Global Economy and Development at BROOKINGS

Using Impact Bonds to Achieve Early Childhood Development Outcomes in Low- and Middle-Income Countries

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Advisory Panel Members

1. INTRODUCTION

The Sustainable Development Goals (SDGs, or Global Goals) and their associated targets set out by the United Nations in 2015 explicitly seek to address some of the largest challenges facing children around the world. Current estimates indicate that 200 million children globally under the age of 5 are at risk of not reaching their development potential.[1] With these goals, the global community has a tremendous opportunity to change the course of history. Investing in the youngest children—though interventions such as breastfeeding promotion and high-quality early childhood education—has demonstrated high potential to help achieve the SDGs related to child development (see Box 1). Furthermore, over time, early childhood development (ECD) interventions have been found to improve adult health and education levels, reduce crime, and raise employment rates, all of which will be paramount to achieving global economic, climate, and physical security.

ECD interventions span the nutrition, health, water and sanitation, education, social protection, and governance sectors, and include interventions from conception to age 5 (see Table 1).[2]

Indicators are falling short across these sectors—165 million children are stunted worldwide (90 percent of them live in Africa or Asia)[3] and in low-income countries, the maternal mortality rate is between 10 and 20 percent.[4] These global statistics are disturbing in and of themselves, yet they hide wide disparities both between and within countries where the poor and vulnerable are faced with even greater disadvantage. Under-5 mortality in low-income countries, for example, is 13 times that of high-income countries,[5] and while preschool enrollment in low-income countries is just 17 percent, it is now 84 percent in high-income countries.[6]

Though these statistics are troubling, great progress has been made in the past 25 years, particularly in child survival and nutrition. Child mortality fell from 90 deaths per 1,000 live births in 1990 to 46 deaths per 1,000 live births in 2013.[7] Child stunting declined from 40 percent in 1990 to 24.5 percent in 2013. Pre-primary enrollment increased globally from 27 percent in 1990 to 54 percent in 2012; in sub-Saharan Africa and South and West Asia, it more than doubled. Despite this progress,

[1] Grantham-McGregor et al. (2007).
[2] Note that some frameworks consider up to age 8, which aims to capture child development up through school entry.
[3] United Nations Children's Fund (UNICEF), World Health Organization, World Bank (2012).
[4] World Bank (2013b).
[5] WHO (2012).
[6] World Bank (2013b).
[7] Despite progress, it is unlikely that the Millennium Development Goal target for 2015 of 30 deaths per 1,000 live births will be met when data become available.

Box 1. Targets Related to Early Childhood Development in the SDGs

2.2	By 2030, end all forms of malnutrition, including achieving, by 2025, the internationally agreed targets on stunting and wasting in children under 5 years of age
3.1	By 2030, reduce the global maternal mortality ratio to less than 70 per 100,000 live births
3.2	By 2030, end preventable deaths of newborns and children under 5 years of age
4.2	By 2030, ensure that all girls and boys have access to quality early childhood development, care and pre-primary education so that they are ready for primary education
6.1	By 2030, achieve universal and equitable access to safe and affordable drinking water for all
6.2	By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations
10.1	By 2030, progressively achieve and sustain income growth of the bottom 40 per cent of the population at a rate higher than the national average
16.2	End abuse, exploitation, trafficking, and all forms of violence against and torture of children
16.6	Develop effective, accountable, and transparent institutions at all levels
16.7	Ensure responsive, inclusive, participatory, and representative decision-making at all levels
16.9	By 2030, provide legal identity for all, including birth registration
17.3	Mobilize additional financial resources for developing countries from multiple sources
17.17	Encourage and promote effective public, public-private, and civil society partnerships, building on the experience and resourcing strategies of partnerships

the quality of child care and pre-primary programs and equity of access are still grossly inadequate and will be among the biggest challenges going forward.[8]

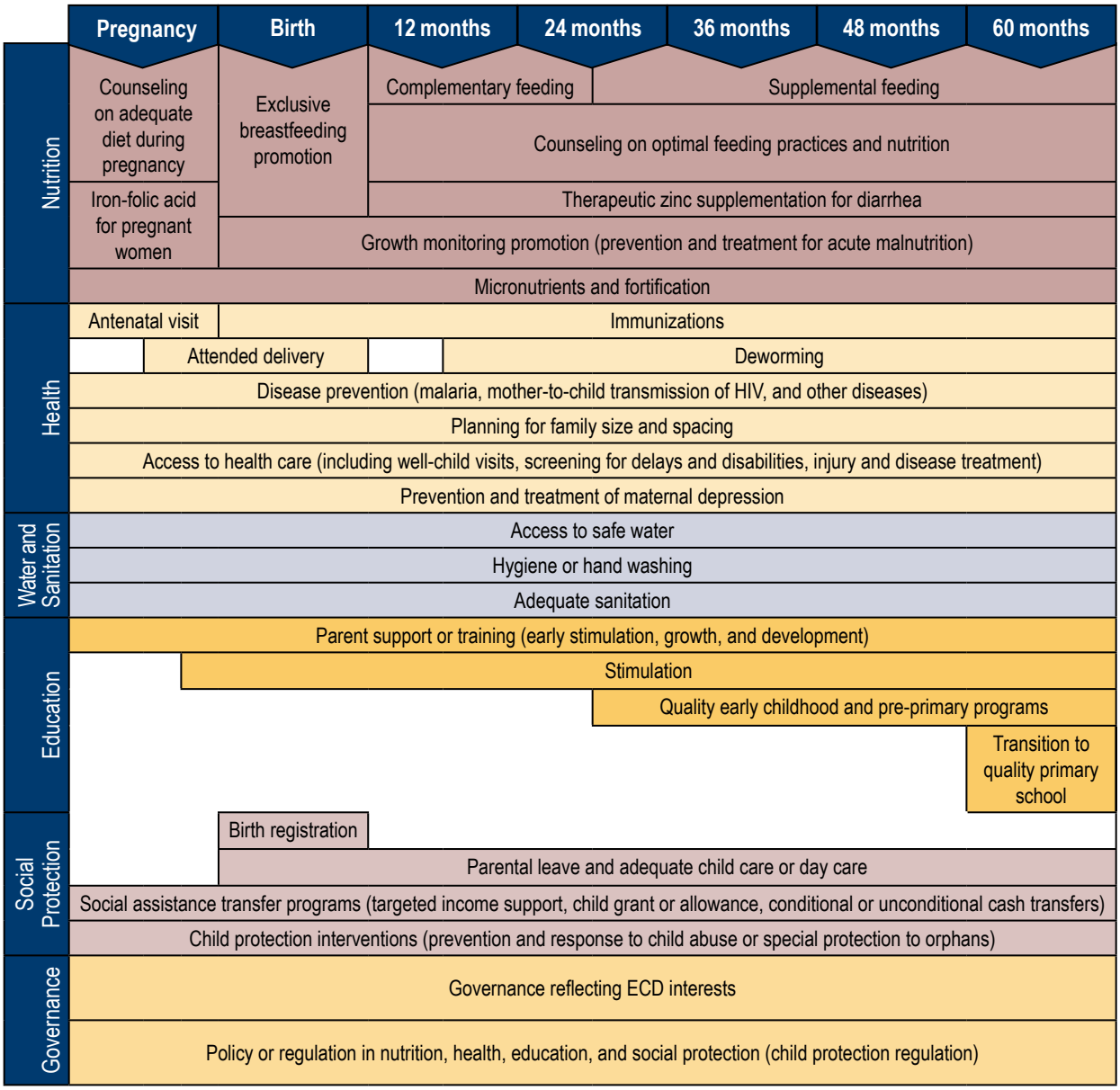
Achieving the ambitious early childhood-related SDGs will require substantial increases in the volume and effectiveness of resources. Thus far, despite the fairly compelling evidence on the benefits of ECD interventions and the strong economic and equity arguments for investing in the early years, few large-scale programs in low- and middle-income countries (LMICs) are supporting the early development of all children. Data on financing for early childhood are quite sparse, and for the few developing countries for which data are available, the amount of resources directed toward ECD programs is often insufficient.

Programs catering to the very young are typically operated at small scale and often financed by external donors or nongovernmental organizations (NGOs). But these investments, too, remain limited: A recent study found that the World Bank made only $3.4 billion of investments in ECD between 2001 and 2013, equivalent to just 4.4 percent of the overall portfolio of the human development network over that period, though investments in ECD rose to 11 percent of the human development portfolio in 2013.[9] Furthermore, many of the ECD services in developing countries fall terribly short of providing the quality necessary to ensure that children develop to their full potential.[10]

While domestic resources and international aid have grown significantly over the past decade, they will be insufficient to meet the estimated cost of achieving the SDGs. No complete estimation of the financing gap to achieve the ECD SDGs exists, largely because it is challenging to combine required spending across all sectors of ECD. Efforts

[8] UNESCO (2015).
[9] Sayre et al. (2015).
[10] Araujo et al. (2013); see also the "report card" on ECD in Berlinski, and Schady, eds. (2015), *The Early Years: Child Well-Being and the Role of Public Policy.*

Table 1. Basic Benefit Package of ECD Interventions



are underway, however, to improve the availability of information on ECD costs.[11] One estimate suggests that countries should be spending 0.5 to 1 percent of their GDP on early childhood education and 0.3 to 0.5 percent on maternal and child health, though spending recommendations are highly context- and quality-specific.[12] The current scale of inadequate outcomes is, however, sufficient justification for creative solutions to increase and improve the efficacy of investment in ECD.

The development landscape has begun to shift dramatically with new actors and financing mechanisms playing an increasing role in financing for

[11] Putcha and van der Gaag (2015) and forthcoming work on costing by the Brookings Institution and the World Bank Strategic Impact Evaluation Fund.
[12] Vargas-Baron (2008).

development. Private and nontraditional finance for development has risen significantly, and there is increasing recognition of the associated investment opportunities for the private sector in support of the longer-term agenda of the SDGs. Donors, private actors, and domestic stakeholders are increasingly exploring innovative mechanisms[13] to leverage new sources of finance and to link financing and results. In the last 15 years, a number of innovative financing mechanisms for international development, which address the volume of finance for development, the effectiveness, or both, have been designed and implemented. The mechanisms include innovative sources and innovative delivery mechanisms; the latter category comprising of non-contingent and contingent disbursement mechanisms (see Table 2). Innovative financing is estimated to have mobilized nearly $100 billion and grown by approximately 11 percent per year between 2001 and 2013 (see Appendix 3).[14] While there is no explicit breakdown on the use of innovative financing for early childhood, the education and health sectors have thus far received a smaller share of such financing—four and 24 initiatives, respectively, out of 348 (for which sector data were available), according to one study.[15] The average size of the innovative instruments used for health, however, was relatively high compared with other sectors[16] and may actually increase substantially in coming years due to some large global initiatives in health.[17]

Contingent disbursement or Payment by Results (PbR) mechanisms reward the delivery of one or more outputs or outcomes upon verification that agreed upon results have been achieved. Tying payments to outcomes or outputs is intended to create beneficial incentives, transparency, accountability, and performance management. PbR mechanisms include results-based aid (RbA), results-based financing (RbF), awards and prizes, individual conditional cash transfers, and impact investing (see Table 3). The terminology in the PbR field is confusing and inconsistent. Table 3 attempts to provide clarity by categorizing each of the mechanisms based on the party that bears the risk of not receiving payments if results are not achieved.

Table 2. Innovative Financing Mechanisms

Innovative Sources	Innovative Delivery Mechanisms	
	Non-contingent Disbursement	Contingent Disbursement
"Sin" taxes and airline taxes	Bonds and notes for development interventions	Payment by Results mechanisms (See Table 3)
Carbon auctions (voluntary)	Guarantees for risk-mitigation	
Consumer donations	Concessionary loans for specific interventions (e.g., green credit lines)	
Corporate social responsibility	Unconditional individual cash transfers	
Impact investors (including for impact bonds)		

[13] Defined as "new products, the extension of existing products to new markets, and presence of new types of investors" (Guarnaschelli et al. 2014).
[14] Guarnaschelli et al. (2014).
[15] Ibid.
[16] Ibid.
[17] The Global Financing Facility (GFF), launched in July 2015, includes $12 billion in domestic and international, private and public funding that has been aligned to country-led, five-year investment plans for women's, children's, and adolescents' health in the four GFF front-runner countries of the Democratic Republic of the Congo, Ethiopia, Kenya and Tanzania. "This partnership between the United Nations, the World Bank Group, and the Governments of Canada, Norway and the United States expects to mobilize between $3 to $5 from the private capital markets for every $1 invested into the GFF." (World Bank 2015a).

Table 3. Payment by Results Mechanisms

	Contingency for… (risk)	Examples	Definitions
Results-based Aid (RbA) (including contingent loans)	**National government** (though the national government often arranges contingency for service providers as a result)	Cash-on-Delivery Aid (including the World Bank's Program-for-Results tool and some of the U.K. Department for International Development's Payment by Results programs)	Donors agree to pay recipient governments a fixed amount for incremental progress made toward a pre-defined outcome (e.g., each additional child who completes primary school).
		World Bank Results-based Financing for Health	Broad use of contingency in loan disbursements.
		Global Alliance for Vaccines and Immunization, Immunization Services Support (GAVI/ISS)	After receiving an initial cash grant to roll out an immunization program, partner countries received additional payments for incremental progress made against a baseline for the number of children vaccinated.
		Contingent debt swaps and buy-downs	Developing country debt repayment obligations are transferred or reduced based on meeting development goals.
		Budget support with variable tranches	In addition to receiving a "fixed" tranche upon meeting eligibility criteria, partner countries may receive "variable" tranches if they meet mutually agreed targets (i.e., public finance or international development goal indicators).
Results-based Financing (RbF)	**Service providers or local governments**	Argentina's Plan Nacer	Results-based financing for provincial governments for maternal and child healthcare in Argentina was scaled across the country in 2006.[18]
		Global Partnership on Output-based Aid (GPOBA)	Contributions are channeled from donors to service providers, typically private firms and NGOs, for the delivery of specific outputs, such as schools built or increased access to water supply.
		Some of the U.K. Department for International Development's Payment by Results programs	Paying providers or contractors based on results.
Prizes and Awards	**Technology developers**	Advance market commitments	Commitment of funds to guarantee price/market for products once delivered.
		Prizes and awards	Financial reward for development solutions in a competitive selection process.
Individual Conditional Cash Transfers	**Individuals in target population**	Conditional cash transfers	Demand-side incentives including cash rewards to clients for using social services (e.g., vaccinations and school attendance).
Impact Investing	**Non-state investors**	Social impact bonds and development impact bonds	Non-state investors provide upfront capital to service providers and are repaid by government/donors contingent on outcomes.
		Investments in microfinance funds or social enterprises	Non-state investors provide upfront capital and are repaid by borrowers or with enterprise profits.

Adapted from: Guarnaschelli et al. (2014), Center for Global Development and Social Finance (2013), and Fritsche et al. (2014).

[18] World Bank (2009).

PbR mechanisms by definition have at least some payment contingent on outcomes (e.g., reduction in disease) or outputs (e.g., vaccinations delivered, also known as fee-for-service), though some also provide a portion of funding for inputs (e.g., vaccines delivered to clinics). If all funding is outcomes-based in a PbR arrangement, the outcome funder is ensured value for money—it will pay only for outcomes achieved. If government is the outcome funder, this may significantly increase political will. If the outcome funder provides some upfront capital, it still holds some risk of service efficacy.

In sum, PbR mechanisms can vary in three ways:

1. Payments based on outcomes or outputs
2. Percentage of payment upfront for inputs[19]
3. Source of outcome funding (national government, international agency, foundation, enterprise)

While some PbR mechanisms have been used to finance early childhood initiatives, social and development impact bonds have yet to be used in the early childhood sector in LMICs. Given the exploding interest in both impact investing and PbR mechanisms and the critical need to think creatively about financing services for young children, this study seeks to explore the potential to use this tool to make some headway in achieving the outcomes laid out in the SDGs.

[19] Less than 100 percent, by definition.

