

Ending Global Poverty: Why Money Isn't Enough

Lucy Page and Rohini Pande

The share of the world's population living below the global extreme poverty line (\$1.90 in consumption per day) has plunged dramatically in recent decades, from 42 percent in 1981 to 11 percent in 2013 (PovcalNet 2018). This remarkable decline has buoyed hopes of continued reductions and created expectations about where future reductions will take place. In 2015, the international community enshrined the aim of ending extreme poverty by 2030 in the Sustainable Development Goals. The current literature talks of passing the “baton” of poverty reduction from China to India, and then to nations of Africa (Chandy, Ledlie, and Penciakova 2013; Commission on State Fragility, Growth, and Development 2018).

Historically, the quest to reduce poverty has relied on two levers: economic growth (the idea that “a rising tide lifts all boats”) and the intentional redistribution of resources to the poor, either by the domestic state or foreign aid. In this essay, we argue that growth and aid, at least as currently constituted, are unlikely to suffice to end extreme poverty by 2030. To end extreme poverty sustainably and as quickly as possible, the states governing the world's poor need to be strengthened such that they are both accountable to the needs of the poor and have the capacity to meet those needs. The international development community should recalibrate the allocation of resources to increase accountability and state capacity.

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Underlying our argument is the changing global geography of need. Table 1 describes a dramatic shift in the concentrations of extreme poverty over the last 30 years. Panels A and B of Table 1 list the 20 countries that were home to the highest shares of the world's poor in 1987 and 2013, respectively. In 1987, 90 percent of the world's poor lived in low-income countries, while only 6.5 percent lived in middle-income countries. Only five of the 20 countries with the most people in poverty were middle-income. By 2013, over 60 percent of the world's poor lived in middle-income countries, and nine of the 20 countries with the highest concentrations of extreme poverty were middle-income. The eight middle-income countries that each have 1 percent or more of the world's poor are India, Nigeria, China, Indonesia, Pakistan, the Philippines, South Africa, and Zambia. In 2013, just under half of the world's extreme poor (49.3 percent) lived in these eight countries, which we refer to as the high-poverty middle-income countries.¹

As the countries where the poor live have grown richer, the world's poorest people are increasingly split between two country groupings: low-income, fragile states like Afghanistan, Liberia, and the Democratic Republic of Congo (DRC); and the set of fast-growing but increasingly unequal high-poverty middle-income countries. Countries in these two groupings have often seen diverging growth trajectories over the last three decades. In 1987, China and the DRC had similar GDP. That year, China was home to more than one-third of the world's extreme poor, and DRC was home to 1.1 percent. By 2013, China had become a middle-income country and its share of the world's extreme poor had fallen tenfold, to just over 3 percent. Meanwhile, the share of the world's poor in DRC increased roughly sixfold. Low-income fragile countries are often trapped in cycles of erratic growth and misdirected aid, while high-poverty middle-income countries typify a global trend of falling cross-country inequality accompanied by greater within-country inequality (Hammar and Waldenström 2017). While a poor person in Liberia might live in a village where nearly everyone else is destitute, a growing share of the poor live in places like Dharavi in Mumbai—Asia's largest slum—in view of a high-rise reported to be the most expensive private residence in the world (Crabtree 2018).

What does this changing geography suggest about how to reduce poverty? In low-income countries, steady economic growth likely remains the most important tool for improving the lives of the poor. Yet instigating and sustaining such growth has often proven hard. Instead, the pattern seems to be one of erratic economic

¹We use data on extreme poverty from PovcalNet (2018). Ferreira et al. (2016) provides a useful summary of PovcalNet's methods for estimating extreme poverty and of the \$1.90 per day poverty line. To be consistent with the 2013 poverty data, we classify countries as low-, middle-, or high-income using the World Bank's country income classifications from FY2015, which are based on data from calendar year 2013. We do not classify any low-income countries that transitioned to middle-income status since FY2015, like Bangladesh and Kenya, as high-poverty middle-income countries. We continue to use FY2015 income classifications throughout the text and figures. The World Bank's PovcalNet released revised data on global poverty through 2015 in September 2018. These estimates suggest that the increasing concentration of the poor in relatively wealthy countries held true through 2015, when the World Bank estimates that 62.1 percent of the world's extreme poor lived in middle-income countries (using FY2017 income classifications).

Table 1
Global Geographies of Extreme Poverty, 1987 and 2013

	<i>Millions in extreme poverty</i>	<i>Poverty headcount (%)</i>	<i>Share of world's poor (%)</i>	<i>Ranking in # of world's poor</i>		<i>Millions in extreme poverty</i>	<i>Poverty headcount (%)</i>	<i>Share of world's poor (%)</i>	<i>Ranking in # of world's poor</i>
A: 1987									
Low-income countries:					Middle-income countries:				
Total	1,587	57.3	90.3		Total	115.2	11.9	6.5	
China	659.5	60.8	37.5	1	Brazil	25.1	17.8	1.4	9
India	391.1	47.9	22.2	2	Philippines	15.4	26.9	0.9	12
Indonesia	122.5	71.4	7.0	3	South Africa	8.9	25.8	0.5	17
Pakistan	61.1	62.2	3.5	4	Thailand	8.3	15.4	0.5	19
Nigeria	56.8	64.5	3.2	5	Mexico	7.8	9.7	0.4	20
Vietnam	42.3	68.5	2.4	6					
Myanmar	36.5	94.4	2.1	7					
Bangladesh	33.4	33.9	1.9	8					
Ethiopia	24.6	56.6	1.4	10					
Dem. Rep. of the Congo	19.6	62.3	1.1	11					
Tanzania	15.0	64.7	0.9	13					
Nepal	12.7	72.6	0.7	14					
Mozambique	11.7	89.5	0.7	15					
Uganda	10.7	68.2	0.6	16					
Sudan	8.4	45.7	0.5	18					
B: 2013									
Low-income countries:					Middle-income countries:				
Total	284.3	36.9	36.3		Total	478.1	9.6	61.1	
Dem. Rep. of the Congo	54.1	75.9	6.9	3	India	210.4	16.5	26.9	1
Ethiopia	27.8	29.3	3.6	4	Nigeria	85.2	49.6	10.9	2
Bangladesh	26.5	16.8	3.4	5	China	25.2	1.9	3.2	6
Tanzania	23.3	45.9	3.0	8	Indonesia	23.6	9.4	3.0	7
Madagascar	17.9	77.8	2.3	9	Pakistan	12.7	7.0	1.6	13
Mozambique	16.9	63.9	2.2	10	Philippines	10.7	10.8	1.4	15
Kenya	15.1	33.7	1.9	11	South Africa	9.3	17.5	1.2	16
Uganda	13.5	35.8	1.7	12	Zambia	8.9	58.8	1.1	17
Malawi	11.7	70.4	1.5	14	South Sudan	7.8	69.5	0.9	20
Mali	8.6	52.0	1.1	18					
Niger	8.5	46.3	1.1	19					

Note: Panels A and B include the twenty countries with the highest share of the world's extreme poor in 1987 and 2013, respectively. Note that Panel B includes the full list of eight high-poverty middle-income countries in 2013, which we define as middle-income countries with at least one percent of the world's poor in 2013: India, Nigeria, China, Indonesia, Pakistan, Philippines, South Africa, and Zambia. We classify countries as low- or middle-income in 1987 and 2013 based on the World Bank's list of economies for FY1989 and FY2015, respectively; classifications for these years use income data from calendar years 1987 and 2013. We use data on extreme poverty from PovcalNet (2018).

growth episodes in which the periods of prosperity reached few (Acemoglu and Robinson 2012) or evaporated or reversed in periods of conflict (Jones and Olken 2008). In the absence of sustained growth, direct provision of cash and services to the poor is a critical, immediate way to alleviate poverty in low-income countries. Foreign aid will likely play a key role in providing these services.

