

Aid and growth across countries: what do we know?¹

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1. Introduction

The question of foreign aid's impact on economic growth is highly controversial and excites polarised opinions. Optimistic views of aid are exemplified by those of Jeffrey Sachs (2005), who calls for a doubling of worldwide aid flows as a moral obligation of rich countries that will send 'forth mighty currents of hope' and lead to 'the end of poverty'. In contrast, William Easterly (2001, 2003, 2006) is a vocal sceptic, highlighting aid's apparent historic inability to buy growth.

This chapter provides an overview of the academic literature that has evaluated the effectiveness of aid across countries. Our focus is on the aggregate impact of aid; that is, its effect on country-wide indicators, particularly economic growth. To assist the reader, Sections 2 and 3 provide some essential background to these debates. In Section 2 we outline the concept of economic growth and what any effective strategy to improve living standards in developing countries must consider. In Section 3 we describe the characteristics of foreign aid and how it has changed over the period from 1960 to now.

Section 4 provides an answer to the core question – does aid support economic growth? In doing so, we review microeconomic and macroeconomic evidence, spanning three generations of literature as well as very recent studies. We highlight that this question is not as simple as it may appear. Methodological difficulties mean that it is almost impossible to provide a definitive and comprehensive conclusion. Even so, there is very little to suggest that foreign aid has a consistent harmful effect across countries over time. In our view, the literature and the data indicate that foreign aid provides growth benefits to recipients; however, these growth benefits should be expected to be modest and to accrue over

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considerable time frames, 30 years or more. Aid should never be considered to be a ‘solution’ in itself to poverty. Section 5 summarises these lessons from the literature; and Section 6 concludes.

2. Why are some countries poor?

The disparities in living standards across countries in the world today are spectacularly large. Using per capita income figures, the average citizen of a wealthy country consumes about as much in a few days as the average citizen of many poor countries consumes in a year. Adjusted for differences in purchasing power, the gap narrows somewhat. Even so, the differences are so large that they defy precise measurement. Rough adjustments for purchasing power imply differentials in per capita income/consumption between wealthy and poor countries of about 50 times. Large differences also exist using other measures of well-being such as life expectancy, educational attainment, and infant mortality.

The proximate cause of this chasm in living standards relates to productive capacity. Poor countries simply do not produce very much. Economists typically view the productive capacity of an economy as being a function of stocks of factors of production especially physical capital (factories, tools, computer, roads etc.), human capital (workers with skills) and labour (workers without skills) as well as technology. Economists also posit a crucial role for institutions, which provide frameworks for organizing these factors in a manner that is productive. Poor countries lack physical capital, human capital, technology, and well functioning institutions. As a result of the lack of these four attributes, the mass of unskilled labour present in the country is highly unproductive with negative implications for nearly all aspects of well-being.

There are some common elements to these four attributes that help to explain their relative absence in poor countries. First, they all accumulate through long run processes. The buildings in most developed country cities reflect more than a century of cumulative construction. Converting a kindergartner into a highly skilled engineer takes at least two decades. While technological leaps are possible, technology improvement is mainly a slow evolutionary process conducted via repeated trial and error. Finally, institutions evolve slowly over time. For example, British common law is based on centuries of case experience.

Second, accumulation of these attributes generally requires a forward looking mind set. In order to accumulate any of these, one must typically sacrifice something today in order to

benefit in the future. This can be difficult when current resources are highly constrained and the future very uncertain. Third, accumulation of these attributes relies on public private partnerships. Even strongly market oriented economies, such as the United States, rely on the public sector to supply basic economic infrastructure such as roads and bridges, education, and to fund research and development for new technologies. This highlights the important role of institutions both for current and future production levels.

Finally, note that, unless very well established, all four of these accumulation processes are highly vulnerable to disruption. At the extreme, years of effort can be wiped out in short order. As a prominent example, wars destroy both physical and human capital. More subtle disruptions than the eruption of violence can also have serious impacts. Experience indicates that nascent institutions are particularly vulnerable to disruption. Even a relatively short period of neglect can substantially harm long run efforts at institution building.

In summary, to improve living standards significantly, poor countries must produce more--much more. To produce more, poor countries must initiate and maintain long run cumulative processes to build physical capital and human capital, acquire technology, and nurture institutions that facilitate growth. The role of aid for development, broadly conceived, is to support these long run cumulative processes. The success of the aid enterprise in accomplishing this objective is the focus of this chapter. However, before reviewing the debate about whether aid 'works' from a broad macroeconomic perspective, it is helpful to start with some background about aid. The next section provides a definition of foreign aid, describes how it has changed over time, and indicates recent trends.

3. What is foreign aid?

3.1. Definitions

Foreign aid takes many forms. The most important in terms of its size and influence is official aid. The definition of official development assistance (ODA) is provided by the Development Assistance Committee (DAC) of the Organization for Economic Cooperation and Development (OECD). ODA is calculated as the sum of grants and loans to aid recipients that: (a) are undertaken by the official sector of the donor country; (b) have as the main objective the promotion of economic development and welfare in recipient countries; and (c) are on concessional financial terms (i.e., with a grant element equal to at least 25 per cent of the total). In addition to these financial flows, technical co-operation costs are included in

ODA; but grants, loans and credits for military purposes are excluded. Transfer payments to private individuals, donations from the public, commercial loans and foreign direct investment (FDI) are not counted. Moreover, while it is common to treat ODA and foreign aid as the same thing, this is misleading. Assistance funded by non-governmental organizations (NGOs), which is foreign aid but not ODA, has grown very significantly in the last 25 years and now equals about one-third of official assistance.

