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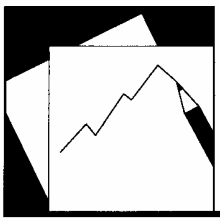

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Why Do Some Countries Manage to Extract Growth from Foreign Aid?

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Why Do Some Countries Manage to Extract Growth from Foreign Aid?

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Abstract

Aid is primarily given to governments whereas the engine of sustained growth is the private sector. It is therefore illusory to investigate the impact of aid on growth without considering the impact of government interventions on the private sector. The model shows how these interventions improve capacity utilization and growth. However, distortionary interventions can also cause capacity underutilization and an increase in the informal economy, that is, the very market failures the interventions initially sought to address. Countries that fall into this trap are characterized by insufficient credibility in promoting the private sector, which translates into aid dependence and slower growth over time. The empirical evidence is supportive. This paper finds that aggregate aid has a positive impact on growth (even without diminishing returns) but the impact is substantially smaller for low-income countries.

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"No one would remember the Good Samaritan if he'd only had good intentions—he had money as well."

Margaret Thatcher
(Television interview quoted in *Times*, London, January 12, 1986).

I. INTRODUCTION

Government involvement in economic development is pervasive. The general presumption for such widespread involvement is based on the notion of market failures justifying both government interventions according to the "helping-hand" argument (as opposed to the market "invisible hand") and official foreign aid. In practice, aid typically stems from donors who repeatedly seek to help domestic governments to help their private sectors to help themselves thereby generating growth. Hence, there is a long "chain-of-help" and, as a result, many potential failures (see Bauer, 1993; Collier, 1997; and World Bank, 1998, 2002).

In the wake of the growing consensus in favor of aid selectivity,[2] this paper considers the effectiveness of government interventions in addressing market failures in a context in which aid is given to governments and, therefore, any effect of aid is mediated by their interventions.[3]

In principle, aid could, on the one hand, substitute for domestic taxes and, therefore, be expected to reduce the level of distortionary government interventions. On the other hand, aid inflows may promote corruption, discourage domestic savings, and displace private investment, or be redirected into public consumption rather than public investment, as many have documented (see Griffin, 1970; Boone, 1996; Adam and O'Connell, 1999; and Alesina and Weder, 2000). In other words, aid may be stolen, misplaced, or wasted; all of these actions are expected to raise the level of distortionary government interventions.[4] On the whole, it is clear that aid-supported distortionary government interventions have an unpredictable impact on the private sector, the engine of sustained growth. Based on these observations, it is not surprising that the empirical evidence of the overall effect of aid on growth appears mixed.

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[2] The aid selectivity strategy entails selecting specific countries to become the prime beneficiaries of foreign aid.

[3] Commercial projects—for instance, those supported by the World Bank's International Finance Corporation (IFC)—probably constitute the exception to the rule that aid is given to governments. Aid channeled through nongovernmental organizations (NGOs), albeit non-commercial, could also fit into this exclusion category. More than 90 percent of aid, however, is given to governments. Hence, this paper assumes aid to be fungible and primarily given to governments—two undisputed facts.

[4] These actions are commonly modeled or considered as distortionary taxes in the literature.

Moreover, what is not emphasized enough, both in the literature and among practitioners, is that even altruistic governments that do not steal, misplace, or waste foreign aid can actually fail to produce sustained growth. The crux of the matter is that governments may face a trade-off between welfare and growth, whereas the private sector is essentially concerned with profits and growth. This means government interventions are not always fully compatible with the incentives of the private sector. When such incompatibility emerges or becomes serious, distortionary government interventions will induce the private sector to retract. It follows that government interventions intended to improve capacity utilization or reduce the extent of the informal economy can actually cause these market failures.

More specifically, suppose we have an economy consisting of a continuum of development projects. At the economy level, capacities can be endowed (e.g., natural resources, land, labor), acquired (e.g., human capital, knowledge, ideas), or built (e.g., institutional design, physical, organizational, or social capital). These capacities, however, are almost never fully utilized. For instance, the area of arable land vastly exceeds the area of cultivated land; labor-force participation in the formal sector is much smaller than the existing labor force; human capital is rarely applied to its most productive use. A government wishing to derive growth from a greater utilization of these existing capacities makes the same cost-benefit project appraisals as the private sector. The only difference is that the government is interested in resource flows and their opportunity costs, whereas the private sector is interested in cash flows and profits. In other words, governments typically make *economic* project appraisals, whereas the private sector makes *commercial* project appraisals (see Gillis and others,1996, p. 149). The reason for this difference lies in positive externalities. For instance, a dam, a rural road, a television station, or a textile factory can utilize capacities that would otherwise be idle or in the informal economy. Such positive externalities are typically at the root of market failures, which induce a private under-utilization of capacities and justify government interventions. However, when the government intervenes in some projects and utilizes some capacities, it denies them to other, profitable private projects; there are potential negative externalities from government interventions, and the private sector has no choice but to withdraw from these otherwise profitable projects.

In order to avoid such potential negative externalities, the government could commit ex ante not to intervene in private development projects ex post (see Svensson, 2000a). These commitments, however, are not always credible, especially in aid-dependent countries. Governments that can precommit credibly will be able to foster welfare and growth, and to extract growth from foreign aid. Other governments may throw their country into a trap characterized by a trade-off between welfare and growth as well as aid dependence (i.e., aid as a high proportion of GDP). The resulting aid dependence and credibility thresholds therefore introduce some heterogeneities across countries which can be exploited empirically to investigate the differential impacts of aid on growth for different groups of countries. This paper's model is crucial to deriving a link between past trends in aid dependence and growth prospects.

Our findings imply that it is unclear how the emerging aid-selectivity strategy—which does not break with the traditional rule of handing official aid to governments and focusing almost exclusively on capacity building, thereby neglecting capacity utilization—will induce greater aid effectiveness.

The paper is organized as follows. Section II puts aid selectivity in the context of other aid strategies and highlights the two key shortcomings of the existing literature on the effectiveness of aid. Section III presents a growth model with imperfect capacity utilization and an informal economy. After introducing the setup of the economy and the agents (i.e., the government and the private sector), it derives a benchmark case without any credibility issue. The latter is then derived and followed by the implications for foreign aid. All the insights of the model are summarized in four propositions, which are brought to the data in Section IV. Finally, Section V summarizes the insights and supporting empirical evidence by exposing the Samaritan's dilemma.

II. SNAPSHOT OF RELATED LITERATURE

Debates on aid effectiveness have divided researchers into at least two camps, depending on the emphasis on particular failures in the "chain-of-help." First, proponents of aid *unconditionality* argue that there are no failures or, in other words, that aid unconditionally spurs growth (see Hadjimichael and others, 1995; and Hansen and Tarp, 2000, 2001). Empirical support for this argument draws on rejections of institutional or policy channels for the impact of aid on growth in favor of an alternative where aid (or a fraction of aid) is considered as a productive investment. Clemens and others (2004) provide an empirical analysis which disaggregates foreign aid into its key components. They isolate what they call "short-impact" aid—defined as an aid disbursement funding an intervention that can plausibly raise GDP per capita within few years—and find a positive relationship between this short- impact aid and growth. Instead, we find a positive relationship between aggregate aid and growth through a separate capacity utilization channel.

Second, a number of recent theoretical papers consider the difficulties in effectively contracting for aid, given institutional and political constraints. These papers attempt to enlighten the ongoing debates and, to some extent, rescue some form of *conditionality* (see Adam and O'Connell, 1999; Drazen, 1999; Svensson, 2000; and Azam and Laffont, 2003). The main justification for foreign aid in these papers is also to provide investment resources to increase growth (and reduce poverty). And the argument goes that incomplete contracts (see Svensson, 2000a, b; and Azam and Laffont, 2003) or elite interests groups (see Boone, 1996; Adam and O'Connell, 1999) are the main culprits for the leakage of foreign aid. As a result, foreign aid that does end up in productive use (or in the hands of the poor) is insufficient to make a difference for growth (and poverty alleviation). In essence, these papers explain why aid may be stolen, misplaced, or wasted, and consequently why institutions that limit these hazards matter.

In practice, conditionality has given way to aid *selectivity* based on a certain skepticism about the effectiveness of aid. For example, the Millennium Challenge Corporation (MCC)[5] specifically states that "aid is most effective when it reinforces sound political, economic and social policies" and that aid should only be disbursed to those countries whose governments have established a track record of "ruling justly, investing in their people, and encouraging economic freedom." Similarly, Collier and Dollar (2002, 2004) assert that countries with low income per capita and a high score on the Country Policy and Institutional Assessment (CPIA) index should be eligible for aid, while countries with a low CPIA score should not be eligible for aid or should receive less aid.[6] This idea has already been adopted by the World Bank's International Development Association (IDA) and the British Department for International Development (DFID) among other aid agencies.

It is noteworthy that none of these three strategies breaks with the traditional reliance on governments to mediate the impact of aid on growth. In addition, as Easterly (2003) shows, virtually all papers in the aid-growth literature are predicated on the notion of incremental capital-output ratio (ICOR), which finds its applicability to aid in the "two-gap" model of Chenery and Strout (1966).[7] The prediction of the ICOR theory is a *constant* ratio between the rate of investment as a proportion of GDP and GDP growth; applied to aid it predicts a *constant* ratio between the rate of aid as a proportion of GDP (or aid dependence) and GDP growth. Easterly (2001, 2003) argues that the ICOR model has "dubious theoretical foundations and numerous empirical failings."

In sum, there is a growing consensus in favor of aid selectivity (at least among practitioners). However, the literature has not given enough credence to the fact that most aid is mediated by governments, and most of the literature relies on the investment (or capacity building) channel in a model with questionable predictions.