2. SOCIAL AND DEVELOPMENT IMPACT BONDS

Impact bonds are a form of PbR where non-state investors provide upfront capital to service providers and are repaid contingent on outcomes. In a **social impact bond (SIB),** a government actor pays investors if outcomes are achieved, while in a **development impact bond (DIB)** a third party pays for outcomes or supplements government payments for outcomes.[20] Despite the terminology, both SIBs and DIBs may be implemented in high-income countries (HICs) and LMICs. SIBs are also referred to as pay-for-success contracts in the United States and social benefit bonds (SBBs) in Australia.[21]

The basic impact bond structure and mechanics are shown in Figure 1. In this basic model, four major types of actors are usually involved in an impact bond transaction, in addition to the **population in need**. **Investors** provide capital for a **service provider** to deliver social services to a population in need. The **outcome funder** (government, or in the case of a DIB, a third party) agrees to repay the investors if pre-determined outcomes are achieved. The **intermediary** can play multiple roles but often has the responsibility of raising capital and bringing the stakeholders together to determine and agree on the transactional details. In addition to these four players, an **evaluator** may be used to assess the outcomes.

Impact bonds may also be contracted in the form of an impact bond fund, where the outcome funder (government in the case of a SIB) issues a rate card of outcomes it is interested in achieving and the maximum price it is willing to pay for each of those outcomes, and then contracts multiple providers. Each of these providers may have its own investors and intermediaries. As of November 2015, there were four impact bond funds in the world, one of which has just two providers contracted, all in the U.K.[22] Impact bond funds can help to increase access to services by providing outcome funding for multiple providers at once, though multiple providers may also be contracted under a central service manager in an individual impact bond.

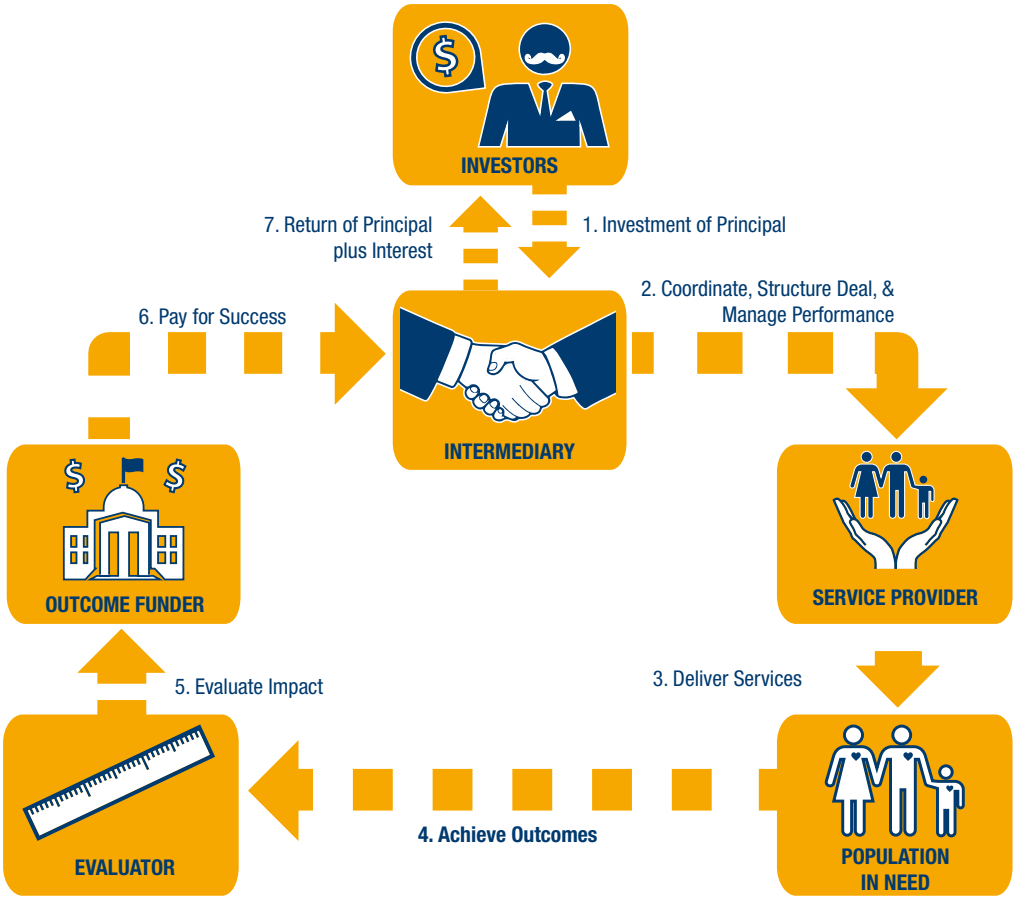
Impact bonds are a form of public-private partnership, which have more often been used to finance infrastructure projects. Like an RbF contract fully tied to outcomes, impact bonds allow governments to pay only for results achieved, which reduces risk to government of service ineffectiveness and ensures value for taxpayer money. They differ in that financing for the provider is provided upfront

[20] Center for Global Development and Social Finance (2013).

[21] For clarity, impact bonds, despite the name, are not bonds in the traditional definition of a bond. The term "social impact bond" has also been used for issuance of traditional, fixed-yield bonds to raise capital for social programs. That differs from the definition of "social impact bond" used in this study, which defines "social impact bonds" as arrangements where payments to investors are dependent on, and positively correlated with, positive outcomes. For a number of uses of the term that do not fit the commonly used definition, see Tomkinson (2015b).

[22] For more on these impact bond funds, refer to Gustafsson-Wright et al. (2015b).

Figure 1: Impact Bond Mechanics



rather than when results are attained, shifting the risk of outcome achievement from the provider to investors. Involving non-state investors through an impact bond may also bring in private sector rigor to performance management to drive results.[23] Impact bonds are intended to be used specifically for outcomes (rather than outputs) more than RbF, though both can be based on outputs.

If upfront capital is needed to finance service provision, impact bonds may be better suited than traditional RbF. The involvement of non-state investors in an impact bond may also increase political will or performance management, or it can help reorganize a government system of data sharing or provision beyond what RbF may be able to accomplish.

Impact bonds may be particularly well suited to fund non-state providers if little is known about their efficacy or if public sector providers are constrained in their ability to implement live service adaptation. As a note, an impact bond fund or individual impact bond may contract with state and non-state providers simultaneously. Impact bonds may also be useful for niche services, often provided by non-state providers, because they provide an opportunity for new data sharing or service coordination systems. An analysis of the use of impact bonds worldwide in Gustafsson-Wright et al. (2015a) found that impact bonds have indeed been used primarily in areas where the government is already contracting out to nongovernmental agencies to deliver services such as programs

[23] Burand (2013); Center for Global Development and Social Finance (2013); Bloomgarden et al. (2014).

that provide job and life skills training; where service inputs are fairly complex but outcomes are simple to measure, such as homelessness, foster care, and prison recidivism; and have not been used for core services under government responsibility, such as primary education.

Impact bonds may be best suited to mezzanine financing, rather than initial pilot or nationwide programming. In impact bonds, investors must be willing to take on the risk of outcome achievement. As a result, impact bonds are unlikely to be the best tool for completely untested interventions (a grant would be more applicable). Gustafsson-Wright et al. (2015a) found that the first 38 impact bonds were not achieving substantial scale in absolute terms but that impact bond funds have the potential to facilitate scale by funding multiple innovative organizations at once. Of the 38 SIBs, 25 serve populations of up to 1,000 individuals. The Innovation Fund in the U.K., where different investors fund 10 service providers for a set list of outcomes, serves more than 16,000 individuals across all providers. The second impact bond fund in the U.K. is not as large in scale—it serves approximately 1,600 beneficiaries. Many of the deals had very specific target populations, so in relative terms the programs were serving an important part of that target population in a given setting.

A SIB may have more potential for sustaining the improvements in service provision than a DIB, because it may encourage continued government funding or a lasting focus on outcomes in the partner agency. A DIB is necessary when there is a complete lack of political will or ability to pay for outcomes. DIBs could be used to pilot programs and make a case for public investment.

3. WHAT COULD IMPACT BONDS DO FOR ECD?

A comprehensive analysis of the impact bond market to date by Gustafsson-Wright et al. (2015a) reveals how impact bonds may help to address some of the constraints found in the ECD sector. The authors tested the purported benefits of impact bonds based on the experience of stakeholders in the 38 impact bonds contracted as of March 1, 2015.

Of the 10 most common claims about the potential of impact bonds five years into their development, five claims in particular capture what are identified as the most promising potential for impact bonds. The most important claim is that impact bonds lead to a shift in focus to outcomes. The study finds that the existing SIBs have truly transformed the conversation among participating government stakeholders about procurement of social services and the transparency and accountability that go along with that. In essence, instead of paying for services, government pays for outcomes. At the same time, SIBs push service providers to deliver on these outcomes. A second very important and related claim is that impact bonds drive performance management. Bringing private sector mentality into the provision of services (which often means getting government bureaucracies out) can lead to more efficient and effective delivery of social services. This has been mainly seen through the push toward outcome achievement and fidelity to the service delivery model and less in terms of adaptation of service provision along the way. Third, there is evidence that the existing impact bonds have successfully stimulated collaboration across government agencies and between the private and public sectors. Fourth, if larger systematic change, such as development of strong monitoring and evaluation systems, continues to happen with impact bond deals, that in itself would be an enormous contribution toward improving many people's lives. Finally, impact bonds can shift the focus of government away from curative or remedial services and toward preventive services. This could have huge economic implications for government and society. Of the other five claims, there was mixed evidence that impact bonds crowd-in private funding (as government or a donor ends up paying for outcomes), achieve scale, and foster innovation in delivery. Finally, the study noted that it was too soon to tell whether impact bonds would lead to sustained impact or if the interventions were risky enough that they represented a true reduction in risk for government.

Of the multiple barriers to achieving ECD at scale, one of the largest is **inadequate and unreliable financing**—the result of numerous factors that relate to the nature, timing, and multi-sectoral make-up of ECD. These financing constraints are related both to a scarcity of government resources and an unwillingness or inability of households to pay due to lack of awareness of benefits and credit constraints. This stems in part from the perception that the responsibility for children during the early years is that of the family, resulting in **governments' unwillingness to commit resources**, in particular when such expenditures compete with

spending on basic education or other services. Services for the early years mainly involve investments that are preventive, with benefits that are accrued over the lifetime of an individual. This affects the willingness of both individuals and governments to make investments, as both may perceive few short-term benefits in doing so and lack evidence on the long-term benefits. This timing problem also arises in connection with election cycles; the benefits of ECD interventions introduced in one administration may not be reaped until another administration has entered office, leaving little incentive to make current fiscal sacrifices. And even when benefits are recognized, the incentive of one part of the system (e.g., Ministry of Education) to invest may be low when the direct benefits will be realized in other parts of the system (e.g., Ministry of Social Services).

How impact bonds could address financing constraints and lack of political will

- Provide upfront capital to service providers, thereby addressing liquidity constraints
- Leverage public capital by allowing outcome funders to pay only for proven outcome achievement
- Allow government to connect preventive programs with short- and long-term outcomes
- Demonstrate value through private sector engagement

The lack of financing and political will is highly correlated with **low quality and capacity** in many developing countries. Much of the ECD services in developing countries fall terribly short of the quality necessary to ensure that children develop to their full potential.[24] It is becoming increasingly apparent that variation in the impacts of ECD interventions in both the developed and developing worlds can be attributed to differing quality, including timing, duration, and intensity of interventions. Recent evidence on preschool education, for example, highlights the tremendous importance of high-quality interventions.[25] Coordination failures and inefficiencies can be related to the fact that service delivery is the responsibility of multiple ministries as well as the non-state sector due to ECD's multi-sectoral nature (the physical, socioemotional, cognitive, and linguistic development of a child). For example, impact bonds could contribute a great deal by coordinating the actors simply within the nutrition sector.[26] Delivery of effective ECD interventions requires adequate and consistent funding and collaboration across stakeholders.

How impact bonds could address quality and capacity

- Shift focus to outcome achievement (see Box 2)
- Support systems of monitoring and evaluation
- Drive performance management and service improvement
- Foster innovation and experimentation in service delivery
- Create accountability
- Incentivize and improve collaboration across stakeholders

[24] Araujo et al. (2013).
[25] Weiland et al. (2013).
[26] Center for Global Development (2014).

Box 2. Does Results-Based Financing Improve Quality in ECD?

Given that part of the impact bond theory of change is that increased service provider incentives for outcomes will improve quality, it is important to examine the current literature around the evidence that RbF improves the quality of ECD services.[27] As described in the introduction, impact bonds differ from other RbF schemes in that the investor, not the service provider or local government, receives payments based on outcomes. However, service providers do receive incentive payments in a number of impact bonds and bear a reputational risk, both of which are intended to motivate the provider to improve service quality (see section 6.2.1). Though the incentives for service providers in an impact bond may be less than in a traditional RbF contract, the RbF literature provides valuable lessons.

Because RbF has been used mostly in the health sector,[28] the literature for this sector is the most advanced,[29] however, a number of studies examine the effect of RbF on social services more broadly.[30] The evaluations of RbF in ECD fall into two categories. The first group is evaluations that measure the impact of an ECD intervention using RbF versus a control group with no intervention. Though this does not isolate the impact of using the RbF mechanism, it provides some indication that ECD interventions funded through RbF mechanisms can have a positive impact. For example, the Plan Nacer Program (additional funding and RbF arrangement) in Argentina reduced neonatal mortality by 74 percent and low birth weight by 19 percent, compared with a control group with the standard funding levels and input-based funding.[31] In education broadly, results-based aid payments for education to the Rwandan government increased primary and secondary completion relative to the previous traditional funding system and was positively received by the Rwandan government, though some concerns remain about impacts on the quality of education.[32] Though these findings are moderately encouraging, they do not isolate the effect of paying for outputs or outcomes.

The second group of evaluations has isolated the effect of the RbF mechanism by comparing identical programs with and without RbF mechanisms. For example, the Rwandan government implemented a performance-based financing initiative in health, providing performance payments to health clinics based on 22 key indicators, including maternal and early childhood heath indicators.[33] In contrast to districts without RbF, districts that used RbF demonstrated an increase in the number of institutional deliveries by 23 percent and an increase in the probability of health center visits for preventive care for children aged 0 to 23 months by 56 percent and for those aged 24 to 59 months by 132 percent.[34] Using the RbF mechanism was also found to be protective of wasting with an adjusted odds ratio of 0.43 percent,[35] compared with districts that had traditional input-based financing. However, "no improvements were seen in the number of women completing four antenatal care visits or of children receiving full immunization schedules."[36] Similar mixed results were found in Indonesia. An evaluation in Indonesia comparing incentivized villages (20 percent of funding for health and education programs was based on performance across 12 targets) and non-incentivized villages found an improvement in eight health indicators in incentivized villages, particularly reductions in malnutrition after 18 months; however, the difference disappeared after 30 months. Furthermore, there were no differences between

[27] As a note, provider incentives are not the only reason an impact bond could help improve the quality of a program. Impact bonds may also facilitate additional increases in quality because investors (often from the private sector) positively influence performance management in an effort to improve the outcome of their investment.
[28] Although the World Bank has previously focused its work on RbF in the health sector (including RbF ECD projects in Jamaica and Brazil), it is now increasing its funding for RbF in education.
[29] See, for example, the many evaluations at http://rbfhealth.org/impact and Oxman and Fretheim (2008).
[30] Fritsche et al. (2014); Gold and Mendelsohn (2014). Savedoff et al. (2015); Bond for International Development (2015); ICF International (2015); Olken et al. (2012).
[31] Gertler et al. (2014).
[32] Musker et al. (2014).
[33] Sekabaraga et al. (2011).
[34] Basinga et al. (2011).
[35] Binagwaho et al. (2014).
[36] Basinga et al. (2011).

the incentivized and non-incentivized villages in terms of education outcomes. Despite mixed evidence of the effects of RbF, both incentivized and non-incentivized villages had positive effects on health and education versus the pure control.[37] Across all sectors, RbF has also had inconclusive effects. A recent review of the U.K.'s domestic and international PbR portfolio across sectors concludes that there is still too little evidence to determine if RbF is effective.[38]

These mixed findings indicate a need for process evaluations that examine why RbF is effective in some instances and not in others. A recent inter-agency workshop on RbF in education in LMICs found that monitoring led to increased provider performance and that additional technical support to government would have improved the entire system. Notably, the participants in the workshop also found no instances of lack of upfront funding for providers (they had other grants), undisbursed development bank funds (they had contingency plans), or perverse incentives.[39] The abovementioned review of the U.K.'s PbR portfolio found that best practices include segmentation of target population groups to address cream skimming (prioritizing services for beneficiaries near the outcome threshold), co-development and co-design with providers and users, training for new performance management systems in providers and government, open book reporting, and increased knowledge sharing of the full costs of RbF management.[40]

The conclusions of process evaluations of RbF for ECD in high-income countries also provide valuable lessons for impact bonds for ECD in LMICs. In a recently completed process evaluation of an RbF trial in the U.K Department of Education's child care centers, evaluators found indications that RbF had a beneficial effect on service delivery. However, RbF may have undermined a culture of collaboration among centers, leading the authors to recommend payments tied to outcomes for groups of centers. The report also recommended that tying outcomes to funds to improve services would be more effective than tying them to bonus payments for employees.[41] In the U.S., at least 14 states use RbF for at least one child welfare service. The barriers to performance-based contracting identified in a recent review of RbF for child welfare in the U.S. include political pressure to retain weak providers, lack of contracting know-how, and restrictions on how funds are used. The reviewers conclude by recommending RbF designers define clear and consistent performance measures, ensure all data collection is transparent and consistent across providers, give providers flexibility, identify and correct perverse incentives, separate incentives and penalties from cost reimbursement, take each provider's target population into account, and shift provision over time to providers producing the best outcomes.[42] These findings are not specific to high-income countries and could help inform the development of impact bonds for early childhood interventions in LMICs.