The above definition indicates that foreign aid may not always be a free resource transfer and may arrive with economic and political conditions. In many cases, official donors require that recipient countries pursue reforms or policies that the donors feel should promote economic growth or development. With respect to the multilateral development finance institutions, such as the IMF and World Bank, these requirements are often known as stabilization and structural adjustment conditions. However, as discussed below, these conditions have been the source of much controversy. Some scholars have argued that the very policy reforms suggested by these institutions have been counterproductive and caused economic and social decline rather than growth.

One should also recognise that aid is often given for very different purposes – e.g., building infrastructure, expanding access to education, or responding to humanitarian emergencies. It is also the case that aid may be given primarily with an eye to the interests of donors (or firms from donor countries) rather than the recipients. In a review of aid allocation patterns, for example, McGillivray (2003) finds that past colonial links and political alliances are major determinants of foreign aid and that such strategic factors are at least as important as variables which reflect recipient needs (also see Alsina and Dollar, 2000). At the same time, and as the next section demonstrates, official aid flows have not been static. Very different motives have driven aid relationships over time, particularly as global conditions and dominant ideas have changed.

3.2. Foreign aid in historical perspective

In its modern form, foreign aid has its origins in the early 1940s and intensified after the disruption that followed the Second World War. The international economic system had collapsed, and war-ravaged Europe faced a critical shortage of capital and an acute need for physical reconstruction. The response was the European Recovery Program, commonly known as the Marshall Plan. During the peak years the USA transferred some 2-3 per cent of its national income to help restore Europe (approximately 20 – 30 times the level of foreign

assistance that the US provides today as a share of national income). The Marshall Plan, which was administered by the Organization for European Economic Co-operation (OEEC), the predecessor of the OECD, was highly successful.

It is useful to highlight distinctions between post-war Europe and the developing countries that have been the focus of foreign aid for the past four decades. In the aftermath of the Second World War, Europe primarily lacked physical capital. To be sure, the War killed a great many highly skilled people, damaged some institutions, and forced institutional change. Nevertheless, compared with the developing countries, post-war Europe was very well endowed with skilled people and institutional frameworks. Furthermore, before and during the War, European countries operated at the leading edge of technology. Hence, the fundamental missing element was capital, which foreign aid provided. The impressive results achieved by the Marshall Plan fuelled highly optimistic expectations about the future effectiveness of foreign aid.

After the success of the Marshall Plan, the attention of industrialized nations turned to the developing countries, many of which became independent during the 1960s. Economic growth in a state-led planning tradition became a key objective during the 1950s and 1960s, and it was widely believed that poverty and inequality would be quickly eliminated through growth and modernization ('trickle-down'). While the Marshall Plan was built around support to finance general categories of imports and strengthen the balance of payments (i.e., program aid), from the early 1950s project aid became the dominant aid modality. Some donors continued to supply program aid, but aid was increasingly disbursed for the implementation of specific capital investment projects and associated technical assistance.

The multilateralism of aid became more pronounced after the mid 1970s. Multilateral channels were at the time seen as more efficient and less political than bilateral aid, so the UN, World Bank, and other multilateral agencies expanded their activities quite considerably. The 1970s also saw an increased focus on employment, income distribution, and poverty alleviation as essential objectives of development and foreign aid. The effectiveness of trickle-down was widely questioned, and new strategies referred to as 'basic human needs' (BHN) and 'redistribution with growth' (RWG) were formulated and propagated alongside more radical 'dependency' theories of development. Nevertheless, the typical project aid modality remained largely unchanged.

The 'golden era' of the 1960s and 1970s came to an abrupt end at the beginning of the 1980s. The (second) oil shock in 1979 reversed economic conditions, and there was a large increase in interest rates due to economic stabilization policies adopted by developed countries. The international debt crisis erupted, and macroeconomic imbalances were widespread among developing countries. On the political scene Ronald Reagan and Margaret Thatcher came to power in the US and the UK respectively, and at the World Bank Anne Krueger became Vice President and Chief Economist, replacing Hollis Chenery. Economic circumstances in the developing countries and the relations between the North and South changed radically. The crisis hit hard, especially in many African countries. Focus in development strategy and policy shifted to internal domestic policy failure, and achieving macroeconomic balance (externally and internally) became widely perceived as an essential prerequisite for renewed development.

During the 1980s, the goal of reducing the role of the state in the economy turned into a rallying call. Reliance on market forces, an outward orientation, and the role of the private sector, including NGOs, were emphasized by the World Bank and others. In parallel, poverty alleviation slipped out of view in mainstream agendas for economic reform, but remained at the centre of attention in more unorthodox thinking such as the 'adjustment with a human face' approach of UNICEF. At the same time, bilateral donors and international agencies struggled with how to channel resources to the developing world. Quick-disbursing macroeconomic program assistance, such as balance of payments support and sector budget support (which were not tied to investment projects, and which could be justified under the headings of stabilization and adjustment), appeared an ideal solution to the dilemma of maintaining the resource flow and the desire to promote policy reform. Financial program aid and adjustment loans (and eventually debt relief) became fashionable and policy conditionality more widespread. In other words, a rationale, which corresponded well with the orthodox guidelines for good policy (known as the 'Washington Consensus'), had been found for maintaining the aid flow.