In the second cluster of countries, growth has lifted millions out of poverty, but has also left millions behind amid increasing inequality (Alvaredo, Chancel, Piketty, Saez, and Zucman 2018). Continued growth may ultimately lift up those remaining millions, but it may do so much more slowly than is necessary. Ending poverty by 2030 in this second group of countries will require not just growth of the economy, but redistribution of new domestic resources to the poorest. Such redistribution must come in the form of services and institutions that the poor need for economic mobility. Because these countries receive relatively little foreign aid, domestic states will bear most of the responsibility for providing these services to the poor.

Perhaps because we typically identify the poor as those living below a certain income or consumption level, providing the poor with resources to exit poverty is often characterized in terms of cash transfers: that is, give the poor money and they will stop being poor. But poverty is more than just a lack of money, and escaping it requires more than cash. A variety of studies have shown that extreme poverty can be reduced by providing poor households with health, education, and access to a secure financial system and credit services, and by creating and enforcing regulation to ensure they are not exploited by shopkeepers, landowners, and employers.

The effective use of resources targeting extreme poverty, therefore, requires a complementary focus on investments in what we term “invisible infrastructure.” We conceive of invisible infrastructure as the social and human systems that enable citizens to realize their capabilities and escape poverty. This comprises traditional elements of social infrastructure like health care and education but also, importantly, the incentive and information structures that bring the actions of those who control resources in line with the needs of the poor.

In advocating for investment in invisible infrastructure, we emphasize that the domestic state is the inevitable regulator, if not always the provider, of these services and institutions for the poor. First, the state is the only body with the mandate to provide certain critical institutions, like property rights and a monopoly of violence. Second, even where for-profit businesses and nongovernmental organizations are best-placed to provide specific services, such as micro-credit, the state alone can regulate the provision of these services to the poor. Third, the state has a role to play in spotting gaps in service provision and intervening in the absence of viable private sector providers. The final reason is pragmatic: the size of the state in each high-poverty middle-income country dwarfs foreign aid. While aid may play a role in providing invisible infrastructure and relieving immediate suffering in low-income countries, these countries too will graduate out of foreign aid as they grow richer; as they do, the state will increasingly bear responsibility for providing the invisible infrastructure and will likely still house large poor populations.

Therefore, enabling the provision of invisible infrastructure requires building capable and accountable domestic states. How can the international development community best deploy its resources to help?

A key part of the task at hand is to ensure that aid policies strengthen domestic institutions rather than undermine them. Especially in low-income countries, aid agencies often bypass messy, corrupt states and instead channel funds through a cadre of nongovernment organizations, contractors, and other nonstate actors. There are reasons for this. Doing so may be necessary on occasion, as, for instance, when delivering humanitarian aid after a natural disaster. Also, donor-country politicians may find it hard to justify working with governments seen as corrupt or compromised. But in the long term, aid transfers that bypass the state may fail to improve—and in some cases may even harm—the state's capacity to provide invisible infrastructure to its citizens. Even in the short term, cutting out the domestic state inhibits the use of two vital tools: local information about what works in context, and mechanisms for taking citizen preferences into account. The loss of these tools can damage long-term prospects for poverty reduction, because people who feel they have no voice in development may be less willing to support it by paying taxes.

We argue, therefore, that a sustainable end to global poverty will require that the international development community and civil society organizations invest resources in interventions that can help build capable, democratic state institutions. Some guidance on successful interventions comes from recent empirical contributions in the political economy of development literature, which support an agency perspective on government functioning: governments comprise individuals interacting along a *human chain* of command. Governance failures like corruption and leakage of funds reflect failures to resolve misaligned incentives and informational asymmetries along this human chain (for an overview, see Finan, Olken, and Pande 2017). Designing such reforms requires insights from the fields of political economy and mechanism design, as well as a theory of government that allows the disempowered to act as principal. Ultimately, it is democracy, done right, that best allows citizens to demand what they need to end poverty.

Can We Rely on Growth to End Poverty?

Economic growth has significantly lowered global poverty (Kraay 2006; Dollar, Kleineberg, and Kraay 2016). China alone was home to three-quarters of the 1.12 billion people lifted out of extreme poverty worldwide between 1981 and 2013, when it grew at an average rate of 10 percent per year. India grew at an average annual rate of 6.2 percent over the same period, and it had about 190 million fewer people in extreme poverty in 2013 than in 1981; Indonesia, which saw average growth of 5 percent, had 92 million fewer.²

²Authors' calculations using poverty data from PovcalNet (2018) and data on GDP growth from World Development Indicators (2018b).

One would hope for growth to produce similar gains in today's low-income countries, lifting their citizens up the income ladder. Yet freeing low-income countries from cycles of conflict, natural disasters, and recession has proved challenging, and it is not clear when and how sustained economic growth will arrive as a driver of substantial declines in absolute poverty (Jones and Olken 2008).

In today's high-poverty middle-income countries, economic growth will certainly continue to reduce extreme poverty. But poverty can have a long half-life in the presence of inequality. In India, which in 2013 contained the largest share of the world's extreme poor, over 100 billionaires lived alongside 210.4 million people in extreme poverty in 2013. This imbalance arises from unequal growth: India's top 10 percent of incomes captured 66 percent of growth between 1980 and 2016, while the bottom 50 percent captured only 11 percent (Alvaredo et al. 2018). Furthermore, growth often discriminates: in India, disadvantaged social groups (Hindu lower castes and Muslims) came to represent 55 percent of the poor in 2011—up from 44 percent in 1983.³ Assouad, Chancel, and Morgan (2018) provide congruent evidence for high-poverty middle-income Brazil and South Africa.

At minimum, these trends in inequality suggest that growth does not reduce poverty as quickly as the equitable distribution of resources might permit. A stronger conjecture is that as the poor are increasingly drawn from socially disadvantaged groups, discrimination and inequality-fueled conflict will weaken growth's ability to raise the incomes of the poor (for instance, Mitra and Ray 2014). In either case, we argue that ending extreme poverty as quickly as possible in both low-income and high-poverty middle-income countries will require coupling growth with mechanisms to directly redistribute resources to the poor in the forms that they need.

Can Physical Infrastructure or Cash Suffice to End Poverty?

Consider people living in a remote rural village separated from the nearest city by a river, a forest, and steep mountains (Castañeda et al. 2018). What would it take for them to gain enough income to exit poverty? A traditional model of economic development that focuses on raising earnings might call for investments in physical infrastructure—perhaps the construction of a road to allow them to sell goods or make their way to the city for work.

How would this road get built? A bridge across the river isn't enough, nor is a tunnel under the mountain, nor is a way through the forest. Rather, all of these things need to be constructed and linked into a viable path from the village to the city. Private companies might build some of these elements—but the road as a whole is expensive and difficult enough that the state will need to coordinate and, likely, subsidize parts of construction.

Rural roads, by themselves, may not bring jobs to the village (Asher and Novosad 2018). But for many male villagers, the road might still enable an escape from poverty. They can get on the bus, go to the town, and find manual work there,

³Authors' calculations using rounds 61 and 68 of India's National Sample Survey (NSS 2016).

perhaps enabled by a free bus ticket (Bryan, Chowdhury, and Mobarak 2015). But neither the road nor a free bus ticket may suffice for a poor female villager, since social norms and safety concerns may prevent her from getting on the bus in the first place. Perhaps she can make some money selling vegetables at the bus stand, but beyond that, the road will do very little for her directly.

