in the middle of the decade. It is plausible that these two distinct results are pointing to the same phenomenon. In the early stages of reform, although needs are great, the capacity to use money productively is simply not in place. As the reforms proceed, that capacity is put in place and then aid becomes enormously useful. The results on whether aid promotes sustained reform (Model 1) are only partly consistent with the results on whether it prevents incipient reforms from collapsing completely (Model 2). In the first eight years, aid (again excluding technical assistance) has no effect on the prospects of collapse. Beyond that the effects are erratic but predominantly significantly adverse: if aid is sustained for many years in a stalled reform effort it is more likely to push the reforms into collapse than to prevent collapse. These results on aid other than technical assistance have implications for the sequencing of different forms of assistance to LICUS which are taken up in the concluding Section.

5. Conclusion and Implications for Donor Strategy

Our analysis has generated both disturbing and encouraging results.

The most disturbing results concern the longevity and cost of LICUS status. Typically, once a country meets the criteria for LICUS status it remains in that state for a very long time: the expected duration of a LICUS is 56 years. Thus, if countries newly entered into LICUS status, such as Zimbabwe and Cote d'Ivoire, conform to the past pattern, not emerge from it within the lifetime of anyone currently working in an aid agency.

In conjunction with this problem of longevity, but only peripherally related to it, is the cost of LICUS status. In total, the cost of the typical LICUS, expressed as a present value is around $80bn. Most of this cost accrues to neighbours rather than to the country itself. This is the case even when the LICUS is entirely peaceful: very weak policies, institutions and governance have adverse neighborhood spillovers.

The encouraging aspect of our analysis is that even with the limited traditional instruments of a development agency – various types of aid – something can be done to enhance the chances that countries will turn themselves around. We note that other forms of international assistance such as the Extractive Industries Transparency Initiative and guarantees of security may have much greater impact. Given the magnitude of the problem and the relative weakness of traditional instruments, their emergence as standard tools of development is surely a priority.

A striking feature of our results is that even with the very limited distinction between technical assistance and other forms of aid, the issue of what form of aid is appropriate at what time is important.

Technical assistance has no discernable effect until after a turnaround has clearly begun. Before that it appears to be a waste: it is not a precondition for reform. However, once there are clear signs that the government has itself embarked upon a turnaround, rapid technical assistance is a highly effective form of aid, increasing the chances that the incipient reform will progress to a substantial and sustained improvement and reducing the chances of relapse. But technical assistance can be excessive and it can continue for too long. Around 4% of GDP appears to be the right amount of technical assistance in early reform environments, although this will obviously have to be nuanced by the particular circumstances. If the incipient reform does not progress towards a sustained turnaround after around a decade, the case for continued technical assistance is weakened, although it still plays some role in averting complete relapse.

This pattern has several important implications for the provision of technical assistance. An obvious interpretation of our results is that technical assistance is only really useful when it is provided to governments that *want* and *need* to use it. An indication of intention is that the government has already made significant reforms – improving the CPIA by at least 0.5. An indication of need is that there is continuing progress. Analogous to the research on the circumstances in which education is productive, knowledge is only really useful when a system is trying to adapt. Without continuing change there is no need for technical assistance. *Technical assistance can help a government get change right, it cannot make change happen.*

If technical assistance is only productive when governments both want it and need it, in such circumstances the government itself should be the best judge of its needs. A practical way of implementing the implied approach would be for newly reforming governments to be given a 'Technical Assistance Account' that they can draw down at their own initiative for international expertise. A second implication is that the supply of technical assistance should be organized by donor agencies in such a way as to be highly responsive to changes in development circumstances. In effect, *it needs to be organized analogous to emergency relief* rather than being handled as if it were simply an ordinary development project. The allocation of TA between countries should be 'volatile': if it does not change much from year to year then it is definitely being misallocated. A final implication is that the evaluation of technical assistance needs to take into account that it is intrinsically a high risk investment, analogous to venture capital. Even when properly allocated in response to opportunities, much of the time it will fail. This is more than compensated by the times when it pays off.

Other forms of aid for LICUS do not need to have this rapid reaction capability. One reasonable use appears to be to improve the pre-conditions for a turnaround. Among these uses, secondary, and by implication, higher levels of education appear to be really productive. The typical LICUS not only has a small share of its population with above-primary education, it has a small population. Hence, the pool of educated people may well be too small either to generate or to manage the radical adaptations that are necessary in the transformation from LICUS status. Even Nigeria is short of people who are qualified actually to implement complex reforms: in a more typical situation such as the Central African Republic, the shortage is severe.