By the early 1990s, a number of factors had fomented rising scepticism of the benefits of foreign aid. These included: (a) the persistence of economic crises in much of the developing world; (b) geo-political changes following the end of the Cold War, which weakened patron-client relationships between developing countries and former colonial powers; (c) the perception that policy conditionality was failing to promote genuine policy reform; and (d) a growing fear that aid was generating undesirable dependency relationships. Consequently, the

traditional support given to foreign aid by vocal interest groups in the industrial countries receded. Bilateral and multilateral aid institutions were subjected to criticism, and at times characterized as blunt instruments of commercial interests in the industrial world or as self-interested, inefficient, rent-seeking bureaucracies. Moreover, acute awareness in donor countries of cases of poor governance, corruption, and ‘crony capitalism’ led to scepticism about the credibility of aid recipients.

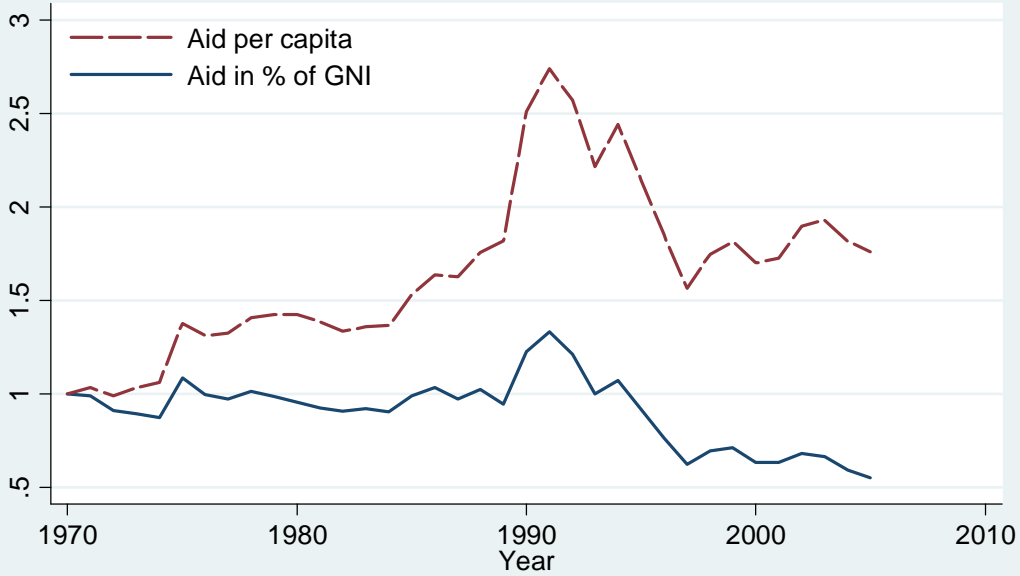
Nevertheless, a resurgence of official development assistance, at least at the level of political rhetoric, occurred. During the late 1990s a consensus emerged among developed country governments that a renewed approach to development assistance, which avoided the mistakes of the past, was warranted. In part this stemmed from a recognition of the growing magnitude of global interdependencies (globalization) which meant that poverty and conflict in one corner of the globe could have implications for all. These views gave birth to the Millennium Development Goals (MDGs), directed explicitly at poverty reduction and addressing basic human needs such as access to education, health and water. The main focus was on the poorest countries and Africa in particular. In this vein, the (then) British Prime Minister Tony Blair launched his Commission for Africa in February 2004, publishing its findings in 2005. Other initiatives, such as the Jubilee Debt Campaign to cancel third world debts, received a high profile. Thus, the plight of the poor has become a part of popular discourse and a cause of celebrities and politicians alike.

3.3. Trends in foreign aid

In accordance with changes in motives and perceptions, aid volumes have fluctuated over time. Figure 1 indicates historical trends in aid flows for the period 1970-2005; Figure 2 compares aid to other financial flows to developing countries for the period 1995-2007. As can be verified, total aid grew steadily in real terms until the early 1990s. After 1992, however, total aid flows started to decline in absolute terms until the turn of the millennium. Since then, there has been a modest upturn in aid flows, but this is not on the scale that corresponds either to estimates of the funds deemed necessary to meet the MDGs or to the promises made by developed country governments (such as those of the G8 at the Gleneagles summit in July 2005).²