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[5] MCC is the U.S. organization that manages the Millennium Challenge Account (MCA).
[6] The CPIA index evaluates a country's policy and institutional framework in a number of dimensions, including, for example, economic management and policies for social inclusion. The MCC uses 16 variables to proxy for the quality of political, social, and economic environment with an emphasis on control of corruption.
[7] "In this model, the first gap is between the amount of investment necessary to attain a certain rate of growth and the available domestic saving, while the second gap is the one between import requirements for a given level of production and foreign exchange earnings." (Easterly, 2003)

III. THE MODEL

Contracting issues between donors and recipients as well as any political economy struggles between the poor and the rich elite are avoided by assuming altruistic donors and recipient governments. This sacrifice in realism allows us to keep away from both conflicts of interests between governments and influences from domestic interest groups. The simplifying assumption is useful in making room for the endogenization of ICOR.

Essentially, we use a version of the extended AK theory, where "K" stands for "capacity" and the constant technology component "A" is included in capacity and replaced by a variable that captures the imperfection of capacity utilization.[8] Imperfect capacity utilization is novel and plays a central role in our model by triggering transitional dynamics which are otherwise missing in the AK theory. It follows that the ratio between the rate of investment as a proportion of GDP and GDP growth may not be constant at any point in time (as the ICOR theory predicts), but may be a reasonable approximation over the long-term (as the AK theory predicts).[9] Furthermore, during the transition to the steady-state, there may be substantial deviations owing to changes in capacity utilization induced by aid-supported government interventions.

A. The Economy

Production in the official (or formal) economy is determined by the following production function

$$y(t) = \gamma(t)\kappa(t),$$

where $\kappa(t)$ is the per capita capacity, $y(t)$ is the official income per capita, and $\gamma(t)$ captures the economy-wide (or aggregate) level of capacity utilization, which constitutes the key departure from the standard AK theory and will therefore be detailed further.

Capacity utilization generally refers to the proportion of potential capacity that is used, and is typically measured as the ratio of output to potential output (see Shapiro, Gordon, and Summers, 1989; Kirkley, Morrison, and Squires, 2002)

$$\gamma(t) \equiv y(t) / \hat{y}(t) \leq 1,$$

where $\hat{y}(t)$ is the potential income per capita. Imperfect capacity utilization formalizes the idea that capacities endowed, acquired, or built are seldom fully utilized. Imperfect capacity

[8] The broad interpretation in terms of "capacity" entails augmenting physical capital not only to include human capital but also ideas, knowledge, technology, organizational capital, social capital, and institutional design (see McGratten, 1998).

[9] Unlike Jones (1995) who argues that the predictions of the AK theory are inconsistent with the data, McGratten (1998) among others has shown that, over the long-term, the predictions do indeed fit the data using a wide cross-section of countries (125 countries) over a long period of time (25-year period). Although this is not a full proof that the AK theory is valid, we take it as a useful departure from the ICOR theory.

utilization essentially implies that growth will increase when these capacities are being effectively utilized. For example, building a dam or a hospital may produce a boost of growth through the construction industry, but further growth will depend on the effective use of these capacities through the electricity and health industries. Another example is that training people has an impact on growth only if there are opportunities to use and exploit the acquired knowledge and ideas.

Assuming that the economy comprises a number of **development projects** over a *range*$(a,\ b)$, the aggregate capacity utilization is $\gamma(t)=\int_a^b \gamma_i di$ where the *intensity* of capacity utilization for a specific project is $\gamma_i \le 1$. If the range of projects is incomplete $b-a<1$, or if at least one project has an imperfect capacity utilization $\gamma_i<1$, then aggregate capacity utilization is imperfect.

Therefore, imperfect capacity utilization also embeds one of the most important characteristic of developing countries: a substantial informal economy.[10] Obviously, there are substantial differences between these two concepts: the informal economy represents goods and services that are produced but not recorded in official statistics, whereas imperfect capacity utilization extends to those goods and services that could be produced but, for some reason, are not produced or not recorded. The very essence of an informal economy is to escape from being measured, and therefore both the definitions and link to capacity utilization should be treated only as a way of approximation more than elsewhere in the economy. We merely suggest that informal economy may be viewed as a symptom of imperfect capacity utilization.[11]

Capacity building is synonymous to investment in broad capital and also constitutes an important component of economic growth, especially in the long term. In the absence of technology growth, it is actually the only determinant of long-term growth. It is governed by the standard investment function

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[10] The size of the informal economy, $\mu(t)$, can be expressed as the share of unofficial income to official income $\mu(t)=\left(\hat{y}(t)-y(t)\right)/y(t)$ that is, the aggregate level of imperfect capacity utilization is inversely related to the size of informal economy, $\gamma(t)=1/\left(1+\mu(t)\right)$.

[11] Estimates of the average size of the informal economy (as a percent of official GNI in the year 2000) are 18 percent in OECD countries, 38 percent in transition countries, and 41 percent in developing countries (see Schneider, 2002). This implies that the estimated average level of capacity utilization, as defined above, is 85 percent in OECD countries, 72 percent in transition countries, and 71 percent in developing countries. Formal capacity utilization ranges from a maximum of 92 percent (informal economy of 8.8 percent) in Sweden, Switzerland, and the United States down to 60 percent (informal economy in excess of 64 percent) is Panama, Bolivia, and Georgia.

$$\dot{\kappa}(t) = \gamma(t)\kappa(t) - c(t),$$

where $c(t)$ is per capita consumption.

Timing matters in introducing the issue of credibility of government interventions (see Kydland and Prescott, 1977; and Svensson, 2000a, for specific application to donors). It is such that each private project i has a building stage, 1 at time (t), and a utilization stage, 2 at time $(t+1)$. At any given period of time (t), there are public or private capacities being built as well as private capacities from the previous period being utilized.

B. The Agents

The government

The government is altruistic and has as objective to maximize the contemporaneous payoff, which is the sum of marginal products of the continuum of projects active at time (t); that includes projects in both the building stage and the utilization stage. The government choice variable $\theta_i > 0$ captures the government intervention

$$\underset{\theta_i}{Max} \quad \Lambda = \int_0^1 \left[y_{i2}(t) + y_{i1}(t) \right] \; di,$$

where y_{i2} is the marginal product of a project i built in the previous period and currently in the utilization stage, y_{i1} is the marginal product of a project i currently in the building stage. The marginal product, y_{i1}, in the building stage 1 is

$$y_{i1} = z_{i1} - \gamma_i,$$

where z_{i1} is the per capita gross return less the intensity of capacity utilization, γ_i, in project i. The marginal product, y_{i2}, in the utilization stage is

$$y_{i2} = \left[(1-\theta_i) \;\; z_{i2} + \theta_i W(t) \right] \;\; G(\theta_i),$$

where z_{i2} is the per capita gross return in the utilization stage and $0 < W(t) < 1$ captures the time-dependent welfare index. The government is interested in resource flows (and their opportunity costs) as well as welfare, $\{y_{i1}, \; y_{i2}, \; W(t)\}$, whereas the private sector is solely interested in gross returns, $\{z_{i1}, \; z_{i2}\}$. Hence, $\theta_i \geq 0$ captures the extent to which government interests diverge from private sector interests. Finally, $G(.)$ with $G(0) = 1$ captures the positive government role in correcting market failures and caring for welfare with $G(\theta_i) > 0$ as well as the negative burden of government contemporaneous distorting interventions with $\partial G(.)/\partial \theta_i < 0 \;\; \partial G(.)/\partial \theta_i < 0$.

For analytical tractability, we use the following specific functional form

$$G(\theta_i) \equiv \begin{cases} \frac{(\theta_i)^{-\varepsilon}}{\varepsilon} > 0 \text{ if } \theta_i > 0 \\ 1 \text{ if } \theta_i = 0 \end{cases},$$

where $\varepsilon > 0,\ \varepsilon \neq 1$ captures the distortionary nature of government interventions.[12] For simplicity, we assume $z_{i1} = \gamma_i^2$ and $z_{i2} = \gamma_i$, meaning that the gross returns are directly related to the intensity of capacity utilization in a specific project i; the quadratic term ensures that is costly, $y_{i1} < 0$, to building a project.

We explicitly introduce the fact that aid from altruistic donors is given to governments by positing that the welfare index depends on the interaction between exogenous and unobservable country-specific efforts to improve welfare, $\omega(t) > 0$, and an exogenous aid dependence ratio, $0 < a(t) < 1$, such that

$$W_j(t) = \omega_j(t)\ \ a_j(t),$$

and, therefore, the welfare index is also exogenous. This welfare index and its components are specific to country j and comprise the sources of cross-country heterogeneity. In order to save on subscript notations, we omit it until the empirical section.

The private sector

The consumer-entrepreneur representing the private sector maximizes the discounted utility from consumption

$$\underset{c(t)}{Max}\ U = \int_0^{\infty} \frac{c(t)^{1-\sigma}}{1-\sigma} e^{-\rho t} dt,$$

where $\sigma > 0$ is the coefficient of relative risk aversion and $\rho > 0$ is the discount rate. The consumer-entrepreneur not only makes consumption/saving decisions, but also decides on the allocation of saving in specific projects. The rule is simply that project i is built if its net present value (NPV) is positive

$$NPV_i = z_{i1} - \gamma_i + E_1[z_{i2}] > 0.$$

This rule will determine the *range* of private projects undertaken, whereas the *intensity* of capacity utilization for a specific private project, γ_i, is determined by NPV maximization with respect to γ_i.

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[12] It is customary to consider distortions induced by taxation (see Boone, 1996; and Adam and O'Connell, 1999). Given our broader definition of capacity, we consider a broader spectrum of distortionary interventions such as price controls, rationing, licensing, factor movement restrictions, poor quality standards, inefficient civil servants, bad regulations, imperfect property rights protection, bribery, embezzlement, corruption, just to name a few (see Johnson, Kaufmann, and Zoido-Lobatón, 1998).