A more modern model of development might advocate sending the woman cash. Indeed, modern digital technology has made it possible to transfer the equivalent of a \$1.90 a day directly to a poor woman living in a remote rural area, bypassing corrupt and ineffective intermediaries. For now, assume that this cash could be funded either by domestic redistribution from the wealthy or through foreign aid, though we will document later that the poor's access to these funding pots varies substantially with country income status.

Many cash transfer programs have been shown to make life significantly better for the poor. For example, GiveDirectly is a transfer program that allows individuals in rich countries to send money directly—typically in the range of several hundred dollars—to poor Africans. Haushofer and Shapiro (2016) find that these grants significantly increased household consumption nine months after they were granted, and a longer-run study suggests that the gains in assets persist three years later (Haushofer and Shapiro 2018).⁴ But if the woman's child becomes ill or her house is flooded, she may be knocked back down into poverty. Cash transfers can help her to pay her children's school tuition, but what if the higher-quality academy run by a nongovernment organization is full or too far away? Furthermore, if we expand our perspective beyond the one woman to all of the world's extreme poor, then cash transfers likely become too expensive to be a sustainable answer for single-handedly ending global poverty.⁵ (Relatedly, Hanna and Olken in this symposium discuss the tax implications of implementing a universal basic income program versus a cheaper targeted transfer program.)

Thus, a woman's road out of poverty is different from a man's, but similarly includes many components. She needs a way to save money and smooth consumption, receive remittances, hide money from friends and family when she needs to, and provide them with informal insurance when she can. Even if she is provided a bank account, if she isn't trained in its use she may well cash out any transfers, keep the account at zero balance, and leave the benefits of that account unrealized (Field, Pande, Rigol, Schaner, and Moore 2016). She needs to have quality education for her children so they can earn more than she does, escape poverty themselves, and

⁴Blattman, Fiala, and Martinez (2014, 2018) find similar mid-term evidence from Uganda's Youth Opportunity Program, but that in the longer run (nine years) the control and treatment groups converge in employment, earnings, and consumption.

⁵Asset transfer programs, or "ultra-poor graduation" programs, get closer to filling the broad set of needs necessary for a permanent escape from poverty, and have been shown to have very significant positive impacts on household income (BRAC 2013; Banerjee, Duflo, Chattopadhyay, and Shapiro 2016; Bandiera et al. 2017). However, a back-of-the-envelope calculation based on Banerjee et al. (2016) suggests that scaling up graduation programs to reach the 783 million people in extreme poverty worldwide would cost between \$288 billion and \$864 billion in US purchasing-power-parity 2014 dollars.

care for her in old age (Montenegro and Patrinos 2014). She needs access to health care in emergencies and the ability to invest early in her children's nutrition (Currie and Vogl 2013). Furthermore, she needs protection—from relatives who might cheat her from her land, from industrial pollution that might destroy her health and her ability to work, from warlords who would forcibly recruit her children. She needs the freedom to use all of these facilities strategically and at her own volition. She needs far more than either a road or \$1.90 a day.

The Need for Invisible Infrastructure

Coordination and provision of these services will require investments in physical infrastructure like roads, schools, healthcare centers, and cellphone towers. It will also require a set of institutions. North (1990) famously characterized institutions as “humanly devised constraints that structure political, economic and social interactions,” setting the *rules of the game* for an economy. He argued that well-functioning institutions enable prosperity by ensuring secure property rights, facilitating complex contractual arrangements, aligning norms to allow markets to function effectively, and so on.

But physical infrastructure and the rules of the game, as implemented, often fail to create the incentives for state and nonstate actors to ensure that the poor receive the services they need to escape poverty. Ultimately, the efficacy of a country's institutions and physical infrastructure depends on how people within each body choose to allocate resources, implement policies, regulate private sector providers, and respond to citizen grievances.

Helping poor and isolated people out of poverty will require more than physical infrastructure and the setting of formal rules of the game. We also need ways to ensure that these basic components translate into the services that the poor need for economic mobility, and that those services work for them and are not coopted by the powerful or derailed by traditional social structures. For this, we need to ensure that the human infrastructure that undergirds service provision selects qualified and motivated individuals to staff these institutions and then gives them the incentives and information they need to do their jobs well. This invisible human and social infrastructure is critical for enabling the poor to realize their capabilities for economic mobility. Ending extreme poverty as quickly as possible will require coupling economic growth with the direct provision of this invisible infrastructure to the poor.

Providing Invisible Infrastructure: Aid, the State, and Private Players

Who are the providers of invisible infrastructure? Some components of invisible infrastructure, like the monopoly of violence and security of property rights, fall squarely within the ambit of the domestic state in all but the most fragile countries. But other components—such as access to health care, education, and financial services—are often provided by a range of players.

A Role for the Domestic Private Sector

Today, various private social sector organizations support the delivery of services for the poor, including for-profit companies, nongovernment organizations, and social enterprises. In some cases, the client is a domestic government that explicitly contracts out service provision.

Consider the provision of financial services, such as loans, savings, and insurance. In the 1960s and 1970s, governments of many developing countries created large-scale social banking programs to provide credit and bank accounts to poor citizens. While state-led financial inclusion efforts did often reduce poverty (Burgess and Pande 2005), these programs were plagued by low repayment rates (Besley and Coate 1995) and elite capture (Cole 2009). As a result, governments began disbanding many of these programs in the 1980s. Lending to the poor was considered a low-profit and risky activity, so private sector financial institutions failed to step in. Nongovernment organizations then played a key role in developing viable financial products for the poor: in the 1980s, Bangladeshi nongovernment organizations—BRAC⁶ and Grameen Bank—innovated by introducing the group lending microfinance model. By 2010, private sector microfinance institutions reported about 26.7 million clients, particularly women and the poor (Srinivasan 2010; Khandker 1998).

While these private sector initiatives largely avoided the pitfalls of corruption and inefficiency, concerns about unregulated lending by microfinance institutions grew. Critics warned that a for-profit drive was incentivizing frontline agents to overload the poor with loans (CGAP 2010). When Compartamos, a for-profit micro-lender in Mexico, became publicly traded in 2007 and created enormous profits for its private investors, several commentators raised concerns of “mission drift” among private microfinance providers (Ashta and Hudon 2012).

In India, these concerns came to a head in October 2010 following news reports linking a series of suicides to allegedly coercive loan collection policies in the state of Andhra Pradesh. The state government responded with an ordinance imposing a set of restrictive regulations on microfinance institutions. This brought the microfinance industry to a sudden halt; the poor were left with no access to credit and suffered large decreases in both household earning and consumption (Breza and Kinnan 2018). The experience of Andhra Pradesh shows that, while private microfinance could offer large benefits to the unbanked poor, sensible government regulation is important, too.

In education—another key pillar of invisible infrastructure—the private sector may provide better service to the poor at reduced cost in the short run (Muralidharan and Sundararaman 2015). Educating the poor is unlikely to be profitable, however, and so private schools typically require state funding to serve the poor. Studies of such efforts have shown promise, but have also revealed some perverse effects. Under the Partnership Schools for Liberia (PSL) program, the Liberian government outsourced management of 93 public schools to eight private contractors, including Bridge International, a for-profit company operating over 500 schools across Africa and India.

⁶BRAC originally stood for Bangladesh Rehabilitation Assistance Committee, but now stands for Building Resources Across Communities. However, the organization is usually referred to by its acronym.