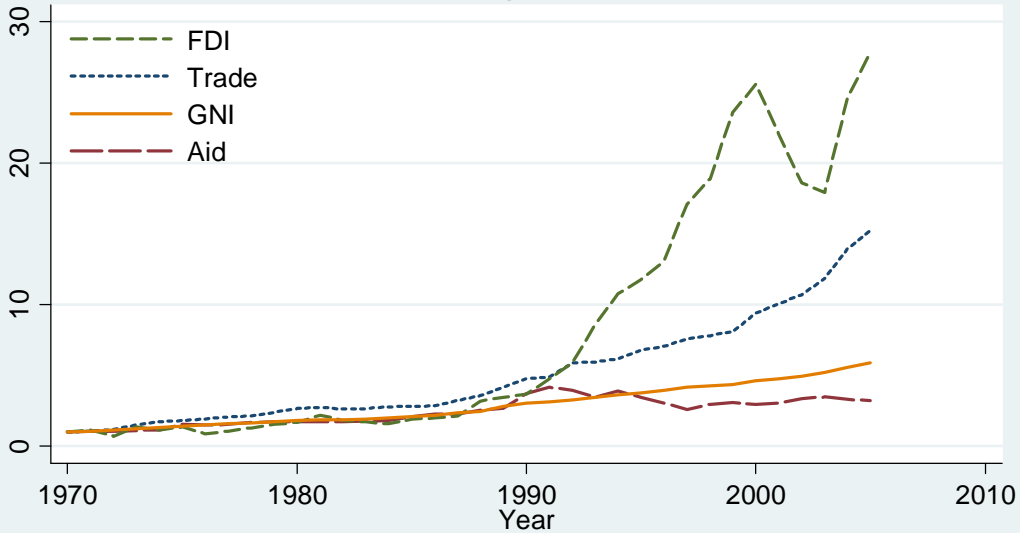
² For further information on the commitments made at the Gleneagles summit see, for example: www.g8.utoronto.ca/summit/2005gleneagles

Figure 1: ODA per capita, and as a percent of GNI in the recipient country



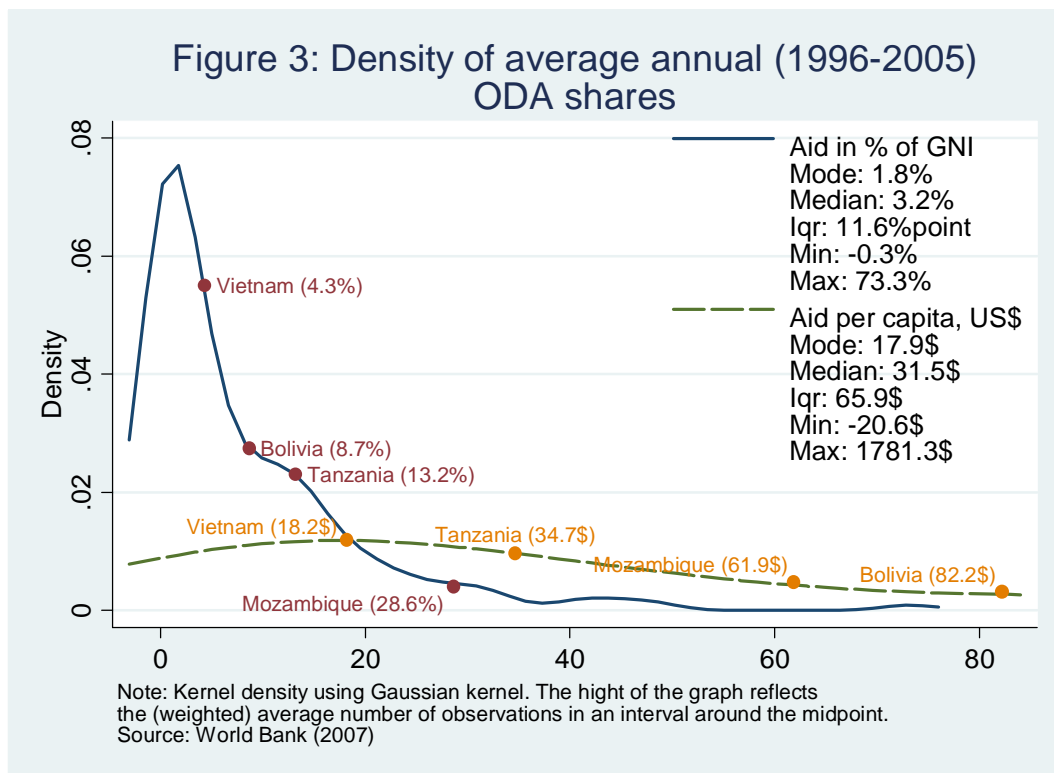
Note: ODA and GNI in constant 2000 US\$, and shares normalized to 1 in 1970
Source: World Bank (2007)

Figure 2: Macroeconomic indicators in aid receiving countries



Note: All variables are expressed as an index equal to one in 1970 and constructed from series of constant 2000 prices in US\$.
FDI is constructed from net FDI inflows and trade is based on the sum of exports and imports.
Source: World Bank (2007)

Two further points merit comment. First, while aid flows have only grown slowly over the past decade, and in many cases have fallen in per capita terms due to consistent population growth, private flows have expanded considerably. Thus, despite the widespread perception that foreign aid amounts to a very significant resource, it is now the case that in many developing countries official assistance is easily dwarfed by other external capital inflows such as foreign direct investment (FDI) and remittances (not shown). This can be seen from Figure 2. However, this phenomenon does not apply equally to all countries. For many of the poorest countries, particularly those in sub-Saharan Africa, foreign aid remains highly significant and is a vital source of funds to support import purchases and government spending.



