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Toward Successful Development Policies

Insights from Research in Development Economics

Erhan Artuc, Robert Cull, Susmita Dasgupta, Roberto Fattal Jaef, Deon Filmer, Xavier Giné, Hanan Jacoby, Dean Jolliffe, Hiau Looi Kee, Leora Klapper, Aart Kraay, Norman Loayza, David McKenzie, Berk Özler, Vijayendra Rao, Bob Rijkers, Sergio Schmukler, Michael Toman, Adam Wagstaff, and Michael Woolcock

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Abstract

What major insights have emerged from development economics in the past decade, and how do they matter for the World Bank? This challenging question was recently posed by World Bank Group President David Malpass to the staff of the Development Research Group. This paper assembles a set of 13 short, nontechnical briefing notes prepared in response to this request, summarizing a selection of major insights in development economics in the past decade. The notes synthesize evidence from recent research on how policies should be designed, implemented, and evaluated, and provide illustrations of what works and what does not in selected policy areas.

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Toward Successful Development Policies: Insights from Research in Development Economics

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D0 (Microeconomics), E0 (Macroeconomics and Monetary Economics), F0 (International Economics), G0 (Financial Economics), H0 (Public Economics), I0 (Health Education and Welfare), O0 (Economic Development, Technical Change and Growth), Q0 (Agriculture, Natural Resource, and Environmental Economics)

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Introduction

Aart Kraay

What major insights have emerged from development economics in the past decade, and how do they matter for the World Bank? This challenging question was posed by recently-appointed World Bank Group President David Malpass to the staff of the Development Research Group in September 2019. After much internal discussion, we settled on a list of 13 topics, prepared short non-technical briefings on each of them and shared them with President Malpass. This paper assembles these briefing notes into a single document for wider circulation and discussion.

Development economics as practiced at the World Bank is a broad field, covering a dizzying array of topics from health and education to climate change, political economy, financial sector development, international trade, growth, and many more. Over the past few decades, development economics as practiced in academia has flourished as well, expanding from a niche area to a mainstream topic, with papers on development regularly appearing in top journals, and with prominent development economists such as Angus Deaton, Abhijit Banerjee, Esther Duflo and Michael Kremer being honored with Nobel prizes.

Any attempt to comprehensively summarize this rich body of research is unlikely to succeed, and we did not attempt to do so. Instead, we tried to selectively focus on major areas where recent research has yielded important new insights for the practice of development policy – with immediate implications for how the World Bank should design and evaluate its projects and how it should engage in policy dialogue with client governments around the world. Rather than confine ourselves to topical silos, we tried to illustrate these insights with examples from different areas of research and different policy domains wherever possible, in order to distill useful broader lessons for development policy. Finally, we tried to keep the notes nontechnical and jargon-free in the hopes of reaching a wider audience than just the professional economists with whom we most often communicate in our writing.

The first four notes illustrate insights from recent research on the general question *of "how to design policies".* Many governments around the developing world have deployed cash transfer programs as a signature policy intervention, in which beneficiary households receive cash if they comply with conditions such as ensuring that their children attend school. Berk Özler's note summarizes recent evidence on how the design features of such programs shape their success in improving outcomes in the short and medium run. In the next two notes, Deon Filmer and Adam Wagstaff take up two key policy design questions in health and education: the importance of focusing interventions on improving the quality – and not just the quantity – of services provided, and how health and education service providers should be paid in order to ensure the delivery of quality services. The fourth note in this category approaches the question of policy design from a more macroeconomic perspective. Roberto Fattal, Hiau Looi Kee, and Sergio Schmukler use examples from macro, finance, and international trade to illustrate how policies aimed at influencing aggregate outcomes such as growth and welfare need to be informed by microeconomic evidence on the mechanisms through which these policies operate.

The next three notes synthesize insights from recent research on the practical question of "*how to implement policies".* Well-designed and technically sound policies are of little use if they are not implemented well. Norman Loayza and Michael Woolcock provide illustrations of how the absence of complementary polices and institutions, as well as the lack of capacity in government agencies tasked with transforming policy decisions into concrete actions, can stymie successful policy implementation and outcomes. Often the ability and the will to implement policies are intertwined with politics. Vijayendra Rao and Michael Woolcock discuss the key roles of citizen accountability and the legitimacy of political decision-making processes in determining which policies are selected and how they are implemented. The third note in this section brings a sobering lesson. Robert Cull and David McKenzie

note that often policies that show promising results when implemented as pilots at small scale turn out to be disappointing when implemented at scale. They point to the need for continuous evaluation and openness to course corrections as projects are scaled up to avoid such disappointing outcomes.

The next group of notes turns to the question of *"how to evaluate policies."* One of the most striking trends in economics – and particularly in development economics – in the past decade or two has been the increase in the seriousness with which the profession has taken the identification of causal effects of policies on outcomes. As Xavier Giné and Hanan Jacoby write, this has most visibly come through the mainstreaming of randomized controlled trials as a tool to evaluate policy interventions. This has been accompanied by increasingly creative use of natural experiments to identify causal effects in circumstances where randomization is not possible or desirable, as well as by more carefully combining economic theory with empirical evidence to shed light on underlying mechanisms. The scope for insightful evaluation of policy outcomes has also broadened remarkably over the past decade as economists have been able to draw on nontraditional data sources, ranging from satellite imagery to cell phone records. Robert Cull, Dean Jolliffe, and Vijayendra Rao provide examples of how these new data types, combined with new tools such as machine learning and natural language processing algorithms, have shed new light on old questions.

The last set of four notes covers an assortment of policy domains where recent research has provided new insights on the effects of policies. Sergio Schmukler, Michael Toman, and Adam Wagstaff draw on examples as disparate as early childhood development, financial crises, and environmental degradation to illustrate the general principle that early policy interventions at large enough scale can be highly cost-effective. They also discuss why, despite these high returns, opportunities for early intervention often are missed. Susmita Dasgupta and Michael Toman describe the accumulating evidence that investments to improve resilience to climate change can have big payoffs in terms of development outcomes. Leora Klapper discusses how the combination of policy and technological changes that have enabled widespread access to digital financial transactions have improved outcomes for users in a variety of ways. Finally, Erhan Artuc and Bob Rijkers synthesize what we have learned from recent research on the size of the welfare gains from trade – and more importantly about how they are distributed across people, space, and sectors.

Contents

1. How Should We Design Cash Transfer Programs?

Berk Özler

How important is the *condition* in accounting for the impacts of conditional cash transfer (CCT) programs? Is it a waste of time and resources to monitor and enforce conditions, when simply giving out the cash with no strings attached would do an equally good – or perhaps an even better – job in reducing poverty in the longer-run? The answer to this question is not straightforward, but over the past 15 years research has generated a fair amount of evidence that provides useful insights for policy makers.

In the short run, CCTs produce better human capital outcomes than unconditional cash transfers (UCTs)

CCTs outperform UCTs for intermediate participation indicators (e.g., school enrollment or visits to health centers) and, to a lesser extent, human capital outcomes (e.g., learning achievement or health indicators). For example, in a Colombian CCT program, children subject to the conditionality requirement had 50% more preventive visits and had improved health compared with children excluded from the requirement.[1] Similarly, two experiments conducted by World Bank researchers in Burkina Faso and Malawi found that CCTs had significantly higher impacts on school enrollment, dropout, and test scores than UCTs – even taking the additional administrative costs of CCTs into account.[2] A systematic review of CCT and UCT programs finds that the effect sizes on school participation increase as the conditions are made more explicit, monitored, and enforced.[3]

However, there may be immediate trade-offs between CCTs and UCTs. The same experiment in Malawi found that UCTs substantially outperformed CCTs in improving psychological well-being and reducing teen pregnancy and child marriage rates. This empirical finding, also supported by theory, has implications for the design of cash transfer programs: CCT programs create incentives for individuals to change their behaviors by denying transfers to those who do not satisfy the conditions. However, at least some of these individuals come from vulnerable households and are equally in need of income support. UCTs to such households can improve important outcomes, even though they are not as successful in improving the desired outcomes targeted by CCTs. Hence, while CCT programs may be more effective than UCTs in obtaining the desired behavior change, they can also undermine the social protection dimension of cash transfer programs. Comparing the overall welfare effects requires estimates of how effective CCTs are at changing behavior, as well as judgments on the importance of the desired behavior change versus other important outcomes.

In the longer run, the effects of UCTs dissipate

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[1] Attanasio, Orazio P., Veruska Oppedisano, and Marcos Vera-Hernández. 2015. Should Cash Transfers Be Conditional? Conditionality, Preventive Care, and Health Outcomes. American Economic Journal: Applied Economics, 7(2): 35-52.

[2] Akresh, Richard, Damien de Walque, and Harounan Kazianga. 2013. Cash Transfers and Child Schooling: Evidence from a Randomized Evaluation of the Role of Conditionality. Policy Research Working Paper No. 6340. World Bank, Washington, DC.; Baird, Sarah, Craig McIntosh, and Berk Özler. 2011. Cash or Condition? Evidence from a Cash Transfer Experiment. Quarterly Journal of Economics 126 (4): 1709-1753. Baird, Sarah, Craig McIntosh, and Berk Özler. 2019. When the Money Runs Out: Do Cash Transfers Have Sustained Effects on Human Capital Accumulation?" Journal of Development Economics, Vol. 140, Sep. 2019, pp. 169-185.

[3] Baird, Sarah, Francisco HG Ferreira, Berk Özler, and Michael Woolcock. 2013. Relative Effectiveness of Conditional and Unconditional Cash Transfers for Schooling Outcomes in Developing Countries: A Systematic Review. Campbell Systematic Reviews 9 (8).

While there are few long-term studies of unconditional cash transfers, the available evidence suggests that their short-term effects are not sustained. Sometimes, this may be because the transfers put beneficiaries on an earlier/accelerated growth path than non-beneficiaries, with the two groups converging over time.[4] In other cases, unconditional cash transfers end up being palliative, meaning that they improve outcomes while the income support is in place, but fail to cause sufficient accumulation of human (or other forms of) capital to alter long-term outcomes.[5] In such cases, UCT beneficiaries end up back at square one soon after the cessation of transfers.

One exception to this finding might be in lasting improvements in the health and nutrition of children in beneficiary households. Several recent studies have found that children who are exposed to unconditional cash transfers in utero and between the ages of 0 and 5 (the earlier the better) are substantially less likely to be stunted.[6]

Longer-term evaluations of CCT programs offer room for optimism. A number of longer-term evaluations of CCT programs indicate that while they might improve school attainment among adolescent beneficiaries, evidence of longer-term gains in terms of learning, employment, and income are mixed as they become young adults.[7] However, recent studies are finding evidence of promising longer-term gains. Examples include a forced savings treatment attached to a traditional schooling CCT program in Bogotá increasing tertiary enrollment and graduation; a CCT program in Malawi and a secondary school scholarship program in Ghana causing large gains in school attainment and substantial reductions in fertility among vulnerable female beneficiaries; Nicaragua's CCT program leading to substantial gains in learning among boys and reductions in fertility and increased economic activity among girls 10 years after they were exposed to the program as early adolescents; and a school-based intervention in Kenya that provided school uniforms finding significant reductions in school dropout, pregnancy, and marriage among girls in the short- and medium-run; and school attainment, marriage, and childbearing by age 16 in the longer-run.[8]

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[4] Blattman, Christopher, Nathan Fiala, and Sebastian Martinez. 2018. The Long-Term Impacts of Grants on Poverty: 9-Year Evidence from Uganda's Youth Opportunities Program. American Economic Review: Insights, *forthcoming;*- Haushofer, Johannes and Jeremy Shapiro. 2018. The Long-Term Impact of Unconditional Cash Transfers: Experimental Evidence From Kenya. Working Paper.

[5] Baird, McIntosh, and Özler (2019), *cited above*.

[6] -Agüero, Jorge, Michael Carter, and Ingrid Woolard. 2006. The Impact of Unconditional Cash Transfers on Nutrition: The South African Child Support Grant. SALDRU Working Paper Series No. 06/08.; Barham, Tania, Karen Macours, and John A Maluccio. 2013. Boys' Cognitive Skill Formation and Physical Growth: Long-Term Experimental Evidence on Critical Ages for Early Childhood Interventions. American Economic Review 103 (3): 467-471; Cahyadi, Nur, Rema Hanna, Benjamin A. Olken, Rizal Adi Prima, Elan Satriawan, and Ekki Syamsulhakim. 2018. Cumulative Impacts of Conditional Cash Transfer Programs: Experimental Evidence from Indonesia. NBER Working Paper 24670. National Bureau of Economic Research.;- Baird, McIntosh, and Özler (2019), *cited above*.

[7] Baez, Javier Eduardo and Adriana Camacho. 2011. Assessing the Long-Term Effects of Conditional Cash Transfers on Human Capital: Evidence from Colombia. IZA Discussion Paper No. 5751.; Behrman, Jere R, Susan W Parker, and Petra E Todd. 2011. Do Conditional Cash Transfers for Schooling Generate Lasting Benefits? Journal of Human Resources 46 (1): 93-122; Filmer, Deon and Norbert Schady. 2014. The Medium-Term Effects of Scholarships in a Low-Income Country. Journal of Human Resources 49 (3): 663-694; Araujo, M Caridad, Mariano Bosch, and Norbert Schady. 2016. Can Cash Transfers Help Households Escape an Inter-Generational Poverty Trap? NBER Working Paper 22670. National Bureau of Economic Research; Cahyadi et al. (2018), *cited above*;Molina-Millan, Teresa, Karen Macours, John A. Maluccio, and Luis Tejerina. 2018. Experimental Long-term Effects of Early Childhood and School-age Exposure to a Conditional Cash Transfer Program. Working paper.