Under the outsourcing scheme, school admission is free, PSL teachers are paid by the government, and contractors cannot screen students by ability or other characteristics. Romero, Sandefur, and Sandholtz (2017) conducted a randomized evaluation of the project and found that contracted schools performed significantly better than regular public schools one year after the intervention, with higher teacher attendance and better student performance in English and math. However, one provider, Bridge International Academies, pushed excess students and worse-performing teachers to government-run schools, subverting policymakers' efforts to maximize access to quality education. This provider was the only one whose funding was not linked to the number of students enrolled and whose contract did not forbid direct dismissal of teachers.

In sum, while private players can often play a substantive role in providing invisible infrastructure, ensuring that those services reach the poor will require that the state remains as an active regulator.

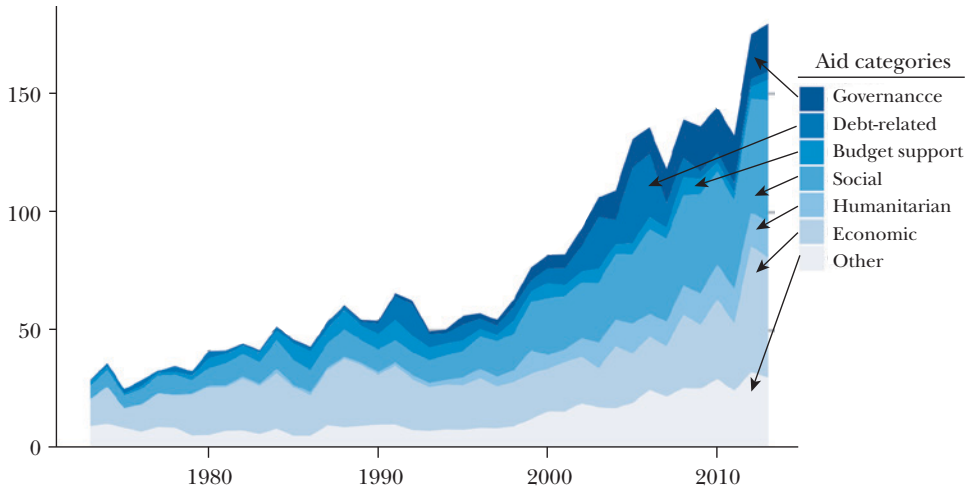
A Role for Foreign Aid

Now consider foreign aid, or official development assistance. The total volume of aid has increased substantially over time, rising nearly fivefold between 1960 and 2016, from about \$32 billion to \$158 billion in 2016—both in constant 2016 US dollars (OECD 2018). The decline of poverty in the same period has raised the prospect of aid as a dominant force in ending deprivation. Indeed, if the cost of ending poverty were simply the dollar value of the shortfall between the poor's daily consumption and \$1.90, then the problem would appear to have been solved; official development assistance has exceeded this value since 2006 (Chandy, Noe, and Zhang 2016).

While early aid flows focused almost exclusively on promoting economic growth, donors began targeting a significant fraction of aid to social sectors in the 1970s (Streeten 1979). Figure 1 plots the distribution of aid by its purpose over time; we focus, in particular, on the fluctuations of "economic" aid (aid for growth) compared to "social" aid (aid for basic social services like education, health care, water sanitation, and food assistance). Social aid made up about 20 percent of average annual aid spending during the 1970s, half the percentage going to economic aid over the same period. Social aid stagnated at around 20 percent of total flows during the structural adjustment era of the 1980s, when conditions from the World Bank and IMF stipulated aid only if borrower countries tightened social spending. Social aid began rising again in the mid-1990s and since 1996 has typically surpassed economic aid as a share of total official development assistance, at between 22 and 31 percent each year.

Some of the aid investments in social infrastructure have been successful. Consider global health, for instance. The world has seen an unprecedented improvement in health outcomes since World War II (Deaton 2013). Average life expectancy worldwide rose from 46 to 69 between 1950 and 2011, and child and infant mortality rates fell in every single country in the world during that period (Bloom 2011). Global health inequality has fallen faster than income inequality (Becker, Philipson, and Soares 2005), as low-income countries see falling child mortality driven by public health advances in access to clean water, immunization, and sanitation. In several prominent cases, foreign assistance has contributed to these improvements.

Figure 1

Official Development Assistance (ODA) by Purpose over Time*(in billions of constant 2011 US dollars)*

Source: Authors use data on official development assistance (ODA) flows from AidData (2017).

Note: We classify aid purpose according to AidData's assignment of OECD Creditor Reporting System (CRS) purpose codes. Economic aid includes aid for productive sectors like agriculture, mining, construction, transport and storage, communications, energy generation and supply, and banking and financial services (1-digit CRS codes 2 and 3). Social aid includes aid for education, health, population policies and reproductive health, water supply and sanitation, and other social infrastructure and services (2-digit CRS codes 11, 12, 13, 14, 16, 42, and 52). Humanitarian aid includes aid for emergency response and preparedness (1-digit CRS code 7). Debt-related aid includes debt forgiveness, rescheduling, and refinancing (1-digit CRS code 6). Governance aid includes institutional capacity building, public sector financial management, civil service reform, and conflict prevention and resolution (2-digit CRS code 15).

The eradication of smallpox—the only human disease ever successfully eradicated—offers a vivid example of the possible gains from aid for global health. In the mid-1960s, smallpox still infected 10 to 15 million people each year (Crosby 1993). In 1967, the World Health Organization established the Intensified Smallpox Eradication Program, which began a massive campaign of vaccination and case surveillance. Outbreaks tapered off, the last endemic case of smallpox was recorded in Somalia in 1977, and in May 1980 the World Health Assembly declared smallpox the first disease ever eradicated. In total, international donors provided \$98 million, with about \$200 million provided by recipient countries themselves (WHO 2011).⁷

⁷There are also some, though arguably fewer, success stories in aid for education. Take the case of Ghana—in the decade and a half after 1986, the World Bank provided the Rawlings government with technical assistance and loans totaling \$260 million for primary education. With the Bank as catalyst, other donors joined the effort, more than doubling the Bank's contribution. Between 1987 and 2000, primary enrollment increased by over 60 percent and was accompanied by genuine learning gains: in identical English tests, two-thirds of primary school graduates in 1988 could not outperform random guessing, but in 2003, the figure was less than 20 percent (World Bank 2004).

Aid-funded health campaigns like the one against smallpox are often designed as “vertical” programs, a type of campaign that targets a particular need and is funded and overseen by external donors. Vertical initiatives may get rapid results by working outside of weak public systems, which may suffer from shortages of trained staff, funding, and equipment or other bureaucratic delays (Atun, Bennett, and Durán 2008).

Moreover, these campaigns may help to satisfy donors’ preferences to safeguard aid from corrupt intermediaries or recipients (Dietrich 2013; Acht, Mahmoud, and Thiele 2015). Less than half of social aid in 2013 (47 percent) was channeled through recipient states (AidData 2017).

However, vertical public health programs may not contribute to the strengthening of domestic “horizontal” primary healthcare systems (Oliveira-Cruz, Kurowski, and Mills 2003). In some cases, vertical programs, or more generally, delivering social services through a cadre of nonstate actors, may even weaken public service delivery by diverting civil servants, funding, and political interest away from state structures and into parallel systems.

We hypothesize that while vertical programs are well-suited to solving problems that can be addressed with short-term and targeted attention, like inoculating children against smallpox or polio, when it comes to more diffuse projects that require working across systems, success or failure can depend on whether aid complements, or substitutes for, the state.⁸ In these cases, aid interventions are more likely to have long-run success if they are designed and applied with state buy-in and eventually turned over to domestic actors.