Secondly, and as a consequence of the foregoing, the allocation of aid (as measured by the aid to GNI ratio) is highly skewed. Based on data for 1996-2005, the largest number of recipient countries received aid to the order of 1.8 per cent of their GNI (the mode) per year and 50% of countries received aid at a rate of 3.2 per cent of GNI or less (the median). This corresponds to a distribution of aid per capita with a mode of US\$17.9 per year and a median of US\$31.5. This distribution of aid flows is illustrated in Figure 3 which also includes a number of country examples. They demonstrate that the relative size of the aid inflow varies

significantly among countries such as Vietnam, Bolivia, Tanzania and Mozambique. With this background, we turn to the issue of analysing the overall impact of past aid on growth.

4. Does aid support economic growth?

This section addresses a key policy question: does foreign aid raise economic growth rates in developing countries? As discussed in Section 2, economic growth is fundamental to achieving nearly all development objectives. Although the above question may be simple, it is not easy to answer. This stems from severe methodological difficulties as well as weaknesses in the available data. To properly measure the effect of aid, ideally the analyst would like to compare the value of a chosen indicator, growth in our case, in two strictly independent situations – with and without aid. To establish the ‘true’ measure of aid impact, the importance of all other circumstances that have affected growth in a given country over time must be properly accounted for. As we do not simultaneously observe the same country ‘with aid’ and ‘without aid’, the fundamental evaluation challenge is to compare what actually happened with an appropriate counterfactual. In observational studies, there is no way of addressing this problem without making assumptions that are bound to be debatable, both in theory and in practice. For this reason, the impact of aid remains highly controversial.

The past decades have witnessed a massive outpouring of studies on the effectiveness of foreign aid. Many development experts, subscribing to different paradigms of development thinking, have grappled with this topic; and methodologies have varied. More specifically: (i) the impact of aid has been evaluated at the micro- and macroeconomic levels; (ii) cross-country comparisons as well as single-country case studies have been used; and (iii) broad surveys of a qualitative and interdisciplinary nature, as well as more ‘hard core’ quantitative work, has been pursued. A brief survey of the main findings of this large literature is attempted in the following sub-sections

4.1. Microeconomic evidence

Whilst the present chapter is chiefly concerned with the impact of aid on aggregate indicators, it is useful to begin with the microeconomic evidence (mainly from specific projects). This evidence paints a reasonably positive picture. The most rigorous evaluations in this area are done by the World Bank, and reports from the Independent Evaluation Group (IEG) of the World Bank are encouraging. Average rates of return to aid are generally above

20 per cent, and decent project rates of return have over the years been reported regularly in one survey after another. Overall, a mass of project based evidence has been collected, and few dispute that aid interventions have worked in helping improve outcomes such as better health, improved access to education and promotion of appropriate agricultural technology (i.e., the green revolution).

The evaluation of development interventions at the microeconomic level has been bolstered by the recent and rapid expansion of randomized program evaluation techniques, including experimental approaches (for an overview see Langbein, 2006). These seek to avoid potential sources of bias from earlier project evaluations, such as selection bias from choosing only completed (successful) projects, and rely on detailed data which is collected both before and after interventions. Moreover, to address the problem of confounding factors, random selection of beneficiaries is also often used in a similar way to clinical trials of new drugs. Evidence from these studies is also largely positive, indicating that aid-financed interventions can generate substantial benefits for individuals. For example, randomized control trials of providing deworming treatments to school-aged children in Kenya have shown that highly cost effective drugs can reduce school absenteeism by 25 percent and increase school participation by at least 0.14 years of schooling per treated child.

Despite the above, two fundamental challenges remain. First, it is problematic and often inappropriate to generalise the results from a specific evaluation to other contexts. In many cases, it is unclear *how* a particular effect was generated or what factors may constrain a putative causal mechanism from operating in other situations (for further discussion see Deaton, 2009). Second, neither the results nor the techniques of (randomised) microeconomic evaluation can be directly translated to the aggregate level. The deworming treatments mentioned in the preceding paragraph are a good example. Microeconomic evaluations establish that the deworming programs studied increased the quality (through reduced absenteeism) and quantity (through increased years of schooling) of education. However, many years of continuous and broad scale effort are required to significantly augment the average education level of the working age population. Hence, the growth benefits of the intervention are contingent upon continued success of scaled up programs and even then will only materialize through time.

Rather than attempt to aggregate the impact of numerous microeconomic interventions, the preferred approach to evaluating the macroeconomic impact of aid examines total aid flows

and the economic growth rate. Normally, this is done across countries with the expectation that, other things being equal, countries that receive more assistance would grow more rapidly. Unfortunately, the *prima facie* evidence suggests that countries that have received the most aid have also performed relatively badly in terms of economic growth. This suggests a contradiction between positive microeconomic evidence and the disappointing aggregate performance of countries that have received substantial aid inflows.

4.2. Three generations of macroeconomic studies

A large number of studies have attempted to shed light on this apparent paradox. Previous studies can be classified into three generations, each influenced by dominant theoretical paradigms as well as available empirical tools. The first two generations were inspired by relatively simple models of the growth process such as the Harrod-Domar model and the two-gap Chenery-Strout extension (for exposition see Hansen and Tarp, 2000). The underlying idea behind the Harrod-Domar model is of a stable linear relationship between growth and investment in physical capital. Assuming all aid is invested, it is straightforward to calculate how much aid is required to achieve a target growth rate. The impact of aid is assumed to be positive and helps plug either a savings or a foreign exchange gap. Empirical studies in this tradition consequently focussed on the extent to which aid increases savings and investment in recipient countries. As the detailed survey in Hansen and Tarp (2000) testifies, first generation studies generally concluded that aid does tend to increase total savings, but not by as much as the aid flow. Quite reasonably, this simply suggests a non-negligible proportion of aid is consumed rather than invested.