[8]Barrera-Osorio, Felipe, Leigh L Linden, and Juan E Saavedra. 2017. Medium- and Long-Term Educational Consequences of Alternative Conditional Cash Transfer Designs: Experimental Evidence from Colombia. NBER Working Paper 23275. National Bureau of Economic Research; Baird, McIntosh, and Özler (2019), *cited above*;- Duflo,

How cash transfers are targeted and delivered are important program design elements

Recent studies suggest that cash transfers can cause declines in life satisfaction and reductions in psychological well-being among non-beneficiaries who live in the same communities as program beneficiaries.[9] Cash transfers can cause prices of non-tradable or perishable goods to increase in remote areas with weak links to markets, while in-kind transfers can have the opposite effect of reducing food prices.[10] A recent World Bank study of the Philippine CCT shows that such effects can have real consequences: price increases in protein-rich perishable food items caused substantial increases in stunting among non-beneficiary children.[11] Hence, it is important for the World Bank and governments implementing large-scale transfer programs to pay attention to spillover and general equilibrium effects.

These findings have several implications for World Bank policies*:*

- A potentially promising way of resolving the tradeoff between CCT and UCT programs is to view them as complements to each other rather than alternatives. Policymakers could provide a basic unconditional cash transfer to, say, adolescent females or poor households, topped up by conditional cash transfers for human capital accumulation and desired health behaviors – providing an incentive to invest in education and health while still guaranteeing a basic level of protection to those who are unable or unwilling to comply with program conditions.
- The promising evidence of the positive effect of UCTs on children's height provides an additional reason to consider providing basic UCTs to adolescent girls and young women. Indeed, other researchers in the U.S. context have suggested that targeting transfers towards women of childbearing age would be beneficial, to maximize benefits to children *in utero*. This form of targeting of young women would suffer from remarkably little 'leakage' in many countries in Sub-Saharan Africa, where the median ages at first childbirth are below 20. It would also have the added benefit of reducing fertility rates.
- The increasing popularity of "cash plus" programs, which involve cash transfers being delivered with complementary services/interventions, seems justified. For example, recent evidence from multi-faceted anti-poverty programs suggest complementarities between various program components, including cash transfers.[12] A program in Bangladesh that combined a behavior change communication nutrition intervention with cash transfers through women's groups that

Esther, Pascaline Dupas, and Michael Kremer. 2017. The Impact of Free Secondary Education: Experimental Evidence from Ghana. Unpublished Manuscript. https://web.stanford.edu/~pdupas/DDK_GhanaScholarships.pdf; Barham, Tania, Karen Macours, and John Maluccio. 2019. Experimental Evidence from a Conditional Cash Transfer Program: Schooling, Learning, Fertility, and Labor Market Outcomes After 10 Years. Working Paper; Duflo, Esther, Pascaline Dupas, and Michael Kremer. 2015. Education, HIV, and Early Fertility: Experimental Evidence from Kenya. American Economic Review 105 (9): 2757-97.

[9]Baird, Sarah, Jacobus De Hoop, and Berk Özler. 2013. Income Shocks and Adolescent Mental Health. Journal of Human Resources 48 (2): 370-403; Haushofer, J., Reisinger, J., & Shapiro, J. (2019). Is Your Gain My Pain? Effects of Relative Income and Inequality on Psychological Well-being. Working Paper.

[10] Jesse M Cunha, Giacomo De Giorgi, and Seema Jayachandran, 2019, The Price Effects of Cash Versus In-Kind Transfers, The Review of Economic Studies 86 1): 240–81.

[11] Filmer, Deon, Jed Friedman, Eeshani Kandpal, and Junko Onishi. 2018. Cash Transfers, Food Prices, and Nutrition Impacts on Nonbeneficiary Children. Working Paper.

[12] Banerjee, Abhijit, Dean Karlan, Robert Darko Osei, Hannah Trachtman, and Christopher Udry. 2018. Unpacking a Multi-Faceted Program to Build Sustainable Income for the Very Poor. NBER Working Paper 24271.

met regularly found beneficial impacts on several important domains for beneficiary women and their children.[13]

- Finally, more attention should be paid to the targeting of large cash transfer programs. Failing to consider the local market price effects of CCT (or UCT) programs can overstate the net benefits of targeted cash transfers. In areas where individual targeting of social programs covers most of the households, offering the program on a universal basis would avoid such negative impacts at moderate, if any, additional cost.[14]

[13]Ahmed, Akhter, John Hoddinott, and Shalini Roy. 2019. Food Transfers, Cash Transfers, Behavior Change Communication and Child Nutrition: Evidence from Bangladesh. Working Paper.;Roy, Shalini, Melissa Hidrobo, John Hoddinott, and Akhter Ahmed. 2019. Transfers, Behavior Change Communication, and Intimate Partner Violence: Post-Program Evidence from Rural Bangladesh. Review of Economics and Statistics, *forthcoming*.

[14] Filmer et al. (2018), *cited above*.

2. Policy Makers Need to Focus on the Quality and Not Just the Quantity of Services Delivered

Deon Filmer and Adam Wagstaff

Education and health policymakers often focus on indicators of the *quantity* of services provided: Are children enrolled in school? Are women delivering their babies in a health facility? Are newborn babies receiving postnatal care? This assumes that children in school will automatically learn, and that health outcomes such as maternal and child mortality will automatically improve as service coverage increases.

This assumption often is wrong. Even in countries on track to hit enrollment targets, children often have low levels of mastery of reading, writing and mathematics. Indonesia and Mexico, for example, had both almost reached the universal primary completion MDG target by the mid-2000s, but at the time 68 percent of Indonesian youth and 50 percent of Mexican youth lacked even minimally adequate competence in mathematics.[15] In health, evidence shows a similar tenuous link between service coverage and outcomes. For example, having women deliver their babies in a health facility (an MDG and SDG target) has been found *not* to lead to lower maternal or neonatal mortality rates.[16]

In both education and health, poor *quality* of service delivery is the key reason why service coverage does not necessarily translate into better outcomes. We know this because research – much of it done at the World Bank – has zeroed in on the quality of service delivery.

Early research focused on a very basic aspect of quality: are teachers and health workers actually teaching and delivering health services? Random unannounced visits to schools and health centers in six developing countries uncovered high absenteeism rates – 19% in the case of teachers and as much as 35% in the case of health workers.[17] Averaging across seven African countries, more recent research found that 23% of teachers were absent from school, and 44% were absent from the classroom.[18] Absenteeism – coupled with teachers spending time in class but not teaching – resulted in, on average, just 2¾ hours of teaching time per day instead of the scheduled 5½ hours.

Later research looked at another aspect of the quality of education and health services – provider knowledge. The study of seven African countries also tested primary school teachers' knowledge of their subject by asking them to grade mock student tests in language and mathematics. Teachers did well enough on spelling and simple grammar, with two-thirds grading at least 80% of the questions correctly. But they did much worse in other areas, averaging 44% on vocabulary and comprehension, and just 25% on composition. In mathematics, the results also were worse the more complex the task. On average, 91%

[15] Filmer D, Hasan A, Pritchett L. A Millennium Learning Goal: Measuring Real Progress in Education: Center for Global Development, 2006.

[16] Gabrysch S, Nesbitt RC, Schoeps A, Hurt L, Soremekun S, Edmond K, Manu A, Lohela TJ, Danso S, Tomlin K, Kirkwood B, and Campbell OMR. Does Facility Birth Reduce Maternal and Perinatal Mortality in Brong Ahafo, Ghana? A Secondary Analysis Using Data on 119,244 Pregnancies from Two Cluster-Randomised Controlled Trials. The Lancet Global Health 2019; 7(8): e1074-e87.

[17] Chaudhury N, Hammer J, Kremer M, Muralidharan K, Rogers FH. Missing in Action: Teacher and Health Worker Absence in Developing Countries. *Journal of Economic Perspectives* 2006; 20(1): 91-116.

[18] Bold T, Filmer D, Martin G, Molina E, Stacy B, Rockmore C, Svensson J, and Wane W. Enrollment without Learning: Teacher Effort, Knowledge, and Skill in Primary Schools in Africa. *Journal of Economic Perspectives* 2017; 31(4): 185-204.

of teachers could add double digits, but only 68% could multiply double digits. Less than one-third could understand a Venn diagram, and only 11% could interpret data on a graph.

Results of studies testing health provider knowledge are similarly sobering. The approach is similar to that used with teachers – health providers are asked to "treat" a hypothetical patient. These "vignette" exercises have been done for a variety of medical conditions including child pneumonia, diabetes and tuberculosis. A study of nine African countries painted a rather bleak picture. On the tuberculosis vignette, 83% of health providers got the correct diagnosis, but only 54% prescribed the correct treatment. On the pneumonia vignette, 70% prescribed the correct treatment, but on the diabetes vignette, only 52% did.

Having providers at their workplace and having them know their subject are necessary conditions for high-quality service delivery, but recent research shows that even this is not sufficient. This research shows that there is often a gap – sometimes a large one – between what service providers know in terms of their mastery of their subject and how well they perform on the job.

In the case of education, teacher performance has been assessed by looking at teachers' pedagogical knowledge (e.g., comprehension of factual text and formulating aims and learning outcomes), their ability to assess students (e.g., formulating questions to check understanding), and their success in applying their knowledge in the classroom (e.g., introducing and summarizing the topic of a lesson). On these criteria, primary school teachers across the same seven African countries performed poorly. They scored on average just 23% on an exercise gauging their ability to formulate aims and learning outcomes and just 23% on an exercise gauging their ability to formulate questions to check students' understanding. And when observed in their class, only 41% of teachers introduced and summarized the topic of the lesson.

In health, too, there have been studies employing the direct observation approach – observing real-life interactions between patients and health workers. But these have their drawbacks. Providers may perform differently when observed. And while in education interactions between teacher and students are limited to just a few age groups and just a few subjects, a health provider in a clinic could be dealing with any number of medical conditions. An alternative approach is to have actors pretend to be a real patient. The provider consents beforehand to participating in the study, knowing that at some stage during the study period an actor may show up pretending to be a patient, but not when. To get around the fact actors can't be subjected to invasive exams, in some studies the actor pretends to be the parent of a sick child who is at home, with, for example, diarrhea or symptoms of pneumonia.[19] Providers mostly did better in the vignettes than they did when confronted with an actor, suggesting a "know-do gap": in the case of diarrhea, 74% got the right diagnosis in the vignette but only 3% did in the real-life interaction with the actor; 3% recommended the correct treatment in the vignette but none recommended the correct treatment in the real-life interaction.

What to do to improve service delivery quality? One rather sobering finding from one health study[20] is that while providers in better-equipped facilities asked more questions and did more tests, they were <u>not</u> more likely to recommend the correct treatment. Another health study[21] found that providers with dual public-private practices performed better in their private practice than in their public practice, suggesting financial incentives may play a role – a theme explored in a separate note in this series.

The above assumes that poor service quality is indeed the reason why getting children into school does not automatically ensure learning and why getting patients in to health facilities does not automatically

[19] Mohanan M, Vera-Hernández M, Das V, Giardili S, Goldhaber-Fiebert JD, Rabin TL, Raj SS, Schwartz JI, and Seth A. The Know-Do Gap in Quality of Health Care for Childhood Diarrhea and Pneumonia in Rural India. *JAMA Pediatrics* 2015; 169(4): 349-57.

[20] Das J, Holla A, Das V, Mohanan M, Tabak D, and Chan B. In Urban and Rural India, A Standardized Patient Study Showed Low Levels of Provider Training and Huge Quality Gaps. *Health Affairs* 2012; 31(12): 2774-84.

[21] Das J, Holla A, Mohpal A, and Muralidharan K. Quality and Accountability in Health Care Delivery: Audit-Study Evidence from Primary Care in India. *American Economic Review* 2016; 106(12): 3765-99.

ensure better health. Studies support this hypothesis. One study[22] found that going from having a teacher in the bottom quality decile to one in the top is equivalent to a full additional business-as-usual year of learning for students. Another study[23] compared mortality in high-income countries and mortality in low- and middle-income countries (LMICs), and concluded that of the 8.6 million excess deaths in LMICs that were amenable to medical care, the bulk (5.0 million) were due to receipt of poor-quality care rather than non-receipt of care.

[22] Bau N, and Das J. The Misallocation of Pay and Productivity in the Public Sector: Evidence from the Labor Market for Teachers. The World Bank, Policy Research Working Paper Series: 8050; 2017.

[23] Kruk ME, Gage AD, Joseph NT, Danaei G, García-Saisó S, and Salomon JA. Mortality Due to Low-Quality Health Systems in the Universal Health Coverage Era: A Systematic Analysis of Amenable Deaths in 137 Countries. *The Lancet* 2018; 392 (10160): 2203-12.