C. The Benchmark Case

The optimization of the representative consumer-entrepreneur discounted utility subject to the capacity building function and $\kappa(t) \geq 0$ yields the usual Ramsey rule

$$\frac{\dot{c}(t)}{c(t)} = (\gamma(t) - \rho)/\sigma,$$

where the productivity of capacity is nothing but the aggregate level of capacity utilization. As usual, lower values of ρ and σ raise the willingness to save and imply a higher per capita growth rate.

The *range* of private projects built is determined by the NPV of individual projects and is such that $(1 - e^{-\rho}) \leq \gamma_i \leq 1$, meaning all projects with capacities above the threshold, $(1 - e^{-\rho})$, are undertaken by the private sector. The *intensity* of capacity utilization for each private project is determined by the first-order condition to maximize the project's NPV and is identical across projects $\gamma_i^p = (1 - e^{-\rho})/2, \ \forall i$.[13] The resulting level of capacity utilization by the private sector turns out to be constant over time in this benchmark case

$$\gamma^p(t) = \int_{(1-e^{-\rho})}^{1} \gamma_i^p di = \frac{1}{2}(1 - e^{-\rho}) \ e^{-\rho}, \ \forall t.$$

With a low level of distortions, $0 < \varepsilon < 1$, the *range* of projects potentially affected by the government is determined by the second-order condition for a maximum payoff, which yields: $\gamma_i \leq W(t)$. In this case, the government affects the projects with capacities below this threshold, that is low-capacity projects. There is a clear separation between the private sector undertaking high-capacity projects and the government focusing on low-capacity projects. Given the level of government intervention, θ_i^l, as determined by the government first-order condition, the *intensity* of capacity utilization for each project is

$$\gamma_i^l(t) = W(t) \ \frac{\theta_i^l(1-\varepsilon)}{\theta_i^l(1-\varepsilon) + \varepsilon},$$

where the super-script l stands for low distortions; it depends positively on the level of interventions and negatively on the level of distortions.

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[13] This is due to the simplifying assumption that the per capita gross return is a quadratic function of the intensity of capacity utilization for each project.

Any gap between the government and the private sector thresholds, $W(t)$ and $\left(1-e^{-\rho}\right)$ gives the extent of the informal economy.[14] Complementary to that, the aggregate level of capacity utilization at time (t) given the overall level of government intervention, θ^l, is therefore

$$\gamma^l(t)=\int_0^{W(t)}\gamma_i^l(t)\ di+\int_{\left(1-e^{-\rho}\right)}^{1}\gamma_i^p di=\left[W(t)\right]^2\frac{\theta^l(1-\varepsilon)}{\theta^l(1-\varepsilon)+\varepsilon}+\gamma^p.$$

With low distortions, aggregate variables $\left\{y(t),\ c(t)\right\}$ begin at value $\left\{y(0)=\gamma^l(0)\ \ \kappa(0),\ c(0)=\phi\kappa(0)\right\}$ where $\phi>0$ is a positive constant (see Barro and Sala-i-Martin, 1995, p.143) and both grow at the same time-depend rate, $g^l(t)$, given by

$$g^l(t)=\left(\gamma^l(t)-\rho\right)/\sigma>g^p.$$

Unlike the ICOR theory, however, the growth rate is not constant so long as the aggregate capacity utilization is not constant. Thus, during the transition to the steady-state, increases in the rate of capacity building as a proportion of GDP are linked to increases in GDP growth in a way that depends on the aggregate level of capacity utilization. In other words, transitional dynamics are such that the income per capita, which is lower than the potential income per capita, converges toward the potential income per capita by satisfying the transversality condition

$$\lim_{t\to\infty}\left[\hat{y}(t)-y(t)\right]=\lim_{t\to\infty}\left[\hat{\kappa}(t)-\gamma^l(t)\ \ \kappa(t)\right]=0.$$

The potential growth rate in steady-state, $\hat{g}=(1-\rho)/\sigma$, is characterized by full capacity utilization or zero informal economy. Therefore, in the steady-state $\partial g^l/\partial a=0$, aid has no impact on growth. Actually, in the steady-state, sustained increases in GDP growth depend solely on sustained increases in the rate of capacity building as a proportion of GDP (as in the AK theory). In the short term, however, aid increases the level of capacity utilization and the growth rate $\partial g^l/\partial a>0$.

D. The Credibility Issue

With a high level of distortions, $\varepsilon>1$, the *range* of projects potentially affected by the government is determined by the second-order condition for a maximum pay-off, which yields: $\gamma_i\geq W(t)$. Here, the government affects the projects with capacities above this threshold, that is, high-capacity projects. There is no longer a clear separation between the private sector undertaking high-capacity projects and the government affecting high-

[14] In other words, the informal sector in this model is simply a residual between the government and the private sector; there is a large body of literature that deals more specifically with the informal economy (see Schneider, 2002).

capacity projects. Given the level of government intervention, θ_i^h, as determined by the government first-order condition, the *intensity* of capacity utilization for each project is

$$\gamma_i^h(t) = W(t) \quad \frac{\theta_i^h(\varepsilon-1)}{\theta_i^h(\varepsilon-1)-\varepsilon} = \frac{W(t)}{\delta_i^h},$$

where the super-script h stands for high distortions; it depends negatively on both the level of interventions and the level of distortions. The parameter δ_i^h captures the distortionary interventions which depend positively on both the level of interventions and the level of distortions.

Proposition 1: *Protracted government interventions in high-capacity projects will induce a retraction by the private sector. This credibility problem results from the inability of governments to pre-commit to avoid such distortionary interventions.*[15]

Proof [16]

With $\delta_i^h = \frac{\theta_i^h(\varepsilon-1)-\varepsilon}{\theta_i^h(\varepsilon-1)}$ which is such that government interventions are distortionary, $\frac{\partial\delta_i^h}{\partial\theta_i^h} = \frac{\varepsilon(\varepsilon-1)}{\left(\theta_i^h(\varepsilon-1)-\varepsilon\right)^2} > 0$, project i 's NPV for the private sector is now

$$NPV_i = \left(\gamma_i^p\right)^2 - \gamma_i^p + e^{-\rho}\frac{W}{\delta_i^h},$$

and is only positive if the private benefit (third term) is greater than the private cost (first two terms together). In effect, the private sector no longer makes commercial project appraisals but, instead, is involved in rent-seeking, for the private benefit in this case is nothing but rents handed out by the government. In order to see this more clearly, we use the internal rate of return (IRR, noted R_i) for the private sector, which is the discount rate for which $NPV_i = 0$. Therefore, the private sector builds those projects for which the IRR exceeds the discount rate $R_i > \rho$;[17] equivalently

$$R_i = -\ln\left(1/\frac{W}{\delta_i^h\left(1-\gamma_i^p\right)\ \gamma_i^p}\right) > \rho,$$

where the critical element is that the IRR, and therefore the private sector decision, depends on the parameter of government distortionary interventions, δ_i^h. We must have $W > \delta_i^h\left(1-\gamma_i^p\right)\ \gamma_i^p$ which is always verified for high-capacity projects with private sector involvement because NPV_i must be positive; $e^{-\rho}W > \delta_i^h\left(1-\gamma_i^p\right)\ \gamma_i^p$ implies

[15] In other words, untied aid to non-credible governments can be counter-productive.
[16] We drop the time reference *(t)* in this proof.
[17] The logic is simply that if the IRR for a project exceeds the return on alternative uses of resources (captured by the discount rate), then it is worth undertaking the project.

$W > \delta_i^h\left(1-\gamma_i^p\right)\ \ \gamma_i^p$ because $e^{-\rho} < 1$. Finally, it is straightforward to determine how these government interventions affect the private IRR

$$\frac{\partial R_i}{\partial \delta_i^h} = -\frac{1}{\delta_i^h} < 0, \text{ thus } \frac{\partial R_i}{\partial \theta_i^h} = \frac{\partial R_i}{\partial \delta_i^h}\frac{\partial \delta_i^h}{\partial \theta_i^h} < 0,$$

meaning that the government interventions decrease the private IRR and therefore the range of projects built by the private sector. ■

The aggregate level of capacity utilization at time (t) given the overall parameter of government distortionary interventions, δ^h, is now

$$\gamma^h(t) = \int_{W(t)}^{1} \gamma_i^h(t)\ \ di + \int_{r(t)}^{1} \frac{1}{2}\, di = \left(1-W(t)\right)\ \ \frac{W(t)}{\delta^h} + \frac{1}{2}\left(1-r(t)\right),$$

where $r(t) = \arg\min_i \left\{R_i(t) - \rho\right\}$; the least profitable private project is given by the smallest wedge between the IRR and the discount rate. Therefore, the size of the informal economy is given by the range $\left(0,\ \min\left\{W(t),\ r(t)\right\}\right)$ in this case.

With high distortions, aggregate variables $\left\{y(t),\ c(t)\right\}$ begin at value $\left\{y(0) = \gamma^h(0)\ \ \kappa(0),\ c(0) = \phi\kappa(0)\right\}$ and both grow at the same time-dependent growth rate, $g^h(t)$, given by

$$g^h(t) = \left(\gamma^h(t) - \rho\right)/\sigma.$$

The following proposition defines the general case for distortionary government interventions.

Proposition 2: *During the transition to the steady-state, sufficiently credible governments promote growth.*

Proof [18]

During the transition to the steady-state, the growth rate is directly influenced by capacity utilization, $g^x = \left(\gamma^x - \rho\right)/\sigma$ for $x = \{l,\ h\}$ with $\partial g^x / \partial \gamma^x = 1/\sigma > 0$. A key difference between credible and non-credible government interventions is the respective intensities of private capacity utilization $\left\{\frac{1}{2}\left(1-e^{-\rho}\right),\ \frac{1}{2}\right\}$ and the respective ranges of private projects $\left\{e^{-\rho},\ \left(1-r\right)\right\}$; together, the difference between aggregate private capacity utilization is $\Omega = \gamma^p - \frac{1}{2}\left(1-r\right) > 0$. Setting the threshold of distortionary interventions,

[18] We drop the time reference (t) in this proof.