Finally, there are also significant **gaps in knowledge** as to what specific ECD intervention design works in which context in terms of both the demand for and the provision of the services. These knowledge gaps include the need for more evidence on the best delivery mode (center-, family-, or community-based); the delivery agents (community health workers, mothers selected by the community, or teachers); the target beneficiaries (universal or targeted, national or local); the program design (the most effective curricula and material to be used, the relative value of nutritional versus stimulative interventions, the benefits from the delivery of an integrated package of services versus sector-specific services that are coordinated at the point of delivery); the program timing (frequency and duration

[37] Olken et al. (2012).
[38] DfID (2014).
[39] Savedoff and Perakis (2014).
[40] ICF International (2015).
[41] Frontier Economics and the Colebrooke Centre (2014).
[42] Layler and Foster (2013). See also discussion of Tennessee child welfare services in Beeck Center for Social Impact and Innovation at Georgetown University (2014).

of interventions, of training for the delivery agents, and of supervision); and the relative effectiveness of methods for stimulating demand (information via individual contact, group sessions, media, conditional cash transfers, and the like).

A recent review of rigorous evidence in ECD by the World Bank's Independent Evaluation Group, discussed further in section 6.2.1, found only 55 rigorous evaluations across all of the ECD interventions outlined in Table 1 on later-life outcomes, which are based on only 25 projects. The paucity of program evaluations is a clear indication of the gaps in knowledge about what improves outcomes. There is also a great deal of variation in program quality in the ECD sector, making the need for increased information about outcomes all the more pressing. The desire to build on existing infrastructure to improve cost-effectiveness needs to be regulated to ensure sufficient quality is achieved in all ECD structures. There is also a need for more evidence on the kinds of standards, training, and supervision that are conducive to safeguarding the quality of the intervention at scale.

Making payments contingent on outcomes (rather than the more simple process of paying for inputs or outputs) is best suited to interventions that require live service adaptation, where evidence is inconclusive on the design of effective interventions, and where inputs and outputs are not good indicators of outcomes. In ECD, inputs, such as teacher certification and teacher-to-student ratios, may be good indicators of service quality in child care centers, while inputs are generally poor indicators of quality in parenting programs. Overall, much learning is needed on effective ECD program design, and impact bonds could help to fill this gap.

How impact bonds could address gaps in knowledge

- Foster innovation and experimentation in delivery
- Allow flexibility in service delivery for adaptive learning
- Collect data on what works

4. WHY MIGHT IMPACT BONDS BE PARTICULARLY WELL SUITED FOR THE ECD SECTOR?

ECD has some particular characteristics that, at least from a theoretical standpoint, make it a good match for impact bonds. Some of these qualities are related to the challenges described above related to impact bonds broadly, while others are related to the nature of how ECD services are funded and provided and the benefits yielded by investing in early childhood.

ECD Interventions Deliver Outcomes and Prevent Higher Costs Down the Road

Early childhood interventions are preventive in that they can thwart poor outcomes and thereby high costs of remediation later on. Evidence shows that investing in ECD has the potential to yield high returns over the course of an individual's life and that these returns can be harnessed at various points across that lifetime and across a variety of institutions. Moreover, ECD has a magnified impact on disadvantaged children.

In the short- to medium-term, early childhood interventions have been shown to lead to improved school readiness, resulting in age-appropriate school entry, reduced need for remedial education, higher school achievement, lower repetition rates, and reductions in the school dropout rate.[43] Health outcomes such as higher birth weight, improved nutritional status, reduced incidence of disease are also the result of quality early interventions. The Plan Nacer Program in Argentina, for example, has provided 4.7 million pregnant women and children with health coverage and delivered 37 million maternal and child health services, and it has reduced the probability of low birth weight by 26 percent for beneficiaries.[44] An impact evaluation of a preschool program in rural Mozambique found that cognitive development was improved—children attending preschool experienced more than a 6 percent increase in problem-solving skills and an equal increase in a test measuring fine motor development.[45] In Vietnam, an early childhood education intervention had lasting effects on the cognitive development of school-aged children in rural areas. The beneficial effect of the program on cognitive test scores was largest for the most nutritionally challenged children.[46]

In the long-term, ECD interventions have been shown to increase employment, reduce crime, and improve health. As noted, outcomes later in life, such as those related to educational attainment, job quality, earnings, and health, are also sensitive to interventions in early childhood. A longitudinal study of a program in Jamaica in which participants received weekly visits from community

[43] World Bank (2015).
[44] Cortez and Romero (2013).
[45] Martinez et al. (2012).
[46] Watanabe et al. (2005).

health workers over a two-year period found program effects 20 years later, as it increased earning of participants by 25 percent.[47] Another example is a nutrition intervention implemented from 1969 to 1977 in Guatemala, in which a high-protein energy drink was given as a dietary supplement to children 36 months of age. Twenty-five years after the intervention was delivered, women's grade attainment increased by one year and women experienced faster grade progression. In addition, both men and women receiving the supplement performed 9 percent better than average on cognitive tests.[48]

In contrast to other sectors, ECD interventions often need to be implemented as an integrated package of nutrition, early stimulation, and health interventions in order to have the high-impact levels referenced above. Multi-sectoral interventions are usually challenging to implement through the government siloes of health, education, and social protection. Impact bonds may be particularly helpful in the ECD sector to integrate the necessary package of services with a common outcome metric.

The positive outcomes achieved through ECD can represent huge benefits for governments and society as a whole. One analysis shows, for instance, that if half of all preschool children in LMICs attended preschool, this could result in lifetime earnings gains of more than $33 billion.[49] Similarly, addressing malnutrition by eliminating anemia could lead to a 5 to 17 percent increase in adult productivity, which could add up to 2 percent of GDP in the worst affected countries.[50] The cumulative short- and long-term benefits over the lifetime of an individual from the receipt of multiple early childhood interventions could be enormous. While these long-term benefits are in large part captured by individuals and society as a whole, which is indeed one of the challenges of ECD described above, there is some strong evidence of links between short- and long-term outcomes that could be brought to light with the use of impact bonds. In addition, short-term cost avoidance from evading the need for remedial or curative services could be harnessed through impact bonds.

Many ECD Services Are Provided by Non-state Actors

Non-state providers are important in the delivery of ECD programs and include a number of actors, including national and international NGOs, for-profit providers, and community and faith-based groups.[51] Non-state providers may have more flexibility in delivery, and they potentially complement public sector services in achieving access and results. For pre-primary education in particular, non-state delivery is important, encompassing 31 percent of pre-primary education enrollment in 2012.[52] Impact bonds are particularly useful in sectors with high participation of non-state providers because non-state providers may have greater flexibility in implementation and may be better suited to non-state investment. Bloomgarden et al. (2014) note that education may be a particularly challenging area for impact bond funding because of its history of public sector provision: "Social Impact Bonds may face fewer barriers when they are used to expand funding in an area where there is currently a significant funding gap (e.g., early childhood education), or in areas where the government already contracts with private providers (e.g., job training in some countries)."[53] ECD

[47] The program consisted of teaching parents of 3-year-olds parenting skills and encouraging mothers and children to interact in ways that develop the child's cognitive and socio-emotional skills (Gertler et al. 2014).
[48] Maluccio et al. (2006).
[49] Engle et al. (2011).
[50] World Bank (2006).
[51] In terms of international NGOs providing ECD services, the most prominent are Save the Children, Plan International, Child Fund International, and World Vision, which are present in more than 100 countries (Britto et al. 2011).
[52] For the 100 countries with available data (UNESCO 2015).
[53] Bloomgarden et al. (2014).

has both a significant funding gap, as mentioned above, and a history of private provision, making it a sector with high potential for impact bonds.

The Funding Sources for ECD Are Mixed

There are four main sources of funds for ECD: public funds, private funds, public-private partnerships, and international agencies.[54] This variety of funding sources may allow more room to innovate with an impact bond structure in order to increase the amount of funding to ECD as well as improve outcomes. Public funding for ECD generally covers allocations made by governments for a variety of services, including pre-primary education, immunizations, and breastfeeding promotion. Public funding for these services is low relative to expenditure on services at other age levels and need; however, it is a significant source of finance.[55] Similarly, data indicate that countries spend relatively little per year on pre-primary education compared with other levels of education. Although often small and inadequate in terms of addressing needs, public sources of funding are still an important source of available funds for ECD interventions in many countries.

Private funding can play a critical role in providing access to ECD services in many contexts. Even if countries express support for ECD programs in policy, public funds may not be available to support such programs. For example, in Tanzania, primary schools are required to have a pre-primary section; however, primary school capitation grants are used to cover pre-primary students, which leads to inadequacy of funds and fees charged to users.[56] Private funding for ECD may originate from households, foundations, private enterprises, and community groups and NGOs.

Foundations play a key role in financing ECD interventions in LMICs. For example, of $122 million in disbursements in 2014, the Children's Investment Fund Foundation (CIFF), disbursed $10.9 million for early education, $26 million for nutrition, $43 million for health, and $6.8 million for deworming across LMICs.[57] It is difficult to estimate foundation giving for ECD interventions. In general, health interventions receive the most funding from such sources, as a 2010 study of U.S. foundations involved in international giving found that 41 percent of all giving was directed to the health sector and 9 percent was directed to the education sector.[58] In addition to these foundations, a growing number of smaller foundations working in particular countries, such as the Maria Cecilia Souto Vidigal Foundation in Brazil and Carulla Foundation in Colombia, support ECD in their grant-making initiatives. Community groups and NGOs also play a major role in providing funds for ECD services. In Zanzibar, for instance, the high rate of Koranic pre-primary schools demonstrates the importance of community and religious groups' financing and provision of ECD programs: the preschool gross enrollment ratio is 87 percent overall, but only 9 percent when Koranic schools are excluded.[59]

Private enterprises can also provide funding for ECD services through, for example, workplace-based care or subsidies to families for ECD services. Funding may also be delivered as part of corporate social responsibility initiatives. In Colombia, co-operatives of employers and employees fund a variety of ECD services.[60] Funds from private enterprises can certainly fill the gap where

[54] Valerio and Garcia (2013).
[55] See overview of spending on ECD in LAC in Armendáriz et al. (2015).
[56] UNESCO (2015).
[57] Orlina and Ramos-Caraig (2015) and Children's Investment Fund Foundation (2014).
[58] Foundation Center (2012).
[59] UNESCO (2007).
[60] Valerio and Garcia (2013).

public funds are unavailable; however, these funds may not always reach the most disadvantaged. One study of the tech sector's giving to education found that the most frequent recipients were in emerging economies, such as Argentina, Brazil, Chile, China, India, and Mexico,[61] rather than countries with the lowest incomes. These types of organizations could also be tapped into vis-à-vis investment, service provision, or outcome funding through impact bonds for the purpose of achieving more cost-effective services. Where private funding is traditionally used, there may be scope for bringing in additional nontraditional funding sources and for tying those to outcome achievement through impact bonds.

In addition to public and private sources, funds may be sourced through public-private partnerships (PPPs); for example, through vouchers for students to attend private pre-primary institutions or public funding provided directly to private institutions. Since 2002, the Ministry of National Education and Culture in Indonesia has funded block grants, which are used by private and non-profit organizations to expand their ECD services.[62] The grants support a portion of provider costs for kindergarten and child care programs, and informal health services.[63] While PPPs may be attractive due to lower costs and efficiency considerations, there are associated risks for government. For example, a PPP may involve a complex funding system, and a government may also need to set up ways to license and inspect providers to ensure the quality of services delivered. In addition, governments may need to identify ways to ensure equitable access for disadvantaged children.[64] Working with the private sector brings several challenges: A recent rigorous literature review of private schools found evidence that government attempts to apply regulatory frameworks for private providers are constrained by their limited capacity and poor implementation.[65] PPP structures could be used to develop an impact bond, though significant adaptation may be needed.

Finally, international agencies provide funding to countries for ECD services through both grants and loans. While funding from international agencies can prove significant in the development of new ECD projects, they may not be sustainable sources of funding for delivering services in LMICs given budget constraints facing donors. For example, it is unlikely that there will be a substantial increase in official development assistance (ODA) in the future, which will have an impact on the ability of countries to leverage this source of funds for ECD interventions.[66] Donor agencies could, however, act as guarantors or co-funders with government in the impact bond model, which would lead to more effective use of limited funding.

[61] Van Fleet (2012).
[62] The Ministry of National Education allocates a share of the early childhood education budget for these block grants, which are disbursed to private providers in the form of subsidies. The grant covers a part of the operational and start-up costs, and parents contribute the rest in the form of user fees. See UNESCO (2009).
[63] World Bank (2012).
[64] Woodhead and Streuli (2013).
[65] Day Ashley et al. (2014).
[66] World Bank (2013a).

5. THE LANDSCAPE OF IMPACT BONDS FOR EARLY CHILDHOOD

While no impact bonds have been contracted for ECD services in LMICs to date, seven SIBs have been implemented in HICs focusing on young children (see Box 3), and a handful of ECD impact bonds are in the development stage in LMICs.

Two DIBs have been implemented in LMICs,[67] one of which is in the education sector and provides many relevant lessons for potential impact bonds for ECD in LMICs. The first DIB in the world was launched in March 2015 for girls' education outcomes in the district of Bhilwara in rural Rajasthan, India. The program is smaller in scale than its potential, but it was designed as a pilot of the DIB mechanism. UBS Optimus Foundation, the investor, will provide $267,000 to Educate Girls, the service provider, to work with more than 18,000 girls and boys over three years to improve learning outcomes for both genders and increase girls' enrollment. Educate Girls has existed for seven years and has enrolled over 100,000 out-of-school girls and improved the learning outcomes of more than 390,000 children. Educate Girls is currently implementing educational quality interventions in 7,700 schools and has made infrastructure improvements in 5,000 schools.[68] To improve enrollment and attendance, "Educate Girls delivers a comprehensive community intervention to enroll girls into school. This intervention includes identification of out-of-school girls through door-to-door surveys, explanation of the value of schooling to the parents and to the community, and multi-channel engagement with the household where a girl is out of school. Educate Girls also uses multiple different interventions to improve school attendance and prevent drop-outs. For example, it works with the School Management Committee to improve school infrastructure. It also identifies girls who have dropped out and works with the community to re-enroll them into school."[69] To improve learning, "Educate Girls has young female volunteers deliver a child-centric curriculum, called 'Creative Learning and Teaching,' three times weekly to boys and girls in grades 3-5."[70] The components of the intervention are implemented by a team of 600 full-time employees and 4,500 part-time volunteers, the latter referred to as "Team Balika." The volunteers are 60 percent boys, largely individuals 18 to 30 years old, and are often selected from the villages where they will be working. The volunteers commit to working with Team Balika 15 hours per week for three years. Volunteers are incentivized to participate largely because the experience is a résumé builder—it improves their

[67] The other DIB launched to date is in Peru, which aims to improve coffee production (Finance Alliance for Sustainable Trade 2015).
[68] Interview with Safeena Husain, Educate Girls, August 31, 2015.
[69] Instiglio (2015a).
[70] Instiglio (2015a).
[71] Interview with Safeena Husain, Educate Girls, August 31, 2015.

soft skills, leadership skills, and networks; they receive a small number of career-development opportunities, such as free English classes; and they have the possibility of being hired by Educate Girls in the future.[71] The Children's Investment Fund Foundation (CIFF) is the outcome funder in the DIB, and the evaluator is IDinsight. Instiglio is the intermediary and project manager.