3. How Service Providers Are Paid Matters as Much as How Much They Are Paid

Deon Filmer and Adam Wagstaff

Service providers, such as schoolteachers or health workers, must be paid. How they are paid shapes their incentives to provide high-quality services as much – if not more than – how much they are paid. Service providers around the world typically are paid in one of three ways, each of which is problematic:[24]

- **According to the specific services they provide (fee-for-service**). This approach is quite common in health. This approach incentivizes the provision of services, and if the payer can observe quality, it may also encourage the provision of quality services. But it also incentivizes the provision of unnecessary services in environments where it is hard for the payer to establish whether the marginal service is necessary. Fee-for-service also encourages providers to "upcode" – to pretend the service was more complex than it really was.

- **According to the number and characteristics of the people they serve (capitation).** A school could get a fixed amount per enrolled pupil. A primary health care provider could get a fixed amount per person on their list. These amounts could vary according to the demographics of the population served, with schools getting more generous capitation payments for older or poorer children and primary health care providers getting more generous payments for seniors and women. A hospital could get paid a specific amount for each patient with a specific diagnosis or for each patient in a specific diagnosis group. However, capitation encourages providers to list more people as being served, but disincentivizes delivering services to them – since providers get the capitation payment anyway. It also discourages providers from taking on hard-to-serve groups, e.g. very old people or students with learning difficulties, and to skimp on quality.

- **According to their own characteristics (budget-and-salary).** A doctor or a teacher could get a salary, linked perhaps to their seniority; a hospital could get a budget linked perhaps to the number of beds it has or the number of operating rooms; a school could get a budget based on the number of classrooms it has. But salaries and budgets fail to reward effort, and often, as one commentator[25] puts it, "condone on-the-job leisure".

Unsurprisingly, sticking with the same payment method and simply making it more generous is not the answer. A study of public-sector health providers in India[26] found that the size of the provider's salary made no difference to the quality of their performance. This is consistent with an experiment in Indonesia[27] where teachers' salaries were doubled with no impact on student learning.

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[24] Robinson JC. Theory and Practice in the Design of Physician Payment Incentives. *Milbank Quarterly* 2001; 79(2): 149.

[25] Das J, Holla A, Mohpal A, and Muralidharan K. Quality and Accountability in Health Care Delivery: Audit-Study Evidence from Primary Care in India. *American Economic Review* 2016; 106(12): 3765-99.

[26] Das J, Holla A, Mohpal A, and Muralidharan K. Quality and Accountability in Health Care Delivery: Audit-Study Evidence from Primary Care in India. *American Economic Review* 2016; 106(12): 3765-99.

[27] De Ree J, Muralidharan K, Pradhan M, and Rogers H. Double or Nothing? Experimental Evidence on an Unconditional Teacher Salary Increase in Indonesia. *Quarterly Journal of Economics* 2018; 133(2): 993-1039.

Some countries have decided to switch between these three approaches. During the 1990s and early 2000s, countries in Europe and Central Asia (ECA) moved from paying hospitals through budgets to either fee-for-service or some form of method based on patient characteristics. As expected, in countries in the first camp, inpatient admissions increased, while in countries in the second camp, average length-of-stay (a measure of the volume of care) fell.[28]

Reforms along these lines fail to address the key point that all three payment methods have their strengths and weaknesses. Moving from one payment method to another simply means trading one set of strengths and weaknesses for another. A more sophisticated approach has been to search for a blend of one or more of the payment methods in the hope of encouraging providers to deliver only necessary quality services. In health, getting the right formula in blended schemes has proved a challenge – in both developed and developing countries. So too has setting up the necessary additional administrative machinery, making some ask whether the extra benefits are worth the extra cost.[29]

In China, where primary health providers have traditionally been paid fee-for-service, the concern has been over-provision of care, especially of drugs and tests which were priced above cost in the government-set fee schedule.[30] Recently the country has explored alternative payment methods. In one experiment,[31] one group of health centers was left being paid fee-for-service while the other group was switched to a mix of capitated global budget and performance-related payments based on the appropriateness of drug prescribing and patient satisfaction. The blended approach led to less antibiotic use and lower patient out-of-pocket expenditures.

An increasingly common hybrid approach in budget and salary systems is to add a pay-for-performance element to the payment system. In education, schools and individual teachers might receive additional payments linked to student learning outcomes. In health, facilities and individual health workers might receive additional payments linked to the delivery of specific services (e.g. antenatal visits, the delivery of babies in a health facility, childhood immunization) or to the quality of care (e.g., a specific set of interventions being delivered, and specific checks being done during the antenatal visits).

Many of these are supported by the World Bank and many have been or are being rigorously evaluated. An ongoing Development Research Group study of the experiences to date in the health sector[32] uses meta-analysis to distill results across these evaluations. Preliminary results point to substantial heterogeneity in impacts across countries and across indicators. Emerging findings suggest relatively large and statistically significant effects of pay-for-performance on facility deliveries and on the content of antenatal care visits, but limited or negligible effects on other indicators, including the likelihood of a woman having four or more antenatal care visits, the likelihood of a baby receiving postnatal care and a child being fully immunized. In education, too, the results to date are mixed. Some studies[33,34] have found

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[28] Moreno-Serra R, and Wagstaff A. System-Wide Impacts of Hospital Payment Reforms: Evidence from Central and EasternEurope and Central Asia. *Journal of Health Economics* 2010; 29(4): 585-602.

[29] Maynard A. The Powers and Pitfalls of Payment for Performance. *Health Economics* 2012; 21(1): 3-12.

[30] Wagstaff A, Lindelow M, Wang S, and Zhang S. Reforming China's Rural Health System. Washington DC: World Bank; 2009.

[31] Yip W, Powell-Jackson T, Chen W, Hu M, Fe E, Hu M, Jian W, Lu M, Han W, and Hsiao WC. Capitation Combined With Pay-for- Performance Improves Antibiotic Prescribing Practices in Rural China. *Health Affairs* 2014; 33(3): 502-10.

[32] de Walque D, Friedman J, Neelsen S, and Wagstaff A. Supply- & Demand-Side Financial Incentives in Maternal & Child Health. A Systematic Review & (Mega) Meta-Analysis. *In progress* 2019.

[33] Cilliers J, Kasirye I, Leaver C, Serneels P, and Zeitlin A. Pay for Locally Monitored Performance? A Welfare Analysis for

Teacher Attendance in Ugandan Primary Schools. *Journal of Public Economics* 2018; 167: 69-90.

[34] Muralidharan K, and Sundararaman V. Teacher Performance Pay: Experimental Evidence from India. *Journal of Political Economy* 2011; 119(1): 39-77.

positive effects of pay-for-performance schemes on teacher behaviors and student learning, while others[35,36] have found no effects.

The health meta-analysis is exploring the causes of the heterogeneity in results, which may be due to differences in the design of the pay-for-performance scheme (e.g., the generosity of the payments relative to cost) and its implementation. Evidence from the education sector is already pointing in this direction. A recent study[37] found a pay-for-performance scheme in Tanzania's schools was more successful if combined with additional spending on school inputs.

In summary, all payment schemes shape service provider incentives, and all three basic schemes have advantages and disadvantages. Blending elements from one or more holds promise but getting the design and implementation of a blended provider payment scheme right is not straightforward.

[35] Fryer RG. Teacher Incentives and Student Achievement: Evidence from New York City Public Schools. *Journal of Labor Economics* 2013; 31(2): 373-407.

[36] Barrera-Osorio F, and Raju D. Teacher Performance Pay: Experimental Evidence from Pakistan. *Journal of Public Economics* 2017; 148: 75-91.

[37] Mbiti I, Muralidharan K, Romero M, Schipper Y, Manda C, and Rajani R. Inputs, Incentives, and Complementarities in
Education: Experimental Evidence from Tanzania. National Bureau of Economic Research, Inc, NBER Working Papers: 24876; 2018.

4. To Design Good Policies, Macro Outcomes Need to Be Understood "From the Ground Up"

Roberto Fattal, Hiau Looi Kee, and Sergio Schmukler

Traditionally, macroeconomic outcomes such as growth, economic fluctuations, and reactions to policies and shocks have been studied using aggregate data at the country level. A flurry of new research over the past decade has centered on using micro data at the product, firm, and sector level to shed new light on aggregate outcomes.

Macro insights from firm dynamics

One approach analyzes the macroeconomic implications of firm-level dynamics and the misallocation of inputs and production across firms.[38] By studying macroeconomic performance as a result of the interaction of individual firms and the surrounding business environment, we have learned how policy distortions at the firm level affect firms' behavior and lead to worse aggregate outcomes.

One example is the allocation of credit. Traditionally, the effect of financial conditions on economic growth was studied by comparing economic performance across countries with different credit market institutions. Developed financial markets foster prosperity by allocating capital efficiently across the various production possibilities in the economy. Even if the cross-country comparison could uncover a positive relation between financial development and growth, it would be silent about the mechanism through which such a positive relation works.

The new firm-level approach to the question proves to be very revealing. Recent research shows that financial markets benefit growth by directly providing credit to firms with good opportunities.[39] Although the overall functioning of financial markets is important, the allocation of credit across firms matters for economy-wide growth. Small firms as well as young that create novel products and technologies but that lack the financing to scale up tend to be harmed the most by misallocation of credit. In countries where credit is expensive and hard to access, firms typically are small, leading to a misallocation of credit. Large firms that are relatively less productive end up producing a significant share of the output, while smaller more productive firms are unable to grow and to contribute as much as they could. Credit frictions tend to discourage firm entry and creative destruction, leading to poor economic performance.[40]

A policy implication is that just developing financial markets might not be enough to generate growth – ensuring that credit flows to the firms that have growth potential is as important.[41] Beyond financial markets, public policy should take into account how different economic agents respond differently to policies. The regulation of entry, for instance, should consider the incentives for low-scale

[38] Hsieh, C.T., Klenow, P., 2009, "Misallocation and Manufacturing TFP in China and India." Quarterly Journal of Economics, 4: 1403-1448.

[39] Buera, F., Kaboski, J., Shin, Y., 2011, "Finance and Development: A Tale of Two Sectors." American Economic Review, 101(5): 1964-2002.

[40] Midrigan V., Xu, D., 2014, "Finance and Misallocation: Evidence from Plant-Level Data," American Economic Review, 104(2): 422-58

[41] Bruhn, M., McKenzie, D., 2014, "Entry Regulation and Formalization of Microenterprises in Developing Countries", World Bank Research Observer, 29 (2): 186-201, 2014.
Didier, T., Levine, R., Llovet, R., Schmukler, S., 2014, "Capital Market Financing and Firm Growth," Mimeo, World Bank.

entrepreneurship to become informal.[42] Similarly, tax policy should anticipate distortions to firm growth that happen when firms of different sizes face differential enforcement.[43] These are examples that illustrate the breadth of the importance of understanding the aggregate impact of policies at a more disaggregated level.

Micro evidence on the aggregate welfare effects of trade

Micro-level evidence yields important new insights on aggregate outcomes in the field of international trade as well. Influential recent research shows that the aggregate welfare gains from trade may not be as big as previously thought, particularly for large countries with a smaller share of trade in GDP.[44] However, subsequent research based on micro data on products, firms, and industries shows that there are subtle but important nuances in the calculations of aggregate welfare gains from trade that could depend on sectoral linkages and the structure of the tariffs. If the products of one sector are used as inputs in other sectors, then the aggregate welfare gains from trade could be higher as expansion in one sector indirectly benefits the other sectors through these linkages.[45] On the other hand, for those countries where higher tariffs are imposed on imported products that respond less to tariff changes, the aggregate welfare gains from trade could be less.[46] This could be because firms are locked into fixed import patterns in global value chains and may not switch inputs in response to tariff changes in the short run. All these nuances are missing when we only focus on aggregate statistics such as average tariff rates.

The bottom-up approach yields insights on how trade affects workers, firms, and localities differently. For example, low-cost imports from China increase unemployment, lower labor force participation, and reduce wages in some local labor markets in the United States, contributing to one-quarter of the contemporaneous aggregate decline in U.S. manufacturing employment, even though the aggregate welfare gains from trade with China are positive.[47]

The firm-level approach also reveals that there are significant downward biases in aggregate measures of domestic value added embodied in exports. This is because aggregate statistics are mainly constructed based on data from large firms, which tend to use more imported material inputs and therefore produce less domestic value added. The new firm-level approach aggregates firms' domestic value added from the ground up based on customs transaction data for all firms, not just large ones. Based on this firm-level

[42] Bruhn, M., McKenzie, D., 2014, "Entry Regulation and Formalization of Microenterprises in Developing Countries", World Bank Research Observer, 29(2): 186-201, 2014.
[43] Bachas, P., Fattal-Jaef, R. N., Jensen, A., 2019, "Size-Dependent Tax Enforcement and Compliance: Global Evidence and Aggregate Implications." *Journal of Development Economics, 140.*
[44] Arkolaskis, C., Arnaud C., Rodriguez-Clare, A., 2012, "New Trade Models, Same Old Gains?" American Economic Review 102(1): 94-130.
[45] Caliendo, L., and Parro, F. 2015. "Estimates of the Trade and Welfare Effects of NAFTA." The Review of Economic Studies 82 (1), 1–44.
[46] Kee, H.L., and Nicita, A. 2017. "Gains from Trade and Heterogeneous Trade Elasticities: Assessing the Short Term Impact of Brexit on the United Kingdom's Export of Goods," World Bank Policy Research Working Paper8195.
[47] Autor, D., Dorn, D., and Hanson, G. 2014, "The China Syndrome: Local Labor Market Effects of Import Competition in the United States." American Economic Review.

evidence, new research shows that the domestic value added of China's exports is higher than previously thought, and rising over time due to trade and FDI liberalization.[48]

One important policy implication from the micro approach to trade is to have targeted redistribution policies in place when countries experience trade shocks, given that trade impacts are often very localized. For example, new World Bank work finds that globalization increases income inequality significantly across locations rather than across industries. Therefore, labor market policies focusing on industries, such as U.S. "Trade Adjustment Assistance", can be less effective than location-based or active labor market policies, such as Denmark's "Flexicurity."[49]

The World Bank has already taken steps in the direction of helping policy makers design policy based on insights from this ground-up approach. It has been doing so by developing statistical tools that enable countries to track the heterogeneous effects of existing policies, such as the Exporter Dynamics Database and the Enterprise Surveys. Moreover, it has increasingly showcased the importance of a firm-level and sectoral-level approach to macroeconomic variables in its various analytical and research products, such as the latest World Development Report on global value chains.