$\tilde{\delta} = (1-W)\ W/\Omega > 0$, there are three possibilities:

(i) With small distortions, $0 < \varepsilon < 1$, the range of private projects and the intensity of private capacity utilization are unaffected by government interventions which, therefore, increase the aggregate capacity utilization, $\gamma^l > \gamma^p$ and $\partial\gamma^l / \partial\theta^l > 0$.

(ii) With relatively small distortionary interventions $\delta^h < \tilde{\delta}$, the retraction of the private sector is more than compensated by both government interventions and a higher intensity of private capacity utilization, $\frac{1}{2}\left(1-e^{-\rho}\right) < \frac{1}{2}$, for those private projects that are still carried out; therefore $\gamma^h > \gamma^p$ and $\partial\gamma^h / \partial\theta^h > 0$.

(iii) With relatively large distortionary interventions $\delta^h > \tilde{\delta}$, the credibility problem is too severe and the retraction of the private sector (i.e., smaller range of projects as derived in Proposition 1) directly impacts the aggregate capacity utilization, such that $\gamma^h < \gamma^p$ and $\partial\gamma^h / \partial\theta^h < 0$.

The link to growth is given by the following partial derivatives

$$\frac{\partial g^x}{\partial \theta^x} = \frac{\partial g^x}{\partial \gamma^x}\frac{\partial \gamma^x}{\partial \theta^x} \text{ for } x = \{l,\ h\},$$

and the impact of government interventions on growth is determined by the impact of government interventions on capacity utilization. In particular, under (i) and (ii), distortionary interventions are such that the government is sufficiently credible to promote growth. In other words, the threshold of distortionary interventions, $\tilde{\delta}$, determines the credibility threshold. ■

In sum, the basic idea underlying the credibility problem is that protracted interventions can cause the retraction of the private sector, even though the interventions were initially motivated (as described by the government objective function) by the presence of idle capacities and the informal economy. By this mechanism, interventions can create the very problems they initially sought to solve. The credibility problem results in a greater likelihood of lower growth during the transition to the steady-state.

E. Insights for Foreign Aid

Because foreign aid is primarily given to governments, aid impacts recipient countries through the government intervention channel.[19] Since, $W(t) = \omega(t)\ a(t)$, aid has a direct impact on government interventions, capacity utilization, and growth. The following propositions summarize the implications of the model for the aid-growth relation and the next section supports their empirical validity.

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[19] Aid could, in principle, impact growth through the capacity building channel, $\kappa(a)$, with $\partial\kappa / \partial a > 0$ (see in particular Hansen and Tarp, 2001) but our focus is on the intermediation of governments.

Proposition 3: *If the country is not aid-dependent and its government is sufficiently credible, then the government manages to extract growth from foreign aid.*[20]

Proof

Consider the following partial derivatives

$$\frac{\partial g^x}{\partial a} = \left(\frac{\partial g^x}{\partial \gamma^x} \frac{\partial \gamma^x}{\partial \theta^x} \right) \frac{\partial \theta^x}{\partial a} \text{ for } x = \{l, \ h\}.$$

From Proposition 2, we know that below the credibility threshold, $\delta^h < \tilde{\delta} = (1 - \omega a) \ \omega a / \Omega$, the term in brackets is positive, $\partial g^x / \partial \theta^x > 0$, meaning government interventions promote growth. Setting the aid dependence threshold at $\overline{a} = 1/2\omega > 0$, we can predict the following: If the country is not aid-dependent, $a < \overline{a}$, then it is more likely that the government is sufficiently credible, $\partial \tilde{\delta} / \partial a > 0$; if, on the other hand, the country is aid-dependent, $a > \overline{a}$, then it is less likely that the government is sufficiently credible, $\partial \tilde{\delta} / \partial a < 0$.
Given that $\partial \tilde{\delta} / \partial \theta^h > 0$, both the aid dependence threshold and the credibility threshold determine whether the government manages to extract growth from foreign aid, because $sign\left(\partial \tilde{\delta} / \partial a\right) = sign\left(\partial g^h / \partial a\right)$. Only fully credible governments can always extract growth from foreign aid, $\partial g^l / \partial a > 0$, as in the benchmark case. ■

Proposition 4: *There is a negative relationship between aid dependence and growth over time such that governments may not manage to extract growth from foreign aid over time.*

Proof

Consider the following partial derivatives

$$\frac{\partial g^x}{\partial t} = \left(\frac{\partial g^x}{\partial \gamma^x} \frac{\partial \gamma^x}{\partial \theta^x} \frac{\partial \theta^x}{\partial a} \right) \frac{\partial a}{\partial t} \text{ for } x = \{l, \ h\}.$$

From Proposition 3, we know that below the credibility threshold, $\delta^h < \tilde{\delta} = (1 - \omega a) \ \omega a / \Omega$, and below the aid dependence threshold, $a < \overline{a}$, the term in brackets is positive, $\partial g^x / \partial a > 0$, meaning governments manage to extract growth from foreign aid. At a low level of aid dependence, $a < \overline{a}$, if $\partial a / \partial t > 0$, then it is likely that $\partial g^x / \partial a$ will remain positive over some periods of time because a sustained increase in aid

[20] We do not address the important distinction between budget- and project-aid, as analyzed by Cordella and Dell'Ariccia (2003). However, this Proposition 3, taken jointly with Proposition 1, matches their conclusion that budget support is not recommended when aid is large relative to the recipient' resources; that is, the country is aid-dependent.

causes a sustained increase in the threshold $\tilde{\delta}$; indeed $\partial\tilde{\delta}/\partial a > 0$ when $a < \bar{a}$. However, for given unobservable country-specific efforts to improve welfare, ω, if $\partial a/\partial t > 0$, then the sustained increase in aid will eventually cause a decrease in $\tilde{\delta}$ because $\partial\tilde{\delta}/\partial a < 0$ when $a > \bar{a}$ which implies $\partial g^x/\partial a$ will become negative after some periods of time. This implies that countries for which aid dependence rises over time, $\partial a/\partial t > 0$, are likely to experience slower growth over time, $\partial g^x/\partial t < 0$. Conversely, countries for which aid dependence falls over time, $\partial a/\partial t < 0$, are likely to experience faster growth over time, $\partial g^x/\partial t > 0$. Only fully credible governments can display rising aid dependence $\partial a/\partial t > 0$ together with faster growth over time, $\partial g^l/\partial t > 0$ as in the benchmark case. ■

In sum, aid mediated by sufficiently credible governments can produce a boost in growth, but such boosts cannot be sustained over time, unless the government is fully credible or the country remains aid-independent $a < \bar{a}$. It should be noted that both the aid dependence threshold and the credibility threshold in Propositions 2-4 have nothing to do with diminishing returns to aid over time (i.e., within-country effect). Instead, unobservable country-specific efforts, ω, create different thresholds of aid dependence across countries (i.e., between-country effect). This is a point we will confirm empirically in the next section.

IV. Empirical Evidence

The logic of the remaining of the paper can be described as follows. First, we find a positive *aggregate impact of aid on growth* (even without diminishing returns); this supports our growth model with imperfect capacity utilization. Next, we tackle the issue of *group heterogeneity* using and verifying the specific predictions of Propositions 3 and 4. We find that the impact of aggregate aid on growth is significantly smaller for low-income countries—defined as member countries of the International Development Association (IDA)—which are deemed less credible; this supports Proposition 3. We also find that past trends of aid dependence are a strong predictor of aid effectiveness; this supports Proposition 4. Finally, the next section summarizes our findings.

A. Impact of Aggregate Aid on Growth

Virtually all existing empirical analyses predicated on the ICOR theory consider four- to five-year averages of data (from Burnside and Dollar, 2000; to Easterly, Levine, and Roodman, 2004; via Dalgaard, Hansen, and Tarp, 2004; Dalgaard and Hansen, 2001; and Hansen and Tarp, 2001). See Clemens and others (2004) for a review of this empirical literature.

Specification

Instead, we are interested in checking the predictions of our model which produces some transitional dynamics. Hence, we use high frequency yearly observations from 1984 to

2002 in order to capture such transitional dynamics over almost two decades. This aside, we use the standard empirical specification in aid-growth regressions

$$g_{jt} = \beta + \beta_0 C_{jt} + \beta_1 a_{jt}^2 + \beta_2 a_{jt} + \beta_3 \left(a_{jt} \cdot D_{\{j\}} \right) + \beta_4 D_{\{j\}} + \tau_t + \nu_{jt},$$

where g_{jt} is real GDP growth in country j, C_{jt} is a vector of common control variables, a_{jt} is aid as a proportion of GDP, $D_{\{j\}}$ are dummy variables for specific groups of countries $\{j\}$, and τ_t are time dummy variables.[21] The treatment of dummies is important for capturing specific group heterogeneity, which will be developed further below; for the moment, we assume $\beta_3 = \beta_4 = 0$.