Aid spent on providing a cadre of well-educated people has an expected pay-off far in excess of its likely cost. Other forms of aid (excluding technical assistance) used to build the preconditions also have a high expected pay-off, but it should be stressed that this pay-off is very risky: mostly such aid will fail. Were donors completely risk neutral, or able to pool their risks across many investments like a venture capital fund, then the optimal amount of 'precondition-enhancing-aid' would be quite high. On our analysis the point at which marginal costs equal marginal benefits is when aid is 22% of GDP. Donors are not risk neutral, and they cannot pool their risks except to a limited extent. Hence, 22% is surely better seen as an upper bound rather than as a target. Nevertheless, it is strikingly high. Donors can justify having some of their portfolio at this high-risk end of the spectrum, even though it cannot be a major component because of the difficulty of showing proper accountability for expenditures with this level of risk.

Beyond its use to build the preconditions for reform, aid (other than technical assistance) also has a role once reform is underway. On our analysis there is no urgency. Aid should scale up during the middle of the first decade of turnaround. At this stage there is some evidence that it should be substantial – well in excess of 12% of GDP. It should not go on at this scale indefinitely. If the incipient reform fails to progress to a sustained turnaround within a decade, continued large aid is likely to reduce the chances of progress and may even increase the risk of relapse.

Taken together with technical assistance, this suggests the following sequence of aid instruments:

Prior to any improvement:	avoid technical assistance, but use other aid, especially for post-primary education, to build the conditions for reform.
Early support for reform:	Once a government has raised the CPIA by 0.5 donors should very rapidly provide substantial technical assistance, of the order of 4% of GDP. Other forms of aid at this early stage are probably counterproductive.
The peak stage of reform:	During the middle of the first decade of reform (around the 5^{th}-8^{th} years), technical assistance should be scaled down and replaced by a large aid program, perhaps in the range 15-20% of GDP.
Sustained turnaround:	If sustained turnaround is attained, then aid can be determined on the more conventional criterion of 'poverty efficiency'.
Reform collapse:	If the incipient reform completely collapses, donor involvement should revert to the first stage, as if there had been no improvement.

Reform limbo:	If the incipient reform gets stuck in limbo, neither progressing to a sustained turnaround, nor collapsing back to the initial position, technical assistance should gradually be scaled down, and other forms of aid should fairly rapidly be scaled down.

Finally, we should note two important caveats. First, we are not able to differentiate technical assistance according to its destination. It is possible that technical assistance to government might have quite different effects from technical assistance to non-government organisations such as the media. In particular, we are not able to test the proposition that technical assistance for such non-governmental organisations is a useful precondition for turnarounds. Second, we cannot for the moment differentiate between different types of non-technical assistance aid, notably between project assistance and budget support, nor between different sectors. Presumably just as with the broad distinction between technical assistance and other aid, such choices matter and would therefore change and deepen the results.

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Appendix 1 – Growth spillover effects of LICUS countries, 4-years subperiods, 1974-01.

OLS estimations	Average Annual Growth Rate			
	(1)	(2)	(3)	(4)
Ln income per capita	-0.0024	-0.0018	-0.0037	-0.0038
	(-1.88)	(-1.48)	(-1.72)	(-1.74)
CPIA			0.021	0.021
			(8.52)	(8.51)
Dummy LICUS	-0.027		-0.017	
	(-7.09)		(-3.43)	
Dummy LICUS at war		-0.038		-0.019
		(-4.28)		(-2.34)
Dummy LICUS at peace		-0.023		-0.016
		(-6.63)		(-3.17)
Dummy "LICUS neighbour"				
Dummy "LICUS neighbour at war"				
Dummy "LICUS neighbour at peace"				
Dummy 1974-1977			0.029	0.029
			(6.59)	(6.56)
Dummy 1978-1981	0.0002	0.001	0.029	0.029
	(0.05)	(0.31)	(5.38)	(5.37)
Dummy 1982-1985	-0.009	-0.011	0.009	0.009
	(-2.24)	(-2.40)	(1.74)	(1.75)
Dummy 1986-1989	-0.0007	-0.001	0.017	0.017
	(-0.20)	(-0.27)	(3.94)	(3.95)
Dummy 1990-1993	-0.013	-0.012	0.006	0.007
	(-3.05)	(-2.96)	(1.52)	(1.55)
Dummy 1994-1997	0.0002	0.0001	0.016	0.016
	(0.05)	(0.02)	(3.60)	(3.63)
Dummy 1998-2001	-0.006	-0.009		
	(-1.73)	(-2.69)		
Constant	0.044	0.039	-0.032	-0.031
	(3.98)	(3.69)	(-1.64)	(-1.63)
Number of observations	871	821	605	605
R^2	0.12	0.13	0.19	0.19