[48] Kee, H., Heiwai T, 2016, "Domestic Value Added in Exports: Theory and Firm Evidence from China." American Economic Review.

[49] Artuc, E., Lee, E., and Bastos, P., 2019, "Trade, Jobs, and Worker Welfare," Mimeo, World Bank.

5. Designing Good Policies Is One Thing, Implementing Them Is Another

Norman Loayza and Michael Woolcock

Forging and adopting technically sound policies is necessary for successful development, but it is not enough: any policy is only as good as its implementation. Policy implementation can fail for two broad reasons: (1) the absence of complementary measures needed to make the chosen policy effective; and (2) the inadequate capability of prevailing institutions and administrative systems.[50]

The development community has long championed individual policies and programs as the solution to development problems: building schools and making schooling mandatory to improve education, lowering barriers to entry for enterprises to reduce informality, increasing the number of policemen to fight crime, pegging the exchange rate to lower inflation, and so on. But without a supporting institutional framework and capable public sector organizations to implement them, even technically sound policies and programs are likely to fail. This realization can explain the wide variety of outcomes of specific interventions and policies, as well as broad developmental approaches. It can also explain the frustrating performance of foreign aid in driving development outcomes – providing money to countries without competent institutions and accountable leaders may only result in waste and corruption.[51]

The need for complementary policies and institutions

Complementary policies can make reforms successful.[52] Children do not learn if they are hungry, so educational and nutritional policies should go hand in hand.[53] Parents do not vaccinate their children if they are struggling to survive, so immunization campaigns should target the poor and provide pecuniary benefits to families that participate.[54] Farmers do not adopt new crops and technologies that are potentially more profitable but also riskier, so introducing new farming practices should be accompanied by improved insurance mechanisms and access to markets.[55] This principle of complementarity also applies to macroeconomic policies. Trade openness cannot promote

[50] See Matt Andrews, Lant Pritchett, and Michael Woolcock (2017). *Building State Capability: Evidence, Analysis, Action.* New York: Oxford University Press.
[51] See David Dollar and Lant Pritchett (1998). *Assessing Aid: What Works, What Doesn't, and Why.* Washington, DC: World Bank). For a more recent work, see Dan Honig (2018). *Navigation by Judgment: Why and When Top Down Administration of Foreign Aid Doesn't Work.* New York: Oxford University Press.
[52] See Raphael Bergoeing, Norman Loayza, and Facundo Piguillem (2016). "The Whole is Greater than the Sum of Its Parts: Complementary Reforms to Address Microeconomic Distortions." *World Bank Economic Review* 30 (2): 268–305.
[53] See Abhijit V. Banerjee and Esther Duflo (2007). "The Economic Lives of the Poor." *Journal of Economic Perspectives*
21 (1): 141–68.
[54] See, for instance, Abhijit Banerjee, Esther Duflo, Rachel Glennerster, and Dhruva Kothari (2010). "Improving Immunisation Coverage in Rural India: Clustered Randomised Controlled Evaluation of Immunisation Campaigns with and without Incentives." *British Medical Journal* 340 (May 17): c2220.
[55] See, for example, Dean Karlan, Robert Osei, Isaac Osei-Akoto, and Christopher Udry (2014). "Agricultural Decisions after Relaxing Credit and Risk Constraints." *Quarterly Journal of Economics* 129 (2): 597–652.

competitiveness if domestic industries are burdened with excessive regulations, so international openness should be accompanied by streamlining regulations and improving public infrastructure.[56]

Beyond a mix of policies, complementary institutions are also needed for successful reforms.[57] Consider, for instance, the "Washington Consensus," which in the early 1990s encouraged a familiar combination of macroeconomic stabilization, trade openness, and market liberalization policies to promote economic growth and poverty alleviation.[58] The Washington Consensus policies by themselves make sense and are potentially useful, but this potential can only be realized when the policies are accompanied by complementary institutions and organizations that make them synergistic and sustainable:[59] a regulatory framework that promotes competition and market flexibility; an autonomous central bank that directs monetary policy to promote price and financial stability; and a government that manages resources responsibly to provide public services, social protection, and infrastructure. Failure to improve the institutional environment can lead to disappointing economic and social outcomes and even the reversal of well-intended policy reforms. Arguably, this is what happened in Argentina over the last two decades, as the country searched for macroeconomic stability and growth without the ability to reform the institutions that controlled fiscal resources at the national and regional levels.[60] From specific sectoral interventions to large macroeconomic reforms, a conducive institutional environment is critical to their success.

The critical importance of strong implementation capacity

No less important is the capacity of the public sector to implement policies and manage institutions. Inadequate public sector capacity undermines policy effectiveness. This gap is often evident in service-delivery sectors that require many people to interact over long periods of time and to exercise considerable discretion – and who are often under pressure *not* to do their job (such as tax collectors and law enforcement officers).[61] For instance, to "produce" a young adult able to contribute to the modern economy takes at least 12 years of formal education, which equates to roughly 12,000 hours of classroom instruction. Yet many countries struggle to implement even the most rudimentary aspect of the education challenge: ensuring that their teachers actually show up for work, let alone deliver a thousand hours of classroom time each year. More broadly, most countries have enacted sound policies pertaining to the provision of universal primary education, but many of them lack robust institutional

[56] Roberto Chang, Linda Kaltani, and Norman Loayza (2009). "Openness Can Be Good for Growth: The Role of Policy Complementarities." *Journal of Development Economics* 90 (1): 33–49.
[57] The scholarly work on the fundamental role of institutions is vast, boosted by the seminal paper of Daron Acemoglu, Simon Johnson, and James Robinson (2001). "The Colonial Origins of Comparative Development: An Empirical Investigation." *American Economic Review* 91 (5): 1369–1401.
[58] The "Washington Consensus," as a set of policies, was first codified in John Williamson, ed. (1990). *Latin American Adjustment: How Much Has It Happened?* Washington, DC: Institute for International Economics.
[59] This is one of the main conclusions of a self-critical 2005 report by the World Bank: *Economic Growth in the 1990s: Learning from a Decade of Reform.* Washington, DC: World Bank. See also Shahid Burki and Guillermo Perry (1998). *Beyond the Washington Consensus: Institutions Matter*. Washington DC: World Bank.
[60] Federico Sturzenegger (2019). "Macri's Macro: The Meandering Road to Stability and Growth." *Brookings Papers on Economic Activity*, Fall, Conference draft.
[61] Michael Woolcock (2017). "Enhancing the Quality of Public Service Delivery: Insights from Recent Research." *Research & Policy Research Brief* No. 8, World Bank Group, Washington, DC.

support and implementation capability to carry out those policies.[62] This results in enormous variation in performance: students in Vietnam perform as well as those in many OECD countries, while students in other middle-income countries can attend school for a decade yet still struggle to read a newspaper headline or do double-digit subtraction.

Much the same can be said of anti-corruption campaigns: countries can hire experts to write laws denouncing the use of public resources for private gain, but in practice such policies only work to the extent that front-line staff, their managers, and the whole public sector hierarchy are bound by strong standards, norms, and controls and are provided with incentives that are effectively enforced. Experimental and other research has carefully documented the ways in which organizational norms and incentives shape employee performance. In India, the same doctor working in her private practice after hours is vastly more diligent than when working in the public sector;[63] in Ghana, certain units within national ministries have created work environments enabling them to perform at considerably higher levels than others.[64]

The World Bank is taking these concerns more seriously, even as it has struggled, over multiple decades, to become a true learning organization.[65] The expansion of the Bank's sectoral agenda (into wide-ranging areas such as governance, social development, gender equality, and climate change) and the global imperative to become more active in fragile states have generated a corresponding demand to deploy an *array* of implementation strategies. Meeting the Bank's corporate objectives and, more importantly, helping our clients meet theirs, will entail not only adopting better policies but also giving more focused attention to building complementary support systems and organizations with strong implementation capacity.

[62] This is amply demonstrated in the World Bank's 2018 *World Development Report*, *Learning to Realize Education´s Promise*.
[63] Jishnu Das and Jeffrey Hammer (2005). "Which Doctor? Combining Vignettes and Item Response to Measure Clinical Competence." *Journal of Development Economics* 78 (2): 348–83.
[64] Erin McDonnell (2017). "Patchwork Leviathan: How Pockets of Bureaucratic Governance Flourish Within Institutionally Diverse Developing States." *American Sociological Review* 82 (3, June): 476–510.
[65] Independent Evaluation Group, World Bank (2014). "Learning and Results in World Bank Operations: How the Bank Learns." Washington, DC: World Bank.

6. Policy Makers and Aid Donors Need to Take the Politics of Development Seriously

Vijayendra Rao and Michael Woolcock

Politics shape development outcomes. The World Bank, in recent World Development and Policy Research Reports[66], encourages all development actors to focus on the political incentives of those in positions of power, which often conflict with providing public goods and upholding civic norms. Analytical approaches such as 'Thinking and Working Politically'[67] offer practical tools for assessing how different forms and sources of power influence institutional structures and shape whose voices, interests, priorities and aspirations prevail.

Taking the politics of development seriously also means taking *accountability mechanisms* and the *legitimacy of decision-making processes* seriously. Politics is not just something that transpires in the proverbial 'corridors of power' in courts, parliaments and board rooms, but in everyday social interactions. This helps to understand how local elites are simultaneously enabled and constrained in their leadership roles, how policy problems and their corresponding solutions are selected, and how success or failure is determined.

Accountability: Citizens and Communities Matter

There is an increasing realization that better development outcomes are delivered within institutional systems where citizens and communities matter. Accountability is not just "upward" (i.e., where bureaucrats are largely concerned about what their superiors think) but also "downward" (i.e., where elected officials and government agents are held accountable by citizens for the delivery of public services).[68] Elections are one mechanism of accountability, but they are not enough because they are held infrequently and can be captured by elites. Elections need to be complemented by citizen bodies – institutions for collective and deliberative decision-making where the voices of citizens can be heard and where they are able to monitor the performance of governments.

This is particularly true for decisions made at the local level: in neighborhoods, villages and cities, where policy actions have a direct bearing on people's lives. Building participatory institutions is complex and requires a different approach to development – one that is more long-term, sensitive to unpredictable changes, and adaptable via systematic learning-by-doing. Building effective community and citizen-based cultures of governance can, over the long term, help societies more effectively address problems of public service delivery, poverty, inequality, risk, and the challenges of a changing climate in ways that are perceived as legitimate, thereby reflecting local priorities and aspirations.[69]

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[66] See World Bank (2016) *World Development Report 2017: Governance and the Law* (Washington, DC: World Bank), and World Bank (2016) *Making Politics Work for Development: A Policy Research Report* (Washington, DC: World Bank).

[67] Various documents associated with this approach are available at https://twpcommunity.org/

[68] Jonathan Fox (2015) 'Social Accountability: What Does the Evidence Really Say?' *World Development* 72(8): 346-361

[69] See https://participedia.net/ for examples, descriptions and research summaries on such citizen-based institutions from around the world.

An important example of this is participatory budgeting, where citizens jointly work with local officials to formulate budget priorities.[70] Evidence from Brazil shows that with participatory budgeting decisions tend to be better matched with citizen preferences and result in allocations that are more pro-poor.[71] Another is the *Gram Panchayat* system in India, which covers two million villages across the country and combines regular elections for local elected officials with *Gram Sabhas* – citizen forums held four times a year, which are tasked with allocating resources for public goods and vetting lists of people eligible for public benefits. A recent review of evidence shows that holding a *Gram Sabha* was correlated with lower corruption, that views expressed in them were broadly representative, and that it made citizen participation more equitable.[72]

Legitimacy of Decision-Making Processes

How difficult and contentious social outcomes (such as elections, judicial rulings, or even the extent of inequality) are reached has enormous bearing on their legitimacy and the extent to which they are accepted, especially by those who would have strongly preferred a different outcome.[73] Political parties that lose close elections can accept this outcome if they believe that votes were cast and tallied impartially; citizens tolerate higher levels of inequality to the extent the wealthy are perceived as having gained their riches by diligence, innovation and prudence (not theft, deception or corruption). Process legitimacy issues are underappreciated by development agencies and economics generally – but their importance is steadily gaining traction.