Why Aid Should Not Bypass the State

A concrete example, focusing on the global philanthropic initiative to eradicate hookworm at the start of the 20th century, can help fix the ideas developed above. Unlike smallpox, which requires a single vaccination, eradicating hookworm requires both treating the infected and preventing reinfection by constructing modern sanitation systems and changing people’s habits. John D. Rockefeller established the Rockefeller Sanitary Commission (RSC) for the Eradication of Hookworm Disease in 1910, when hookworm infections were widespread across the southern United States. The Rockefeller campaign treated hookworm disease in about 400,000 people across the South and ran large public education campaigns on the importance of hygiene and the symptoms of infection. As the campaign wound down, state and local governments took over responsibility for sponsoring construction of latrines, as well as dispensing hookworm medication. The campaign produced large

⁸The fact that many public health and education problems require continued attention, rather than a one-off fix, could explain why we observe mixed results in sector-level estimates of the impact of aid in health and education. While Mishra and Newhouse (2009) find that health aid significantly decreases infant mortality, Williamson (2008) finds no significant impact of health-related aid on infant mortality, and neither Williamson (2008) nor Wilson (2011) finds that health aid reduces mortality in general. Birchler and Michaelowa (2016) and Dreher, Nunnenkamp, and Thiele (2008) find that education-sector aid increases primary school enrollment.

and lasting reductions in hookworm infection rates, thereby increasing school attendance, literacy, and the returns to education among school children (Bleakley 2007).

Following the success of the Sanitary Commission, the Rockefeller Foundation was created in 1913 with the specific intent of developing a global health program. Its initial efforts were concentrated in Latin America and the British Caribbean, though it quickly expanded throughout the tropical world. But its international efforts on hookworm eradication had mixed results.

The Foundation's work in Costa Rica was a success. Between 1914 and 1921, it tested over 300,000 Costa Ricans and treated over 65,000. A primary reason for the success of this campaign was that it learned from the mistakes of an earlier government-led effort implemented by local doctors. The head of Rockefeller's program and governmental partners centralized control, worked through the public school system, and broadened the set of implementing actors to include schoolteachers, community leaders, and priests. Palmer (2003) argues that this use of the public school network was central to the program's success: by the end of Rockefeller Foundation's operations, more of the foundation's funds were being channeled through the country's School Health Department, rather than directly, to hookworm relief. The campaign contributed to centralizing and modernizing health care in Costa Rica and paved the way for the foundation of a national health ministry in 1927, the third in Latin America.

In contrast, the results in India were disappointing. In the 1920s, the Rockefeller Foundation initiated a large hookworm treatment campaign in Madras. Ten years after the campaign ended, the hookworm infection rate remained at about 90 percent (Kavadi 2007). While the campaign made substantial short-term progress by dispensing medications, it could not enduringly reduce hookworm infections without large-scale improvements in domestic sanitation systems. John F. Kendrick, one of the leaders of the Madras campaign, acknowledged that any such shift would rely on the domestic state, noting that "sanitation would have never reached its present state of perfection even in England had government not taken a hand in the matter" (as quoted in Kavadi 2007).

Vertical initiatives can beat smallpox, but building invisible infrastructure to reduce poverty is more akin to conquering hookworm: it requires the poor person to interact with a broad set of different systems. If we are to provide the poor with the systematic array of services needed to escape poverty, then we must invest in building domestic states that have the capacity to monitor and coordinate provision of services by nonstate actors and, when necessary, to provide services directly to the poor.

Yet foreign aid has historically not devoted much attention to building accountable and effective states. One prominent manifestation of this tendency—which we highlighted earlier using the example of vertical health programs—is that aid initiatives frequently bypass relatively weak states, instead delivering resources through a network of nonstate actors, like international and domestic nongovernmental organizations, multilateral organizations, public-private partnerships, and private contractors. State bypass is most common in humanitarian aid, where a fast response is key: only about 7 percent of humanitarian aid commitments were

implemented through recipient states in 2013.⁹ In some cases, aid agencies may have no choice but to deliver aid through nonstate systems immediately following conflict or natural disasters. But if aid continues to take this route as countries transition from emergency to recovery, states will likely fail to develop the institutional capacity necessary to oversee service delivery in the long run.

Aid projects that bypass the state also lack built-in mechanisms for accountability to recipients; rather, aid projects may be accountable primarily to donors. Bypassing the accountability mechanisms built into the social contract of the state, especially democratic states, may leave projects ill-informed by on-the-ground realities and citizen preferences and, therefore, less likely to meet citizen needs.¹⁰

All of this assumes that aid is even reaching the poor where they live. With an increasing mismatch between the countries that contain large fractions of the world's poor and the countries that receive large amounts of aid, the role of the domestic state in building invisible infrastructure becomes even more crucial.

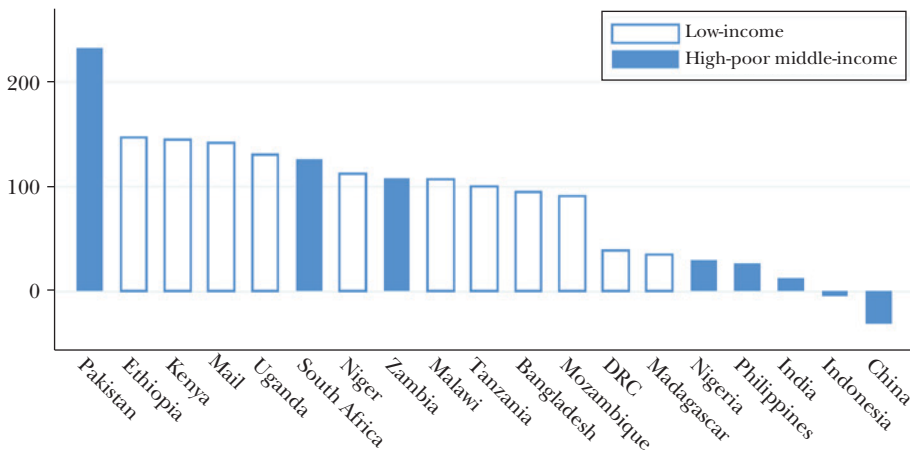
While aid remains a sizable share of GDP in many low-income countries, the 61 percent of the world's poor living in middle-income countries receive relatively little aid per capita. Figure 2 plots 2016 official development assistance per person in extreme poverty, assuming a constant distribution of global poverty between 2013 and 2016. We include all low- and middle-income countries that were home to at least one percent of the world's poor in 2013; for middle-income countries this is the set of eight high-poverty middle-income countries. Some middle-income countries, like Pakistan, received substantial aid in 2016, but China and Indonesia were net aid *donors* in 2016, and India, the Philippines, and Nigeria received nearly the lowest net aid per poor person among all aid-receiving countries. The politics of this aid allocation, with aid targeting poor countries rather than poor people, are unlikely to change. Particularly in times of austerity, citizens of rich countries are unlikely to stomach giving aid to countries that give aid themselves, or that have the resources to invest in “vanity” projects. After the state-run Indian Space Research Organization announced plans to launch a rocket carrying 103 satellites in January 2017, the United Kingdom's popular *Daily Mail* tabloid ran an article titled, “India Boasts of Satellite Launch (as We Hand Them £54m of Aid).”