Retaining the focus on capital accumulation, the second generation of literature moved on to explore the impact of aid on growth via investment. Using data for a cross section of countries, a large number of studies of this kind were produced during the 1980s and early 1990s. Hansen and Tarp (2000) conclude that the findings from these studies consistently indicate a positive link between aid and investment. The more striking result, however, is that many studies do not establish a clear positive relationship between savings and growth across countries over time. This puzzle raises the doubts as to whether the underlying growth model and the techniques used for empirical analysis in these studies are appropriate. Indeed, it is a tall order to expect both a linear relationship between output and capital and that all aid is invested. A second line of critique of the Harrod-Domar and two-gap approach has been the argument that growth is less related to physical capital investment (including aid) than often

assumed (Easterly, 1999, 2001, 2003). If the productive impact of aid depends more on incentives and relative prices, as well as the policy environment more generally, then it becomes important to consider the potentially distortionary effects of aid on incentives and economic policies.

Perhaps more critically, the second generation of studies introduced the problem that poorly performing countries may receive more aid precisely *because* of their poor growth performance. There is no necessary logical inconsistency between low growth and high aid inflows. When countries have done well for a while, average incomes will have increased and donors tend to transfer less aid (at least relative to GNI) and may eventually withdraw. At the same time, donor nations have specifically sought to direct aid towards the poorest countries. This implies that, over time, there is a marked tendency for the best performing countries to receive less aid relative to GNI and for the worst performers to receive more. Empirical analyses that do not account for the two-way relationship between aid and growth (that is, the endogeneity of aid) will not reveal aid's 'true' impact. Most second generation studies, however, did not deal with this issue, which may partly explain some of their puzzling results.

From the early 1990s a third generation of more sophisticated econometric studies came to dominate the academic and public discourse about aid. This was motivated by the availability of much better data, allowing analysts to look at changes both across and within countries over time (i.e., panel data became available). Insights from new theories of economic growth, as well as a rapidly increasing numbers of general empirical growth studies, also influenced the research literature. Mindful of the weaknesses of previous studies, the aid-growth relationship came to be perceived as (possibly) non-linear and the endogeneity of aid was taken more seriously. Among the numerous studies of this generation, a leading paper that also came to exert a significant influence on aid policy is the study out of the World Bank by Burnside and Dollar (1997, 2000). The authors argued that although aid has no impact on growth on average, it can work as long as recipients pursue 'good' policies. In their own words: "... aid has a positive impact on growth in developing countries with good fiscal, monetary and trade policies ... [but] ... in the presence of poor policies, aid has no positive effect on growth" (2000: 847).

These results, however, were subject to substantial criticism and were shown to be highly fragile. For example, Hansen and Tarp (2001) found that a story of diminishing returns to aid,

captured by a squared aid term, best captures the non-linear relationship between aid and growth and is the empirical specification with most support in the data. They concluded that aid has a positive impact on growth but with diminishing returns. Alternatively, Dalgaard et al. (2004), found that variation across countries in the returns to aid seems to be related to their geographical location. Specifically, aid was found to be far less effective in tropical areas over the last 30 years. They also stress, however, that it is hard to believe that aid should be inherently less potent in the tropics. Thus, the real explanation for the aid-tropics link is likely to be elsewhere and the authors call for further research to help disentangle the channels through which aid matters for productivity and efficiency. In an empirical review of many of these contributions, Roodman argues that the results of this generation are extremely sensitive to methodological choices. He goes on to conclude that while some aid is likely to increase investment and growth, aid “is probably not a fundamentally decisive factor for development” (2007: 275). Moreover, due to the multiple kinds of aid, and differences in the efficiency with which it may be put to use, the noise in the data may mask any valuable information regarding the ‘true’ impact of aid.

4.3. Recent contributions

Despite the methodological difficulties, a series of recent studies have taken a decidedly pessimistic stance. In particular, in their widely cited paper, Rajan and Subramanian (2008) conclude that aid has had no systematic effect on growth and assert that this conclusion holds across methodologies, time periods and forms of aid. Thus, and as advocated by the authors (2008: 660), an appropriate research agenda may be to unpack the different effects of aid on growth by focussing on intermediate outcomes which are proximate determinants of income growth.

A number of scholars have interpreted this agenda as being one of explaining why resource transfers in the form of aid, at least some of which are invested, don’t lead to an overall increase in the growth rate. A leading explanation for a negative effect of aid that offsets the benefits of resource transfers is that aid undermines or weakens governance by increasing the returns to corruption and/or increasing rent seeking activities. Djankov *et al.* (2008), for example, argue that aid has a statistically significant negative effect on changes in political institutions (specifically, democracy). Aid is likened to natural resource windfalls, which in principle could be used to boost growth, but in practice have often resulted in poor governance and a poor growth record over time. According to Djankov *et al.* (2008), the

negative effect of aid on political institutions is larger in magnitude than that caused by natural resource windfalls. Similarly, in an earlier study, Rajan and Subramanian (2007) find that manufacturing sector growth in developing countries is undermined by a detrimental effect of aid inflows on governance.