Process legitimacy matters for the World Bank, because how it promotes difficult change as part of a development strategy will play a large role in shaping its legitimacy and thus the willingness of citizens to embrace the accompanying uncertain social challenges. This matters in areas such as building the rule of law, modernizing the public sector, diversifying employment, improving regulation, and developing tax capacity. Securing and sustaining legitimacy is likely to be deeply context-specific, varying considerably between and within countries. Even professional 'best practices' (fiscal rules, meritocratic hiring) and scientifically verified 'solutions' (immunizations, fertilizers) must earn local legitimacy and credibility before they will be embraced, at scale. Creating public spaces within which such practices and solutions can be identified, adapted to the local context, and/or be improved is a key way in which legitimacy is acquired.

Finally, earning legitimacy requires methodologies suited to those who are most affected by a given intervention. People who are illiterate and/or innumerate, for example, are unlikely to convey their needs, experiences, concerns and aspirations regarding a particular development initiative using the

[70] This emerged in Porto Alegre in Brazil and has since been institutionalized in several different countries. See Gianpaolo Baiocchi, Marcelo Kunrath Silva, and Patrick Heller (2011) *Bootstrapping Democracy: Transforming Local Governance and Civil Society in Brazil* (Palo Alto, CA: Stanford University Press).

[71] Sónia Gonçalves (2014) 'The Effects of Participatory Budgeting on Municipal Expenditures and Infant Mortality in Brazil," *World Development* 53(1): 94-110.

[72] Ramya Parthasarathy and Vijayendra Rao (2018) "Deliberative Democracy in India," in Andre Bächtiger, John S. Dryzek, Jane Mansbridge, and Mark Warren (editors) *Oxford Handbook of Deliberative Democracy* (New York: Oxford University Press)

[73] Vijayendra Rao (2019) "Process-Policy and Outcome-Policy: Rethinking How to Address Poverty and Inequality," *Daedalus* 148(3): 181-190

formal discourse, administrative categories and empirical metrics familiar to researchers and project managers. Securing legitimacy requires the analytical foundations of pro-poor projects to make sense to those whose lives and livelihoods will be most affected by them. Such projects are most likely to emerge from analytical foundations that integrate formal statistical data with qualitative approaches grounded in the distinctive realities of local communities. In work in India with India's $5 billion portfolio of women's self-help group projects, such an approach resulted in more gender-equal participation, better project implementation, better access to credit and improved climate resilience.[74]

[74] See various papers, and other material in the website of the World Bank's Social Observatory http://socialobservatory.worldbank.org/, and Yuen Yuen Ang (2019) *Integrating Big Data and Thick Data to Transform Public Service Delivery* (IBM Center for Business and Government).

7. Implementing Successful Small Interventions at a Large Scale Is Hard

Robert Cull and David McKenzie

The last decade has seen a large increase in the number of policy evaluations, with many pilot programs tested rigorously for their impacts. This is a boon to governments looking to practice evidence-based policy making. However, even when pilots and local development interventions have proven very successful, they have often been difficult to scale up in a cost-effective way to achieve development impact on a large scale. Conversely, several development interventions that have managed to achieve impressive scales at relatively low costs are increasingly under scrutiny for their lack of transformative impacts on the lives of the poor. This raises key questions about why promising programs are so hard to scale, and what can be done to enhance the impacts of large-scale programs.

Taking successful pilots to scale is challenging

A recent meta-analysis of more than 600 research papers covering 20 different types of development interventions found that the larger the study, the smaller the size of the effect, and that programs implemented by governments tend to have smaller effect sizes than academic or NGO-implemented programs.[75] Moreover, several recent experiences provide stark examples of successful pilot programs not having the intended impacts when taken to scale:

- A first example comes from efforts to reform education in Kenyan primary schools by changing the way teachers are hired.[76] New teachers offered a fixed-term contract by an international NGO significantly raised test scores. However, when the Kenyan government offered identical contracts, this produced zero impact.
- A second example is seen in efforts to help low-income agricultural workers in rural Bangladesh to be less vulnerable to seasonal food insecurity during the agricultural lean season. Researchers tested the impact of offering small grants and interest-free loans to enable these workers to temporarily migrate to cities in search of work.[77] This was incredibly successful in increasing internal migration flows, delivering higher income and consumption to program participants. The evidence was so striking that Givewell, a charity evaluator, recommended this program as one of the best values for money approaches of helping the poor, and an NGO scaled up the program dramatically to reach over 150,000 households in 2017. However, evaluations of this scaled-up program found it was unsuccessful in increasing migration rates, and the program was shut down.

[75] Vivalt, Eva (forthcoming). "How Much Can We Generalize from Impact Evaluations?", *Journal of the European Economics Association*.

[76] Bold, Tessa, with Mwangi Kimenyi, Germano Mwabu, Alice Ng'ang'a and Justin Sandefur. "Experimental Evidence on Scaling Up Education Reforms in Kenya", *Journal of Public Economics*, December 2018.

[77] G. Bryan, S. Chowdhury and A. M. Mobarak, "Under-investment in a Profitable Technology: The Case of Seasonal Migration in Bangladesh," *Econometrica*, 82(5): 1671-1748. September 2014.

Why is scaling up programs so challenging?

There are a variety of reasons why program impacts may become smaller as programs are taken to scale. These can include programs having different effects on different types of people, implementation and political economy issues, and cost challenges.

- **Small-scale pilots may concentrate efforts on those who benefit most**. It is natural for those planning a pilot to target the most promising households or locations first, where they think the program will have most effect. Any program expansion is then likely to involve relaxing eligibility criteria to include those who may not have such large benefits from the program. This is seen clearly in a study of electricity conservation programs carried out in the United States.[78] The power company began this program by targeting locations it thought would benefit most from the program, and subsequent expansion to new areas had much smaller effects. This was also one of the reasons behind less impact in the Bangladesh migration example, since scaling up the program meant relaxing eligibility requirements and offering loans to many households for whom lack of credit may not have been the binding constraint.
- **Implementation and political economy issues can arise as programs grow.** Small-scale pilots are often closely monitored and implemented with a degree of oversight that becomes challenging to carry out at large scales. This is particularly the case once the government becomes involved in implementation, where a combination of low state capacity, poor bureaucratic management, and capture by vested interests can seriously degrade the quality of the program offered. This was a key feature for the lack of success of government implementation of the Kenyan school reform, as resistance from teacher unions helped prevent the new contracts from working as intended.
- **General equilibrium effects can further reduce some impacts.** Pilot programs to train a small number of workers may be successful in helping them find new jobs, but when large numbers are trained, they may end up competing with one another for a limited set of jobs and the impact on employment could be much lower.
- **Cost issues can make scaling prohibitive.** Programs that have large and promising effects when delivered to small numbers of households or firms are often very intensive and expensive, making them challenging to scale up from a fiscal standpoint.

What can be done to enhance the impacts of programs at scale?

It is not simply enough to see which programs are successful in reaching large numbers of people in a cost-effective way. Microfinance is a good example of an institution that has managed to do this but has come under increasing scrutiny for not delivering the transformative development benefits that its proponents promised.[79] Instead, efforts to scale up programs should:

[78] Allcott, Hunt "Site Selection Bias in Program Evaluation", Quarterly Journal of Economics 130 (3, August 2015): 1117-1165.

[79] Admittedly, a key part of the problem may have been overly optimistic expectations for microcredit among some proponents. Its failure to lift recipients out of poverty thus far does not imply that microcredit is not a useful financial tool for many poor households. See Cull, Robert, Asli Demirguc-Kunt, and Jonathan Morduch. "The Microfinance Business Model: Enduring Subsidy and Modest Profit," *World Bank Economic Review*, 32 (2): 221-244. June 2018.

- **Pay more attention to the quality of the bureaucracy and to improving management within government.** The World Bank's Bureaucracy Lab[80] has been set up to facilitate this.
- **Experiment with using technological solutions to deliver standardized products at scale**. New technologies may enable replicable and scalable ways of maintaining quality while reaching large numbers of people. For example, a World Bank study with small firms in Togo found personal initiative training led to large increases in business profits.[81] However, delivering this in person was expensive and relied heavily on quality trainers. An ongoing study in Ecuador is testing the promise of online training to deliver standardized content to over 20,000 students.
- **Continue to evaluate at scale.** The above lessons illustrate the importance of testing whether programs work as intended as they scale, and of the number of areas where further experimentation and learning are needed.
- **Do not stop trying to improve**. The basic microfinance model of group loans to women with immediate and regular repayment has not led to large reductions in poverty or growth in small businesses. But recent research has suggested that modifications to this basic model, such as introducing more flexibility in the repayment structure[82], can greatly enhance the effectiveness. This highlights the need for continued innovation, even when a program has reached millions of people.

[80] https://www.worldbank.org/en/research/dime/brief/Bureaucracy-Lab.

[81] Campos, Francisco, Michael Frese, Markus Goldstein, Leonardo Iacovone, Hillary Johnson, David McKenzie, and Mona Mensmann. "Teaching Personal Initiative Beats Traditional Training in Boosting Small Business in West Africa", *Science, v*ol. 357, issue 6357: pp. 1287-90, 22 September 2017.

[82] Field, E., R. Pande, J. Papp, and N. Rigol (2013). Does the Classic Microfinance Model Discourage Entrepreneurship among the Poor? Experimental Evidence from India. *American Economic Review 103(6): 2196–2226*.

8. Basing Policy Decisions on Rigorous Causal Evidence

Xavier Giné and Hanan Jacoby

To inform policy decisions, policymakers need evidence that answers questions about causality such as "*how does an SME credit program affect business growth?*" This amounts to asking, "*how would SMEs that participated in the program have fared in the absence of such a program and how would SMEs that did not participate have fared had they participated?*" Answering such questions is hard. Simply comparing the same firm's performance before and after participation in the program will not give a reliable estimate of the program's impact, since other factors that affect outcomes may have changed since the program was introduced. Identifying the program's impact is complicated further if the program is voluntary, and firms that choose to participate are different from those that do not. Recovering the average impact of the program requires a comparison of firms that participated in the program to an otherwise identical group of firms that did not participate.

The recent Nobel Prize awarded to Abhijit Banerjee, Esther Duflo and Michael Kremer cited their pioneering work in adapting randomized controlled trials (or RCTs) to answer these types of development policy questions. The key idea behind an RCT is that the group that receives the program, and the status quo or "control" group are chosen by random lottery. Since these groups are identical on average, we can compare outcomes in both groups over time to credibly estimate the impact of the program.

Perhaps more than introducing RCTs in development economics, however, the Nobel committee recognized the efforts of these three prominent scholars in building a consensus that policy decisions must be informed by rigorous evidence. In the words of Michael Kremer, "*a new medication goes through the rigor of an RCT even when it only affects a few thousand people; so, it's crazy that we spend billions of dollars on policies and programs affecting hundreds of millions of people with nothing close to the same level of evidence on effectiveness or lack thereof*."

RCT evaluations of educational policies have shown that adding an extra teacher to a school may not have nearly as much impact on learning as matching instruction to the learning levels of children.[83] RCTs have shown that a school deworming program greatly increases school participation and improves long-term outcomes at very low cost.[84] Together, these RCTs show that an extra year of school attendance "costs" much less if policy makers focus on deworming kids instead of providing additional teachers.

While RCTs can establish what works in a particular setting, they often cannot say much about *why* it works or *whether* it could work elsewhere. In response, a new generation of impact evaluations integrate their empirical design with theoretical or "structural" modeling, with three main benefits:

- **It allows researchers to quantitatively assess the mechanisms underlying policy impacts.** This often helps to understand why interventions did not work as intended or why their effects differed across certain groups of beneficiaries. For example, an RCT of fertilizer subsidies in

[83] Duflo, E., P. Dupas, and M. Kremer, 2015. "School Governance, Teacher Incentives and Pupil-Teacher Ratios: Experimental Evidence from Kenyan Primary Schools." *Journal of Public Economics* 123: 92-110.

[84] Miguel, E. and M. Kremer, 2004. "Worms: Identifying Impacts on Education and Health in the Presence of Treatment Externalities," *Econometrica* 72 (1):159-217; Baird, S., J.H. Hicks, M. Kremer and E. Miguel, 2016. "Worms at Work: Long-Run Impacts of a Child Health investment." *Quarterly Journal of Economics* 131 (4): 1637-1680.

Kenya[85] considers a behavioral economics model in which some farmers are patient and others procrastinate, to rationalize low investment in fertilizer in the face of high returns to its use. A study of microfinance in Thailand[86] uses a structural model of entrepreneurship to explain why credit provision can have highly heterogenous impacts on subsequent investment. A later RCT of a microfinance program in India confirms precisely this pattern of response across beneficiaries.[87]

- **Structural modeling also enables researchers to predict the impact of hypothetical policies that have yet to be implemented.** A study[88] of Mexico's celebrated PROGRESA conditional cash transfer program uses a dynamic decision-making model to show that an alternative subsidy scheme could generate greater schooling impact at similar cost to the existing program. In the Thailand microfinance study, a counterfactual policy of providing credit explicitly tied to investment is found to substantially outperform the actual policy of unconditional credit provision.