Three impact bonds are being developed to finance early childhood interventions in LMICs. In the Western Cape Province of South Africa, Social Finance and the Bertha Centre for Social Innovation are structuring an impact bond focusing on a broad range of early childhood outcomes. Very little is known about the quality of non-center-based day care in the Province, and the impact bond is being designed to help test various models and build evidence about the current quality levels. The Department of Social Development of the Western Cape has committed funding for outcomes, which will be supplemented by private funding. The contracts will be structured as an impact bond fund, with the Department of Social Development contracting with multiple providers at once. Outcomes will include a range of indicators for 2- and 4-year-olds.

The Palladium Group is designing a second impact bond in the state of Rajasthan in India, focusing on maternal and child health. The program would provide payments to private health clinics for reproductive, maternal, and child health outcomes across the entire population of Rajasthan, targeting individuals in the second and third income quintiles. The upfront capital would fund provision of reproductive tools through a network of social entrepreneurs, capacity building of the public and private sectors to ensure clinical quality and capacity, and demand generation to increase knowledge of the importance of these services. The outcomes will likely be reductions in infant mortality rate (IMR), maternal mortality rate (MMR), and usage of modern family planning across the entire state. The target outcomes are a 20% reduction in IMR, 40% reduction in MMR, and an addition 6 million couple-years of protection. The impact bond will have various outcome funders and investors.

In Cameroon, Grand Challenges Canada (GCC), Social Finance, and the MaRS Centre for Impact Investing are working together to explore the potential of a DIB to scale the Kangaroo Mother Care (KMC) program, which has been shown to save and improve the lives of infants with low birth weight. This builds on GCC's current work funding the development of a promising train-the-trainer model for scaling KMC in Cameroon, under the leadership of the Colombia-based Kangaroo Foundation. By putting in place a rigorous outcomes measurement framework, a DIB would provide a credible demonstration of a model for scaling KMC with relevance to other LMICs with high mortality rates of low-birth-weight infants. The DIB exploration is at an early design stage, but potential outcome metrics for the low-birth-weight infants include: increase in access to quality KMC, weight gain, and reduction in mortality. GCC is anticipating playing the role of an outcome funder, and it is seeking additional partners with an interest in co-funding outcomes or becoming an investor.

Nairobi City County in Kenya considered a DIB model to fund preschool, which was spurred by the recent commitment of the Kenyan government to provide free preschool to all children. However, restrictions in PPP laws prevent the County government from committing future payments for outcomes through an impact bond. The County is currently planning to implement a contract where salary payments for preschool staff will progressively transfer from a non-state education trust fund to the County government, based on outcomes. This initiative, though not an impact bond because it does not provide possible returns to investors, is an informative example of the different ways PbR and non-state financing can be leveraged.

In addition, some early discussions have taken place of impact bonds around nutrition[72] and education interventions across the world, including two potential impact bonds for Newcastle disease for poultry in Ethiopia and Nigeria and one for girls' education in Papua New Guinea, though no contracts have been signed to date.

Box 3. Impact Bonds for ECD in High-Income Countries

In HICs, seven SIBs across four countries (Australia, Canada, U.K., and U.S.) provide services to children in their early years. Two of these SIBs support preschool services and the other five finance child welfare services related to foster care avoidance and adoption. In addition, dozens of SIBs are in early stages of consideration in HICs and some are close to completing contracts. It's worth noting that a number of the following programs are structured around reductions in need for remedial education or child protection services. In all cases, safeguards were put in place to ensure that children were not denied services or protection they required as a result of perverse incentives. This is an important challenge in measuring impact in this sector.

Utah High Quality Preschool Program

The Utah High Quality Preschool Program is locsted in the state of Utah (specifically Salt Lake City and the surrounding vicinity) in the United States. The five-year program began in August 2013. The SIB provides financing for a targeted and high-impact preschool curriculum that aims to improve school readiness and academic performance among preschool students, most of whom are in the Granite School District (GSD). The district is home to a large number of Hispanic students and also serves as

Table 4. Impact Bonds Reaching Children Under Age Five

Name	Location	Intervention	Age	Outcome Metrics
Utah High Quality Preschool Program	U.S.	Preschool	3-4	Years of special education avoided
Child-Parent Center Pay for Success Initiative	U.S.	Preschool	4-5	Years of special education avoided, kindergarten readiness, 3rd grade reading
Partnering for Family Success	U.S.	Parenting support to keep families together	0-18	Reduction in out-of-home placement days
Newpin Social Benefit Bond	Australia	Parenting support to keep families together	0-5	Proportion of children that are restored to family care (court decided)
Benevolent Society Social Benefit Bond	Australia	Parenting support to keep families together	0-6	Reduction in a weighted metric of out-of-home placement days, helpline reports and safety and risk assessments
Sweet Dreams Supported Living Project	Canada	Parenting support to keep families together	0-12	Number of children residing with their mothers six months after the program
It's All About Me	U.K.	Adoption	4-18	Child enters program, child placed with family, 1st anniversary of a placement, 2nd anniversary of placement.

[72] Center for Global Development (2014).

the hub for refugees within the Salt Lake City area, including families from Afghanistan, Burma, Nepal, and several African countries. Two of the targeted GSD preschools are within established refugee centers. Overall, English is not the first language of approximately 50 percent of children in GSD preschools. One-third of the schools in GSD qualify for Title I funding from the federal government, meaning that more than 40 percent of the students qualify for free or reduced-price lunch, an indicator of poverty based on parent income. In many of the Title I schools, more than 70 percent of children qualify for free or reduced-price lunch. A large number of these students are placed in remedial ("special") education[73] in primary school because they are diagnosed with a need for extra help in reading or math or with their behavior. These extra needs are often a result of multigenerational poverty or English not being a student's first language, and they may be prevented if a student receives high-quality preschool.

Of the 12,000 3- and 4-year-olds in GSD, the SIB is designed to fund programming for 3,500 low-income children in that age group, with children divided into up to five annual cohorts. While the initial cohort consisted of 600 children for the 2013-14 school year, the 2014-15 student group expanded to 750 children. The SIB provides financing for children to attend the high-quality preschool program at six providers—Granite School District, Park City School District, Guadalupe School, Lit'l Scholars, Children's Express, and the YMCA of Northern Utah—with funding linked to the students rather than specific schools. Each of these providers implements the high-quality preschool model with fidelity.

GSD developed the high-quality preschool model, which the other providers are trained to implement. The program design is based on 10 key components for high-quality early childhood education, including relevant curriculum, strong parental engagement, and expanded teacher training. The outcome funders for the first year of the program are Salt Lake County and the United Way of Salt Lake, and the outcome funder for the remaining four years is the state of Utah.[74] Goldman Sachs' Urban Investment Group, the lead investor, has committed $4.6 million in upfront capital. J.B. Pritzker has committed $2.6 million and has taken a subordinate lender position. The United Way of Salt Lake serves as the program intermediary, managing the contracts and flows of funds between parties. Outcomes are determined by the "payment cohort," which are students with the highest probability of using services for special education, defined as testing two standard deviations or more below the mean for pre-kindergarten (pre-K) students on the Peabody Picture Vocabulary Test (PPVT). Payments are made for each year of kindergarten through grade 6 that children in the "payment cohort" do not require special education services. In the first year of special education results, released in October of 2015, 109 of the 110 students[75] determined to be at risk for use of remedial education did not require remedial services. This resulted in a payment to the senior investors of $267,000 for the first year of the program, equivalent to 95 percent of the savings accrued to the state for special education avoidance.[76]

Child-Parent Center Pay for Success Initiative

The Child-Parent Center Pay for Success Initiative was started in October 2014 in Chicago, Illinois, in the United States, and provides a four-year contract to fund the Child-Parent Center preschools. The SIB is in part a result of Chicago Mayor Rahm Emanuel's commitment to expanding access to half-day preschool to the approximately 25,000 4-year-olds who qualify for free or reduced-price school lunch in the city.[77] The Child-Parent Center (CPC) program, operated by the Chicago Public Schools (CPS),

[73] Defined as receiving an Individualized Education Program. Also referred to as "special education" in the U.S.
[74] The Utah legislature had not passed the bill allowing for outcome payments in time for the first year of the five-year contract, so Salt Lake County and the United Way of Salt Lake were the outcome funders for the first year.
[75] These 110 students were part of the whole cohort of 600 students and part of the 4-year-old cohort of approximately 390 children.
[76] Wood (2015); note that the outcome funder for these payments is the United Way of Salt Lake.
[77] Sanchez (2014b).

seeks to enhance educational outcomes for 3- and 4-year-old students through half-day pre-K classes and parent engagement programs. CPCs have demonstrated robust academic and social outcomes for children in the long-term.[78] Initially established in 1967, they are one of the oldest early childhood education initiatives in the U.S. CPCs are designed to incorporate relevant curriculum, learning approaches with parental engagement, collaborative management models, and sustainability. In the CPCs, head teachers oversee five classroom teachers and assist with their professional development, and parent resource teachers help coordinate with parents. CPCs differ from other preschools in the degree of parental involvement and professional development for teachers. In 2012, existing CPCs in Chicago were among Midwest locations that received an Investing in Innovation (i3) grant from the U.S. Department of Education, which allowed the CPCs to expand to 16 Chicago public school sites.[79]

The SIB will provide funding for 2,600 low-income 4-year-olds across eight schooling sites by funding pre-K slots at five existing CPCs and providing financing for new CPC centers at three public schools, bringing the total number of CPCs in the city to 19. Of the approximately 50,000 low-income 3- and 4-year-olds in Chicago, approximately 32,500 are in CPS preschools. Of those children, approximately 2,100 attended CPCs prior to the SIB funding, while the others attended different CPS programs. The initial cohort for the 2014-2015 school year included slots for 374 children. The SIB funded cohort is expected to grow over the years, expanding to an estimated 780 children each for the 2015-16 and 2016-17 school years, and 680 children for the 2017-18 school year.

The CPC program is housed within CPS, and CPS also serves as an outcome funder. Outcome payments are measured by the need for special or remedial education support for target students from Kindergarten through grade 12 (paid by CPS); Kindergarten readiness as indicated by achievement on a standard assessment tool (paid by the City of Chicago); and reading scores in grade 3 (paid by the City of Chicago). Goldman Sachs' Social Impact Fund and Northern Trust are the senior investors and the J.B. and M.K. Pritzker Family Foundation is the subordinate investor, together providing a total of $16.9 million in upfront capital. IFF serves as the program coordinator and a conduit for funds, and Metropolitan Family Services serves as a program intermediary, managing the performance of the CPCs. The CPC program funded by the SIB differs from program prior to SIB funding in that Metropolitan Family Services will provide a full-time parent facilitator, who will help the traditional CPC parent resource teacher.

Partnering for Family Success Program

The Partnering for Family Success Program was established in Cuyahoga County, Ohio, in the United States in January 2015. The SIB will address family homelessness and child welfare over five years. The program targets 135 families, including approximately 270 children, whose caregivers may be homeless, in unstable housing situations, and/or struggling with issues like domestic abuse, substance abuse, and mental illnesss, and whose children are involved in the child welfare system. The SIB outcomes are a reduction in children's use of out-of-home care and the reunification of children and caregivers. The program will work with children ages 18 or younger, though it is expected that approximately 60 percent of the children will be 5 years old or younger. Critical Time Intervention is the primary intervention implemented by the program's service provider, FrontLine Service. Critical Time Intervention provides families with emotional and practical support during the critical transition from homelessness to stable housing. FrontLine Service also links families to housing and provides age-appropriate and evidence-based trauma services to strengthen healthy and secure caregiver-child relationships. By providing caregivers critical access to stable housing before they are reunited with their children, this program helps caregivers to more successfully receive mental health services, complete substance abuse counseling, and access job interviews while allowing for an increased amount

[78] Reynolds et al. (2007).
[79] Human Capital Research Collaborative (2015).

of child visitations in a safe and stable home. The intervention implemented by FrontLine Service is a mix of Critical Time Intervention, evidence-based trauma services, and housing.The outcome funder is Cuyahoga County, Ohio. The senior investor is the Reinvestment Fund, with multiple subordinate investors and grantors, which together provided a total of $4 million in upfront capital. Third Sector Capital Partners Inc. serves as the transaction coordinator and an adviser to the special purpose vehicle (SPV), which is often set up in impact bonds as a conduit for funds in the deal. Enterprise Community Partners Inc. is the project manager and owner of the SPV. Outcomes are measured by the reduction in the length of time (measured by days) in out-of-home care for children in the treatment group over the five-year period, using the control group as a reference point.

Newpin Social Benefit Bond

The Newpin Social Benefit Bond (SBB) started in June 2013 in the state of New South Wales (NSW), Australia. In NSW, 18,000 children are in out-of-home care and more than 61,000 children are classified as at risk of harm. Child safety is a growing challenge in the state, with the number of children in foster or kinship care increasing by more than a factor of two within the past 10 years. In addition to the social concerns, there are economic implications, with costs ranging from $40,000 to $318,000 per child in foster care annually.[80] The contract duration of the Newpin SBB is seven years and three months, and the bond aims to improve child welfare, with a specific focus on restoring children in government care to their families. The Newpin SBB seeks to benefit the large number of children at risk of harm in the state. Specifically, the program aims to support more than 1,400 children across 700 families across three categories: families with at least one child age 5 or younger who is in government out-of-home care for a minimum of three months; is deemed at risk of serious harm; or is deemed in need of external support. Newpin is an intensive, long-term intervention that aims to ensure a safe home living environment for children, through improving parenting skills and therapeutic support for parents. Parenting courses, family therapy, and relationship-building between parents and children take place two to four times a week for up to a year and a half. The service provider, UnitingCare Burnside, established the initial Newpin Center in Australia in 1998. The SBB funds will finance the operation of the four existing Newpin Centers and the addition of six new Centers, contingent on performance. The outcome funder is the NSW Department of Family and Community Services. Investment funds were raised through the SBB, with 59 investors providing $6.73 million (AU$7 million) in upfront capital. Social Ventures Australia is the intermediary. Outcome payments are determined based on the number of children who have participated in the intervention and have been restored from out-of-home care to their family or have been prevented from entering out-of-home care, as determined by the judiciary system. The Newpin SBB managers have disclosed that investors received a 7.5 percent interest payment in the first year of the program and an 8.9 percent interest payment in the second, which is in the middle of the range of interest that investors can receive.[81]

The Benevolent Society Social Benefit Bond

The second SBB in the state of New South Wales (NSW), Australia, started in October 2013 and aims to improve children's safety. The five-year SBB will finance an intervention implemented by the Benevolent Society. The project will target up to 400 families that have at least one child under the age of 6, or are expecting a child, and that have been assessed by the NSW Department of Family and Community Services as being at "risk of significant harm." The SBB will finance the Resilient Families intervention, an intensive nine- to 12-month family support program that uses the Resilience Practice Framework developed by the Benevolent Society (TBS) in partnership with the Parenting Research Centre.

The program builds on the evidence base from the intensive home support program "Homebuilders," developed in the United States in the 1970s, as well as TBS' substantial experience with at-risk

[80] The Benevolent Society (2015).
[81] Social Ventures Australia (2015).

communities. Resilient Families has demonstrated positive gains in previous evaluations, with a 75 to 80 percent reduction in interactions with the children protection system for those who successfully exited the program. The outcome funder is the NSW Treasury and Department of Family and Community Services. A total of 47 investors, ranging from institutional fund managers to corporate and personal foundations and individual high-net-wealth investors, have provided $10 million in upfront capital. Westpac Institutional Bank and the Commonwealth Bank of Australia participated in the development of the bond and served as joint lead managers (a type of intermediary role) to raise the investment. The Benevolent Society manages the charitable unit trust, which, through Perpetual Corporate Trust Limited, issued the SBB. Outcome payments are determined by a weighted average of out-of-home care, child protection helpline reports, and safety and risk assessments, which are adjusted for low referrals and children who cannot be matched in the control group. The results from the first nine months of the Benevolent Society SBB projected expected returns of 5 percent to senior investors and 8 percent to subordinate investors. Actual returns will be calculated based on cumulative results and payments will be made at the end of the contract term.[82]

Sweet Dreams Supported Living Project

The Sweet Dreams Supported Living Project, focused on social welfare, was established in Saskatoon, Saskatchewan, Canada, in May 2014. The intervention seeks to improve child welfare over a contract period of five years. The project targets single mothers with at-risk children who are on the verge of needing support from the Department of Child and Family Services. The program covers a total of 22 children age 12 or younger. The intervention provides housing for both mothers and children at a government-owned residence called the "Sweet Dreams House," and aims to improve parenting skills and enhance the likelihood of employment for the mothers through classes and workshops. The Sweet Dreams Project is implemented by the Saskatoon Downtown Youth Center, and the outcome funder is the Province of Saskatchewan Ministry of Social Services. The investors, Conexus Credit Union and Wally and Colleen Mah, provided $1.4 million in upfront capital. The Saskatchewan Executive Council designed the outcome measures and contract and raised investor capital. The outcome payments will be provided at the completion of the project, given that 17 of the total 22 children are living with their mothers six months after the end of the project. If all of the children remain living with their mothers, the payments will rise from 75 percent to 100 percent of the principal plus 5 percent interest.