In today's high-poverty middle-income countries, low aid flows mean that the domestic state already bears the bulk of responsibility for providing invisible

⁹Authors' calculations using data on official development assistance from AidData (2017). We classify aid as being channeled through the public sector if it has an OECD creditor reporting system channel code beginning with 1.

¹⁰A classic example was PlayPumps International's merry-go-round water pump, which was based on the idea that children play on a merry-go-round, causing water to be pumped from the ground into an elevated tank for storage. This project received widespread international coverage and attracted significant aid: for instance, in 2006 the US President's Emergency Plan for Aids Relief (Pepfar) announced a \$60 million public-private partnership with PlayPumps International, with \$10 million to directly come from the US government. However, in reality, installing the pumps was expensive, children were not always keen to volunteer their labor at times of high demand (early morning and evening), and the complexity of the mechanism rendered local maintenance impossible. In 2010, PlayPumps International shut down operation.

Figure 2

Net 2016 Official Development Assistance per Person in Extreme Poverty

Source: Authors use data on official development assistance from World Development Indicators (2018a) and use data on extreme poverty from PovcalNet (2018).

Note: We use data on net official development assistance in 2016 but calculate aid per person assuming that the number of people in extreme poverty by country stayed constant between 2013 and 2016. Our sample comprises high-poverty middle-income countries (middle-income countries with at least one percent of the world's poor in 2013) and low-income countries that were home to at least one percent of the world's poor in 2013. To be consistent with our classification of high-poverty middle-income countries in Table 1, we classify country income status according to the World Bank's FY15 list of economies, which is based on data from calendar year 2013. DRC is the Democratic Republic of the Congo.

infrastructure to the poor. As low-income countries grow richer, they likely will also lose access to foreign aid. If aid today fails to contribute to building capable states in those countries, they may be left with weak institutions when aid dries up. Recent literature in economic history demonstrates how institutional persistence can influence a country's longer-term development (for instance, see Dell, Lane, and Querubin 2017). In addition, if citizens lack ownership of the process by which programs are decided, they may be less willing to pay taxes to fund those programs in the future.¹¹

The domestic states of countries where the world's poor live will increasingly bear responsibility for provision of invisible infrastructure. Thus, building pathways out of poverty for the millions still in extreme poverty will require strong domestic states, and the role of aid should be to support, rather than substitute for, their institutions.

¹¹ Conversely, Weigel (2018) uses a field experiment in the Democratic Republic of Congo to show that citizens will respond to increased tax collection by participating more in politics. Citizens in neighborhoods where a door-to-door tax campaign took place increased political participation by 5 percentage points (28 percent), attending government-hosted townhall meetings and submitting suggestion cards evaluating government performance.

What Are the Governance Challenges in Providing Invisible Infrastructure?

To propose ways to support developing states in the provision of invisible infrastructure, we must consider the governance challenges they face. We can approach them under two broad categories: problems of capacity and problems of will.

Problems of Capacity

It takes money to run programs for the poor, and countries in both of our clusters of poverty typically lack the fiscal capacity to collect and spend resources at the scale needed to provide services to their populations. Weak fiscal capacity may be expected in the poorest countries, where low levels of economic activity, combined with the state's low ability to tax, result in a lack of funds to run programs for the poor. But Figure 3 shows that tax capacity in most high-poverty middle-income countries is as low as in many low-income countries. In 2015, high-poverty middle-income countries collected 16.9 percent of their GDP as tax revenue, versus 13.3 percent in low-income countries.¹²

To the extent that developing countries are successful in raising tax revenue, low state capacity causes them to rely extensively on a value-added tax and other more indirect taxation methods. These tend to fall on all consumers—particularly the poor, who spend a higher portion of their income on food and goods—in contrast to an income tax that can target the rich (Higgins and Lustig 2016).

Lacking both foreign aid and comprehensive tax nets, high-poverty middle-income countries constitute the “missing middle” of the global distribution of fiscal capacity, lagging between better-funded low-income and high-income countries (Kharas, Prizzon, and Rogerson 2014). This financing gap manifests in low government spending, especially on social services (Bastagli, Coady, and Gupta 2012).

Even when states can mobilize domestic funds for the provision of invisible infrastructure, corruption and leakage may hamstring their ability to reach the poor (Svensson 2005). The poor are particularly likely to face corruption in accessing services, either because wealthier households' connections and knowledge of the law equip them to resist corrupt officials or because the wealthy can opt out of free public services (Justesen and Bjornskov 2014; Peiffer and Rose 2016). As a result, a significant share of the resources that high-poverty middle-income countries earmark for social protection may not reach the right beneficiaries. Hanna and Olken discuss targeting in their companion paper in this issue.

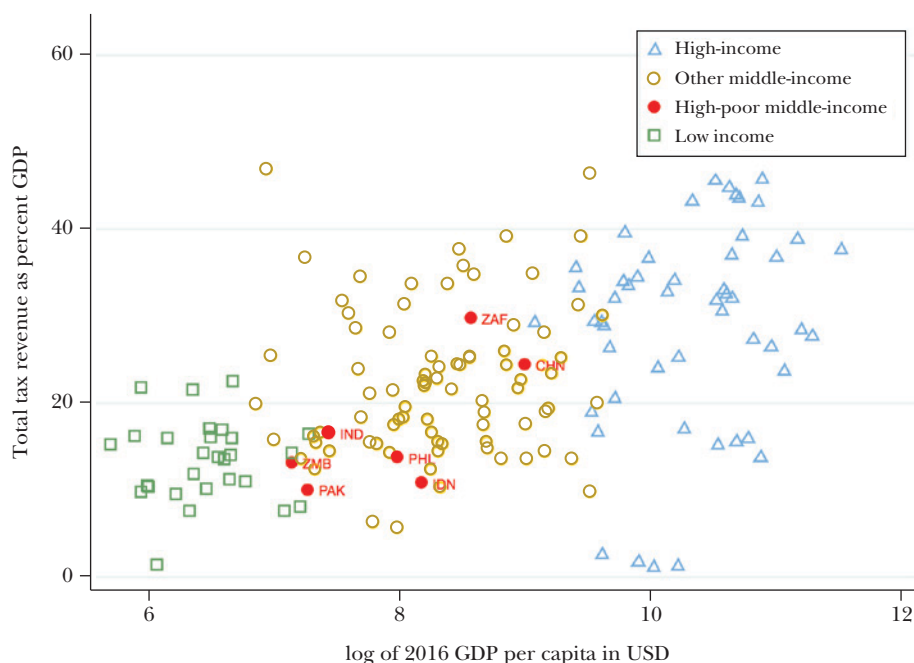
Problems of Will

Even where states have the capacity to deliver invisible infrastructure to the poor, they may lack the will to do so. This lack of will can find expression in spending resources on projects that seem frivolous given the high rate of poverty, and that can

¹² Authors' calculations using most recent taxation data since 2010 available from ICTD/UNU-WIDER (2017); 134 of 172 countries in our sample have data for 2015.

Figure 3

Tax Revenue as a Share of GDP by Country Income



Source: Authors use data on tax revenue from ICTD/UNU-WIDER (2017) and data on GDP from World Development Indicators (2017).