- **Finally, a tight link to theory can allow researchers to go beyond cost-benefit analysis and make quantitative welfare statements, identifying winners and losers from a policy (or a range of alternative policies) and the magnitudes of these gains or losses.** In the Kenya study, the authors use the structural model to show that small and time-limited fertilizer subsidies can lead to higher social welfare compared to heavy subsidies or no subsidies at all. The Thai study shows that large-scale credit provision is not a cost-effective policy on average; although some households value the added liquidity substantially more than it costs to provide, many more value it very little.

The World Bank, as well as many governments and large NGOs, now insist on evaluations – often in the form of RCTs – wherever feasible. Many World Bank researchers regularly use these methods and a specialized unit named DIME was set up to facilitate impact evaluations within World Bank projects. However, not all development policies or programs can be evaluated with RCTs. For example, policies that affect the whole of the economy or an entire market, like a minimum wage regulation, are not amenable to RCTs. To identify causal effects of market-level policies, researchers rely on non-experimental methods such as difference-in-differences – e.g., comparing employment changes in border-counties across lines of U.S. states with and without minimum wage hikes – and regression-discontinuity – e.g., comparing employment rates among individuals just below the age threshold to qualify for the minimum wage in Denmark to those just above it.[89]

In the developing country context, a difference-in-differences strategy was used to study the labor market consequences of a massive school construction program in Indonesia by comparing cohorts that would

[85] Duflo, E., M. Kremer, and J. Robinson. 2011. "Nudging Farmers to Use Fertilizer: Theory and Experimental Evidence from Kenya." *American Economic Review*, 101 (6):2350-90.

[86] Kaboski, J., and R. Townsend, 2011. "A Structural Evaluation of a Large-Scale Quasi-Experimental Microfinance Initiative." *Econometrica*, 79: 1357-1406.

[87] Banerjee, A., E. Duflo, R. Glennerster, and C. Kinnan. 2015. "The Miracle of Microfinance? Evidence from a Randomized Evaluation." *American Economic Journal: Applied Economics,* 7 (1): 22-53.

[88] Todd, P., and K. Wolpin. 2006. "Assessing the Impact of a School Subsidy Program in Mexico: Using a Social Experiment to Validate a Dynamic Behavioral Model of Child Schooling and Fertility." *American Economic Review*, 96 (5): 1384-1417.

[89] Card, D., and A. Krueger, 1994. "Minimum Wages and Employment: A Case Study of the Fast-Food Industry in New Jersey and Pennsylvania," American Economic Review 84(4): 772-793 and Kreiner, C., D. Reck, and P. Skov. Forthcoming. "Do Lower Minimum Wages for Young Workers Raise Their Employment? Evidence from a Danish Discontinuity" *Review of Economics and Statistics*.

have had access to the new schools with those that would have graduated by the time of the school construction.[90] A regression discontinuity design was used to estimate the impact of India's huge road-building program targeted to smaller villages by comparing outcomes in villages just below the population cutoff to those just above it.[91]

In conclusion, in recent decades development economists have honed several empirical tools that demonstrate both the feasibility and importance of providing rigorous analysis to support evidence-based policy making.

[90] Duflo, E. 2001. "Schooling and Labor Market Consequences of School Construction in Indonesia: Evidence from an Unusual Policy Experiment." *American Economic Review*, 91 (4): 795-813.

[91] Asher, S., and P. Novosad. Forthcoming. "Rural Roads and Local Economic Development." *American Economic Review*.

9. New Data for Development Policy

Robert Cull, Dean Jolliffe, Vijayendra Rao

Until recently, most of development economics research relied on traditional data types such as household and firm surveys and national accounts. Governments (or agents authorized by governments) have typically been central to the data collection efforts and data typically have been collected for specific purposes, often to foster development. For example, the earliest social surveys were undertaken in England by Charles Booth and Seebohm Rowntree in the 1890s to measure poverty, to describe the deplorable living conditions of the poor, and to bring about social policy reform.

Traditional data methods require strong statistical capacity. Trained staff, budgetary autonomy for agencies that collect data, adequate installations, connected databases, and international partnerships are important factors in shaping successful national data systems.[92] These resources are often scarce in low-income countries,[93] leaving them least equipped to collect the data necessary to assess and understand the scope and nature of development problems and make inroads to solving them. Enhancing the statistical capacity of client countries therefore has, and will continue to be, a point of emphasis for the World Bank Group.

Moving beyond traditional data

At the same time, traditional data collection methods can be relatively costly.[94] Surveys are therefore performed infrequently,[95] and they lack the granularity necessary to make meaningful inferences about sub-populations of interest. In contrast, so-called "digital data" from mobile phones, satellites, and other sources can be collected cost-effectively, with high frequency, and at fine levels of granularity. Digital data therefore may offer new insights for understanding and resolving some development challenges. Recent examples from empirical research include:

- **Measuring poverty, agricultural productivity, and malnutrition.** Influential recent work has used satellite imagery of nighttime lighting to measure poverty by using it as a proxy for wealth.[96] In Rwanda, researchers have mapped personal data from mobile networks to individual phone subscriber wealth. They applied their model to predict wealth throughout the country, showing

[92] World Bank. 2018. *Data for Development: An Evaluation of World Bank Support for Data and Statistical Capacity.* Independent Evaluation Group, Washington, DC: World Bank.
[93] Cameron, Grant J., Hai-Anh H. Dang, Mustafa Dinc, James Foster, and Michael M. Lokshin. 2019. "Measuring the Statistical Capacity of Nations." World Bank Policy Research Working Paper 8693.
[94] Kilic, Talip, Umar Serajuddin, Hiroki Uematsu, and Nobuo Yoshida. 2017. "Costing Household Surveys for Monitoring Progress toward Ending Extreme Poverty and Boosting Shared Prosperity." WPS7951. The World Bank. http://documents.worldbank.org/curated/en/260501485264312208/Costing-household-surveys-for-monitoring-progress-toward-ending-extreme-poverty-and-boosting-shared-prosperity.
[95] Serajuddin, Umar, Hiroki Uematsu, Christina Wieser, Nobuo Yoshida, and Andrew L. Dabalen. 2015. "Data Deprivation : Another Deprivation to End." WPS7252. The World Bank. http://documents.worldbank.org/curated/en/700611468172787967/Data-deprivation-another-deprivation-to-end
[96] Neal Jean et al. (2016), "Combining Satellite Imagery and Machine Learning to Predict Poverty," *Science* 353 (6301): 790-794.

that the predictions match well with those from costlier traditional surveys of the population.[97] Similar approaches have been used to produce granular maps of crop yields and malnutrition.[98]

- **Improved targeting of public health interventions and natural disaster relief.** Understanding who is most affected by natural disasters and predicting relocation patterns is key to effective humanitarian relief operations, public health interventions, and long-term reconstruction efforts. Mobile phone data have been used to reveal who is most affected by natural disasters,[99] where people relocate in response to a disaster,[100] and the implications of relocation for the spread of disease.[101]
- **Natural Language Processing methods: text as data.** Traditional qualitative surveys require in-depth analysis of interviews coupled with participant observation in small groups. These have recently been supplemented with the analysis of narratives from much larger samples by applying Natural Language Processing methods to existing texts. Such methods have been used to analyze Wikipedia pages to predict levels of economic development[102], and to study discourse within village meetings in rural India.[103]

Challenges in harnessing digital data for development

Governments have been at the center of traditional data collection efforts. In contrast, digital data is typically collected by firms, which focus on its commercial value rather than its potential social value. Moreover, data are "non-rival", meaning that a person's call data records, location history, internet usage and medical records can be used by many firms (and governments) at the same time and for different purposes. Recent theoretical research shows that this may lead firms to respect data privacy less than is socially desirable, and they may also have incentives to inefficiently hoard data.[104] In short, when firms own data, they may over-use and under-share it while not adequately respecting consumer privacy. Policy priorities for making digital data work for development include:

[97] Blumenstock, Joshua, Gabriel Cadamuro, Robert On. 2015. "Predicting Poverty and Wealth from Mobile Phone Metadata." *Science* 350 (6264): 1073-1076..

[98] Burke, Marshall and David A. Lobell. 2017. "Satellite-Based Assessment of Yield Variation and Its Determinants in Smallholder African Systems." *Proceedings of the National Academy of Sciences* (USA) 114(9): 2189-2194. Osgood-Zimmerman, Aaron, et al. 2018. "Mapping Child Growth Failure in Africa Between 2000 And 2015." *Nature* 555 (41): 41-47.

[99] Blumenstock, Joshua, Nathan Eagle, and Marcel Fafchamps, 2016. "Airtime Transfers and Mobile Communications: Evidence in the Aftermath of Natural Disasters." *Journal of Development Economics* 120: 157-181.

[100] Lu, Xin, Linus Bengtsson, and Petter Holme, 2012. "Predictability of Population Displacement after the 2010 Haiti Earthquake." *Proceedings of the National Academy of Sciences* (USA) 109: 11576-11581.

[101] Wesolowski, Amy, et al., 2015. "Impact of Human Mobility on the Emergence of Dengue Epidemics in Pakistan." *Proceedings of the National Academy of Sciences* (USA) 112: 11887-11892.

[102] Evan Sheehan et al. 2019. "Predicting Economic Development Using Geolocated Wikipedia Articles," Proceedings of the 25th ACM SIGKDD International Conference on Knowledge Discovery & Data Mining, pp. 2698-2706.

[103] Ramya Parthasarathy, Vijayendra Rao and Nethra Palaniswamy "Deliberative Democracy in an Unequal World: A Text-As-Data Analysis of South India's Village Assemblies" *American Political Science Review*, 113 (3, August 2019): 623-640

[104] Jones, Charles I. and Christopher Tonetti, 2019. "Nonrivalry and the Economics of Data." Stanford University Graduate School of Business, mimeo.

- **Data Governance: Privacy and Sharing.** Establishing data governance frameworks that safeguard individual data and privacy while expanding the development benefits of that data to many stakeholders is challenging. Frameworks for supervising and enforcing new laws with respect to data that are designed for developed economies may not transfer well to weaker institutional environments.
- **Ownership: Democratizing Data.** By crowd-sourcing information to facilitate more responsive governance, and by giving citizens the ability to conduct their own surveys and analyze the data over large numbers of people, data can foster voice, government accountability, and transparency. Examples of such projects are underway in both India and Indonesia.[105]
- **Measures to Avoid Politicization of Data.** Personal data are now widely available and can be manipulated to further the private interests of firms leading to fears of "surveillance capitalism." There is also a fear that governments will use individuals' digital data to pursue political objectives, centralize power, and discourage dissent.[106] This calls for data governance frameworks to safeguard privacy, and give citizens more control over the use of their personal data.
- **Making Traditional and New Data Work Together.** Most new data are generated by individuals through their interactions on mobile devices and computers. In some places, the digital user population may approximate the overall population. In other contexts, including many developing countries, large swaths of the population who are not digitally connected will not be reflected. Data collected via traditional methods, which sample the entire population, can speak to the validity of, for example, poverty maps generated using digital data, and help identify which sub-populations are systematically under-represented in these applications.

[105] Yuen Yuen Ang (2019), *Integrating Big Data and Thick Data to Transform Public Service Delivery*," IBM Center for Business and Government.

[106] Shoshana Zuboff, "Big Other: Surveillance Capitalism and the Prospects of an Information Civilization," Journal of Information Technology 30 (1) (2015): 75 – 89; and Dirk Helbing, Bruno S. Frey, Gerd Gigerenzer, et al., "Will Democracy Survive Big Data and Artificial Intelligence?" Scientific American, February 25, 2017.

10. Returns to Early Interventions at Sufficient Scale Are High

Sergio Schmukler, Michael Toman, and Adam Wagstaff

Research shows that the benefits of early interventions at a scale sufficient to have real impact are large in many areas of economic development. However, behavioral, financial, institutional, and political constraints mean that interventions are not always implemented in a timely or adequate way. Uncertainty compounds the problem, as decision makers must balance the certain up-front costs of early interventions with the uncertain future benefits. These considerations lead to too late and/or too small actions by individuals, businesses, and governments. The resulting missed opportunities can be very costly for society at large.

Early childhood interventions in education and health

Education and health interventions in early childhood have large returns. In part, this is because key stages in a child's development happen during the early years of a child's life. Early brain development is threatened – possibly irreversibly – by nutrient deficiencies, stress, disease and under-stimulation. Interventions very early in a child's life reduce the risk of this happening, whether through improved nutrition, an improved health environment or parental stimulation. These interventions can have long-lasting effects in terms of cognitive capacity in later life, as reflected in better learning outcomes at school and higher wages once the child transitions to adulthood and joins the labor market.[107,108] The period over which returns accrue is therefore very long. By contrast, the costs of early childhood interventions occur over just a few years. But even after discounting to present values, the benefit-cost ratio is large – one package of early childhood nutrition interventions has been estimated recently to have a benefit-cost ratio of 15:1 and a rate of return of 17%.[109] In addition, and not accounted for in these calculations, preschool interventions can have indirect benefits too by making children better able to benefit from instruction during their years of formal schooling, and hence making these later investments more productive. Empirical work supports this idea that early investments enhance the productivity of (i.e., are complementary to) later investments: a recent study in the United States found that increases in K12 spending were more efficacious for poor children who benefitted from higher levels of Head Start spending during their preschool years.[110]

Despite these high returns to preschool investments, the high rates of childhood stunting (a physical manifestation of inadequate nutrition and an adverse disease environment during the child's first 1,000 days) in developing countries suggest underinvestment. This underinvestment may be due to the fact that the costs are incurred now, and the benefits accrue only after the child reaches adulthood, and that families and policy makers discount the future more heavily than economists assume. But it could also be

[107] Grantham-McGregor S, Cheung YB, Cueto S, Glewwe P, Richter L, Strupp B, International Child Development Steering G. Developmental Potential in the First 5 Years for Children in Developing Countries. *Lancet* 2007; 369(9555): 60-70.