It's All About Me

The It's All About Me (IAAM) program, established in September 2013, is a 10-year, country-wide SIB in the United Kingdom. The program will aim to address barriers to adoption for at least 650 children who are in state care, with an emphasis on children between the ages of 4 and 18 who have been waiting for an adoptive family placement for more than a year. The goal of the SIB is to assist and accelerate the adoption of hard-to-place children and youths through voluntary adoption agencies. Local governments (or "authorities") and service providers can join the "IAAM Scheme" as cases of hard-to-place children arise. Multiple service providers are engaged with the SIB; the initial providers to join the SIB are Action for Children, Adoption Matters NW, After Adoption, Caritas Care, Family Futures and PACT. Local authorities that have joined the IAAM SIB (11 of them as of April 2015) serve as outcome funders, with supplementary funding from the Cabinet Office's Social Outcomes Fund. These service organizations will provide training courses in therapeutic parenting as well as 24-hour support throughout the first two years following an adoption placement. The investors, Bridges Ventures and Big Society Capital, provided $3.1 million in upfront capital. Repayment for investors is based on the number of children entering the program, placement with a family, the duration of the placement for one year, and the duration of the placement for two years.

[82] The Benevolent Society (2014).

6. DESIGN CONSIDERATIONS FOR IMPACT BONDS FOR ECD IN LOW- AND MIDDLE-INCOME COUNTRIES

Many of the potential benefits of impact bonds for the ECD sector are dependent on certain design considerations, outlined below. These considerations often apply to other sectors as well as ECD, high-income countries as well as LMICs, and other PbR mechanisms as well as impact bonds, though specific considerations for impact bonds for ECD in LMICs are highlighted. The considerations span the four stages of developing a SIB or a DIB: determining feasibility, structuring the contracts, implementing the service, and evaluating and repaying investors. This process is complex and nonlinear, and each transaction is unique.

There are three main goals driving design considerations.

1. Quality services that lead to the best possible outcomes for beneficiaries, which in turn requires…
   a. locally appropriate interventions;[83]
   b. adaptable programs (often as a result of performance management); and
   c. a healthy ecosystem of providers.
2. Procurement and financing based on quality and transparency[84]
3. Sufficient working capital and outcome funding

These considerations build on a number of research and thought pieces written on impact bonds. While impact bonds are still young (the first one was implemented in the U.K. in 2010) a number of useful introductory pieces of literature exist on SIBs,[85] a large literature on U.S.[86] and U.K. SIB activity,[87] as well as publications specifically targeting governments,[88] service providers,[89] investors,[90] and foundations,[91] which provide useful recommendations. The rest of this section is structured as a deep dive into each stage of impact bond development and the key considerations that relate in particular to ECD. A report of

[83] Eddy (2015).
[84] Rangan and Chase (2015), Palladijian and Shumway (2015), and Overholser (2015) all agree that the most important part of an SIB is that it encourages government and service providers to operate more effectively by reallocating funds to evidence-driven interventions. Patton and de Witt (2015) argue that this transparency is particularly important in developing countries for both governments and donors.
[85] Social Finance U.S. (2012), Liebman, J. (2011), Callanan et al. (2012), Mulgan et al. (2011).
[86] Galloway (2013), Golden and Nagendra (2015), Corporation for National and Community Service (2015).
[87] Since structuring the first SIB in 2010, Social Finance U.K. has published more than 30 publications, including in the past year publications on existing or potential impact bonds in the U.K. for children's services (Social Finance U.K. 2015a), loneliness (Social Finance U.K. 2015b), and adolescent out-of-home care (Social Finance U.K. 2014); Ronicle et al. (2014) provides a recent overview analysis of impact bonds in the U.K.
[88] In the U.S., see Government Accountability Office (2015) and Liebman, J. (2013).
[89] So and Jagelewski (2013).
[90] Godeke and Resner (2012). Nonprofit Finance Fund (2012).
[91] Hughes and Scherer (2014).

the Development Impact Bond Working Group has informed many of the considerations for impact bonds in LMICs, as it provides a detailed analysis of the impact bond development process across sectors in LMICs.[92] Other authors[93] have also written detailed considerations for impact bond development, aimed to guide practitioners. This section of this report, in contrast, will provide an overview of the key considerations with a focus on ECD and is intended for a broad audience.

6.1 Stage 1: Feasibility

6.1.1 Identify Social Challenge

The starting point when considering an impact bond, or any type of policy tool for that matter, should first and foremost be the identification of the social challenge.[94] In other words, what is inhibiting the realization of the desired social outcomes? Only after the problem has been identified should the appropriate tool or combination of tools be considered.[95] In section 4 we identify some broad characteristics of ECD that potentially make impact bonds and ECD a good match, but this isn't to say that impact bonds will be the right solution in all situations. There should be a solid theory of change related to the social challenge and how the tool will help to address the challenge.

In section 3 we identified a lack of financing, insufficient political will, low quality and capacity, and knowledge gaps as the four main constraints to achieving quality ECD programming at scale. We also laid out some plausible arguments for how impact bonds may be able to address some of these challenges. An examination of the existing and developing impact bond market for early childhood interventions illustrates the variety of challenges that stakeholders are attempting to address and early results demonstrate some success in achieving those goals.

In Salt Lake County, Utah, the challenges to achieving quality pre-K at scale were primarily related to a lack of financing due to insufficient political will. In this case, the key steps to delivering scale had been identified already through rigorous evaluations of an existing program in a local school district, but the funding to continue to provide and expand that level of quality had not been budgeted because the majority of legislators did not consider it a priority. In the impact bond, the state had to pay for the provision of the pre-K program to the chosen beneficiaries only if remedial education in elementary school was avoided. By demonstrating through the SIB that the program would result in fiscal savings, political will shifted. In Chicago, Illinois, the social challenge to delivering quality pre-K at scale was also related to political will and funding. Despite insufficient political will in some institutions to expand pre-K, the clear savings presenting in the SIB have increased interest in funding pre-K in the future. In this case, some measures were added to the repayment terms, which represented not only short-term savings from remedial education avoidance, but also the achievement of outcomes associated with longer-term success in life and thereby long-term fiscal savings. Though cost savings were driving factors behind both the Utah and Chicago SIBs, intrinsic and extrinsic value more broadly are equally strong motivations.

Capacity gaps were the main challenges that were identified before the introduction of a child welfare SIB in Cuyahoga, Ohio, which aims to bring together caregivers and their young children separated due to their caregivers being homeless, in unstable housing situations, and/or struggling

[92] Center for Global Development and Social Finance (2013),
[93] Barclay and Symons (2013), Goodall (2014).
[94] Post and Glassman (2015).
[95] See analysis of challenges in maternal and child health services and potential tools to solve them in USAID (2015).

with such issues as domestic abuse, substance abuse, and mental illness. Because the existing service system was unable to jointly tackle the combination of complex social issues, coordination was a big challenge.[96] In the SIB, with a reduction in days in out-of-home placement for the children as the outcome metric, these services could be bundled in a more coordinated way such that caregivers could improve their lives and their children could be returned to a safe home life with their caregivers. The resulting outcome metric increased political will and availability of funding to support wraparound services for families in need. The SIB also helped resolve gaps in government data coordination capacity between the homelessness and child welfare systems in Cuyahoga County. In LMICs, there is a great opportunity for impact bonds to facilitate the development of government data systems that don't currently exist or that have great potential for improved operation.

In LMICs, the social challenges could include some of those described above in the Utah, Chicago, and Cuyahoga County cases,[97] though the degree of the challenge may vary. Political will is sure to remain a hurdle in many LMICs. The impact bonds in Utah and Chicago were able to shift political will in part because of the clear cost savings from a reduction in remedial education. There are fewer remedial services available in LMICs, which could preclude cost avoidance. Though fiscal savings could result in LMICs through other channels, e.g., reduced repetition rates in school, the intrinsic and long-term societal and economic benefits will be the primary drivers of impact bonds in LMICs.

Government and other outcome funders may want to achieve outcomes, but the current evidence base behind the intervention may be insufficient for them to take the risk. In such cases, an impact bond may be necessary to reduce the risk of outcome achievement for government. Such was the case in both of the impact bonds in Australia[98] and in the Innovation Fund in the U.K., where 10 innovative service providers were contracted to implement services that improve education and employment outcomes for young people. Impact bonds could be particularly useful to test interventions in LMICs, given that there is generally less information available about program effectiveness.

The main constraining factor for Educate Girls—the service provider in the DIB focused on girls' education—was a lack of funding to expand. Expansion would require a strong system of data collection and performance management to achieve and demonstrate program impact.[99] For this organization, the DIB is an important demonstration program to show that private sector dollars can be put to good use.

Each impact bond will differ based on the social challenge at hand. One outcome funder may choose to engage in an impact bond because it is a way to circumvent political hurdles or overcome coordination challenges, while another may choose to engage because it is a way to learn more about how to deliver services more efficiently or cost-effectively. An investor may engage because it has the desire to tackle one or more of the abovementioned constraints, or because it has identified an opportunity for social, and potentially financial, return. The social challenge's starting point will play an important role in the remaining steps of developing a deal including choices about the duration of the deal, outcome metrics, repayment terms, performance management, ability to adapt the model during the contract, and evaluation methodology.

[96] Interview with Marcia Chong and Brian Beachkofski, Third Sector Capital Partners, October 9, 2015.
[97] Note that these programs will be referred to by the government body serving as the outcome funder (the state of Utah, the city of Chicago, and Cuyahoga County, respectively).
[98] Interview with Madly Bodin and Wendy Haigh, the Benevolent Society, September 20, 2015.
[99] Interview with Safeena Husain, Educate Girls, September 2015.

Finally, experience in past impact bonds has indicated that agreeing on a communication strategy about the social problem the impact bond aims to solve establishes clarity for external parties. For example, if the aim of impact bond is to experiment with new interventions rather than to scale the interventions of promising providers, that should be made explicit from the beginning of the structuring process.

6.1.2 Determine Feasibility for an Impact Bond

Before actors begin planning possible structures for an impact bond, a number of criteria must be met in order for an impact bond to be feasible. First, appropriate legal and political conditions must be in place that allow for the outcome funder to pay for outcomes and the investors to be repaid based on outcomes. Second, an outcome funder must be willing to pay for outcomes. This depends on the existence of meaningful and measurable outcomes that can be achieved in a reasonable time frame. Next, sufficient capable service providers must exist with satisfactory evidence for investors that the services will lead to outcomes. Finally, a group of individuals is needed who are willing to collaborate and commit to a complicated, but potentially valuable, contracting process. This section will address appropriate legal and political conditions and the criteria related to outcomes will be discussed in the following section on structuring the transaction.

Appropriate Legal and Political Conditions

Although there may be many benefits of the new contract arrangements in impact bonds, it may be impossible to structure an impact bond due to legal restrictions. Each impact bond has a different arrangement of contracts (see Gustafsson-Wright et al. 2015a), but three features are consistent across SIBs: a commitment for investors to partially or fully fund a service; a commitment of the government to make payments contingent on outcomes, often in future budget cycles; and a commitment for investors to be repaid using those government payments. One may not need to investigate the legality of government involvement in a DIB, where a third party pays some or all of the outcome payments; however, the legal requirements for investments in the intervention country still apply. A nearly universal recommendation from stakeholders involved in impact bonds is to involve lawyers early in the process. The extra cost to determine a more accurate timeline of contract development will almost certainly pay for itself in time and energy saved.

Instiglio and Thomson Reuters Foundation produced a report in 2014 that examined the legality of impact bonds in Brazil, Chile, Colombia, India, Mauritius, Mexico, and South Africa and provides a useful overview for other practitioners of the process of determining legal considerations for impact bonds. Table 5 lists the questions answered in each case in the report.

Table 5. A Legal Roadmap for Social Impact Bonds

Investors: Funding and Procurement	Does the law of your jurisdiction allow donors in general (regardless of their legal nature) to fund SIB schemes by directly delivering funds to an intermediary?
	What options, if any, would an investor have when contracting with the government directly?
	Are “hybrid investments” legal or subject to special regulation?
	What legal framework applies to debt and equity investments? What limitations or procedures apply to bringing in funds to the jurisdiction?
	For equity investments, are there quantitative/qualitative legal limitations for repatriation of profits?
	Would the independent evaluator’s report be binding to the government (i.e., assuming that the government is committed to accepting the outcome of this report, could the government challenge such a report)?

Investors: Tax Aspects	What tax rules apply to the funding provided by investors?
	Does the jurisdiction have international investment agreements, preferential trade, or double taxation treaties in force?
	Are there tax incentives/breaks for socially oriented investing? How cumbersome is the process for obtaining/collecting these incentives?
	Is it possible to write off losses or to reframe a failed investment in SIBs as a grant/donation? If so, would the grant/donation be subject to taxes?
Government	What is the general structure of the state in your jurisdiction? What degree of autonomy do government entities have for contracting?
	Do applicable public procurement rules authorize the implementation of a SIB scheme, i.e., in which payment from the government would be entirely contingent on the organization achieving measurable social outcomes?
	How does the government of the jurisdiction contract social services? Is public procurement subject to special rules, or would it be subject to general and commercial law rules? Is there flexibility in the performance and supervision of contracts by government?
	May an intermediary tender for both design and implementation stages, or would there be impediments because of conflict of interests? Would it be possible to combine direct contracting or PPPs with public procurement and, thus, avoid the conflict of interest issue?
	Does annual budgeting apply? If so, are there legal mechanisms to ensure future payments? Can these mechanisms commit future administrations? Where the law does not readily allow for future payments, could trust structures or special vehicles be set up to make up for any shortfalls in the law?
	What happens if a government entity does not execute the whole of its annual budget? Would there be any negative consequences for the entity? If so, would there be legal mechanisms to enable the “freezing” of budget funds?
Intermediary	If the intermediary carries out activities as simply an adviser, would the law require the intermediary to set up a permanent presence in the jurisdiction? If the intermediary is receiving and administering investors’ money, would the law require the intermediary to set up a specific type of entity in the jurisdiction?
	What types of entities are available in the jurisdiction?
	Assuming that the intermediary will receive funding (either through equity or loans) and will use them for the advancement of social projects, could the law of the jurisdiction consider that the intermediary is carrying out financial intermediation activities or any other sort of regulated activity? What thresholds apply (if any) for being considered a regulated entity (i.e., under financial regulations)?
	Does the law of the jurisdiction set forth foreign exchange constraints or mechanisms for remitting money into the jurisdiction and converting it into local currency?
	What types of visas/permits may be required 1) if the intermediary requires bringing foreign personnel into the jurisdiction, or 2) if the intermediary has been already set up as an entity in the jurisdiction?
	Is there any requirement for intermediary’s directors/officers in the jurisdiction to be national or residents of the jurisdiction?
Service Provider	Assuming that the intermediary signs a contract with the government, would the law allow the intermediary to freely choose and contract with the service provider? Would the contract with the government restrict the choice of service provider made by the intermediary?
	Is there a substantial risk that service providers’ personnel could be recharacterized as employees of the intermediary? What mechanisms are available for reducing/managing this risk?

Source: Adapted from Instiglio and Thomson Reuters Foundation (2014).