t-student in parentheses.

Appendix 2 – Determinants of the start of sustained turnarounds, annual data, 1973-1999.

Start of sustained turnarounds	Logit	Rivers & Vuong	x at mean	xb at mean	x	xb	x	xb
Ln income p.c., t-1	0.365	0.101	7.289	2.659	7.289	2.659	7.289	2.659
	(0.52)	(0.16)						
	(0.46)	*(0.14)*						
Democracy	-0.004	-0.017	1.583	-0.006	1.583	-0.006	1.583	-0.006
	(-0.04)	(-0.14)						
	(-0.03)	*(-0.13)*						
Education	0.073	0.102	7.791	0.572	8.791	0.645	7.791	0.572
	(2.43)	(3.20)						
	(2.07)	*(2.26)*						
Ln population	1.105	1.200	8.649	9.557	8.649	9.557	8.649	9.557
	(1.76)	(1.72)						
	(1.69)	*(1.51)*						
(ODA-TA)/GNI, predicted	0.343		6.823	2.338	6.823	2.338	7.823	2.680
	(1.98)							
	(1.75)							
TA/GNI, predicted	-0.141		2.362	-0.333	2.362	-0.333	2.362	-0.333
	(-0.24)							
	(-0.23)							
(ODA-TA)/GNI		0.334						
		(1.93)						
		(1.49)						
Residual from instrumentation reg. (ODA –TA)/GNI		-0.279						
		(-1.43)						
		(-1.18)						
TA/GNI		-0.049						
		(-0.09)						
		(-0.08)						
Residual from instrumentation reg. TA/GNI		0.582						
		(1.00)						
		(0.76)						
Constant	-18.79	-18.41	1.000	-18.79	1.000	-18.79	1.000	-18.79
	(-1.70)	(-1.66)						
	(-1.59)	*(-1.44)*						
Observations	410	410						
Countries	24	24						
Start of sustained turnarounds	15	15						
Log-Likelihood	-55.02	-50.22						
Pseudo R^2	0.15	0.22						
probability				0.0179		0.0193		0.0251

t-student in parentheses under coefficients. In italics and parentheses, t-student calculated with the standard errors from bootstrapped estimations.

Appendix 2 (continued) – Instrumentation regressions, annual data, 1973-1999.

OLS estimations	(ODA-TA)/GNI	TA/GNI
Ln income p.c., t-1	35.64	7.856
	(3.22)	(2.20)
Ln income p.c. squared, t-1	-2.496	-0.514
	(-3.27)	(-2.10)
Democracy	0.208	-0.023
	(1.82)	(-0.64)
Education	-0.291	-0.116
	(-5.37)	(-8.95)
Ln population	-1.812	-0.842
	(-6.06)	(-11.97)
Same language as UK	-3.009	0.949
	(-1.14)	(1.24)
Same language as France	-1.667	1.011
	(-0.82)	(2.44)
Same religion as UK	4.213	-2.125
	(1.44)	(-2.26)
Same religion as France	2.057	0.264
	(1.46)	(0.72)
Same religion as Germany	-0.826	0.061
	(-0.69)	(0.17)
Distance from Washington	0.0001	0.0002
	(0.29)	(3.80)
Distance from Tokyo	-0.001	-0.0001
	(-3.62)	(-1.13)
Distance from Brussels	-0.001	0.00002
	(-1.54)	(0.26)
Total ODA budget of France	0.003	0.001
	(2.22)	(2.31)
Total ODA budget of Germany	-0.001	-0.0003
	(-2.23)	(-3.76)
Total ODA budget of Japan	-0.002	0.0005
	(-2.26)	(1.64)
Total ODA budget of USA	-0.0001	0.0002
	(-0.17)	(1.91)
Total ODA budget of UK	-0.006	-0.001
	(-1.87)	(-0.89)
ODA budg. of France x Same religion as France	-0.0003	-0.0001
	(-0.77)	(-1.26)
ODA budg. of France x Same language as France	-0.0001	-0.00003
	(-0.21)	(-0.14)
ODA budg. of UK x Same religion as UK	-0.004	0.0008
	(-1.24)	(0.73)
ODA budg. of UK x Same language as UK	0.002	-0.0003
	(0.72)	(-0.33)
ODA budg. of Germany x Same religion as Germany	0.0005	0.0002
	(1.82)	(3.11)
ODA budg. of USA x Same religion as USA	-0.0005	-0.0003
	(-1.15)	(-1.51)