As controls, we use the most common variables in aid-growth regressions. These *basic controls* include (i) initial income given by the natural log GDP in 1982 because our sample starts in 1984—World Development Indicators (WDI); (ii) ethnic fractionalization measures the probability percentage that two randomly selected people from a given country will not belong to the same ethnic group—Alesina and others (2003); (iii) financial depth measured as lagged M2 as a percentage of GDP—International Financial Statistics (IFS); inflation in annual percentage captures macroeconomic instability—IFS; (iv) a dummy for sub-Saharan Africa (SSA); and (v) a dummy for fast-growing East Asian countries (EASIA). Because we are interested in changes in capacity utilization, we need to control for the *sources of capacity building*: (vi) investment gives the annual percentage growth of gross capital formation—WDI;[22] (vii) foreign direct investment (FDI) is the net inflow of foreign direct investment as a percentage of GDP—WDI; and (viii) school gives the primary to secondary gross enrollment ratio—WDI. Because we are interested in the impact of government interventions on the private sector, we control for the *quality and size of government*: (ix) institutional quality is based on the International Country Risk Guide (ICRG) of the Political Risk group—WDI;[23] and (x) government size is measured as general government final consumption expenditure as a percentage of GDP. The summary statistics are presented in Table 1.

Hence, our aid-growth regressions contain these ten control variables as well as 18 time dummies for 1985 to 2002 (dropping 1984) in an unbalanced panel of 68 countries and up to 19 years. Real GDP growth is given by the annual growth rate of real GDP from the

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[21] We allow for a quadratic aid term not because it is relevant to our model but because it has gained so much importance in the literature.

[22] Notice, controlling for investment is appropriate in our framework because, unlike many papers predicated on the ICOR theory, we do not rely on the investment channel for aid.

[23] The version in the WDI is a composite of subjective scores on five aspects of politics, policy, and institutions relevant to the security of property rights in various countries and periods: (i) the political autonomy and expertise of the public bureaucracy, (ii) the degree to which the 'rule of law' is institutionalized, (iii) the extent of government corruption, (iv) the risk of expropriation or nationalization of property, and (v) the risk of government repudiation of contracts.

WDI and aid dependence is official development assistance and official aid as a percentage of GDP, as provided by the WDI.

Evidence: Impact of aid on growth

Table 2 presents the regression results. Consistently across the columns (1) through (14), we confirm that macroeconomic stability (inflation variable) and gross capital formation (investment variable) are important for growth. More importantly, we confirm that both government quality and government size strongly matter for growth. In other words, the ability of the government to secure property rights (i.e., institutional quality) and to remain limited in size appear as essential ways through which the government can promote the private sector; this confirms Proposition 2.

We turn to the issue of foreign aid, in columns (7) to (14). A number of empirical studies that do find an aggregate impact of aid on growth have been proposed by Dalgaard, Hansen, and Tarp (DHT) among others. Basically, they find that aid spurs growth regardless of the policy environment, thereby contradicting Burnside and Dollar (2000) who argued that aid effectiveness must be evaluated after having controlled for "good" policies.[24] Easterly, Levine, and Roodman (ELR) show that the latter finding is not robust to the use of additional data (extending the data from 1993 to 1997), to alternative treatments of outliers, or to changes in variables. Thus, the aggregate impact of aid on growth has been found not to depend on policies, but on the investment channel whereby aid increases investment and then that investment increases economic growth (see specifically Hansen and Tarp, 2001). As a consequence, DHT incorporate a quadratic aid term in the regression; the justification is that there are diminishing returns to aid in the same vein as there are diminishing returns to investment in the neoclassical theory of growth. Hence, as indicated above, we allow for a quadratic aid term in spite of its being irrelevant in our model. The results using OLS and GLS in columns (7)-(8) do not support the existence of a statistically significant impact of aid on growth; this is similar to what DHT or ELR find under OLS.

The general consensus, however, is that aid is endogenous. As DHT, we use a lagged value of aid (the correlation between the one-year lagged value of aid and growth is 0.0157) as an instrument for aid (the correlation between the one-year lagged value of aid and aid is 0.9036), and run a 2SLS and G2SLS in (9)-(10). We then test for endogeneity of aid using a Durbin-Wu-Hausman test proposed by Davidson and MacKinnon (1993).[25] The test statistic is $F(1,\ 984) = 18.03$ with p-value of 0.000 indicating that OLS or GLS estimates

[24] The policies under consideration are (i) monetary policy captured by inflation, (ii) fiscal policy measured by the fiscal balance, and (iii) openness policy measured by the Sachs-Warner index. Inflation is considered here, but the fiscal stance and openness are largely captured by government size and FDI respectively, which we need to introduce as controls.

[25] The F-test is based on whether OLS estimates do not deviate significantly from instrumental variable (IV) estimates in growth regressions when aid regressor is treated as an endogenous variable.

are not consistent in the presence of the aid regressor. Empirically, this matters tremendously for our findings as well as the findings of DHT and others who have found a positive impact of aid on growth, including Clemens and others (2004). Indeed, failure to reject the null would lead to the conclusion that aid does not have an impact on growth. Rejecting the null, as the test suggests, leads to the conclusion that aid does have an impact on growth.

In the presence of endogeneity, we can compare columns (7)-(8) under inconsistent OLS and GLS with columns (9)-(10) under consistent 2SLS and G2SLS. The differences are twofold: first, initial income does matter (even though it suggests divergence among the 68 aid-recipient countries in our sample) and second, aid does have an aggregate impact on growth. More specifically, with our use of high frequency yearly observations, we find that the average aid-recipient country does manage to extract growth from aid as predicted in Proposition 3.

In columns (11)-(12), we remove the quadratic aid term because it is irrelevant to our model (see below). There are no significant differences between 2SLS and G2SLS estimates, both of which suggest that increasing aid as a proportion of GDP by 1 percentage point increases GDP growth by 0.12 percentage points or, equivalently, annual aid of 8.3 percent of GDP adds a whole 1 percentage point to the annual growth rate.

Quadratic aid term

Having dealt with the issue of endogeneity, and before turning to the issue of heterogeneity, we confirm the point that the quadratic aid term is irrelevant to our model and results. Indeed, the credibility thresholds identified in Propositions 2-4 have nothing to do with diminishing returns to aid over time (i.e., within-country effect) but, instead, are due to unobservable country-specific efforts which create different thresholds of aid dependence across countries (i.e., between-country effect). Within-country effects capture differences between aid and time-averaged aid for each country, whereas between-country effects capture differences of time-averaged aid across countries. Columns (13)-(14) are specifically fitted to determine whether the significance of aid stems from within- or between-effects. Column (13) introduces time-averaged aid (i.e., aid averaged over the sample period 1984-2002) instrumented by initial aid (i.e. aid averaged over the pre-sample 1978-1983 period). Column (14) introduces both aid and time-averaged aid with both lagged aid and initial aid as instruments. The point is clear over the two decades in our sample: the significant aid variable primarily captures a between-effect, which is consistent with our model.[26]

[26] The sharp observer would have noticed that the "Ethnic fractionalization" regressor turns significant in columns (13)-(14). Because it would be possible that the significance of "Time-averaged aid" be induced by collinearity with "Ethnic fractionalization" (both fixed over time), we re-ran column (14) without "Ethnic fractionalization" but the result remains unchanged. This is not surprising because the coefficient of correlation between these two variables is only 0.36.

B. Group Heterogeneity

We now turn to the issue of group heterogeneity. The identification of groups of countries that manage to extract growth from foreign aid can be done by allowing the coefficient of aid in the aid-growth regressions to differ across specific groups of countries. This involves interacting aid with a dummy variable for a specific group and then including both aid and aid-interacted in the regression and testing the significance of heterogeneity. Hence, we now relax the assumption that $\beta_3 = \beta_4 = 0$.

There is a trade-off between the amount of "granularity" in the dummy variables (at the extreme there could be one dummy per country) on the one hand, and the level of multicollinearity between a_{jt} and $a_{jt} \cdot D_{\{j\}}$ on the other hand. The 2SLS estimators in the presence of multicollinearity remain unbiased and efficient. The major consequence of multicollinearity is that the variance of the 2SLS estimates of the parameters of the collinear variables are large and therefore their statistical significance is low. In other words, when the regressors are highly correlated, most of their variation is common to both variables, leaving little variation unique to each variable. If nonetheless, the estimates of coefficients β_3 and β_4 are significant, then the variation unique to each regressor is informative. Hence, this procedure is rather demanding on data and makes the significant variable even more compelling because of its unique variation. For instance, if β_3 is negative and significant, then the specific group of countries $\{j\}$ is less able to extract growth from aid than other countries.

Categories of aid recipients

We want to check the validity of the predictions from Proposition 4. This implies that countries for which aid dependence rises over time, $\partial a / \partial t > 0$, are likely to experience slower growth over time, $\partial g^x / \partial t < 0$. Conversely, countries for which aid dependence falls over time, $\partial a / \partial t < 0$, are likely to experience faster growth over time, $\partial g^x / \partial t > 0$. The identification of countries can be achieved by running the following regressions on a country-by-country basis

$$a_{jt} = \alpha_{0j} + \alpha_{1j} T_t + \alpha_{2j} g_{jt} + \upsilon_{jt} \quad j = 1,\ 2,...,\ J\ ,$$

where T_t is a time trend. These regressions serve two purposes: first, they allow us to assess whether there is a time trend in aid as a percentage of GDP (i.e., aid dependence) and second, they allow us to detect potential endogeneity where growth affects aid (i.e., reverse causation).

The results for each IDA aid-recipient country are presented in Table 3, which contains the t-statistics for the estimated coefficient α_{1j} in column (1) and α_{2j} in column (2) as well as regional dummies. The results for each aid-recipient non-IDA country are presented in Table 4, which presents the corresponding columns (1) and (2). In both tables, countries are

grouped into four categories: (Category 1) countries with significant positive trends at 5 percent level of significance, $\partial a / \partial t = \alpha_{1j} > 0$; (Category 2) countries with statistically non-significant trends, $\partial a / \partial t = \alpha_{1j} \approx 0$; (Category 3) countries with significant negative trends, $\partial a / \partial t = \alpha_{1j} < 0$; and (Category 4) countries with strong aid endogeneity, $\partial a / \partial g = \alpha_{2j} \neq 0$.