Negative responses to the questions in Table 5 may not preclude the development of an impact bond; the impact bonds developed to date and in the works demonstrate a number of strategies to address local requirements. Government ability to commit future funding for outcomes, which is necessary for any government-funded RbF contract, is worth highlighting in particular. Commitment of future funding puts a liability, or debt, on government balance sheets, rather than an annual appropriation. LMICs often have restrictions on the debt-to-GDP ratios they are allowed to undertake, which could make outcomes-based financing infeasible. In addition, local government multiyear debt may require approval from the national treasury, which may reject plans for an impact bond designed by local government. Training will likely be needed on techniques for budgeting future outcomes funds.

Interestingly, outcome payments in the impact bonds in the U.S. are appropriated to a holding vehicle at the start of the bond or are appropriated over the course of the bond term for legal protection, which is counter to the original impact bond design where government makes payments only when and if outcomes are achieved. For example, in Massachusetts, the outcome payments for the two SIBs in place there were put into a trust fund prior to the start of the SIBs and are backed by the full faith and credit of the state. If expected outcomes are not achieved, it may be difficult for government to account for funding appropriated for outcome payments. The credibility of the outcome funders' commitment to repay based on the terms of the contract will be a particular concern in LMICs. Tools such as the World Bank's Multilateral Investment Guarantee Agency could be used to insure government payments. The agency insures foreign direct investments against losses related to currency inconvertibility, expropriation, war and civil disturbance, and non-honoring of financial obligations.[100]

LMICs and high-income countries alike could use existing public-private partnership frameworks for impact bond outcome payments and investments. PPP frameworks may be particularly helpful in Latin America, where they are well established.[101] The impact bond in development for maternal and child health in India may use PPP frameworks in a particularly innovative way. The government has previously committed to reimburse private clinics for family planning and birth services, which will be used in the impact bond to augment outcome payments. The use of the PPP may also make it more likely that the services are continued following the cessation of the impact bond. In addition, there may be potential in India to take advantage of the new Companies Act, which requires companies to donate 2 percent of their profits to social causes, for impact bond outcome funding. PPP frameworks may need to be rewritten to accommodate payments based on social outcomes, rather than physical or service outputs.

Impact bond investment regulation may be improved through legislation. The U.K. has enacted a social investment tax relief scheme that applies to investments in SIBs. In the U.S., investors pay taxes as they would on a typical investment, though there is increasing interest in a special tax status for impact bond investments and new speculation as to whether they fall under mainstream securities regulation.[102] Such laws in all potential investor countries could be leveraged to expand the capital available for impact bonds in LMICs.

In addition to the appropriate legal conditions, a favorable political environment is necessary for impact bonds to be feasible. Government commitment to the impact bond transaction was the second-most cited facilitating factor in arranging impact bonds in Gustafsson-Wright et al. (2015a) (after measurable outcomes), with 87 percent of stakeholder respondents in the first 38 impact

[100] Guarnaschelli et al. (2014).
[101] Bloomgarden et al. (2014).
[102] Grossman and Chong (2015).

bonds saying it was "very important." High-level support in the national government or local government can drive state-level impact bonds, and vice versa. Countries with recently established mandates for ECD provision are particularly well suited for efforts to expand ECD; in Kenya, the conversation around a modified DIB would not have started if access to preschool had not been added as a right in the constitution. If outcome funds are appropriated annually, or when outcomes are achieved, political support across party lines could reduce the risk of default on payments that may arise from political changes.

One of the main differences between impact bonds in high-income countries and LMICs is that there may be less government funding available to pay for outcomes in LMICs. There may be more opportunities for third-party funders to augment or match government funds, or pay for outcomes entirely, as in a DIB. Structures may already be in place in LMICs to mix third-party funding with government funding as a result of foreign or development aid.[103] Where third parties lead in outcome payments, government involvement early in the process may help to ensure ownership so that government may step in after the impact bond is finished, as in other programs funded by foreign aid. Regardless of donor involvement, government commitment will be important in defining the target population and success in an impact bond.

One issue faced by countries of all income levels in securing outcome payment funding is the so-called wrong pocket problem. This problem arises when the entity paying for a program is not the same as the entity that may receive the benefits of that program in the medium to long run. The value of outcomes from early childhood programs, for example, could be spread across social welfare services, the criminal justice system, health care, and education, as well as across levels of government within each of those sectors. The agency paying for the early childhood services will likely be different than the one that benefits from the value of the outcomes.[104] Golden and Waters (2014) suggest structuring impact bond contracts around a small number of outcomes that are high priorities for government and produce at least a significant portion of the benefits to society (or savings).[105] One way to encourage impact bonds for programs with high value to society but with diffuse value across agencies is to establish a central outcomes fund to augment an individual agency's funding. In the U.K., the Cabinet Office's Social Outcomes Fund and the Big Lottery Fund's Commissioning Better Outcomes Fund together have committed to make up to £60 million (about $91 million) available to supplement outcome funding from local governments and support proposal development for SIBs or other PbR contracts.[106] A similar fund has been proposed in the U.S. in each of President Obama's past four federal budgets, but it has not been passed by Congress.

Impact bonds in the ECD sector in particular may face opposition from politicians concerned that government intervention in early childhood interferes with family responsibilities. Furthermore, the long time frame for improvement in employability may make ECD an even more politically challenging issue in LMICs, where governments are forced to prioritize pressing issues more than high-income countries.[107] In early childhood, there is the potential for an impact bond where different investors and outcome funders pay for different outcomes across the lifespan of a child, depending on the funders' relative interests. The impact bond in Chicago is currently the only impact bond where different outcome funders pay for separate outcomes.

[103] Patton and de Witt (2015).
[104] See also Roman (2015).
[105] Golden and Waters (2014).
[106] Big Lottery Fund (2015).
[107] Patton and de Witt (2015).

In addition to legal and political feasibility, there must be adequate service provider capacity and all stakeholders must be committed to collaborating in the impact bond process. The other aspects of feasibility—meaningful and measurable outcomes, a reasonable time frame for achieving outcomes, and evidence connecting interventions to outcomes—will be covered in the following section on outcome selection.

Key Takeaways: Feasibility Stage

- Identifying and clearly defining the social challenge to be addressed is the first step of the impact bond process and influences all design considerations
- Outcome funders must be willing and able to pay for outcomes (requires favorable legal conditions, political commitment, and meaningful and measurable outcomes that can be achieved within a reasonable time horizon)
- A sufficient number of capable service providers must be available, and there must be evidence that they can deliver outcomes
- Investors who are willing to invest in outcome achievement are critical
- A group of individuals willing to collaborate and commit to the contracting process is essential

6.2 Stage 2: Structuring the Impact Bond Contracts

Once there is reasonable evidence that an impact bond could be feasible, the details of the contracts and specific structures are negotiated. The structuring process will be different in an impact bond fund and an individual impact bond. In a fund, the outcomes and maximum prices are set by the commissioning government body (outcome funder), while in an individual impact bond this is an iterative process among all stakeholders as they work toward terms that suit all parties.

6.2.1 Determine Outcome Metrics

The choice of outcome metrics around which the impact bond contract is centered is the most critical piece of structuring the transaction. Before even beginning to consider an impact bond transaction, some set of outcomes that are meaningful, measurable, and respond within a reasonable time frame must be under consideration. The time frame will depend on the investors' and outcome funders' constraints. Private, commercial, and impact investors generally have a short period in which they are willing to wait for financial returns. It is important to look at these short-term outcomes not as the end goal for an early childhood intervention, but rather as proxies for the longer-term outcomes.[108]

Optimal outcome metrics are meaningful, malleable, and measureable (see Table 6). These categories are almost always in opposition to one another, so stakeholders must find a balance between the three. The three categories are explored in greater detail throughout the section.

Meaningful Outcomes

Meaningful outcomes are outcomes that have some intrinsic or extrinsic value. Intrinsic value may be derived from a conviction that all children have the right to be happy, healthy, and well educated, or that all individuals have the right to shared prosperity in their lifetime. The new SDGs provide a common definition of outcomes that are intrinsically valuable to the global community (see Box 1). National policy agendas also define outcomes that are intrinsically valuable to policymakers. The extrinsic, long-term value of an early childhood education program could include labor market outcomes (more refined and diverse skills, lower unemployment, higher wages) and societal outcomes (reduction in risky behavior, crime). Impact bonds in high-income countries have thus far been structured around cost savings to government, though the field is increasingly emphasizing the broader intrinsic and extrinsic value of outcomes to government.[109] A broad definition of intrinsic and extrinsic value will be even more relevant in LMICs.

Table 6. Outcome Metric Consideration Factors

Meaningful	Malleable	Measurable
Intrinsic value	Evidence that they can be influenced by interventions	Simple (few metrics, simple to measure, inexpensive)
Extrinsic value (outcomes across critical development domains and critical ages)	Attributable	Accurate (resistant to manipulation)
Capture the breadth of potential impact		Measurable within a time frame that meets investor and outcome funder requirements

Source: Authors' research.

[108] For a technical guide to developing outcome metrics in impact bonds, see Social Finance U.K. (2015c).
[109] Kohli et al. (2015).

Since the ultimate goal of ECD interventions is that they improve an individual's life trajectory, using outcomes that are not linked to medium- or long-term benefits (such as a standardized test that has no correlation with success later in life) as a metric in an impact bond would have little meaning or impact. However, impact bonds require an outcome that can be measured within a time frame that meets the requirements of investors and outcome funders, which often excludes measures of adult outcomes. Ideal outcome metrics, therefore, will be intrinsically valuable (e.g., child survival) and serve as proxies for extrinsically valuable long-term outcomes (e.g., reduction in risky behavior).

The choice of metrics should also capture a meaningful combination of outcomes. For example, simply measuring one dimension of learning, such as third grade reading ability, will not capture the range of capabilities required for lifelong success. Furthermore, early childhood programs may have impacts in numerous ways, which the combination of selected outcomes must capture. A choice of various measures can protect the investor and service provider from undue losses if the intervention does not affect one measure for contextual or implementation reasons but does affect another.[110] Finally, even if there is a strong link between a proxy outcome and later-life impacts, a set of outcomes over a long period of time could help to ensure that key outcomes are achieved at critical ages, such as height-for-age z-score and preschool enrollment at age 3, kindergarten readiness at age 5, and reading, math, and socioemotional development at age 9. In the early childhood field, there is some concern over the fadeout of the cognitive benefits of early childhood programs. Setting outcomes over time could help incentivize and capture the importance of continuity of quality programming, although this would complicate investor and outcome funder risk and value-for-money assessments.

Malleable Outcomes (evidence of success in achieving outcomes)

The selection of outcomes for an impact bond should also be informed by the evidence-base on evaluations of ECD interventions. A recent review by the World Bank's Independent Evaluation Group (IEG) analyzes the effects of early childhood interventions on later-life outcomes. While this does not provide information on the relationship between short- and longer-term outcomes, it is an informative overview of the state of knowledge about the potential long-term outcomes of ECD programs. Overall, the evidence-base on the impact of ECD on long-term economic and societal outcomes in developing countries is relatively thin. Some of the evidence that does exist, however, shows surprisingly large impact on long-term outcomes. The IEG review found 55 rigorous evaluations of ECD interventions on later-life outcomes based on only 25 projects across 22 countries.[111] As Table 7 demonstrates, the evidence base varies greatly in terms of the number of studies for each outcome area associated with a given intervention. Some outcomes and some interventions are heavily represented, while others have not been evaluated rigorously.

[110] Cited, for example, in Benevolent Society SBB case

[111] Though the IEG review is the most recent and rigorous systematic review of evaluations of long-term outcomes of ECD interventions, it is not the only systematic review of ECD. In addition, the field has learned a great deal about what works in the field through less rigorous quasi-experimental evaluations and practitioner experience.

Table 7. Rigorous Impact Evaluations of Early Childhood Intervention in Low- and Middle-Income Countries on Later-Life Outcomes (numbers of evaluations)

			Outcome Domains							
		Intervention Categories	Cognitive dev.	Language dev.	Socioemotional dev.	Physical dev.	Schooling	Labor market	Unique studies	Unique projects
Nutrition	Mother	Micronutrients and iron-folic acid: supplementation and fortification for mothers	2	1		8	2		8	4
		Exclusive breastfeeding promotion	1	1	1	5	1		8	1
	Children	Supplemental feeding (preschool, center-base and/or take-home rations)	3	3	3	3	4		10	5
		Counseling on optimal feeding practices	2	3	2	2	4		5	2
		Micronutrients and fortification for children	1	1		1	1		1	1
Health	Pregnancy, delivery, and postnatal	Attended delivery	1				1		1	1
	Disease treatment	Deworming	1	1		1			1	1
		Planning for family size and spacing	1			1	1		1	1
	Access to health care	Well-child visits, growth monitoring, screening for developmental delays	4	4	2	3	5		7	4
		Immunization	1			1	1		1	1
Water, Sanitation	Water and sanitation	Access to safe water					1		1	1
		Hygiene or hand washing			1	1			2	1
		Adequate sanitation	1	1					1	1
Education	Parent support		5	4	6	6	3		15	5
	Stimulation		7	6	10	6	2	1	18	3
	Early childhood and pre-primary programs	Quality teaching, programming, or curricula	1	1	2	2	4		6	5
		Preschool Infrastructure	1	1	1	1	2		2	2
Social Protection	Child care/day care						1		1	1
	Social assistance transfer programs	Conditional	3	4	2	3	4		6	3
		Unconditional/targeted income support (child grants, etc.)	1	1		1	1		1	1
	Child protection interventions	Orphans and fostering	2	1	6	4			10	1
Gov	Governance reflecting ECD interests	Women's political reservation							1	1
		Unique Studies	21	19	15	27	19	1	**55**	-
		Unique Projects	16	15	7	14	16	1	-	**25**

Source: Tanner et al. (2015).

Table 8 attempts to summarize (with some large assumptions) the findings from the evaluations examined by the IEG. It breaks down interventions by nutrition, early stimulation, health, and social protection (those categories with the largest number of evaluations) and divides the outcomes into the categories of physical development, cognitive development, language development, socioemotional development, schooling, and finally employment and labor market outcomes. While this table does not demonstrate how intermediate outcomes relate to longer-term outcomes, some evidence of those links has been explored.

A few salient findings emerge from this analysis, though some important caveats should be noted. First, the findings are notably based on only 25 programs. Second, there is variation in the number of evaluations associated with each finding (see Table 6). Third, the quality of the programs evaluated may vary in, for example, the frequency, intensity, and duration of interventions as well as the qualifications of the service providers. Fourth, some outcomes have no evaluations associated with them for particular interventions and at certain ages. Fifth, the populations receiving the interventions may differ substantially in individual, household, or community characteristics. Sixth, though all tools and measurement techniques are deemed rigorous by the reviewers, they may vary across evaluations. Finally, there is some variation across programs in terms of geographical context, though particular regions are more heavily represented (Europe and Central Asia as well as Latin America) and others are represented weakly or not at all (the Middle East and North Africa). The evidence of significant positive impact can be summarized as follows:

Physical development outcomes—Health interventions were the only interventions shown to have a significant impact on physical development, but only on children in the 6-12 age range. Notably, the nutrition interventions evaluated were not found to have any significant impact on physical development.

Cognitive development outcomes—Nutrition[112] and early stimulation interventions were found to have a significant impact on cognitive development measured in adults. Early stimulation was also found to have a significant impact on cognitive development among the 13-17 age group. Health and social protection interventions were found to have a significant impact among the 6-12 age group.

Table 8. Impact of Early Childhood Interventions on Later-Life Outcomes

Intervention Domains	Outcome Domains					
	Physical development	Cognitive development	Language development	Socio-emotional development	Schooling	Employment and labor market
Nutrition	◆ ■ ●	◆ ■ ●	◆ ■ ●	◆	◆ ■ ●	
Early Stimulation	◆	◆ ■ ●	◆ ■ ●	◆ ■ ●	◆ ■ ●	●
Health	◆ ■	◆ ■	◆		◆ ■ ●	
Social protection	◆	◆	◆ ■	◆	■	

◆ Age 6-12 ■ Age 13-17 ● Age 18+ ■ Significant ■ Not significant

Source: Adapted from Tanner et al. (2015).
Note: No symbol where evidence is insufficient or nonexistent.

[112] Note that the positive findings on nutrition stem from one study of an intervention in Guatemala. Some experts suggest that this intervention had positive findings due to the longer duration of the intervention, while some researchers question the rigor of the research.