ODA budg. of USA x Same language as USA	0.0004	0.0003
	(0.77)	(1.25)
ODA budg. of USA x Distance from Washington	0.00000002	-0.00000001
	(0.58)	(-0.94)
ODA budget of Japan x Distance from Tokyo	0.0000002	-0.00000003
	(2.32)	(-1.32)
ODA budget of UK x Distance from Brussels	0.0000007	0.00000007
	(1.68)	(0.51)
ODA budget of France x Distance from Brussels	-0.00000009	-0.00000006
	(-0.74)	(-1.60)
Constant	-92.59	-22.24
	(-2.31)	(-1.70)
Observations	410	410
Countries	24	24
R^2	0.44	0.62
R^2 without instruments	0.14	0.32

t-student in parentheses under coefficients.

Appendix 3 – Econometric estimates of hazard function parameters

	MODEL 1 dep. variable : time to sustainability of turnarounds		MODEL 2 dep. variable : time to unsustainability of turnarounds	
	(1)	(2)	(3)	(4)
Ln income pc	1.376	1.089	-2.063	-2.326
	(2.10)	(1.53)	(-2.98)	(-3.46)
Ln population	1.002	0.934	-1.351	-1.456
	(2.84)	(2.72)	(-3.67)	(-3.73)
(ODA-TA)/GNI, predicted	0.066	-0.892	-0.019	-0.038
	(0.60)	(-4.19)	(-0.24)	(-0.16)
(ODA-TA)/GNI, pred^{d} squared		0.037		0.0009
		(4.97)		(0.12)
TA/GNI, predicted	0.325	2.663	-0.523	-0.955
	(0.87)	(3.15)	(-1.82)	(-1.49)
TA/GNI, predicted squared		-0.334		0.048
		(-3.70)		(0.63)
Constant	-24.68	-20.79	25.04	28.61
	(-3.14)	(-2.55)	(3.18)	(3.48)
Observations at risk	325	325	242	242
Countries	64	64	63	63
Exit from the risk category	15	15	28	28
p (se in parentheses)	1.417 (0.18)	1.603 (0.21)	1.879 (0.19)	1.910 (0.22)
Log-Likelohood	-37.70	-32.18	-47.17	-46.56
Wald test (p-value)	0.022	0.000	0.006	0.001

Weibull regressions with duration in years as dependent variable. Z-statistics in parentheses, calculated from robust standard errors to control for clustering on countries. (ODA-TA)/GNI and TA/GNI are predicted from instrumentation regressions as in Appendix 2, except that education and democracy variables are dropped to be consistent with the duration model specification.

