I. Channels from Aid to Growth

Why is there little robust evidence that foreign aid significantly enhances the economic growth of poor countries? The search for an explanation is becoming immensely important as industrial countries are being exhorted to increase their aid budgets in order to help developing countries achieve the Millennium Development Goals.

Perhaps one should not expect an impact on growth from the mere infusion of additional capital into a country. But, perhaps, any beneficial effects are offset by adverse spillover effects, and academic focus should shift to determining what these are and how to mitigate them. In this regard, Figure 1 is suggestive. We plot the log of the manufacturing to gross domestic product (GDP) ratio in a country against the log of the ratio of aid received to GDP for that country for two separate time periods (the late 1990s and the early 1980s), conditional on a number of variables. As the figure suggests, the more aid a country has received, the smaller its share of manufacturing. The coefficient estimate suggests that a 1 percentage point increase in the ratio of aid to GDP is associated with a reduced share of manufacturing in total GDP of about 0.2 to 0.3 percentage points.2

Without further analysis, we do not know if this relationship is causal. If causal, this figure offers a proximate explanation for why aid may not have led to substantial growth. As pointed out by Simon Johnson, Jonathan Ostry, and Subramanian (2007); and Benjamin F. Jones and Benjamin A. Otken (2005), virtually all countries that have had a sustained period of growth in the postwar period have seen a large increase in their share of manufacturing production and manufacturing exports.

But what is the deep underlying cause? Manufacturing is more complex than agriculture or mining in that it requires many more transactions between unrelated parties. Thus, manufacturing is likely to be more dependent on a good-governance environment that can foster multiple transactions. Here is where aid could hurt. By expanding a government's resource envelope, aid reduces the need for governments to explain their actions to citizens, which may reduce its need to govern well (Deborah A. Brautigam and Stephen Knack 2004). In particular, the government could falter in its responsibility to maintain rule of law, ensure a predictable judiciary and contract enforcement, and limit corruption. In a companion paper (Rajan and Subramanian 2005b), we examine another channel through which poor governance could affect manufacturing—the mismanagement of the real exchange rate.

We use the methodology in Rajan and Luigi Zingales (1998) to test the hypothesis that aid might reduce the quality of governance. They suggest that one way to check whether a channel is at work is to see whether industries that might be most affected by a channel grow differentially (faster or slower depending on the nature of the effect) in countries where that channel is likely to be more operative. The industry characteristic we are interested in is the degree to which an industry depends on governance (hereafter referred to as "governance" sensitivity or dependence). The channel is the quality of governance, and countries that get more aid are likely to be the ones where the channel is most
adversely affected. The estimation strategy is then to run regressions of the form

\[
\text{Growth}_{ij} = \text{Constant} + \sum_{l=1}^{m} \xi_{l} \text{Country Indicators} + \sum_{m+1}^{n} \xi_{m+1} \text{Industry Indicators} + \xi_{n+1} (\text{Industry } i\text{'s share of manufacturing in country } j\text{ in the initial period}) + \alpha (\text{Aid to country } j\text{'s Sensitivity of industry } i\text{ to governance}) + \epsilon_{ij},
\]

where \(\text{Growth}_{ij}\) is the annual average rate of growth of value added of industry \(i\) in country \(j\) over the ten-year period 1981–1990, obtained by normalizing the growth in nominal value added by the GDP deflator; \(\xi_{l}\) are the coefficients of the country fixed effects; \(\xi_{m+1}\) are the coefficients of the industry fixed effects; \(\xi_{n+1}\) is the coefficient of the initial period share of industry \(i\) in total value added in country \(j\) (which controls for convergence-type effects). Aid to country \(j\) is the average aid-to-GDP ratio for that country over the sample period. The coefficient of interest for us is \(\alpha\). It captures an interaction between a country-specific aid variable and an industry’s sensitivity to governance. We posit countries that receive more aid should see a more negative impact in industrial sectors that are more governance sensitive. The chief advantage of this strategy is that by controlling for country and industry fixed effects, the problem of omitted variables bias or model specification, which seriously afflicts cross-country regressions, is diminished.\(^3\)

\(^3\) We focus on the 1980s because of the large sample size. For the 1990s, data are available for only 15 developing countries.

\(^4\) Essentially, we are making predictions about within-country differences between industries based on an interaction between a country and industry characteristic. Moreover, because we focus on differences between manufacturing industries (rather than between, say, manufacturing and services industries), we can rule out factors that would keep manufacturing underdeveloped as explanations of our results—for these factors should not affect the differences between manufacturing industries.

II. Sensitivity to Governance

Details on data sources are available from the authors, while summary statistics and detailed tables with robustness checks are available in a longer version of this paper available at Rajan's Web site (http://faculty.chicagogsb.edu/raghuram.rajan/research/). The sample comprises all developing countries in the United Nations Industrial Development Organization (UNIDO) database (see the Web version of this paper for a list of countries in the sample).