Language development outcomes—Nutrition,[113] early stimulation, health, and social protection interventions were all shown to have a significant impact on language development among children ages 6-12. Only early stimulation was found to have a significant impact on language among those ages 13-17. Both nutrition and early stimulation were found to have a significant impact on language among adults.

Socioemotional development outcomes—Early stimulation and social protection were found to have significant impacts on socioemotional development among children ages 6-12. Only early stimulation had sustained impacts on the socioemotional development of children ages 13-17 and adults.

Schooling outcomes—Early stimulation and health interventions were found to have significant impacts on schooling of children ages 6-12. Early stimulation and social protection were found to have a significant impact on schooling of 13- to 17-year-olds. Nutrition, early stimulation and health were found to have significant impacts on schooling outcomes for adults.

Employment and labor market outcomes—Only one study has been conducted in the LMIC context that links an ECD intervention with employment and labor market outcomes. This study, from Jamaica, found that earnings increased by 25 percent in adults who had participated in an early stimulation program when they were 0 to 24 months of age.

Though the review provides a good indication of which interventions are most likely to lead to outcomes, namely early stimulation programs,[114] there is no clear story about the short- or medium-term outcomes that are the best proxies for long-term outcomes, which is needed to inform the selection of impact bond metrics. The complication can be attributed to the fact that these outcomes are highly interrelated and nonlinear. The nonlinearity arises because each of these outcomes, for example cognitive and socioeomotional development, can relate to themselves (self-productivity) and to each other (cross-productivity) over time.[115] While little evidence on this topic exists in for LMICs, Helmers and Patnam (2011), using data from the "Young Lives" study in India, find that self-productivity of cognitive skills and cross-productivity of cognitive skills on socioemotional skills during the transition from 8 to 12 years old are significant.[116] The relationships are still not fully understood, but it is sufficient to say that one intermediate measure may link to other intermediate outcomes.

Although the IEG review does not provide evidence on intermediate outcomes' ability to predict long-term outcomes, a number of studies on the predictive power of intermediate cognitive and socioemotional outcomes on long-term outcomes provide informative findings. Until recently, the vast amount of literature emphasized cognitive skill development[117] during the early years as the main factor leading to an individual's long-term success.[118] It is increasingly recognized, however, that cognitive skills are only one side of the coin.[119] For example, Heckman et al. (2006) show

[113] Ibid.
[114] It is plausible that this is in part due to the fact that it is the intervention with the most studies associated with it (15 for parenting support programs and 18 for stimulation). Notably for each of those categories, only five and three unique programs, respectfully, are evaluated.
[115] See Cunha and Heckman (2010).
[116] In contrast to Cunha and Heckman (2010), no cross-productivity effect of socioemotional on cognitive skills are found in Helmers and Patnam (2011).
[117] Including nutrition, which contributes to the development of cognitive skills.
[118] Carneiro and Heckman (2003), Heckman and Rubinstein (2001), Rosen et al. (2010).
[119] Rosen et al. (2010).

that non-cognitive (socioemotional) skills are at least as important as cognitive skills for social and economic success.[120] In fact, the authors suggest that early interventions, such as Head Start and the Perry Preschool Program in the United States, owe their success to improvements in an individual's socioemotional rather than cognitive skills. Heckman and Rubenstein (2001) also find that differences in socioemotional skills explain why GED recipients[121] have lower hourly wages than other high school dropouts who do not take the GED exam, when controlling for cognitive ability. Finally, in a U.K. study that uses two longitudinal samples, the authors present evidence that personality, measured with the Big Five personality factors and the Eysenck Personality Questionnaire (EPQ-R), predicts academic performance.[122] One of the few studies that attempts to investigate the link between socioemotional skills and future well-being in a developing world context is Bassi et al. (2012), which used data from the Inter-American Development Bank (IDB) Skills and Trajectory Survey (STS) from Argentina (2010) and Chile (2008) for 25- to 30-year-olds. According to the authors, this is the first dataset in the region that made analysis of skills, education, and employment outcomes possible. The results for both countries indicate that higher levels of self-efficacy are associated with increased labor force participation, a higher probability of being employed, and higher wages.

Great progress is being made in research on the early- and mid-life outcomes that are predictive of long-term success, though more evidence is clearly needed. In addition to informing the selection of outcomes in impact bonds and other outcome-based contracts, this research will be critical to broader support for ECD interventions.

In addition to evidence of the intrinsic or extrinsic value of the outcome metrics, there must exist some evidence that a provider can achieve that outcome. The required historical evidence of intervention impact on the outcomes selected for the impact bond is dependent on the risk appetite of the investors, as this evidence is the basis for the investors' risk assessment. The entities that can serve as investors range from foundations to commercial investors, with any combination of community development financial institutions, international development financial institutions, impact investors, pension funds,[123] or service providers in between. Each investor will have different interests and risk profiles.[124] There is some debate in the field as to the extent to which mainstream investors will engage in impact bonds, but there is evidence that many mainstream investors are sincerely motivated by both social and financial return.[125] Evidence of success in achieving outcomes could come from evaluations of interventions that closely mirror the intended impact bond service and delivery mechanism. These evaluations are more relevant if they come from a context similar to the one in which an impact bond is planned and if they are rigorous evaluations that compare outcomes for a group receiving the service with another group that does not receive the service, while accounting for differences between the groups. If there is strong evidence linking an intervention to outcomes, stakeholders may agree to use a less rigorous evaluation to determine payments. Alternately, if little historical evidence is available on intervention effectiveness, a more rigorous evaluation may be used in the impact

[120] Social and economic success are measured using hourly wages, dropout rates, employment, work experience, smoking behavior, incarceration for males, and teenage pregnancy for females.
[121] The General Education Development (GED) testing program is a second-chance program for self-selected high school dropouts. When passed, it certifies that the taker has high school-level academic skills.
[122] Chamorro-Premuzic and Furnham (2003).
[123] In both impact bonds in Australia.
[124] For example, in the impact bond in Cuyahoga County there are five investors, investing in four tranches. All are on the socially motivated end of the spectrum (the most financially motivated is a community development financial institution).
[125] Palandjian and Shumway (2015).

bond to develop an evidence base. Nonetheless, all stakeholders must be united in their interest in outcome achievement and may require at least country-level historical evidence of intervention effectiveness.

The extent to which program-specific evidence will be necessary or whether meta-analyses of intervention impacts will be sufficient will vary for each impact bond. The impact bonds implemented thus far have a relatively high degree of evidence linking the interventions to outcomes. The preschool programs in Chicago and Utah do not have randomized controlled trial (RCTs) linking programs to outcomes,[126] but they have strong quasi-experimental matched-control group evaluations. Interestingly, in Chicago, there was higher probability of achieving the kindergarten readiness and third grade outcomes than special education avoidance, and the inclusion of the higher probability outcomes improved the transaction's overall risk profile. In another example, the Benevolent Society's intervention was found to cause a 75 to 80 percent reduction in engagement with the child protection system for those who exited the program, in a past evaluation.[127]

In LMICs, it can be particularly challenging to determine causality and attribution of outcomes because other services and risk factors are extremely variable.[128] For example, a particularly bad year for crops may have drastic negative effects on child nutrition and cognitive development. However, if design and instruments are well thought through, establishing robust counterfactuals can be accomplished, as demonstrated by many active experimental impact evaluations of ECD interventions in LMICs.

Although a focus on outcomes is highly important for certain ECD interventions, inputs are excellent predictors of outcomes in a number of ECD interventions. For example, child care center teacher certification and teacher-to-student ratios are highly correlated with outcomes. For these interventions, outcomes-based impact bonds or RbF mechanisms are unlikely to be worth the additional cost of contract negotiation.

Measurable Outcomes

Though it is important to capture the most accurate proxy for the long-term outcome as well as include the necessary combination of outcomes, and include measurements across time, this must be weighed against the feasibility (cost, capacity, simplicity) and accuracy of the outcome metrics.

While there will be variation across the range of ECD interventions and countries, there may be some overarching challenges in LMICs related to identifying outcome measures. The first is a potential problem of poor data availability and quality.[129] The second is a lack of tools that are applicable in LMICs that capture the array of outcomes known to be important for child development.[130] Generally, physical development, schooling, and employment and labor market outcomes are easier to measure than cognitive or language development. Socioemotional development is usually the most challenging area to measure, though great progress has been made recently. Third, there can be challenges of capacity to measure and high costs related measurement. Fourth, as discussed in section 6.4.1 on evaluation, there are considerations related to how measurement can affect the program beneficiaries (or non-beneficiaries in

[126] Palandjian and Shumway (2015).
[127] Interview with Madly Bodin and Wendy Haigh, the Benevolent Society, September 20, 2015.
[128] Patton and de Witt (2015); see also the discussion of attribution in impact bonds in Post and Glassman (2015).
[129] Referenced as well in Patton and de Witt (2015).
[130] UNESCO Institute for Statistics and the Center for Universal Education (2013).

a control group). Finally, there may be legal or privacy issues related to data collection or sharing.

Given the challenges described above, the outcomes chosen for impact bonds should ideally be as simple as possible so that those structuring the deal can easily set up systems of data collection. Administrative data, where available, make good sense as a source for outcome metrics. Table 8 includes a list of potential output and outcome metrics and associated measurement tools. This list is based on the evidence of malleability,[131] the intrinsic and extrinsic value of each measure, measurability within a reasonable time horizon, and cost. For a given outcome metric, the measurement tool should be the cheapest and most accurate, and ideally have the highest predictive validity. The table shows both output and outcome measures of quality of the ECD services. Input or output measures could be a useful intermediate step if they have intrinsic value or high correlation with long-term outcomes. We know that early childhood programs of low input quality can have immense detrimental effects on physical and cognitive development.[132]

In addition to these measures and associated tools, an increasing amount of work is being carried out to develop low-cost or open-source indicators that can be used in LMICs for the range of early childhood development outcomes, which may also hold promise for use in impact bond transactions.[133] These tools include a core set of indicators that is consistent across countries and a set of potential additional metrics that can be adapted to local context. Calibration of measurement tools to LMIC contexts, and potentially developing bespoke tools or processes, are going to be crucial for the success of PbR broadly in LMICs. These tools are in the process of being tested for predictive validity of future outcomes, which, if successful, would make them ideal impact bond metrics. In addition, female labor force participation has been included as an outcome, as it can be an important outcome of pre-primary and child care provision. However, great care needs to be taken to ensure that quality of services for children is not sacrificed in an effort to improve female labor force participation.

Table 9. Select Potential Outcome Metrics and Tools for ECD Impact Bonds

	Outcome Metric	Tool(s)	Value	ECD Interventions
Physical Development and Health	Birth registration‡	National birth registration	Intrinsic and correlated with reductions in poverty, social exclusion, and inequality[134]	National birth registration
	Stunting‡	Height for age	Intrinsic and correlated with cognitive development, school achievement, and future economic activity	Cash transfers (mixed evidence), well-child visits
	Low birth weight	Weight, length, and head circumference	Correlated with cognitive development, school achievement, health outcomes, and future economic activity *Potential cost avoidance in health, education, welfare, and criminal justice systems	Antenatal care (at least 4 visits)

[131] Tanner et al. (2015).
[132] Araujo et al. (2013).
[133] See Brookings's MELQO tool (Anderson el al. 2015) and Save the Children's IDELA (Pisani and Borisova 2015).
[134] Tanner et al. (2015).

	Outcome Metric	Tool(s)	Value	ECD Interventions
Physical Development and Health	Infant mortality rate‡	Infant mortality rate	Intrinsic	Antenatal care, skilled birth attendant, early exclusive breastfeeding during first 6 mos., post-natal care, preventive Anti-retroviral Treatment (ART), immunizations, skin-to-skin contact, Water, sanitation and hygiene (WASH)
	Under-5 mortality rate‡	Under-5 mortality rate	Intrinsic	Antenatal care, skilled birth attendant, exclusive breastfeeding during first 6 mos., preventive ART, immunizations, WASH
	Maternal-to-child transmission rates of HIV	Testing of mother and child	Intrinsic *Potential cost avoidance in health system	
	Fine and gross motor skills	Ages and Stages Questionnaire (ASQ) Early Development Instrument (EDI)	Correlated with school readiness *Potential cost avoidance in education system	Early stimulation (parenting), preschool
Language Development	Receptive language, communication	Peabody Picture Vocabulary Test (PPVT) Ages and Stages Questionnaire (ASQ) Early Development Instrument (EDI)	Correlated with school readiness and school achievement *Potential cost avoidance in education system	
Socioemotional Development	Externalizing behavior	Strength and Difficulties Questionnaire (SDQ) Early Development Instrument (EDI)	Correlated with cognitive development, school readiness, school achievement, labor market outcomes, and crime reduction *Potential cost avoidance in education, health, social welfare, and criminal justice systems	Early stimulation (parenting), preschool
	Parental behavior (proxy)	Home Observation for Measurement of the Environment (HOME) tool UNICEF Multiple Indicator Cluster Survey (MICs)		
Cognitive Development	Reasoning ability, nonverbal cognition, IQ	Raven's Matrices	Correlated with cognitive development, school readiness, school achievement, labor market outcomes *Potential cost avoidance in education and criminal justice systems	Early stimulation (parenting), deworming Conditional cash transfers, sustained, supplementary feeding

	Outcome Metric	Tool(s)	Value	ECD Interventions
Schooling+	Kindergarten readiness	Peabody Picture Vocabulary Test (PPVT) Word gap using LENA word pedometer Early Development Instrument (EDI)	Intrinsic and correlated with cognitive and socioemotional development, school achievement, labor market outcomes, and crime reduction *Potential cost avoidance in education, social welfare, and criminal justice systems	Early stimulation, preschool, cash transfers
	Gross/net preschool enrollment rate‡	School administrative data		
	Primary school repetition rate	School administrative data		
	Cohort survival rate in primary	School administrative data		
	Secondary school repetition and completion	School administrative data		
	Classroom/ center quality	Infant/Toddler Environment Rating Scale (ITERS-R) Early Childhood Environment Rating Scale (ECERS-R) Classroom Assessment and Scoring System (CLASS)		
Employment and Labor Market Outcomes	Employment	Administrative data/tax records	Intrinsic and correlated with socioemotional development, reduction in early marriage, improved health outcomes, economic growth and stability, and security	Early stimulation
	Earnings‡	Monthly or annual earnings	Intrinsic	Early stimulation
Parent Outcomes	Maternal mortality rate‡	Maternal mortality rate	Intrinsic and child well-being *Potential cost avoidance in welfare system	Antenatal care, skilled birth attendant
	Female labor force participation	Employment and/or wages	Intrinsic and leads to economic growth and stability	Pre-primary education, center-based child care

*Potential cost avoidance

+ Appendix 2 provides a more extensive list of tools associated with schooling outcomes as well as some information about their cost.

‡ Sustainable Development Goals (SDGs)

Informed by: Tanner et al. (2015) and Britto et al. (2013).

Much can be learned from the existing SIBs focused on early childhood interventions, despite the fact that they are in high-income countries, especially related to the choice of metrics or choice of the evaluation method (Appendix 2 summarizes the metrics for the Chicago Child-Parent Center Pay for Success Initiative and for the Utah High Quality Preschool Program). For impact bonds with experimental evaluations, establishing the parameters of the treatment and control groups is crucial to accurately measuring the outcome (for more on evaluations, see section 6.5) and is often a lengthy part of negotiation between stakeholders. In defining the treatment group, both the Chicago and Utah SIBs exclude students with prior severe special education diagnoses. Stakeholders also had to define the required amount of time a student had to participate in order to be included in the treatment group, using past research to determine the necessary intervention time for expected results. In Chicago, this was defined as attending 66 percent of school days; in Utah, it was five of the nine months (56 percent). Contract stakeholders also needed to determine who would bear responsibility for referred individuals who refuse to participate and for outcome reversals. For example, in the Benevolent Society SBB, outcomes measurement includes the performance of those who refuse to participate in the Resilient Families program. Returns are calculated based on an "intention to treat" principle.[135] Similar considerations must be made for inclusion in the control group. There may be challenges in finding a true counterfactual group or individual that has not participated in any other relevant intervention. This will be an important challenge in LMICs in particular, where individuals often participate in many government and donor-funded interventions and may be part of multiple impact evaluations at once.