Appendix 3 (continued) – Control for unobservable heterogeneity

	MODEL 1 dep. variable : time to sustainability of turnarounds				MODEL 2 dep. variable : time to unsustainability of turnarounds			
	Observation level		Country level		Observation level		Country level	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Ln income pc	2.315	2.057	2.040	1.089	-2.774	-3.073	-2.375	-2.536
	(1.81)	(1.44)	(1.86)	(1.42)	(-2.58)	(-2.82)	(-2.40)	(-2.58)
Ln population	1.566	1.739	1.280	0.934	-1.976	-2.079	-1.656	-1.725
	(1.90)	(2.01)	(1.92)	(2.08)	(-3.48)	(-3.61)	(-3.29)	(-3.34)
ODA/GNI, predicted	0.081	-1.619	0.032	-0.892	0.037	0.147	0.037	0.013
	(0.46)	(-2.58)	(0.21)	(-2.90)	(0.36)	(0.49)	(0.37)	(0.05)
ODA/GNI, pred^{d} squared		0.067		0.037		-0.005		0.001
		(2.89)		(3.45)		(-0.40)		(0.08)
TA/GNI, predicted	0.570	4.903	0.525	2.663	-0.975	-1.857	-0.712	-1.143
	(0.68)	(2.29)	(0.76)	(2.38)	(-2.06)	(-1.94)	(-1.64)	(-1.36)
TA/GNI, pred^{d} squared		-0.603		-0.334		0.111		0.052
		(-2.35)		(-2.51)		(1.06)		(0.53)
Constant	-38.12	-35.98	-32.92	-20.79	35.97	39.823	29.55	32.14
	(-2.21)	(-1.97)	(-2.33)	(-2.15)	(2.83)	(3.02)	(2.59)	(2.76)
Observations	325	325	325	325	242	242	242	242
Countries	64	64	64	64	63	63	63	63
Exit from risk	15	15	15	15	28	28	28	28
Log-Likelohood	-36.59	-31.65	-36.98	-32.18	-45.53	-44.76	-46.71	-46.27
Wald test (p-value)	0.09	0.007	0.12	0.01	0.000	0.000	0.000	0.001
p	2.321	2.903	2.267	1.603	2.735	2.693	2.662	2.553
(se of p)	0.726	0.821	0.805	0.382	0.713	0.667	0.771	0.838
Test θ=0 (p-value)	0.067	0.151	0.114	1.000	0.035	0.029	0.167	0.225

Weibull regressions with duration in years as dependent variable. Z-statistics in parentheses. Frailty (observation-level heterogeneity) and shared frailty (country-level heterogeneity) models are estimated assuming an Inverse-Gaussian distribution for frailty. In MODEL 1, we find no evidence of unobservable heterogeneity when squared aid variables are introduced (θ=0). In MODEL 2, we find evidence of observation-level heterogeneity. (ODA-TA)/GNI and TA/GNI are predicted from instrumentation regressions as in Appendix 2, except that education and democracy variables are dropped to be consistent with the duration model specification.

Appendix 3 (continued) – Decomposition of the impact of technical assistance and other aid by period.

	MODEL 1 dep. variable : time to sustainability of turnarounds		MODEL 2 dep. variable : time to unsustainability of turnarounds	
	1	2	3	4
Ln income p.c.	0.434	0.241	-4.133	-2.683
	(0.59)	(0.35)	(-5.40)	(-4.37)
Ln population	0.505	0.585	-2.708	-2.203
	(1.24)	(1.44)	(-4.33)	(-4.14)
(ODA-TA)/GNI pred, years 1 and 2	-15.14		0.689	
	(-2.11)		(2.86)	
(ODA-TA)/GNI pred, years 3 and 4	-0.101		0.097	
	(-0.86)		(1.09)	
(ODA-TA)/GNI pred, years 1 to 4		-0.155		0.077
		(-0.84)		(0.70)
(ODA-TA)/GNI pred, years 5 and 6	0.272		0.164	
	(1.93)		(0.69)	
(ODA-TA)/GNI pred, years 7 and 8	0.007		0.207	
	(0.05)		(0.87)	
(ODA-TA)/GNI pred, years 5 to 8		0.248		0.0005
		(2.11)		(0.00)
(ODA-TA)/GNI pred, years 9 and 10	-0.169		-0.381	
	(-0.47)		(-1.69)	
(ODA-TA)/GNI pred, years 11 and 12	-0.716		-3.505	
	(-2.42)		(-5.10)	
(ODA-TA)/GNI pred, years 9 to 12		-0.133		-0.562
		(-0.47)		(-2.53)
(ODA-TA)/GNI pred, years 13 and 14	-5.435		8.749	
	(-16.20)		(13.35)	
(ODA-TA)/GNI pred, years 15 and 16	-5.259		0.437	
	(-9.28)		(1.07)	
(ODA-TA)/GNI pred, years 13 to 16		-0.721		1.758
		(-1.96)		(2.93)
(ODA-TA)/GNI pred, years 17 and 18	-1.934		-19.449	
	(-3.03)		(-24.73)	
(ODA-TA)/GNI pred, years 19 and 20	-4.825		-33.032	
	(-9.20)		(-18.50)	
(ODA-TA)/GNI pred, years 17 to 20		-4.876		-18.638
		(-7.18)		(-22.04)
(ODA-TA)/GNI pred, years 21 and 22	-7.712	-6.868		
	(-11.80)	(-11.09)		
TA/GNI pred, years 1 and 2	12.078		-2.770	
	(1.92)		(-3.37)	
TA/GNI pred, years 3 and 4	0.949		-1.096	
	(1.65)		(-2.42)	
TA/GNI pred, years 1 to 4		1.485		-0.881
		(1.98)		(-2.04)
TA/GNI pred, years 5 and 6	-0.368		-2.363	