Note: We use data for taxes including social contributions from the “merged” government revenue dataset available through ICTD. We exclude observations where ICTD flags that “accuracy, quality or comparability of data is questionable.” We use the most recent taxation data available since 2010; data is from 2015 for 131 of 167 countries in the figure sample. No data is available for Nigeria, one of the eight high-poverty middle-income countries. To be consistent with our classification of high-poverty middle-income countries in Table 1, we classify country income status according to the World Bank’s FY15 list of economies, which is based on data from calendar year 2013. We label the points for high-poverty middle-income countries with country codes from the World Bank as follows: IND is India, CHN is China, IDN is Indonesia, PAK is Pakistan, PHL is the Philippines, ZAF is South Africa, and ZMB is Zambia.

only be justified through complex trickle-down reasoning: the Indian state’s space program is one example; Rwanda’s £30 million sponsorship of Arsenal football club in 2018 is another. But it can also find expression through projects that ostensibly serve all, but that exacerbate poverty in pockets of the population. For example, a large dam construction policy in India increased regional inequality and aggregate poverty: while districts located downstream of the dam saw agricultural productivity rise and poverty fall, the districts where dams were built saw poverty rise. These rises were particularly pronounced in districts that had a history of extractive colonial institutions and, therefore, adversarial relationships between the elite and disadvantaged populations (Duflo and Pande 2007).

Lack of will can also find expression in states' choices to address extreme poverty in ways that do not fully account for poor people's values, preferences, and quality of life. For example, President Xi Jinping of China plans to relocate 9.8 million of the rural poor between 2016 and 2020 as part of a push to end extreme poverty in China by 2020 (as reported in Phillips 2018). But forced migration can disrupt valuable social networks and decrease quality of life in ways that are not captured by income measures (Barnhardt, Field, and Pande 2017).

Given the myriad vested interests in any society, governments—especially in the presence of resource constraints—will often only respond to clear demands from citizens. The poor are more likely to be sidelined both in economic development and in democratic processes. Recent evidence suggests that nondemocratic countries on average exhibit lower growth than democracies (Acemoglu, Naidu, Restrepo, and Robinson forthcoming). Moreover, the mechanisms that link growth with democracy include elements of invisible infrastructure. Democratic institutions also tend to be friendly to labor: they result in higher wages (Rodrik 1999).

In this light, problems of will on the part of government become problems of agency on the part of the poor: provision of good invisible infrastructure requires both that domestic states have the capacity to deliver it, and that poor citizens have the voice to demand it.

Building Invisible Infrastructure that Delivers for the Poor

When a democracy functions as intended, there are two core positive consequences for invisible infrastructure. First, there is a systematic way for citizens to voice their needs (via voting on manifestos, or engaging in protests). Secondly, state bodies are accountable and incentives for delivering services are strong—ineffective or poor governance can be punished by removal from power at elections (or via impeachment) (Acemoglu and Robinson 2011).

Democracy is also increasingly the form of government the poor live under: We estimate that the proportion of the world's poor living in democracies rose from 25.8 to 47.1 percent between 1987 and 2013. Assuming that the distribution of the world's poor by country remained constant between 2013 and 2015, this figure would have risen to 60.7 percent by 2015—at which point, 11 of 33 low-income countries and all high-poverty middle-income countries but one (China) were classified as democracies by Polity IV measures.¹³

How do we further engage and empower citizens in developing countries to demand well-functioning invisible infrastructure?

¹³ Authors' calculations using data on poverty from PovcalNet (2018) and Polity IV democracy data available through the Center for Systemic Peace (2016). We classify states as democracies if they have a Polity IV score of at least six. We continue to classify country income status according to the World Bank's FY2015 list of economies (data from calendar year 2013).

Free and fair elections in democracies are a critical first step. The international aid community has recognized their value: Between 1990 and 2013, annual official development assistance commitments for democracy and governance increased nearly twentyfold, from just above \$1 billion to about \$20 billion in 2011 US dollars.¹⁴ While the literature on whether aid promotes or impairs democracy is mixed (Djankov, Montalvo, and Reynal-Querol 2008; Kersting and Kilby 2014; Knack 2004), a small literature finds that aid earmarked for democracy assistance does promote democratic institutions. The analysis of Finkel, Pérez-Liñan, and Seligson (2007) makes use of the 500 percent increase in US foreign assistance for democracy building between 1990 and 2003. Using program information for 165 countries, they find that democracy assistance helped build democratic institutions. Dietrich and Wright (2015) provide complementary data using all OECD democracy aid flows to 44 countries of sub-Saharan Africa in the 1990s and 2000s. They find that democracy aid stabilized multiparty regimes and decreased the incidence of electoral misconduct, which they interpret as increasing horizontal accountability.

Giving poor citizens the democratic tools to demand invisible infrastructure means not just giving them votes, but also establishing systems of broader accountability—where citizens have the tools and information to make demands of the various players involved in the provision of invisible infrastructure.

How can we design governance reforms to aid this? A first step is to model the behavior of actors engaged in the provision of invisible infrastructure in a way that can shed light on the root problems.

Principal-agent frameworks provide a natural way to model the provision of invisible infrastructure as involving a *human chain* of interlinked actors—upper tiers of management, or principals, delegate tasks to lower tiers of agents (Dixit 2002). In turn, agents at higher tiers often act as principals at lower tiers. When we so decompose the state from monolith to interlocking principal-agent relationships, we can see failures like widespread corruption as localized malfunctions of particular links in the human chain. The principal-agent framework allows us to model these malfunctions as agency problems: the principal and agent may have different preferences, and weak information limits the principal's ability to fully observe the agent's action. We can then approach policies to build invisible infrastructure for the poor as opportunities to solve a series of *mechanism design problems*, where efficient design requires understanding the political environment.

In the case of a democratic state providing services, the chain is often circular: citizens delegate policymaking to elected leaders, who delegate tasks to senior administrators, who in turn delegate tasks to lower-level bureaucrats, who, finally, direct the activities of frontline service providers. Ultimately, these providers often seek to influence the actions of citizens. It is useful to visualize a human chain forming a circle with two sides: a democratic side extending from the citizen up

¹⁴ Authors' calculations using AidData (2017). Following Dietrich and Wright (2015), we classify governance and democracy aid as official development assistance to which AidData has assigned a Credit Reporting System purpose code beginning with 15.

to the politician, and an implementation side stretching from the politician back down to the citizen.

The failure to align the incentives of actors along the chain with the preferences of citizens is often at the root of weak delivery of invisible infrastructure. The human chain may be difficult to consider in the abstract, so we now give a series of concrete examples from a massive social protection program in a high-poverty middle-income country—the type of program states will need to execute successfully to draw their citizens out of extreme poverty.

Seeing the State as a Human Chain: The Example of Workfare Program Reforms in India

In 2005, India launched a federal workfare program—the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS)—that seeks to guarantee employment to the rural poor when they need it. This large program (with a 2017–18 budget of over \$7 billion) has historically been beset by significant corruption, though multiple program reforms appear to have reduced the leakage of funds over time (Imbert and Papp 2018).¹⁵ In addition, the quality of MGNREGS implementation exhibits significant geographic variation. Research on the effects of this program and the trends in its implementation provides multiple lessons on how aligning incentives and improving information flows can help build states capable of delivering the invisible infrastructure.

First, it is crucial to ensure that information on reform reaches those with the will and ability to implement reforms. Working in Bihar, one of India's poorest states, Banerjee, Duflo, Imbert, Mathew, and Pande (2016) found that a new digital accounting system that cuts out administrative tiers lowered corruption and reduced MGNREGS program spending by 24 percent, with no detectable decline in payments to beneficiaries. This was a positive result, but scaling up the reform required dealing with the entire human chain of the state, not just tuning up a single malfunctioning link. The Bihar accounting reform first hit resistance from mid-tier administrators—those links in the chain who were being cut out—who lobbied against the reformed system. The state government repealed it. Eventually, the federal government—the program's funder (and so the primary principal within the administration)—overrode that decision and rolled out the reform nationwide because it saved them money. Thus, reform is more likely to be successful when actors higher up in the human chain with superior policy authority have both incentives to implement it well and access to independent information on program performance.