The composition of these four categories is summarized in Table 5 with the representativeness of each group in our regression sample (corresponding to the column "sample" in Tables 2-3). The majority of IDA countries have either a non-significant aid trend (Category 2: 43 percent of total) or a significant negative trend (Category 1: 31 percent of total).[27] Among the 79 countries non-IDA countries, the majority of countries have either a significant negative trend (Category 1: 38 percent of total) or strong endogeneity (Category 4: 28 percent of total). The key point is that non-IDA countries are more likely to display a significant negative trend. Our regression sample is shown to preserve the representativeness of each group.

Evidence: Group heterogeneity

The evidence on group heterogeneity is presented in Table 6. We start by considering the general difference between IDA and non-IDA countries in column (1). This shows that IDA countries are much less able to extract growth from aid than non-IDA countries; increasing aid as a proportion of GDP by 1 percentage point increases GDP growth by 0.12 percentage points in IDA countries, but by 0.47 percentage points in non-IDA countries. For IDA countries, annual aid dependence of 8.3 percent of GDP adds a whole 1 percentage point to the growth rate, whereas for non-IDA countries, annual aid dependence of 2.1 percent of GDP adds a whole 1 percentage point to the growth rate. Hence, there is strong evidence that non-IDA countries manage to extract more growth from foreign aid, consistent with our prediction for less aid-dependent countries with more credible governments. Indeed, besides the level of income, a key difference between IDA and non-IDA countries is the level of aid dependence, which is 11.5 percent on average for IDA countries (the standard deviation is 11.1, with a minimum of 0.1 and a maximum of 78.9 percent in 1992 Mozambique) and 1.4 percent on average for non-IDA countries (the standard deviation is 2.4, with a minimum of 0 and a maximum of 22.4 percent in 1991 Jordan).

Turning to the past trends of aid dependence, columns (2) and (3) show that countries for which aid dependence falls over time (i.e., **Category 1** dummy for countries with a negative trend, $\partial a / \partial t < 0$) display a different pattern whether they are IDA countries or not. On the whole, countries in this category do manage to extract growth from foreign aid and are strong performers over time ($\partial g / \partial t > 0$), with about 1.2 percent higher real GDP growth per annum. There is, however, a major difference between aid-recipients as a whole and IDA countries. Indeed, IDA countries in this category do not manage to extract growth

[27] There were a total of 81 IDA countries in 2003 but only 77 countries with available aid data.

from foreign aid, but are still expected to be strong performers over time ($\partial g / \partial t > 0$) with more than 1.4 percent higher real GDP growth per annum. This implies that giving aid to governments of such IDA countries is not expected to boost growth (contrary to what it does for the average aid-recipient), but these countries are expected to be strong growth performers even after they graduate out of IDA status (i.e., move from column (3) to (2)).

The results for countries for which aid dependence neither rises nor falls over time (i.e., **Category 2** dummy for countries with a non-significant trend, $\partial a / \partial t \approx 0$) are shown in columns (4) and (5). These countries do not manage to extract growth from foreign aid and are neither better nor worse performers over time. About 41 percent of IDA countries belong to this stagnating category. Among IDA countries, about half the countries in this category are sub-Saharan African countries. There is no evidence that these countries manage to extract growth from foreign aid during the sample period from 1984 to 2002. At worst, aid to these countries is stolen, misplaced, or wasted. At best, aid to these countries comprises mainly what Clemens and others (2004) call "long-impact" aid—defined as aid disbursements funding interventions that do not raise GDP within a few years; our sample comprises almost two decades.

Column (6) shows that countries for which aid dependence rises over time (i.e., **Category 3** dummy for countries with a positive trend, $\partial a / \partial t > 0$) are neither more nor less able to extract growth from foreign aid than the average aid-recipient country. However, these countries are significantly worse performers over time ($\partial g / \partial t < 0$), with about 1.4 percent lower real GDP growth per annum. Column (7) shows that the latter does not hold for IDA countries for which aid dependence rises over time. This implies that giving aid to governments of such IDA countries is expected to boost growth (as it does for the average aid-recipient country), but is not expected to sustain the growth performance and may even hinder growth performance as these countries graduate out of IDA status (i.e., move from column (7) to (6)).

As a robustness check, we also screen out the 29 countries for which we find that growth significantly affects aid (i.e., **Category 4**);[28] this influences the results under OLS or GLS, but not under 2SLS or G2SLS. We interpret this as further evidence that endogeneity of aid is important and our instruments perform well.

[28] Only seven of these 29 countries are IDA countries: Armenia, Bolivia, Djibouti, Georgia, Niger, Togo, and Yemen.

V. CONCLUSIONS

Buchanan (1975) demonstrates that a dilemma frequently arises when a modern-day Samaritan's actions are generalized as a rule of conduct for individuals or organizations attempting to assist people or countries in need. On the one hand, there is a desire to help low-income countries, some of which cannot help themselves. On the other hand, there is the recognition that aid disbursements may be harmful to the long-term interests of the recipients.

Relatively little attention has been given to the inherent problems of the "chain-of-help" in effectively coping with this dilemma under the traditional rule that aid is mediated by recipient governments and is almost exclusively targeted at capacity building, thereby neglecting capacity utilization. Considering these problems, the paper suggests that aid effectiveness can be improved if aid is given to governments of non-IDA countries, for these countries are less aid dependent and more credible in promoting their private sectors, on average (see Proposition 3). This is especially true for those non-IDA countries for which aid dependence falls over time (see Category 1 in Table 4).

Yet, altruistic donors often feel compelled to assist needy IDA countries that are highly aid dependent, on average. The evidence shows that either these countries are sufficiently credible in promoting their private sectors and are inherently strong performers, but do not manage to extract growth from foreign aid (see Category 1 in Table 3), or they do manage to extract growth from foreign aid, but lack the credibility to sustain growth performance over time (see Category 3 in Table 3). The former are IDA countries for which aid dependence falls over time whereas the latter are IDA countries for which aid dependence rises over time (see Proposition 4). One way or another, aid has both positive and negative impacts for these countries, so the Samaritan can always claim to have done some good.

A more profound Samaritan's dilemma emerges for the many low-income countries that do not manage to extract growth from foreign aid and that are weak performers over time (see Category 2 in Table 3). Therefore, this paper argues that the traditional rule of handing aid to governments and neglecting capacity utilization can contribute to the problem of underdevelopment (i.e., imperfect utilization of capacities and informal economy). This is true even if donors and recipient governments are altruistic and aid disbursements benevolently seek to alleviate the problem of underdevelopment or market failure in recipient countries.

The challenge in terms of policy is to shorten the long "chain-of-help." An example of possible improvement in aid strategies, beyond better selectivity, would be to promote the activities of organizations like the International Finance Corporation (IFC) that support private and commercial undertakings and directly address market failures in recipient countries. But these development assistance activities currently constitute the exception rather than the rule of giving aid to governments, although the engine of growth is the private sector.

Table 1. Summary Statistics

Variable	Mean	Std. Dev.	Min	Max
Growth	3.59	4.27	-17.60	14.98
Initial income	22.95	1.57	18.92	26.36
Ethnic fractionalization	0.52	0.24	0.04	0.93
Financial depth	36.40	22.42	3.56	150.22
Inflation	14.96	18.50	-11.45	114.16
SSA dummy	0.33	0.47	0	1
EASIA dummy	0.08	0.28	0	1
Investment	4.22	17.02	-81.14	87.10
FDI	2.00	2.70	-9.87	17.24
School	2.71	1.52	1.03	10.01
Institutional quality	59.69	11.28	25.50	91.25
Government size	13.34	4.96	2.98	35.34
Aid	6.11	9.26	0	78.94
Aid square	123.07	434.06	0	6231.91
Time-averaged aid	6.12	8.31	0	47.45

Note: 1,020 observations representing 68 countries.