[108] Galasso E, Wagstaff A. The Aggregate Income Losses from Childhood Stunting and the Returns to a Nutrition Intervention Aimed at Reducing Stunting. *Economics & Human Biology* 2019; 34: 225-38.

[109] Galasso E, Wagstaff A, Naudeau S, Shekar M. The Economic Costs of Stunting and How to Reduce Them. *Policy Research Note, World Bank, Washington, DC* 2016.

[110] Johnson RC, Jackson CK. Reducing Inequality through Dynamic Complementarity: Evidence from Head Start and Public School Spending. *American Economic Journal: Economic Policy* 2019; 11 (4): 310-49.

due to ignorance about the high returns and the simple 'technology' involved in investing in very young children. The World Bank has employed a mix of strategies to discourage underinvestment in the early years: publicizing the high returns, naming and shaming countries with high stunting rates, advertising success stories (such as Peru which reduced stunting rates quite quickly through a concerted multi-ministerial effort spearheaded by the country's president), and offering the Bank's services in helping to finance and design early childhood programs.

Large-scale, long-lived environmental degradation

Some environmental problems pose serious challenges to ecological systems, human health, and economic progress that persist for a long time, even after the cause of the environmental damage is mitigated. For example, adverse environmental and economic impacts from climate change will persist for centuries, even after greenhouse gases are cut sharply;[111,112] and large-scale extinctions from environmental degradation imply a permanent loss of biodiversity.[113] Early actions sufficient to stem persistent damages before they become extremely harmful thus can yield large productivity and human welfare benefits over time.

Such actions often are impeded by the tangible near-term costs that need to be incurred to obtain large but uncertain benefits that accrue only over the longer term.[114,115] Moreover, because climate change and biodiversity loss are *global* problems that disproportionately harm poorer populations, it is difficult to achieve international cooperation for action among nations at a scale consistent with the global losses.[116] The opportunity but also the challenge for the World Bank is to support effective global responses to

[111] Field, C.B., V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L.White (eds.), *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects*. *Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change.* Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 2014. Also available at https://www.ipcc.ch/site/assets/uploads/2018/02/WGIIAR5-PartA_FINAL.pdf.

[112] Barros, V.R., C.B. Field, D.J. Dokken, M.D. Mastrandrea, K.J. Mach, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L.White (eds.), *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part B: Regional Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 2014. Also available at https://www.ipcc.ch/site/assets/uploads/2018/02/WGIIAR5-PartB_FINAL.pdf.

[113] Díaz, S. J. Settele, E. S. Brondizio E.S., H. T. Ngo, M. Guèze, J. Agard, A. Arneth, P. Balvanera, K. A. Brauman, S. H. M. Butchart, K. M. A. Chan, L. A. Garibaldi, K. Ichii, J. Liu, S. M. Subramanian, G. F. Midgley, P. Miloslavich, Z. Molnár, D. Obura, A. Pfaff, S. Polasky, A. Purvis, J. Razzaque, B. Reyers, R. Roy Chowdhury, Y. J. Shin, I. J. Visseren-Hamakers, K. J. Willis, and C. N. Zayas (eds.), *Summary for Policymakers of the Global Assessment Report on Biodiversity and Ecosystem Services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES)*. IPBES Secretariat, Bonn, Germany, 2019. Available at https://www.ipbes.net/global-assessment-report-biodiversity-ecosystem-services.

[114] Hallegatte, S., A. Vogt-Schilb, M. Bangalore, J. Rozenberg, *Unbreakable: Building the Resilience of the Poor in the Face of Natural Disasters*. Washington, DC: World Bank, 2017. Available at https://openknowledge.worldbank.org/handle/10986/25335.

[115] Hallegatte, S., J. Rentschler, J. Rozenberg, *Lifelines: The Resilient Infrastructure Opportunity*. Washington, DC: World Bank, 2019. Available at https://openknowledge.worldbank.org/handle/10986/31805.

[116] Intergovernmental Panel on Climate Change (IPCC), *Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. IPCC, Geneva, Switzerland, 2014. Available at https://www.ipcc.ch/site/assets/uploads/2018/02/SYR_AR5_FINAL_full.pdf.

forestall the damages while also advancing effective initiatives by developing countries to reduce the impacts of those harms. The World Bank has focused on helping client countries to lower policy and institutional barriers to greater use of cost-effective renewable energy, improve protection of natural habitats while responding to local populations' needs for land, and respond more effectively to more frequent and serious natural disasters engendered by climate change. A key priority is to broaden and deepen work on increasing resilience to climate change and climate variability, as articulated in the Bank's recent *Action Plan on Climate Change Adaptation and Resilience*. [117]

Financial crises

Recognizing that financial crises are costly,[118] governments around the world have moved to implement measures to act early in order to prevent them. Such early actions are particularly useful when individual agents do not take into account the negative externalities of their actions. Delayed intervention may lead to larger costs of crises later on. By intervening soon, governments provide a backstop, deter self-fulfilling crises, and shift the financial system from a bad to a good equilibrium. Preventive measures include financial regulation and supervision, macroprudential policies, and even capital controls. By minimizing currency and maturity mismatches, obtaining high capitalization and liquidity buffers, adopting flexible exchange rate regimes, and introducing sand-in-the-wheel types of measures, the financial system can be less prone to boom-and-bust scenarios. Furthermore, early action can make the efforts to contain crises more targeted and efficient. Negative distributional impacts can be another reason for early intervention.[119] However, a main drawback of early intervention is that it is costly and might dampen some of the financial activity that fuels growth during tranquil times.

Since it is not certain that such early actions will make makes crises less likely and less severe, governments and international organizations have focused on implementing shock-absorbing mechanisms as a means of self-insurance. For example, they have fostered borrowing in domestic currency, GDP- and inflation-indexed debt, and equity markets. Central banks have also bolstered international reserves to withstand negative balance-of-payments shocks. Some positive results were observed with the resilience of emerging economies during the global financial crisis, which had adopted policies learned during previous crises.[120] The World Bank regional hubs in Austria, Chile, the Republic of Korea, and Malaysia are researching how to develop more robust financial systems in the respective regions to withstand future crises better, while providing further financial services to more firms and individuals.

[117] World Bank Group, *Action Plan on Climate Change Adaptation and Resilience: Managing Risks for a More Resilient Future.* Washington, DC: World Bank. Available at http://documents.worldbank.org/curated/en/519821547481031999/The-World-Bank-Groups-Action-Plan-on-Climate-Change-Adaptation-and-Resilience-Managing-Risks-for-a-More-Resilient-Future.pdf.

[118] Reinhart C, Rogoff, K, Recovery from Financial Crises: Evidence from 100 Episodes. *American Economic Review* 2014, 104(5): 50-55, May.

[119] Halac M, Schmukler S, Distributional Effects of Crises: The Financial Channel, *Economia-Journal of the Latin American and Caribbean Economic Association* 2004, 5:(1): 1-67, Fall.

[120] Didier T, Constantino C, Schmukler, S, How Resilient and Countercyclical Were Emerging Economies to the Global Financial Crisis? *Journal of International Money and Finance* 2012, 31:(8) 2052-20

11. Increasing Resilience to Climate Change Is Good Development Policy

Michael A. Toman and Susmita Dasgupta

Scientific and economic research over the past decade has provided increased understanding of the threats that climate change poses for inclusive economic progress and poverty reduction.[121] While the timing and severity of future climate change impacts remain uncertain, the world will confront threats to economic productivity and welfare through a variety of channels including elevated health risks, reduced land and labor productivity, degradation of natural ecosystems, greater exposure to extreme events (droughts, storms, floods), and higher infrastructure investment costs.[122] Low-income people face greater exposure to climate change risks but have lower capacity to reduce their vulnerability. Without strong counter-measures, climate change impacts will exacerbate poverty and inequality in developing countries and make escape from poverty considerably more difficult. This places increased resilience to climate change at the center of development policy.

The threats to sustainable development and poverty reduction posed by climate change are starkly illustrated by the findings of a multi-year, multi-disciplinary program of research in southwest coastal Bangladesh, a very impoverished area of the country. As sea level rises and storm-caused inundations increase in severity and frequency, the resulting soil and water salinization will reduce the availability of food, harm maternal and child health (including higher infant mortality), damage a World Heritage site, and lead to outmigration that increases poverty among those vulnerable family members left behind.[123,124,125] These problems are hardly unique to southwest coastal Bangladesh. Climate variability has been shown to have adverse impacts on household welfare in rural Mexico, due in particular to challenges in smoothing out fluctuations in agricultural incomes.[126] In both marginal agricultural areas and coastal zones, the poor are especially disadvantaged by climate change because they are so dependent on natural assets affected by climate change, and because their options for escaping their difficult circumstances are limited.[127] In urban areas across the developing world, poor people live in the areas most vulnerable to

[121] Intergovernmental Panel on Climate Change (IPCC), *Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. IPCC, Geneva, Switzerland, 2014. https://www.ipcc.ch/site/assets/uploads/2018/02/SYR_AR5_FINAL_full.pdf.

[122] Leichenko, Robin and Julie A. Silva, Climate Change and Poverty: Vulnerability, Impacts, and Alleviation Strategies, *WIREs Climate Change* 2014. doi: 10.1002/wcc.287.

[123] Dasgupta, Susmita, Mainul Huq, and David Wheeler, Drinking Water Salinity and Infant Mortality in Coastal Bangladesh. *Water Economics and Policy* 2:(1), 2016, pages 205-242.

[124] Dasgupta, Susmita, Istiak Sobhan, and David Wheeler, The Impact of Climate Change and Aquatic Salinization on Mangrove Species in the Bangladesh Sundarbans, *Ambio* 46:(6), 2017, pages 680-694.

[125] Dasgupta, Susmita, Md. Moqbul Hossain, Mainul Huq, and David Wheeler, Facing the Hungry Tide: Climate Change, Livelihood Threats, and Household Responses in Coastal Bangladesh. *Climate Change Economics* 7 (3), 2016, pages 1-25.

[126] Skoufias E, K. Vinha, The Impacts of Climate Variability on Household Welfare in Rural Mexico. *Population and Environment* 34, 2013, pages 370–399.

[127] Barbier, Edward B, and Jacob P Hochard, The Impacts of Climate Change on the Poor in Disadvantaged Regions. *Review of Environmental Economics and Policy* 12:(1), 2018, pages 26–47.

natural disasters because they are affordable.[128] Other global evidence indicates that adverse climatic conditions are an important source of conflict among people and groups.[129]

Research showing how climate change threatens economic development and poverty alleviation reveals the importance of seeing climate change adaptation as a key part of overall development policy. However, the research also has highlighted the substantial institutional and other challenges to implementing focused climate change adaptation measures and "resilience-smart" development policies and investments: the problem of "adaptation deficits." One reason these arise is that sustained adaptation to climate change is more complicated than traditional informal coping mechanisms, making adaptation costly and risky for poor households.[130] For example, poor migrants to cities from southwest coastal Bangladesh have low human capital, so it may take some time for them to gain enough income to be able to have sufficient funds to remit to their families. This is just one example of how marginalized groups in ecologically marginal areas can get left behind, even as economic development progresses in the more formal sectors.[131]

Adaptation policies are subject to the same challenges of limited institutional capacities and other social capital deficits as are other development measures.[132] Improved access to infrastructure and financial services are among the elements needed to lower barriers to successful adaptation. Yet all too often, actions that can ameliorate climate change threats *and* improve economic development prospects aside from climate change are not taken. For infrastructure, there is a tendency to focus on the cost of constructing capacity while not adequately appreciating the longer-term costs of inadequate resilience, relative to the incremental cost of installing more resilient capacity.[133] For natural disasters, there is a tendency to focus more on asset replacement while under-estimating the welfare cost of disrupted lives and livelihoods, leading to less than adequate measures to reduce risks in advance.[134]

Increased income can have a powerful effect on the capacity of individuals to cope with climate change. In that sense, economic development and poverty alleviation are key ingredients for reducing vulnerability to climate change, just as reducing vulnerability to climate change enhances development prospects. However, higher income does not automatically assure less vulnerability. For example, a large bridge investment in Bangladesh connected a previously isolated territory to the rest of the economy, bringing with it substantial improvements in living standards. The improvement resulted largely from the previously isolated territory becoming able to utilize its comparative advantage in high-value agriculture

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[128] Lall, Somik. V. and Uwe Deichmann. 2012. Density and Disasters: Economics of Urban Hazard Risk. *World Bank Research Observer* 27, 2012, pages 74–105.

[129] Burke, Marshall, Solomon M. Hsiang, and Edward Miguel, Climate and Conflict. *Annual Review of Economics* 7 (1), 2015, pages 577–617.

[130] Castells-Quintana, David, Maria del Pilar Lopez-Uribe, and Thomas K.J. McDermott, Adaptation to Climate Change: A Review Through a Development Economics Lens. *World Development* 104, 2018, pages 183–196.