Second, it is necessary to align policy choices with the preferences and needs of the poor. Again, Bihar's reform experience is revealing. A continuing shortcoming

¹⁵ Imbert and Papp (2018) compare MGNREGS employment in official reports to the estimated number of days spent by rural adults on any public works estimated based on National Sample Survey data. They find that in 2007–2008 only 51 percent of reported MGNREGS employment was independently confirmed by the survey data. They also find that this gap narrows over time to 71 percent in 2009–2010 and 80 percent in 2011–2012.

of the digital accounting reform was that citizens did not directly benefit from reduced corruption: the amount they earned from the workfare program remained unaffected, while implementation issues *increased* delays in their wage payments in the short term. Furthermore, since citizens had no way of knowing that the modified system had cut leakage, they could not lobby for the money saved to be spent on more job opportunities through the program.

In contrast, a different reform of the employment guarantee scheme did translate into higher wages for the poor, arguably because citizens were directly engaged in and, therefore, well informed of the reform. Muralidharan, Niehaus, and Sukhtankar (2016) demonstrate that investments in secure payment infrastructure for MGNREGS that directly included citizens—by altering how they obtain payments from banks—delivered a faster and less corrupt payment service while raising effective wages received by beneficiaries.

Third, leveraging the circular nature of the human chain in democratic settings can provide a powerful way of aligning incentives across the chain. Specifically, a well-designed human chain can ensure that elected politicians are incentivized to monitor administrators and verify that they provide services effectively. Gulzar and Pasquale (2017) compare MGNREGS performance in districts where bureaucrats are supervised by a single political principal with those supervised by multiple politicians and find that program performance is substantially better where bureaucrats answer to a single politician. They conclude that politicians face strong electoral incentives to motivate bureaucrats as long as they internalize the benefits from doing so.¹⁶

Beyond the State: Enabling Citizens as the Ultimate Principal

These examples focus on the circle of principal-agent interactions between the state and citizens. While this essay cannot do justice to the myriad ways in which state and nonstate actors engage with each other and with citizens to affect the provision of invisible infrastructure, we conclude by highlighting a few ways in which these interactions support an important tool of empowerment for citizens—the information they have on the provision of invisible infrastructure.

The media can play an important role in ensuring political accountability. To ensure impartiality, some of the institutions that provide information—like the media—need to exist outside the state (Besley and Prat 2006). Conversely, autocracies often use media censorship to reduce information available to citizens and, arguably, to lessen their will to engage with policymaking (Chen and Yang 2018). The role of a free media in highlighting situations of distress for the poor was famously argued by Sen (1999), who showed that famines in India disappeared with the establishment of democracy

¹⁶A famous historical example of how state capacity and accountability can go hand in hand comes from the simultaneous creation of the American modern welfare state and dramatic decline in corruption in the public service delivery in the 1930s. Wallis, Fishback, and Kantor (2006) provide evidence that Roosevelt's political interests were better served by ensuring that the American poor received services, rather than by using relief to aid small sets of politically connected contractors or to give jobs to loyalists.

and free media. Besley and Burgess (2002) show that calamity relief and public food distribution systems work better in Indian states with greater newspaper circulation.

Other institutions that empower citizens by providing information can be mandated by the state, but need to have operational autonomy and significant resources to be effective. A classic example is implementation of Freedom of Information Acts. Over the last half-century, these acts have spread from northern Europe to over 100 countries, rich and poor (according to data collected by Access Info Europe and the Centre for Law and Democracy). These acts are seen as embodying citizens' right to have access to information about the functioning of their government, and may also help citizens to access invisible infrastructure. In India, Banerjee, Enevoldsen, Pande, and Walton (2018) partnered with nongovernmental organizations to publish politician report cards in local newspapers, with performance data collected via right-to-information laws. These report cards moved politicians's spending allocations to more closely match citizen preferences for public goods delivery. In this case, as in many transparency initiatives, a nongovernment organization served as a vital intermediary between the poor and the state. Reinikka and Svensson (2011) report comparable evidence for Uganda.

Transparency initiatives—often organized by civil society organizations and nongovernment organizations—can empower citizens even in nondemocratic settings. After China passed regulations in 2008 giving the public access to certain types of environmental information, investigative journalist Ma Jun created an online public database that made information on water and air pollution violations easily available to citizens. By 2012, this portal had exposed over 90,000 private sector air and water pollution violations and was contributing to a swelling citizen-based environmental movement (Goldman Environmental Foundation 2012). Between 2000 and 2013, pollution was the largest driver of large public protests in China (Steinhardt and Wu 2016). While this example shows how transparency can enhance invisible infrastructure for all citizens, it is worth pointing out that a wide literature has shown that the costs of environmental damage fall most heavily on the poor through channels such as exposure to air pollution (Hajat, Hsia, and O'Neill 2015) and vulnerability to climate change (UN DESA 2016).

Conclusion

Is it a realistic aim to end extreme poverty by 2030? We believe that achieving this goal within this timeframe will require substantial recalibration of efforts. While economic growth has fueled large reductions in poverty over recent decades, further reductions will also require providing the “invisible infrastructure” that the poor need for economic mobility. This provision can rely in part on aid and private players, but it will need to work principally through the domestic state. Thus, eliminating absolute poverty will require investing in—not circumnavigating—domestic states, both in low-income countries and high-poverty middle-income countries. It will also require empowering citizens to act as principals in demanding services from the state.

How can international actors help? On the grand scale, international democracy assistance groups who focus on fair and free elections can coordinate activities with groups that seek to strengthen state capacity via greater administrative efficiency and transparency. In low-income countries, aid should contribute to building effective, accountable state-run service delivery as much as possible. In high-poverty middle-income countries, well-targeted technical assistance intended to support transparency and accountability initiatives can yield high returns. Building sound invisible infrastructure will require working with individuals within the state who have the power and incentives to implement reform, and at the same time ensuring that poor citizens remain the ultimate principal.

In this spirit, we argue for research that unpacks the state and recognizes it as a chain of individuals, all acting on their own interest and responding to incentives. In recent decades, development economics has seen the emergence of an experimental literature that evaluates microeconomic policies one by one. This has led to a robust discussion on the relationship between single-program evaluations and system-level change—whether, for example, a program that improved learning in a small number of schools can guide reforms on a country’s educational system (Alcott 2015; Bold, Kimenyi, Mwabu, Ng’ang’a, and Sandefur 2013). Some experts have suggested conducting experiments at the scale of the reform you want to effect (Muralidharan and Niehaus 2017), while others express concerns that the micro view may divert attention and resources from system-level improvement (Deaton and Cartwright 2018). We believe that micro-level evidence can inform system-level reforms, but to do so effectively requires engaging with the political economy of reform. That is, research must also examine whether policymakers have the means to monitor implementation, whether bureaucrats have the motivation to implement the policies, and whether citizens have effective mechanisms to make their voices heard. A focus on political economy allows us to develop hypotheses about how the incentives of different actors in the human chain of the state can be aligned and how information flows will influence their behavior—hypotheses that can be tested by rigorous evaluations, experimental or otherwise.

By 2030, we will likely be living in a much richer world. Whether it will be a world free of poverty will depend on whether we can reach the world’s most isolated, disadvantaged, and demoralized people—those who remain untouched by record growth and unprecedented flows of aid. This task goes beyond money and into power: we must understand and restructure social and political institutions so that the powerful have reason to serve the powerless.

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