Clearly, the success of our method depends on whether we have a plausible measure for the dependence of an industry on the governance environment. Olivier Blanchard and Michael Kremer (1997) develop such a measure. Broadly speaking, the fewer other industries an industry buys from—that is, the more concentrated its purchases—the more possibility it has of regulating transactions via long-term, repeated relationships or vertical integration, and less possibility of its need to rely on explicit governance by the courts or regulatory authorities. If the country has little governance capacity, industries that depend on contracts or arm’s-length transactions (that is, score lower on the concentration index) are likely to either have to distort their organizational structure or transact less, both of which will affect their growth.

The governance-dependence measure (from Andre A. Levchenko 2006), which is based on Blanchard and Kremer (1997), is calculated as follows from US input-output data. For each manufacturing industry \(i\), we obtained its intermediate goods purchases from other industries \(k\). The Herfindahl index for each sector \(i\) is calculated as the sum of the squares of the shares of the purchases of each input \(k\) in total input purchases of \(i\). We multiply the Herfindahl index by \(-1\) to get the HERF measure, where a value of zero indicates an industry that is highly dependent on public institutions to govern its transactions, while a value of \(-1\) denotes an industry that transacts fairly narrowly, and thus is less dependent on public institutions.

Ideally, we would like to measure the number of outside transactions with different firms
TABLE 1—The Governance-Dependence Index, the Impact of Aid on Institutions, and Robustness Checks  
(Independent variable is the annual average rate of growth of value added of industry (i) in country (j) for the 1980s)

<table>
<thead>
<tr>
<th>Estimation method</th>
<th>OLS</th>
<th>OLS</th>
<th>IV</th>
<th>IV</th>
<th>IV</th>
<th>IV</th>
</tr>
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<tbody>
<tr>
<td>Initial industry share (ij)</td>
<td>-0.370*** [-0.069]</td>
<td>-0.457*** [0.068]</td>
<td>-0.590*** [0.074]</td>
<td>-0.494*** [0.070]</td>
<td>-0.416*** [0.068]</td>
<td>-0.366*** [0.080]</td>
</tr>
<tr>
<td>Investment protection (j)* Governance-dependence (i) (Herfindahl)</td>
<td>1.194*** [0.336]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technical aid/GDP (j)* Governance-dependence (i) (Herfindahl)</td>
<td>-41.831** [16.791]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Initial income (j)* Governance-dependence (i) (Herfindahl)</td>
<td>-0.231* [0.092]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aid/GDP (j)</td>
<td>-1.395** [0.592]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Initial income 1980s</td>
<td>-0.007 [0.006]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SW trade policy index</td>
<td>0.059*** [0.007]</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

Observations 811 809 809 809 758 758  
R-squared 0.46 0.46 0.43 0.44 0.45 0.13

Notes: All standard errors reported below the coefficient estimates are robust. All regressions include country and industry effects, not reported above for presentational simplicity. Governance-dependence (Herfindahl) (i) is the negative of the Herfindahl index of concentration of outside purchases for industry (i), calculated as the sum of the square of the shares of purchases of each input on the total input purchases. It ranges between 0 (institutions-intensive) and 1 (not institutions-intensive). Initial industry share (ij) is the initial share of the value added of industry (i) in the total value added of all manufacturing sectors in country (j). Investment protection (j) is the ICRG measure of investment profile in country (j) that relies on risk assessments regarding contract viability/expropriation, profit repatriation, and payment delays. We use a normalized 0 to 1 version of the original 1 to 12 ICRG measure (average over the decade for country j). Aid to GDP in country (j) is the average over the decade of the ratio of aid to GDP for that country. Technical aid to GDP is the respective measure for the technical component of aid to country (j). Initial income is measured by the log of the initial level of per capita PPP GDP, as reported in the Penn World Tables database. SW trade policy index is the Sachs and Warner measure; see Sachs and Warner (1995). In regressions (2) to (6), the dependent and independent variables are winsorized at 5 percent and 95 percent of their sample distributions. In the IV estimations, we use fitted aid to GDP, or fitted technical aid to GDP, as an instrument for the respective variables, or its interactions, as in Rajan and Subramanian (2005a).

*** Significant at or below 1 percent.  
** Significant at or below 5 percent.  
* Significant at or below 10 percent.
(ICRG), which is a good proxy for our notion of governance quality as representing the rule of law and contract enforcement. The coefficient on the interaction term is positive and significant at the 1 percent confidence level, suggesting that in countries that have better governance, industries that are more governance-dependent grow faster. Specifically, the annual growth rate of an industry that is one standard deviation higher in governance-dependence in a country that has one standard deviation better governance is 0.8 percent higher, which is a sizeable magnitude, given that the average annual growth rate of industries is 2.1 percent in our sample. This result survives various robustness checks (see Web version, Table 2).