[131] Barbier, Edward B, and Jacob P Hochard, Poverty-Environment Traps. *Environmental and Resource Economics* 74(3), 2019, pages 1239–1271.

[132] Fankhauser, Sam., and Thomas K. J. McDermott, Understanding the Adaptation Deficit: Why Are Poor Countries More Vulnerable to Climate Events than Rich Countries? *Global Environmental Change* 27, 2014, pages 9–18.

[133] Hallegatte, Stéphane, Jun Rentschler, and Julie Rozenberg, *Lifelines: The Resilient Infrastructure Opportunity.* Washington, DC: World Bank, 2019. http://documents.worldbank.org/curated/en/111181560974989791/Lifelines-The-Resilient-Infrastructure-Opportunity.

[134] Hallegatte, S., A. Vogt-Schilb, M. Bangalore, J. Rozenberg, *Unbreakable: Building the Resilience of the Poor in the Face of Natural Disasters*. Washington, DC: World Bank, 2017. https://openknowledge.worldbank.org/handle/10986/25335.

with faster and lower-cost access to outside markets.[135] However, this also could leave the territory more vulnerable to future climate change related disruptions as agricultural intensification makes the region more vulnerable to extreme weather events. Economic development and poverty reduction policies need to factor in climate change risks to deliver both economic progress and reduced vulnerability.[136]

The World Bank and other international development partners are increasingly active in encouraging client countries to pursue more holistic assessments of life-cycle benefits and costs of more resilient and efficient investment, and greater emphasis on risk reduction as well as recovery capabilities.[137] Nevertheless, experience highlights the importance of better understanding why so many pro-development, pro-resilience initiatives encounter resistance in developing countries.

[135] Blankespoor, Brian, Shahe M. Emran, Forhad Shilpi and Lu Xu. Bridge to Bigpush or Backwash? Market Integration, Reallocation, and Productivity Effects of Jamuna Bridge in Bangladesh. 2018. SRN: https://ssrn.com/abstract=3162451.

[136] Bowen, Alex, Sarah Cochrane, and Samuel Fankhauser, Climate Change, Adaptation and Economic Growth. *Climatic Change* 113, 2012, pages 95–106.

[137] World Bank Group, *Action Plan on Climate Change Adaptation and Resilience: Managing Risks for a More Resilient Future.* Washington, DC: World Bank, 2019. http://documents.worldbank.org/curated/en/519821547481031999/The-World-Bank-Groups-Action-Plan-on-Climate-Change-Adaptation-and-Resilience-Managing-Risks-for-a-More-Resilient-Future.pdf.

12. Digital Financial Transactions Matter for Development

Leora Klapper

Recent research has shown that a range of development benefits follow from using digital financial transactions instead of cash. This research has direct implications for World Bank work on safety nets, service delivery, and poverty reduction.

Digital transactions improve service delivery

In high-income countries, most safety net programs – such as social security or subsidies for the poor – are delivered digitally. In low-income countries, they are commonly made in cash. Using cash creates enormous costs. For example, governments must spend money bringing truckloads of paper currency to remote areas; these trucks also need to be insured and protected by armed guards. Cash payments also require people to spend time traveling and waiting in line to get their payments at government offices. Digital transfers improve efficiency and remove corruption opportunities—a relevant finding for the World Bank's efforts to promote safety net coverage and improve service delivery.

- When Andhra Pradesh used biometric smart cards instead of cash to distribute social security payments, the government saved nearly $40 million annually, which was nine times greater than the cost of implementing the program. Theft of funds went down, people spent less time collecting payments, and recipients got more money because less was being stolen.[138]
- In Niger, using mobile phones rather than cash to distribute payments for an anti-hunger program reduced administrative costs by a fifth, lowered costs for recipients, and allowed households to feed their children more and purchase more protein-rich food.[139]

Digital transactions help prevent people from falling into poverty

Most development interventions aim to help people escape poverty. But escaping poverty is no guarantee of not falling back in. Every year millions of people fall into poverty due to unexpected shocks such as natural disasters, high medical bills, or sudden unemployment. In poor countries, safety nets are often absent, so people rely on their social networks for emergency funds. Mobile money accounts let people send money through simple text messages, which makes it easier to collect funds from faraway friends and relatives. As a result, they are less likely to become poor during an economic emergency. These findings are relevant to the World Bank's work on resilience and poverty reduction.

[138] Muralidharan, K., P. Niehaus, and S. Sukhtankar. 2016. "Building State Capacity: Evidence from Biometric Smartcards in India." *American Economic Review* 2016, 106 (10): 2895-2929.
[139] Aker, J. C., R. Boumnijel, A. McClelland, and N. Tierny. 2016. "Payment Mechanisms and Antipoverty Programs: Evidence from a Mobile Money Cash Transfer Experiment in Niger." *Economic Development and Cultural Change* 65 (1): 1-37.

- When hit with an agricultural shock, Kenyan households with no mobile money access suffered a 7 percent drop in use of goods and services, while those who did have mobile money experienced no such drop on average.[140]
- In Tanzania, rainfall shocks resulted in 6 percent lower consumption on average, but mobile money users were able to maintain consumption due to improved risk sharing.[141]

Digital transactions help people build savings

People are more likely to build savings when they are paid directly into accounts instead of in cash, in part because the money is protected from theft, loans to family members, and the temptation to spend. This money can be invested in educational and business opportunities and has implications for the World Bank's work on employment and poverty reduction.

- In Afghanistan, workers who automatically deposited part of their salary into a mobile savings account had higher savings and financial security than workers who received a mobile savings account but did not sign up for automatic deposits.[142]
- In India, weekly payments resulted in significantly higher savings for a group that received the payments into accounts, but not for a group that received them in cash.[143]
- In Malawi, farmers who had their earnings deposited into a savings account had higher savings before the next planting season, spent more on agricultural equipment, and increased crop sales.[144]

[140] Jack, W., and T. Suri. 2014. "Risk Sharing and Transaction Costs: Evidence from Kenya's Mobile Money Revolution." *American Economic Review* 2014, 104(1): 183-223.
[141] Riley, E. 2018. "Mobile Money and Risk Sharing Against Village Shocks." *Journal of Development Economics* 135: 43-58.
[142] Blumenstock, J., M. Callen, and T. Ghani. 2018. "Why Do Defaults Affect Behavior? Experimental Evidence from Afghanistan." *American Economic Review* 2018, 108 (10): 2868-2901.
[143] Somville, V., and L. Vandewalle. 2018. "Saving by Default: Evidence from a Field Experiment in Rural India." *American Economic Journal: Applied Economics* 10 (3): 39-66.
[144] Brune, L., X. Gine, J. Goldberg, and D. Yang. 2016. "Facilitating Savings for Agriculture: Field Experimental Evidence from Malawi." *Economic Development and Cultural Change* 64 (2): 187-220.

13. Trade, Poverty, and Inequality

Bob Rijkers and Erhan Artuc

International integration accelerates growth and reduces poverty when it is supported with strong institutions, rule of law, and investment.[145] Historically, episodes of rapid growth are associated with increasing international integration and trade. Many East Asian economies, such as Japan, the Republic of Korea and China have managed to attain remarkable growth rates while integrating into the global economy. Conversely, many slow growing regions are left out of the globalization process.

Despite the compelling associations between international integration and growth, empirical evidence on the causal relationship is more limited. This is because separating the impact of trade from other developments that overlap with episodes of increasing globalization, such as technological progress, is challenging.[146] To accurately quantify the gains from trade it is also necessary to account for the structure of global value chains, input-output linkages, knowledge spillovers, pro-competitive effects, and other mechanisms that may amplify them. In addition, trade may create dynamic gains which can be sizable. A recent study of the impact of WTO accession on patenting, for example, finds that about 7 percent of the increase in knowledge creation during the 1990s can be attributed to trade policy reforms.[147] Studies that exploit quasi-experimental variation in trade costs generated by shocks as varied as the closing of the Suez Canal,[148] the reunification of Germany,[149] oil price fluctuations,[150] and major infrastructure expansions[151] consistently show that reducing trade costs improves incomes on average.

Although globalization has been a force for development for the last three decades, protectionism is now on the rise. One reason is the frustration of those whom trade may have left permanently behind. International trade is not a zero-sum game, as it increases the size of the pie. However, it also changes how the pie is divided, creating winners and losers. The losses often are highly visibly concentrated among specific people in specific areas. The gains, by contrast, are often widely spread and therefore less salient. This undermines political support for global integration.

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[145] Atkin, David, and Amit Khandelwal (forthcoming). "How Distortions Alter the Impacts of International Trade in Developing Countries," *Annual Review of Economics*.

[146] Harrison, Ann, John McLaren, and Margaret McMillan (2011). "Recent Perspectives on Trade and Inequality," *Annual Review of Economics,* 3 (1).

[147] Coelli, Federica, Andreas Moxnes, Karen Helene Ulltveit-Moe "Better, Faster, Stronger: Global Innovation and Trade Liberalization" NBER Working Paper No. 22647.

[148] Feyrer, James (2009). "Distance, Trade, and Income -- The 1967 to 1975 Closing of the Suez Canal as a Natural Experiment," Mimeo.

[149] Redding, Stephen, and Daniel Sturm (2008). "The Costs of Remoteness: Evidence from German Division and Reunification" American Economic Review, 98(5).

[150] Storeygard, Adam (2016). "Farther on Down the Road: Transport Costs, Trade and Urban Growth," *Review of Economic Studies,* 83(3).

[151] Donaldson, Dave, and Richard Hornbeck (2016). "Railroads and American Economic Growth: A "Market Access" Approach," *The Quarterly Journal of Economics*, 131 (1).

In the past 10 years, the increased availability of microdata and computing power have spawned a burgeoning literature measuring these distributional impacts of trade,[152] yielding several novel insights:

- **The negative distributional impacts of international trade are large, localized, and long-lived.** The emergence of China as a great economic power and its integration into the global trading system have caused regions in both developed and developing countries with a high concentration of import competing industries to fall behind other regions. Workers who are adversely affected by trade liberalization face high moving costs and are often not able to leave to find better jobs in other regions. The adverse effects of trade liberalization are consequently concentrated in particular regions, while the benefits are widespread throughout the whole economy.[153] These negative localized effects persist in the long run, and the affected regions take a long time to recover, if at all.[154] Since workers' regions seem as important as their industries and occupations in determining the distributional impacts of globalization, it is crucial to switch from industry-based social protection policies to more flexible and possibly region-based policies.[155]
- **Trade liberalization can favor the poor because low-income households often consume traded goods more than services and non-traded goods**.[156] The consumption gains resulting from lower prices tend to be widely distributed (as most people consume many different products), but job losses in import-competing sectors tend to be highly concentrated (as most people usually only have one job – which if lost to import competition is a major shock). [157]
- **Lower prices due to trade liberalization are often not fully passed on to consumers.** Evidence from Ethiopia and Nigeria suggests that intermediaries capture most of the surplus from lowering international trade barriers.[158] Similarly, firms in India increased their markups after trade was liberalized, thereby offsetting some of the gains for consumers.[159]

Harnessing the potential of globalization to reduce poverty and boost growth requires complementary social protection and investment policies that address market imperfections and compensate losers. These include reducing intranational trade costs in developing countries by investing in infrastructure, connectivity and market access, and setting up flexible social protection systems. Better infrastructure allows domestic and export market access for poor households, thereby facilitating structural transformation from subsistence farming to cash crops. Improved connectivity and platforms allow small enterprises, which tend to employ more low-skill and informal workers than large firms, to compete in global markets. Flexible social protection and investment schemes can help protect workers and

[152] Goldberg, Penny and Nina Pavcnik (2016). "The Effects of Trade Policy," in Bob Staiger and Kyle Bagwell (eds), The Handbook of Commercial Policy, Volume 1A, Elsevier, pp. 161-20.
[153] Autor, David, David Dorn, and Gordon H. Hanson (2016). "The China Shock: Learning from Labor-Market Adjustment to Large Changes in Trade," *Annual Review of Economics*, 8(1).
[154] Dix-Carneiro, Rafael, and Brian Kovak (2017). "Trade Liberalization and Regional Dynamics," *American Economic Review*, 107 (10).
[155] Artuc, Erhan, Paulo Bastos, and Eunhee Lee (2019). "Trade, Jobs and Worker Welfare," Mimeo: World Bank.
[156] Fajgelbaum, Pablo, and Amit Khandelwal (2016). "Measuring the Unequal Gains from Trade," *The Quarterly Journal of Economics*, 131 (3).
[157] Artuc, Erhan, Guido Porto, and Bob Rijkers (2019). "Trading off the Income Gains and the Inequality Costs of Trade Policy," *Journal of International Economics*, 120.
[158] Atkin, David and Dave Donaldson (2015). "Who's Getting Globalized? The Size and Implications of Intranational Trade Costs," NBER Working Paper No. 21439.
[159] De Loecker, Jan, Pinelopi Goldberg, Amit Khandelwal, and Nina Pavcnik (2016). "Prices, Markups and Trade Reform," *Econometrica*, 84 (2).

entrepreneurs in lagging regions, whereas industry-based protection systems are often unsuccessful, since they fail to target groups that are suffering localized knock-on effects arising because of adjustment costs and limits to their mobility.