	(-0.73)		(-2.42)	
TA/GNI pred, years 7 and 8	-0.031		-4.649	
	(-0.06)		(-2.77)	
TA/GNI pred, years 5 to 8		-0.295		-1.764
		(-0.67)		(-3.12)
TA/GNI pred, years 9 and 10	0.180		-1.275	
	(0.20)		(-2.85)	
TA/GNI pred, years 11 and 12	1.217		7.075	
	(1.78)		(4.53)	
TA/GNI pred, years 9 to 12		-0.022		-0.362
		(-0.03)		(-0.77)
TA/GNI pred, years 13 and 14	8.304		-58.141	
	(12.28)		(-18.93)	
TA/GNI pred, years 15 and 16	7.490		-7.872	
	(5.85)		(-3.87)	
TA/GNI pred, years 13 to 16		1.271		-14.435
		(2.00)		(-4.27)
TA/GNI pred, years 17 and 18	-4.527		60.292	
	(-2.00)		(21.98)	
TA/GNI pred, years 19 and 20	5.935		88.665	
	(4.12)		(21.03)	
TA/GNI pred, years 17 to 20		7.377		54.076
		(3.99)		(24.17)
TA/GNI pred, years 21 and 22	15.298	13.610		
	(9.46)	(8.92)		
Constant	-17.963	-15.37	48.300	37.910
	(-2.19)	(-1.86)	(4.82)	(4.12)
Observations	325	181	242	136
Countries	64	64	63	63
Exit of the risk category	15	17	28	29
Log-Likelohood	-22.69	-19.98	-15.31	-20.22
Wald test (p-value)	0.000	0.000	0.000	0.000
p (se in parentheses)	5.623 (1.79)	6.525 (1.94)	7.361 (1.208)	6.178 (0.729)

Weibull regressions with duration in years as dependent variable. Z-statistics in parentheses, calculated from robust standard errors to control for clustering on countries. (ODA-TA)/GNI and TA/GNI are predicted from instrumentation regressions as in Appendix 2, except that education and democracy variables are dropped to be consistent with the duration model specification.

Data and variables

Technical assistance and other aid

Aid is defined as net disbursements of official development assistance, minus technical assistance. ODA disbursements and technical assistance data is from OECD, and was divided by the Gross National Product (GNI) from World Development Indicators of the World Bank (2001).

Instruments for aid

Same language as donor *i* : dummy taking the value of one if the donor country and the recipient country share a common language [from Collier, Hoeffler and Pattillo (2004), source : CIA factbook (2003)].

Same religion as donor *i* : dummy variable taking the value of one if 30 percent or more of the population belong to one religious group in the donor as well as in the recipient country [from Collier, Hoeffler and Pattillo (2004), source : Barrett (1982)].

Distance from capitals : it is measured as the inverse of the distance in kilometres between the capitals of the recipients and Washington D.C., Tokyo and Brussels [from Collier, Hoeffler and Pattillo (2004), source : data made available by the World Bank]

Total aid budget of donor *i* : total net disbursements of ODA by donors *i*, in constant prices 2001 (OECD).

CPIA

Country Policy and Institutional Assessment (World Bank). It has 20 equally weighted components, divided into four categories : (1) Macroeconomic management and sustainability of reforms ; (2) Structural policies for sustainable and equitable growth ; (3) Policies for social inclusion ; (4) Public sector management.

Income per capita

Real gross domestic product *per capita* ($ in 1996 constant prices), Penn World Tables 6.1.

Democracy

Polity IV score for democracy. Ranges from 0 to 10 (0 = low; 10 = high). Measures the general openness of political institutions. The 11-point Democracy scale is constructed additively. The operational indicator is derived from coding of different authority characteristics.

Education

Barro R. and J.W. Lee (2000) dataset. Percentage of the population who attained secondary education (population aged 25 and above).

Population
World Development Indicators of the World Bank (2001).