Table 2. Impact of Aggregate Aid on Growth

Growth	**(1) OLS**	**(2) GLS**	**(3) OLS**	**(4) GLS**	**(5) OLS**	**(6) GLS**	**(7) OLS**	**(8) GLS**	**(9) 2SLS**	**(10) G2SLS**	**(11) 2SLS**	**(12) G2SLS**	**(13) 2SLS**	**(14) 2SLS**
Initial income	0.06	0.07	0.13	0.16	0.08	0.09	0.21 *	0.21	0.52 **	0.57 **	0.35 **	0.39 **	0.65 **	0.63 **
	(0.69)	(0.55)	(1.48)	(1.33)	(0.93)	(0.78)	(2.12)	(1.73)	(3.82)	(3.87)	(3.41)	(2.98)	(4.74)	(4.86)
Ethnic fractionalization	-1.59 *	-1.55	-1.44 *	-1.41	-0.96	-0.81	-1.09	-1.00	-1.43 *	-1.42	-1.31 *	-1.26	-1.87 **	-1.85 **
	(-2.46)	(-1.65)	(-2.52)	(-1.73)	(-1.68)	(-1.02)	(-1.88)	(-1.37)	(-2.44)	(-1.94)	(-2.27)	(-1.63)	(-3.21)	(-3.20)
Financial depth	0.00	0.01	0.01	0.00	0.01 *	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.00
	(0.56)	(1.01)	(1.10)	(0.23)	(2.05)	(1.25)	(1.36)	(1.04)	(0.25)	(0.16)	(0.53)	(0.33)	(0.10)	(0.42)
Inflation	-0.03 **	-0.03 **	-0.02 *	-0.03 **	-0.02 *	-0.02 **	-0.02 **	-0.02 **	-0.02 *	-0.02 **	-0.02 **	-0.03 **	-0.02 **	-0.02 **
	(-3.03)	(-3.61)	(-2.93)	(-3.52)	(-2.34)	(-2.80)	(-2.60)	(-2.84)	(-2.30)	(-2.59)	(-3.08)	(-3.41)	(-3.09)	(-2.80)
SSA dummy	0.20	0.11	0.35	0.20	0.55	0.51	0.49	0.47	0.20	0.18	0.46	0.46	0.59	0.57
	(0.53)	(0.19)	(0.93)	(0.40)	(1.40)	(1.03)	(1.22)	(1.02)	(0.48)	(0.38)	(1.16)	(0.96)	(1.39)	(1.34)
EASIA dummy	3.50 **	3.68 **	2.57 **	2.64 **	1.77 **	1.56 *	1.73 **	1.60 **	1.74 **	1.63 **	1.67 **	1.48 **	1.28 **	1.30 **
	(6.72)	(5.50)	(6.07)	(4.10)	(3.99)	(2.35)	(3.91)	(2.66)	(3.89)	(2.69)	(3.77)	(2.32)	(2.93)	(2.97)
Investment			0.12 **	0.12 **	0.12 **	0.11 **	0.12 **	0.11 **	0.11 **	0.11 **	0.11 **	0.11 **	0.11 **	0.11 **
			(14.03)	(18.34)	(13.69)	(17.70)	(13.75)	(17.50)	(13.17)	(16.54)	(13.64)	(17.27)	(13.44)	(13.18)
FDI			0.14 **	0.15 **	0.09 *	0.10 *	0.07	0.09	0.04	0.05	0.05	0.07	0.06	0.07
			(2.96)	(3.04)	(1.95)	(2.07)	(1.55)	(1.74)	(0.89)	(1.03)	(1.03)	(1.32)	(1.33)	(1.55)
School			0.11	0.17	0.14	0.17	0.01	0.05	-0.22	-0.21	-0.18	-0.15	-0.34 *	-0.26
			(0.93)	(1.43)	(1.10)	(1.48)	(0.05)	(0.41)	(-1.51)	(-1.56)	(-1.24)	(-1.13)	(-2.21)	(-1.90)
Institutional quality					0.06 **	0.07 **	0.07 **	0.08 **	0.11 **	0.11 **	0.09 **	0.10 **	0.11 **	0.10 **
					(3.56)	(4.49)	(4.13)	(4.83)	(5.35)	(6.14)	(5.20)	(5.79)	(5.62)	(5.57)
Government size					-0.07 **	-0.11 **	-0.08 **	-0.10 **	-0.09 **	-0.11 **	-0.08 **	-0.11 **	-0.08 **	-0.08 **
					(-2.62)	(-3.42)	(-2.75)	(-3.31)	(-3.13)	(-3.73)	(-2.92)	(-3.58)	(-2.98)	(-2.71)
Aid squared							-0.00	-0.00 *	-0.00 **	-0.00 **				
							(-0.23)	(-0.75)	(-2.62)	(-3.86)				
Aid							0.06	0.07	0.30 **	0.33 **	0.12 **	0.13 **		-0.09
							(1.28)	(1.65)	(3.79)	(4.54)	(4.91)	(4.48)		(-0.94)
Time-averaged aid													0.21 **	0.29 **
													(4.94)	(3.43)
Observations	1083	1083	1083	1083	1020	1020	1020	1020	1017	1017	1017	1017	996	996
Countries	68	68	68	68	68	68	68	68	68	68	68	68	66	66
R-squared	0.10	0.10	0.35	0.35	0.36	0.36	0.36	0.36	0.34	0.34	0.36	0.35	0.36	0.36

Notes: * indicates that the coefficient is significant at the 5 percent level and ** indicates significance at the 1 percent level. T-statistics (or pseudo t-stat where relevant) in parenthesis and standard errors are White heteroskedastic-consistent. All regressions include time dummies and a constant term. All regressions omit outliers using the Hadi procedure. In 2SLS and G2SLS, aid is instrumented using lagged aid (see text).

Table 3. International Development Association (IDA) Countries,
Grouped in Categories of Trends of Aid Dependence

Country	(1)	(2)	IDA	AFR	EAP	SAS	ECA	LAC	MNA	sample
Category 1:										
Cape Verde	-5.01	0.46	1	1	0	0	0	0	0	
Central African Rep.	-3.49	0.70	1	1	0	0	0	0	0	
Chad	-2.59	0.08	1	1	0	0	0	0	0	
Comoros	-6.36	-1.01	1	1	0	0	0	0	0	
Gambia, The	-3.84	0.28	1	1	0	0	0	0	0	1
Guinea	-2.99	-0.17	1	1	0	0	0	0	0	
Kenya	-1.97	-1.00	1	1	0	0	0	0	0	1
Lesotho	-8.16	0.71	1	1	0	0	0	0	0	
Mali	-7.34	-0.83	1	1	0	0	0	0	0	1
Senegal	-3.37	0.34	1	1	0	0	0	0	0	1
Sudan	-5.70	-1.22	1	1	0	0	0	0	0	1
Tanzania	-3.84	-0.23	1	1	0	0	0	0	0	
Kiribati	-3.47	-1.39	1	0	1	0	0	0	0	
Mongolia	-2.56	0.68	1	0	1	0	0	0	0	
Papua New Guinea	-7.60	-1.73	1	0	1	0	0	0	0	1
Tonga	-5.10	-1.16	1	0	1	0	0	0	0	
Vanuatu	-2.52	0.54	1	0	1	0	0	0	0	
Bangladesh	-5.86	-0.47	1	0	0	1	0	0	0	1
India	-7.22	-1.19	1	0	0	1	0	0	0	1
Nepal	-3.42	0.82	1	0	0	1	0	0	0	
Sri Lanka	-8.14	-0.30	1	0	0	1	0	0	0	1
Bosnia and Herzegovina	-4.10	-1.60	1	0	0	0	1	0	0	
Dominica	-3.70	-1.55	1	0	0	0	0	1	0	
Grenada	-4.45	0.78	1	0	0	0	0	1	0	
Category 2:										
Burundi	-0.64	-1.20	1	1	0	0	0	0	0	
Guinea-Bissau	-1.81	0.01	1	1	0	0	0	0	0	1
Mauritania	-0.23	1.83	1	1	0	0	0	0	0	
Zimbabwe	-0.87	-0.37	1	1	0	0	0	0	0	1
Cambodia	-1.34	-1.50	1	0	1	0	0	0	0	
Indonesia	-0.99	0.84	1	0	1	0	0	0	0	1
Samoa	-0.52	0.92	1	0	1	0	0	0	0	
Solomon Islands	-1.04	-0.65	1	0	1	0	0	0	0	
Bhutan	-0.22	-0.68	1	0	0	1	0	0	0	
Maldives	-0.99	0.05	1	0	0	1	0	0	0	
Pakistan	-0.71	0.37	1	0	0	1	0	0	0	1
St. Lucia	-0.94	-0.58	1	0	0	0	0	1	0	
St. Vincent and Grenadines	-1.60	0.48	1	0	0	0	0	1	0	

Table 3. IDA Countries, Grouped in Categories of Trends of Aid Dependence (concluded)

Country	(1)	(2)	IDA	AFR	EAP	SAS	ECA	LAC	MNA	sample
Benin	0.52	-1.54	1	1	0	0	0	0	0	
Congo, Dem. Rep. of	0.21	1.33	1	1	0	0	0	0	0	
Congo, Republic of	1.54	-1.47	1	1	0	0	0	0	0	1
Côte d'Ivoire	1.58	0.69	1	1	0	0	0	0	0	1
Ghana	1.38	-1.29	1	1	0	0	0	0	0	1
Liberia	1.21	-1.66	1	1	0	0	0	0	0	
Madagascar	0.26	0.09	1	1	0	0	0	0	0	1
Malawi	0.91	-0.91	1	1	0	0	0	0	0	1
Mozambique	1.25	-0.38	1	1	0	0	0	0	0	1
Nigeria	0.96	1.06	1	1	0	0	0	0	0	1
São Tomé & Príncipe	0.83	-1.81	1	1	0	0	0	0	0	
Uganda	1.32	1.27	1	1	0	0	0	0	0	1
Zambia	0.71	-0.99	1	1	0	0	0	0	0	1
Albania	0.32	-1.84	1	0	0	0	1	0	0	
Azerbaijan	1.46	-0.93	1	0	0	0	1	0	0	
Kyrgyz Republic	0.89	1.63	1	0	0	0	1	0	0	
Guyana	0.30	1.66	1	0	0	0	0	1	0	1
Haiti	0.40	-0.86	1	0	0	0	0	1	0	1
Honduras	0.90	-1.74	1	0	0	0	0	1	0	1
Nicaragua	0.83	0.59	1	0	0	0	0	1	0	1
Category 3:										
Angola	2.13	-0.72	1	1	0	0	0	0	0	
Burkina Faso	2.47	-0.12	1	1	0	0	0	0	0	1
Cameroon	5.57	-1.37	1	1	0	0	0	0	0	1
Eritrea	3.78	1.82	1	1	0	0	0	0	0	
Ethiopia	2.19	0.40	1	1	0	0	0	0	0	1
Rwanda	2.71	-1.11	1	1	0	0	0	0	0	
Sierra Leone	4.15	1.61	1	1	0	0	0	0	0	1
Lao People's Dem. Rep	2.71	1.83	1	0	1	0	0	0	0	
Vietnam	3.42	1.71	1	0	1	0	0	0	0	
Moldova	5.49	-0.77	1	0	0	0	1	0	0	
Serbia and Montenegro	6.05	0.04	1	0	0	0	1	0	0	
Tajikistan	2.70	-0.30	1	0	0	0	1	0	0	
Uzbekistan	6.54	-0.77	1	0	0	0	1	0	0	
Category 4:										
Djibouti	-2.55	-3.24	1	0	0	0	0	0	1	
Niger	-3.02	3.11	1	1	0	0	0	0	0	1
Togo	-6.42	2.84	1	1	0	0	0	0	0	1
Armenia	-0.35	3.11	1	0	0	0	1	0	0	
Bolivia	-0.81	2.93	1	0	0	0	0	1	0	1
Georgia	0.94	3.10	1	0	0	0	1	0	0	
Yemen, Republic of	-0.38	-2.62	1	0	0	0	0	0	1	
No data										
Somalia			1	1	0	0	0	0	0	
Myanmar			1	0	1	0	0	0	0	
Timor-Leste			1	0	1	0	0	0	0	
Afghanistan, I.S. of			1	0	0	1	0	0	0	

Notes: The numbers in columns (1)-(2) are T-statistics based on White heteroskedastic-consistent standard errors; groupings in categories are based on a 95 percent level of confidence; and the "sample" column indicates whether the country is in the regression sample.