Other scholars argue that, given that the association between income growth and investment in both human capital (skills, education, health) and physical capital appears to be fragile within countries over time (Kenny, 2005), it is unsurprising that a robust relationship between aid and growth has been elusive. This accords with the view that growth is an extremely complex, idiosyncratic and open phenomenon that cannot easily be captured by simple empirical models (see Temple, 2000). Indeed, in the wider development economics literature, there has been a shift away from grand theories of how developing countries grow, towards a more nuanced emphasis on binding constraints (Rodrik, 2007) and varieties of coordination challenges. All-purpose explanations of growth that apply equally across countries over time are viewed with scepticism. Collier (2007), for instance, identifies numerous growth traps to which low income countries may be subject and each of which demands a different policy response. Accordingly, he argues that foreign aid is only likely to directly boost growth in a relatively small number of cases. In the remaining cases, it will often only sustain countries on a form of minimal life support.

In light of this increasing humility concerning what we know about how growth is initiated and then sustained, a set of recent papers focuses on the effects of aid on non-growth outcomes such as infant mortality, health, and education. Mishra and Newhouse (2007), for example, find a small but statistically significant effect of health aid on reductions in infant mortality. Masud and Yontcheva (2005) also find that some types of aid help reduce infant mortality. Easterly (2009) documents substantial improvements across a range of social indicators in sub-Saharan Africa since 1960 despite disappointing growth performances.

Recent theoretical exercises give further weight to the need for modest expectations regarding the magnitude of the possible impact of foreign aid on growth. To their credit, Rajan and Subramanian (2008) contributed to this literature. Based on a standard neoclassical production function framework, and assuming that aid only increases physical capital investment, they estimate that the overall increase in the growth rate accruing from aid inflows of 10% of GDP may only lie in the range of 1% to 2.5% depending on the share of aid that is invested and productivity impacts. Thus, at the levels of aid seen by most countries

(under 5% of GDP, see Section 3), these effects may be very difficult to distinguish from business cycle fluctuations and external shocks, especially when endogeneity of aid and the quality of data on GDP and aid flows are considered. In fact, while Rajan and Subramanian emphasize that their estimates rarely have an effect on growth that is statistically different from zero, they are also unable to conclude statistically that the impact of aid on growth falls outside of the range that they suggested. This is particularly true when longer time frames are considered. In these cases, the estimated parameters are much closer to the suggested ranges than they are to zero.

Furthermore, the range proposed by Rajan and Subramanian may be overoptimistic. Using a more sophisticated theoretical approach, Dalgaard and Erickson (2009) find that expectations with respect to the impact of aid on growth should be even more modest. They consider aid inflows to sub-Saharan Africa over the past 30 years, which averaged around 5% of recipient GDP, and calculate an expected annual increase in the growth rate from past aid flows of around 0.1%. This assumes that all aid is invested and there are no productivity impacts. An effect of this magnitude would be impossible to isolate from other factors affecting growth with existing data and methods. In our view, it is reasonable to expect aid to contribute positively to productivity growth; hence, one might reasonably expect a larger aid impact even though few believe that all aid is invested. Whatever the lower limit of the expected reasonable range, a fundamental point is that, once one uses more realistic theoretical models compared to those used in the first and second generation literatures (see Easterly, 1999), the expected potency of aid in stimulating growth declines significantly. Given the ranges predicted by modern growth models, there may be no aid effectiveness puzzle after all.

Finally, research attention also has been given to long-run determinants of growth that have a cumulative but often not immediate impact on the rate of income growth. Changes in human capital, such as education and health, move only slowly at the aggregate level and exert a positive influence on economic growth with a substantial lag. This comes from simple demographics whereby improvements in schooling indicators, for example at the primary level, can take many years to translate into noticeable increases in average education levels among working age adults. Ashraf et al. (2008) demonstrate that the immediate economic impact of gains in life expectancy from disease eradication may be a *reduction* in per capita incomes due to increased child survival and the consequent increase in the ratio of the non-working age to the working age population. In short, as a result of these interventions,

incremental growth in population can easily exceed the incremental growth in income for two, three or even more decades following interventions.

The impressive performance of many developing countries, including countries in sub-Saharan Africa, in improving social indicators such as expanding access to education, reducing infant mortality, and expanding access to health services over the past three decades may only now be translating into gains in per capita income. This reinforces the need for modest expectations regarding the effect of aid on observed income growth. Where aid has been used primarily to boost social spending, as advocated under the MDGs, it may be inappropriate to investigate the aid-growth relationship under anything other than a time horizon of 30-40 years.

In response to these concerns, there have been calls for more detailed country case studies, which permit a more nuanced assessment. Arndt et al. (2007) provide a case study of Mozambique in which they attempt to evaluate the effects of aid across different proximate drivers of growth. Starting with long-run growth accounting estimates, they find that aid has played a crucial role in rebuilding infrastructure and expanding access to health and education. Aid has supported rapid reconstruction and seems to have crowded-in private and foreign investment, but has also brought substantial governance and economic management challenges. This provides supporting evidence for Collier's (2007) argument that aid can be particularly beneficial in post-war environments but also brings new challenges.