It appears then that our governance-dependence variable, postulated on theoretical considerations by Blanchard and Kremer (1997), picks out industries that thrive (relatively) in an environment with good governance. A finding in our core difference-in-difference estimation, that aid affects the relative growth rate of these industries, should then give us more confidence (than in a simple cross-country regression between aid and institutions) that the channel through which the effect is transmitted is governance quality.

III. Endogeneity of Aid

Because we examine growth differentials between industries within countries, the results are less sensitive to the rationale for why aid is given. For example, even if aid is given only to countries that display poor growth, interindustry growth differentials should not be seriously affected. Suppose, however, low growth is primarily because countries have poor quality institutions, and aid is given systematically to countries that have low growth. In this case, we might be attributing to aid what is driven directly by governance quality. The way to address this is through instrumentation, which allows us to disentangle the direction of causality. We instrument for aid based on strategic, historic, and cultural links between donor and recipient (see Rajan and Subramanian 2005a for details of the instrumentation process).

One possible concern is that our instruments, based on strategic and colonial links, could be correlated with governance quality, thus violating the exclusion restriction underlying the instrumentation. In our sample, the direct correlation between our instrument for aid and investment protection is low (0.07 in magnitude) and not statistically significant, suggesting this should not be a strong concern.

IV. Core Result

In column 2 of Table 1, we present the OLS estimate for model 1. We present the IV estimate in column 3. The interaction coefficient is negative and significant at standard levels, suggesting that in a country that receives more aid, governance-dependent industries grow relatively more slowly. Specifically, using the IV estimate, the annual growth rate of an industry that is one standard deviation higher in governance-dependence (HERF) in a country that receives one standard deviation more aid is 2.8 percentage points lower, which is a sizeable magnitude, given that the average annual growth rate of industries is 2.1 in our sample. The IV estimate remains significant when we cluster by country or by industry.

One could argue that not all forms of aid are equal. A number of economists try to identify certain forms of aid that are likely to be “good” or development oriented. Specifically, technical assistance is geared toward building capacity and institutions, and if the logic bears out, we should expect to see a less negative interaction with this form of aid. This is what we check in the estimate reported in column 4. It turns out that the estimate is again negative and significant. Either it could be that all forms of aid are correlated with one another so that ‘good’ aid is hard to tell apart from other aid, or aid inflows are fungible, so it does not matter whether the use of certain inflows are carefully specified or not, aid frees up resources elsewhere.

In column 5, we include an interaction between initial per capita GDP and governance-dependence to check whether aid is just a proxy for the country’s per capita income. The basic interaction coefficient continues to be significant, even with this inclusion. In the core specification of column 3, we can include an interaction between governance quality and governance-dependence. If aid inflows “work” by reducing the quality of institutions, then introducing this direct interaction should weaken the aid governance-
dependence interaction. It does: the magnitude on the coefficient declines substantially and it is also no longer statistically significant (see Web version of this paper for estimates).

Finally, when we include country indicators, we cannot estimate the effects of individual country-specific variables. In column 6, we drop the country indicators and include standard explanatory variables in growth regressions. The direct correlation of aid inflows (which is instrumented) is negative, suggesting industry growth rates are lower in countries that receive more aid. This is consistent with the figure with which we started the paper.

5 More robustness checks are reported in the Web version of this paper.

V. Conclusions

One of the ways aid might have affected growth adversely is by constraining the growth of the manufacturing sector. A possible channel for which we provide evidence in this paper is that aid might be particularly associated with weak governance, possibly because aid inflows reduce the need for governments to tax the governed or enlist their cooperation. The paper also offers a methodological approach to checking whether governance actually matters, based on the growth of governance-dependent industries.

Broadly speaking, the paper suggests that even if the paucity of capital is the missing ingredient in the process of setting countries on the path to prosperity (and the jury is still out on this), the form in which the capital is received could...
have adverse spillover effects that limit its value. Indeed, if foreign aid reduces competitiveness by inflating the exchange rate, or if foreign aid reduces the efficiency of manufacturing investment by adversely affecting governance, and thus contracting, then aid inflows may reduce the profitability of investment and limit growth, especially in export sectors that have traditionally proved to be the engine of growth.

None of these effects is inevitable, though they are not easily resolved either. An important step for both aid givers and aid recipients is to recognize that aid inflows are not an unmitigated blessing, and that the worst thing that can happen with a greater quantity of aid is not only that it will be wasted. More aid, if ineffectively used, can actually set back a country in its path to development. This is why it is extremely important to examine ways of improving aid effectiveness, recognizing that the state of knowledge here is limited. Open-mindedness, allowing for various approaches to aid delivery and utilization, is essential here.

Finally, it is important to recognize that while aid is essential in situations of humanitarian need, it is probably likely to play a much smaller part in the process of economic growth. The sooner countries recognize that aid is no panacea, the less likely they are to postpone development indefinitely.

REFERENCES