Table 4. Non-IDA Countries, Grouped in Categories of Trends of Aid Dependence

Country	(1)	(2)	sample	Country	(1)	(2)	sample
Category 1:							
Argentina	-2.02	-0.11	1	continued			
Barbados	-2.14	0.72					
Belize	-5.06	0.67		Colombia	1.49	-0.72	1
Botswana	-9.29	0.95	1	Estonia	1.07	-1.42	
China	-2.21	0.31	1	Kazakhstan	1.80	-0.30	
Hong Kong SAR	-8.97	-1.66		Latvia	1.15	-0.67	
Costa Rica	-10.77	-1.53	1	Lithuania	0.07	0.38	
Cyprus	-3.41	-0.56	1	Russia	1.68	-0.36	
Dominican Republic	-3.43	0.27	1	Suriname	0.40	-0.19	
Ecuador	-3.00	-0.59	1	Turkmenistan	0.17	-0.20	
Egypt	-3.35	-0.89	1				
El Salvador	-8.06	-0.46	1	**Category 3:**			
Fiji	-3.58	0.53					
Gabon	-3.19	1.54	1	Algeria	2.71	0.40	1
Israel	-5.04	-0.81	1	Bulgaria	2.94	-1.38	
Jamaica	-11.48	0.14		Iran, I.R. of	3.55	-0.03	1
Jordan	-3.84	0.08	1	Macedonia, FYR of	7.09	0.32	
Korea	-2.18	0.95		Micronesia, Fed. Sts.	2.98	-1.73	
Lebanon	-1.99	0.47		Namibia	3.17	1.09	
Malaysia	-6.12	-1.87	1	Romania	3.32	-0.90	
Morocco	-2.60	0.31	1				
Poland	-3.60	-0.72		**Category 4:**			
Saudi Arabia	-5.96	1.62					
Seychelles	-6.83	0.00		Brazil	-0.29	2.78	1
Singapore	-5.73	-0.44	1	Belarus	-3.46	-2.18	
Swaziland	-7.47	-1.33		Equatorial Guinea	-3.71	-3.32	
Syrian Arab Republic	-4.46	0.30	1	Guatemala	-3.30	3.52	1
Thailand	-6.33	-1.07	1	Kuwait	-2.75	-3.10	1
Tunisia	-2.79	-0.23	1	Mauritius	-8.24	3.37	
Turkey	-2.38	0.75	1	Mexico	-3.09	-4.13	1
				New Caledonia	-4.52	-4.48	
Category 2:				Panama	-5.28	2.64	1
				Peru	-7.70	-2.67	1
Bahrain, Kingdom of	-1.89	-0.43		Antigua and Barbuda	0.46	2.39	
Paraguay	-1.85	1.69	1	Bahamas, The	0.33	3.21	
St. Kitts and Nevis	-1.83	0.98		Chile	0.38	2.52	1
Macao SAR	-1.70	-0.42		Croatia	0.04	2.04	
Oman	-1.59	0.16		Slovenia	1.07	-2.93	
United Arab Emirates	-1.14	-0.07		West Bank/Gaza Strip	1.40	-2.04	
French Polynesia	-1.04	0.80		Czech Republic	3.09	-4.98	
Uruguay	-0.88	1.28	1	Hungary	3.46	-4.58	1
Malta	-0.57	-0.84		Marshall Islands,Rep	4.00	-3.87	
Bermuda	-0.37	-0.86		Slovak Republic	2.62	-2.86	
Venezuela, Rep. Bol. de	-0.33	-0.68	1	South Africa	3.92	-3.00	1
Trinidad and Tobago	-0.29	-0.35	1	Ukraine	3.73	2.53	

Notes: The numbers in columns (1)-(2) are T-statistics based on White heteroskedastic-consistent standard errors; groupings in categories are based on a 95 percent level of confidence; and the "sample" column indicates whether the country is in the regression sample.

Table 5. Summary of Tables 3–4

	Universe		Regression sample	
	Number of countries	**Proportion in percentage**	**Number of countries**	**Proportion in percentage**
IDA				
Category 1	24	33	9	29
Category 2	32	44	17	55
Category 3	13	18	4	13
Category 4	4	5	1	3
	73	100	31	100
Non-IDA countries				
Category 1	30	38	19	54
Category 2	20	25	5	14
Category 3	7	9	2	6
Category 4	22	28	9	26
	79	100	35	100

Source: Tables 2 and 3. Category 1: positive trend of aid dependence over the 1984-2002 period; category 2: non-significant trend; category 3: negative trend; and category 4: specific endogeneity. All significance evaluated at 95 percent level of confidence.

Table 6. Group Heterogeneity

growth		(1)	(6)	(7) Category 1	(4)	(5) Category 2	(2)	(3) Category 3
2SLS	Base	IDA	Category 1	for IDA	Category 2	for IDA	Category 3	for IDA
Initial income	0.35 **	0.44 **	0.38 **	0.30 **	0.31 **	0.33 **	0.43 **	0.35 **
	(3.41)	(4.21)	(3.68)	(2.87)	(3.07)	(3.15)	(4.07)	(3.41)
Ethnic fractionalization	-1.31 *	-1.32 *	-0.99	-1.13	-1.21 *	-1.33 *	-1.25 *	-1.21 *
	(-2.27)	(-2.28)	(-1.71)	(-1.96)	(-2.11)	(-2.27)	(-2.20)	(-2.10)
Financial depth	0.00	-0.01	0.00	0.00	0.00	0.00	0.01	0.00
	(0.53)	(-0.79)	(0.02)	(0.34)	(0.21)	(0.65)	(0.90)	(0.62)
Inflation	-0.02 **	-0.02 **	-0.04 **	-0.02 **	-0.02 **	-0.02 **	-0.03 **	-0.03 **
	(-3.08)	(-2.63)	(-3.24)	(-2.80)	(-3.28)	(-3.24)	(-3.64)	(-3.45)
SSA dummy	0.46	0.49	0.65	0.49	0.60	0.56	0.86 *	0.71
	(1.16)	(1.20)	(1.41)	(1.19)	(1.45)	(1.33)	(2.14)	(1.78)
EASIA dummy	1.67 **	2.02 **	1.68 **	1.82 **	1.65 **	1.63 **	1.39 **	1.66 **
	(3.77)	(4.36)	(3.75)	(4.04)	(3.67)	(3.55)	(3.12)	(3.79)
Investment	0.11 **	0.11 **	0.11 **	0.11 **	0.12 **	0.12 **	0.12 **	0.12 **
	(13.64)	(13.67)	(13.72)	(13.57)	(13.66)	(13.67)	(13.73)	(13.74)
FDI	0.05	0.07	0.06	0.05	0.05	0.04	0.03	0.04
	(1.03)	(1.42)	(1.23)	(1.10)	(1.11)	(0.87)	(0.69)	(0.79)
School	-0.18	-0.18	-0.20	-0.21	-0.19	-0.19	-0.23	-0.20
	(-1.24)	(-1.25)	(-1.41)	(-1.49)	(-1.38)	(-1.36)	(-1.63)	(-1.43)
Institutional quality	0.09 **	0.10 **	0.09 **	0.10 **	0.09 **	0.09 **	0.09 **	0.09 **
	(5.20)	(5.42)	(4.96)	(5.58)	(5.02)	(4.85)	(5.11)	(5.09)
Government size	-0.08 **	-0.09 **	-0.08 **	-0.08 **	-0.08 **	-0.08 **	-0.09 **	-0.09 **
	(-2.92)	(-3.24)	(-2.97)	(-2.68)	(-2.87)	(-2.94)	(-3.19)	(-3.17)
Aid	0.12 **	0.47 **	0.14 **	0.13**	0.07	0.10 *	0.13 **	0.12 **
	(4.91)	(5.05)	(5.41)	(5.24)	(1.67)	(2.26)	(5.03)	(4.91)
Aid x IDA dummy		-0.35 **						
		(-3.86)						
IDA dummy		0.66 *						
		(2.00)						
Aid x Category-1 dummy			-0.07	-0.14 **				
			(-1.85)	(-3.03)				
Category-1 dummy			1.19 **	1.44 **				
			(4.38)	(3.33)				
Aid x Category-2 dummy					0.07	0.03		
					(1.92)	(0.76)		
Category-2 dummy					-0.62 *	0.04		
					(-2.15)	(0.09)		
Aid x Category-3 dummy							-0.01	-0.04
							(-0.16)	(-0.31)
Category-3 dummy							-1.43 **	-0.95
							(-2.73)	(-0.63)
Observations	1017	1017	1017	1017	1017	1017	1017	1017
Countries	68	68	68	68	68	68	68	68
R-squared	0.36	0.36	0.36	0.36	0.36	0.36	0.37	0.36

Notes: * indicates that the coefficient is significant at the 5 percent level and ** indicates significance at the 1 percent level. T-statistics in parenthesis and standard errors are White heteroskedastic-consistent. All regressions include time dummies and a constant term. All regressions omit outliers using the Hadi procedure. Aid and aid-interacted are instrumented using lagged aid and lagged aid-interacted.

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