5. Some stylized lessons

Despite what may be seen as the rather paltry fruits of hundreds of academic studies, a number of lessons have been learnt. In our view these can be summarised as follows:

- a. We now have a better understanding of the difficulties involved in investigating whether aid stimulates growth on aggregate. In particular, we have a solid grasp of why it may be difficult to find *any* robust answers in the data and why empirical results are often biased towards zero (even if there is a positive true long-run relationship). The principal factors behind this are noisy and weak data; the high complexity and openness of the growth process; the endogeneity of aid; and the demographic implications of gains in social indicators that may be driven by aid. Furthermore, convincing methods that enable the analyst to deal with all of these factors simultaneously, and thereby tease-out the 'true' impact of growth, remain lacking.

- b. Putting these methodological difficulties aside, it is essential that one maintains appropriately modest expectations about the magnitude of aggregate returns to aid. As discussed in Section 4, theoretical exercises built on realistic assumptions tend to indicate only small growth gains from the average volumes of aid that have been donated in the past (and which are likely to continue). Such expectations are significantly smaller than those generated from the early generations of research on aid and growth. However, this message is not widely disseminated and needs to be absorbed by the wider policy community and general public.
- c. It is important to recognise the multiple channels through which aid may have an impact on growth, as well as corresponding differences in the horizon over which aggregate effects may become apparent. Improvements in health, education and institutions can take a very long time (up to a generation) to cumulate into potential growth effects. This indicates that non-growth aggregate outcomes associated with aid, such as changes in education or health, can be usefully studied in their own right. At the same time, this also means that countries with very different initial conditions and/or aid profiles may see very different responses to aid over time. Few studies, if any, have rigorously and explicitly taken this issue into account.
- d. Finally, an obvious but often forgotten point is that history matters. Aid has not been provided on a random basis, nor has there been any kind of stability in donor aid allocation strategies or views about what constitutes the 'right' set of policies to induce growth. Consequently, one must exercise substantial caution in using past trends to inform about future possibilities. There is no doubt that during the Cold War, aid was often used as a geo-political tool of advanced countries. Today, the emphasis is on poverty, social welfare and conflict (or terrorism) prevention. Of course these shifts in donor behaviour and global conditions further frustrate the methodological challenge, but they cannot be ignored.

So, where does this leave us? Perhaps the key message is that we do not have a definitive answer about whether aid buys growth on aggregate, nor do we expect a definitive answer to emerge any time soon. While the tone of the very recent literature is pessimistic, this literature comes nowhere near to confining the estimated causal impact of aid on growth to be less than the range reasonable expectations would suggest. Moreover, the pendulum in the

literature tends to swing slowly with more critical assessments tending to follow more positive assessments and so forth. At the same time, methodological improvements are being realized by works on both sides of the debate. It is possible, even likely, that next year's "recent literature" will introduce new methodological improvements and arrive at a more positive tone.

Overall, looking broadly across the full range of existing literature from microeconomic evidence to the cross country macroeconomic analyses relating aid to growth, we believe that the balance of evidence indicates positive effects, particularly when longer time frames are considered. In this, we agree with Collier's assessment that over the past 30 years aid has probably increased the annual growth rate of the poorest countries by around one percentage point and that: "Without aid, cumulatively the countries of the bottom billion would have become much poorer than they are today" (2007: 100). These conclusions do not deny that aid can be inefficient or that negative side-effects may arise from specific projects or relationships. Nor do they imply that we should stop learning about how aid works or how to do aid better. Here, on the contrary, much work remains to be done.

6. Conclusion

One might be tempted to interpret this chapter as saying there is no hope of finding *any* aggregate effect of aid on growth and that a focus on this question is futile. We do not agree. Growth is a key long-run objective of aid and demands to be evaluated as such. While some focused study on specific aspects or impacts of aid is useful, it is important not to lose sight of the issue of the overall effectiveness of aid. Policy-makers and the wider public will continue to seek answers to this question, and abandoning serious research in this domain only leaves it open to speculative and potentially unhelpful contributions.

However, given the challenges involved in undertaking evaluations at the aggregate level, a valid strategy for researchers and policy-makers alike is to use evidence from a wide range of approaches, both micro and macro, as well as from different disciplines. This should include research into different types of aid and non-growth objectives. No single methodology has claims to absolute truth. Thus openness to evidence from varied sources, whilst being keenly aware of the weaknesses of each, is appropriate.

In our view, future research into the aggregate aid-growth relationship can be fruitful. Among the research possibilities, we would encourage: (i) applying lessons and techniques from the

microeconometrics of (causal) evaluation to the aggregate setting; (ii) further exploring methods for undertaking long horizon cross-section analysis using both actual and simulated data; and (iii) analysing detailed time series analysis for individual countries over time.

With respect to policy-makers, there is nothing in what we have reviewed to suggest that there is a robust, harmful effect of aid on growth across countries over time. Moreover, given the fragility of what we know about both aid and growth, it may be dangerous to allocate aid solely on results from individual studies or theories. Rather, it is better to draw upon the accumulated knowledge drawn from a variety of studies spanning various perspectives, as has been attempted here. A key message from this chapter is that positive but modest (aggregate) expectations about what aid can achieve are in order. This should inform both aid allocations and communications with stakeholders.

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