Stakeholders must also consider whether the outcome metric will be subject to a surveillance bias. For special education in the U.S., parental advocacy is often needed for a child to be assessed for an Individualized Education Program (IEP), which defines the enrollment into special (remedial) education. In programs where parents are encouraged to participate in their child's learning, such as the Chicago and Utah programs, there may be higher levels of evaluation for IEPs in the treatment group. In the Benevolent Society SBB, one of the outcome metrics is a reduction in Helpline Reports, which are the first point of contact for Family and Community Services. The Benevolent Society is a mandatory reporter of Helpline Reports. The treatment group therefore may be more likely to have Helpline Reports filed simply by participating in the program. The team that designed the impact bond, however, determined that the simplicity of the Helpline Report metric outweighed the surveillance bias of outcomes over time.[136]

Finally, in some impact bonds the government may need to be able to coordinate data systems to measure outcomes, which are likely to be less developed in LMICs than in HICs. For example, in the SIB in Chicago, data from the Chicago Public Schools are merged with census data to build matched control group. The Granite School District in Utah was able to implement an impact bond in part because of a previous grant to develop a data system.[137] Despite the challenge this may pose, the effort may be well worthwhile—impact bonds could serve as a catalyst for the establishment of high-quality integrated data systems.

6.2.2 Determine the Payment Structure

One of the most important parts of structuring the impact bond is to translate the value of the outcome determined in the previous section to a specific outcome payment amount. Though stakeholders have

[135] Interview with Madly Bodin and Wendy Haigh, the Benevolent Society, September 20, 2015.
[136] Interview with Madly Bodin and Wendy Haigh, the Benevolent Society, September 20, 2015.
[137] Interview with Janis Dubno and Gretchen Anderson, September 15, 2015.

used different strategies across impact bonds, the balance of risk and reward between outcome funders and investors is at the core of the decision. If risk and return are not balanced properly, for example, if the threshold of success is well beyond what is already intrinsically valuable or if outcome measures do not reflect the array of potential impact, the outcome payments will not accurately reflect program impact. Underestimation of program impact could negatively impact advocacy in the sector, particularly given the high publicity impact bonds are likely to continue to receive.

One of the first considerations is whether the impact bond will be an individual transaction or an impact bond fund. An impact bond fund may be used when there are multiple providers with high potential to achieve a similar set of outcomes. A second consideration is whether payments will be based on individual outcomes or on percentage changes in the outcome for the entire target population group. The impact bond funds use primarily individual outcomes in the rate cards, though some use group outcomes. The individual transaction impact bonds use group outcomes, individual outcomes, or a combination of both. Some have suggested that using group outcomes may help balance the numerous risk factors faced by individuals in LMICs.[138]

To set the payment amount, stakeholders take into consideration the value of the outcome to government (across the range of value propositions) and the cost of implementing the service. No impact bond to date has charged participants for services, but some impact bonds in the works would involve some beneficiary contribution to offset program cost. For the impact bonds that have been contracted, establishing a model of intervention costs and outcome value was an important step in determining feasibility. The model was then used to develop a financial model of intervention costs and potential cost savings to determine payments in the deal-structuring phase. Financial models in future impact bonds will need to be structured around economic and well-being benefits rather than only cost savings.

For each cohort in the SIB in Utah for preschool, repayment is calculated as a percentage of that year's state special education cost (federal support is about one-quarter of special education funding), and a cap on payments is set based on that year's bond yield. Both of these calculations are locked in for that cohort. The cap on returns was required by the state legislature and is 5 percent plus the yield on a 10-year, AAA-rated, general municipal market bond for the state of Utah. The yield was 2.26 percent when cohort one began the program and 2.19 percent when cohort two began, thus the caps for the respective cohorts are 7.26 percent and 7.19 percent. There are two outcome funders in the SIB in Chicago. The city of Chicago will pay $2,900 once per cohort per child who is deemed kindergarten-ready[139] and $750 per child who scores above the 25th percentile for third grade reading.[140] The Chicago Public Schools will make outcome payments based on the annual savings in reduced special education usage. CPS will pay its annual savings rate (starting at $9,100 and growing 1 percent per year) per child per year in kindergarten through 12th grade for those who do not require special education services.[141]

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[138] Patton and de Witt (2015).

[139] Base cohort size funded by SIB * % of all kids at partially/fully SIB-funded CPCs who are kindergarten-ready (at or above national standards [to be defined] in five of six learning domains on TS Gold) * % of kids enrolled for kindergarten the next year. (SRI International 2015).

[140] Base cohort size funded by SIB * % of all kids at partially/fully SIB-funded CPCs who score at least in the 25th percentile for English Language Arts/Literacy on the PARCC exam [subject to change] * % of kids retained through third grade. (SRI International 2015).

[141] Base cohort size funded by SIB * (% of kids in matched control using special education minus % of kids in partially/fully SIB-funded CPCs using special education) * retention rate through that grade level. The average difference in special education use grades 4-6 will be calculated and used as the effect size for the cohort in grades 7-12. (SRI Evaluation 2015).

The team involved in designing the DIB around Educate Girls' work in Rajasthan (see section 5 for an overview of this impact bond) calibrated payments such that investors would earn a target internal rate of return (IRR)[142] at expected outcome levels. The cost of the optimal service expansion was calculated to be 17,332,967 rupees (about $26,240), which was set as the required investment. The target IRR for the investor, the UBS Optimus Foundation, was 10 percent. To achieve this IRR with the investment schedule and one outcome payment at the end of the contract, the final outcome payment needed to be $367,000.[143] This target outcome payment was then distributed to outcome areas (80 percent of outcome payments for learning outcomes and 20 percent for enrollment). Next, the allocated target payments were divided by the expected performance for each outcome based on historical data. This resulted in 910.14 Swiss francs (CHF) per percentage point of girls enrolled from an out of school girls list[144] and CHF43.16 per unit (grade unit per student) of improvement on the ASER test[145] versus the control. These rates were set as the payment level per outcome. In addition, the outcome funder, CIFF, capped outcome payments at $422,000 and UBS Optimus decided to pass on 32 percent of outcome payments beyond the principal to Educate Girls as incentive payments.

Another lesson from the Educate Girls DIB is that currencies must be specified to ensure all stakeholders are adequately protected. In this case, Educate Girls is paid the investment in rupees to ensure funding; outcome payments are made in CHF, which protects UBS Optimus, but the payment cap is in USD, protecting CIFF. Finally, the actors in this DIB considered, but did not ultimately incorporate, tariffs (different prices for different subgroups) and thresholds (holds on payment until a statistically significant change, for example, has been achieved). These were removed for simplicity in both instances, for improved statistical significance in the former, and to avoid cream skimming and unnecessary investor risk in the latter.[146]

Potential for Perverse Incentives

When tying payments to outcomes, it is particularly important to consider any perverse incentives that might arise for each actor.

For outcome funders, perverse incentives may arise if outcomes actually increase their costs, for example with increased enrollment and attendance at school. Further, a government actor may have a monopoly on a certain service, such as job training and placement, and may have perverse incentives in funding a non-state job placement service. In ECD in particular, there may be also be incentives for the government to produce low-quality child care programs so that both parents can work.[147]

For investors, impact bonds may allow financial institutions to increase their influence on public sector priorities.[148] Investors may also be incentivized to influence program results, for example by providing placeholder jobs to achieve employment outcomes. Where investors are incentivized to earn the highest possible outcome payment for

[142] An internal rate of return is a measure of return that is comparable across investments and is based on cash inflows and outcomes.
[143] If capital recycling were used, structuring would have been different.
[144] Due to data limitations, the total number of out of school girls in each village is not known until Educate Girls starts its enrollment intervention. Therefore, instead of contracting on price per girl enrolled, the contracted enrollment metric is defined as the price per percentage points of girls enrolled off of an out of school girls list. Educate Girls compiles this list at the start of each school year, and IDinsight verifies the accuracy of these lists. Enrollment is corrected for discrepancy between Educate Girls' lists of enrollment and the government's, the latter of which is considered highly unreliable.
[145] Annual Status of Education Report, the largest citizen-led survey in India conducted every year since 2005 in almost all rural districts of India.
[146] Instiglio (2015a).
[147] Golden and Gruendel (2014).
[148] Whitfield (2015).

the lowest upfront investment, there may be pressure to cut service costs. This could be a positive pressure for increased efficiency, as long as regulations are in place to ensure quality services, fair employee wages, and services to support job displacement.[149] Pressure to reduce costs and close providers that fail to achieve outcomes are standard practice in the private sector, but the extent to which they will be appropriate in the non-profit sector needs to be considered.

For the service providers, there may be risks of service exclusion and reduction in service quality. It is important to point out that unlike in RbF financing frameworks; the service provider does not always have a financial incentive in the basic impact bond model. Service providers face reputational risk if the service is shown to be less effective than expected, which could have significant ramifications for their future funding. In addition, 12 impact bonds have been structured with incentive payments to service providers. For example, Educate Girls shares 32 percent of upside payments with UBS Optimus. Previous experience shows that even very small financial incentives can make a large difference in a non-profit organization accustomed to working with no profit margin.[150] Regardless of whether service providers have an additional financial incentive, there is a risk that service providers will face a perverse incentive to prioritize one outcome over others. For example, in the India DIB, the cap on payments includes both enrollment and learning outcomes to pool performance risk and reward outstanding performance in one area or the other; however, this structure creates a risk that the provider may prioritize one outcome over the other up to the payment cap.[151] Service providers may also be particularly incentivized to prioritize some outcomes over others in a rate card model.

In addition to a risk of prioritizing certain outcomes over others, stakeholders must consider the effects on the quality of the service of incentivizing certain outcomes. For example, there is concern that including third grade reading as an outcome in the Chicago SIB will put even more pressure on a test score that some have argued is already too high-stakes.[152] There has been a wider backlash against the promotion of high-stakes testing across the U.S. (including a recent announcement from the president[153]), which many have argued can reduce the quality of education if overemphasized.

Concerns have also been voiced that impact bonds will disincentive services for the most disadvantaged. On a broad scale, impact bonds may be best suited for interventions with highly disadvantaged target populations, because this is where the greatest impacts can be realized.[154] As a result, many impact bonds target the most disadvantaged through strict selection criteria; for example, the Benevolent Society has worked closely with the New South Wales government to establish very strict selection criteria for the impact bond program and to match treatment families with control families who are similarly at risk of having their children removed.[155] However, once the target population has been established, there is a risk that service providers will be incentivized to work only with the beneficiaries nearest to the achieving the outcome and may not focus efforts on beneficiaries who seem highly unlikely to achieve the outcome.

The incentives for the intermediary depend on the role the intermediary is playing, but are most

[149] Ibid.
[150] Layler and Foster (2013). See also discussion of Tennessee child welfare services in Beek Center for Social Impact and Innovation at Georgetown University (2014).
[151] Instiglio (2015a).
[152] Sanchez (2014a).
[153] Zernike (2015).
[154] Palidijian and Shumway (2015).
[155] Interview with Madly Bodin and Wendy Haigh, the Benevolent Society, September 20, 2015.

often driven by reputational risk. If the intermediary serves a more significant role, such as in performance management, it may receive some deferred fees or portion of outcome payments. Often, however, the intermediary will receive a flat payment per transaction or yearly payments. Intermediaries may be incentivized to produce impact bonds without sufficient preparation, given that their outcome incentive is less than that of the investors; however, most intermediaries are mission-driven organizations and so their motivation to deliver outcomes will outweigh their desire to earn higher fees. One point worth noting is that the market for intermediaries is relatively small, which may cause some market distortion.

Finally, the evaluator must be an independent body to ensure that outcomes are not biased. Protection measures could be established to ensure that investors and outcome funders have no influence over the independent evaluator.

Variations on Payment Structures

Five noteworthy variations in outcome payment structures have arisen. In early childhood in particular, there is a possibility of constructing an impact bond with outcomes across the development spectrum and different outcome funders for each stage. Chicago is the only active impact bond where different outcome funders pay for different outcomes. A "chained" impact bond of outcomes across the early years of a child's life, such as height-for-age z-score and preschool enrollment at age three, kindergarten readiness at age five, and reading, math, and socioemotional development at age nine, could help ensure continuity of outcomes. Second, the model could begin as a fee-for-service model and outcomes payments could be phased in. This could be used to help balance risk of outcome achievement in developing countries, because it would provide service providers with a greater period of preparation before outcome-based payments began.[156] The proposed variation on a DIB in Kenya is an example of a third model, where government fee-for-service funding for the service provider is phased in as outcomes are achieved with no return to investors. Fourth, the metrics for payments from the outcome funder to the service provider (or intermediary) could differ from the metrics for payments from the service provider (or intermediary) to investors. The Newpin SBB is the only impact bond contracted to date that is structured in this way.[157] Finally, the existing impact bonds demonstrate that there are possibilities to change outcome payment terms midway through the contract. In the Newpin SBB, the outcome metrics between the government and provider and between the investors and provider were altered slightly in the second year of the bond to better account for outcome reversals. All 60 investors had to agree to the change.[158] In Chicago, the independent evaluator, SRI International, is responsible for establishing the national average for the kindergarten readiness metric (which has not yet been set) and may change the test of third grade reading (with other stakeholder approval) if the test does not appear to accurately reflect the outcomes. The test, the Partnership for Assessment of Readiness for College and Careers (PARCC) exam, was implemented for the first time in Chicago in 2015.[159] These potential variations could provide lessons for future contracts.

6.2.3 Procure Service Provider

Transparent public procurement has long been supported by scholars and advocates[160] and has

[156] Social Finance U.K. in collaboration with the Bertha Centre for Social Innovation.
[157] Tomkinson (2015c).
[158] Ibid.
[159] SRI International (2015).
[160] Kenny (2014).

recently received high-level attention in the Addis Ababa Action Agenda,[161] the outcome document of the United Nations Third International Conference on Financing for Development. Open procurement is as important in an impact bond as it is in any contracting process, though it will likely be more challenging.[162]

Many have argued that the entry requirements for service providers to participate in an impact bond are too high, which excludes many providers from a chance to receive funding.[163] There is also a risk for corruption in procurement if the process is not fair and open, which may be greater in LMICs with less developed procurement systems. To ensure that a diversity of providers is able to access impact bond funding, there needs to be some form of support to help providers prepare for procurement and access investment. In addition, public providers should be able to compete with non-state providers and should be judged based on their potential to deliver quality services with additional funding. It is worth noting that in ECD, there will be a relatively high number of private providers in comparison to other sectors, such as primary education.

Open procurement can be a challenge in an impact bond because the motivation to develop an impact bond often arises out of a high-impact intervention of a particular organization. In addition, a service provider must have a high capacity for data collection and performance management for an impact bond to be effective. For example, the Benevolent Society has its own research team that had produced high-quality evidence on the effectiveness of the program and had a strong monitoring and evaluation system. The Benevolent Society was also fortunate to have three former investment bankers, as well as an experienced project manager on its staff. Its high internal capacity is one of the reasons it was one of the first organizations contracted in a SBB in Australia.[164]
In the existing impact bonds in high-income countries, some jurisdictions have issued requests for proposals or responses to procure the service provider, evaluator, or intermediary. The two SBBs in New South Wales in Australia arose out of a request for proposals issued by the state in September 2011 for programs working in juvenile justice and parenting skills for at-risk families.[165] A similar process was carried out in Massachusetts, where the state established a trust fund and solicited proposals for intermediaries and service providers for SIBs in the sectors of homelessness and juvenile justice, which resulted in two SIBs.[166] Cuyahoga County issued the first county-level SIB procurement in the United States—the county issued a request for responses procurement related to adolescent behavioral health and child welfare but did not exclude responses that targeted other populations or interventions. The request for responses procurement yielded responses from more than 15 service providers and evaluators. The proposals were evaluated based on key SIB criteria, such as organizational history, capacity, existing relationship with the county and other community partners, ability to scale up, and performance management systems.[167]

In the impact bonds in the works in LMICs, some proposals are based on a specific organization's intervention and others are preparing for an open procurement process. In South Africa, there will likely be a request for expression of interest for providers. Once potential service providers have been identified, the investors or intermediaries will need to conduct due diligence on the ability of the provider to deliver outcomes. This process will

[161] United Nations (2015).
[162] For a technical guide on procurement in impact bonds, see Social Finance U.K. 2011.
[163] Rangan and Chase (2015).
[164] Interview with Madly Bodin and Wendy Haigh, the Benevolent Society, September 20, 2015.
[165] New South Wales Social Impact Investment Knowledge Hub (2015).
[166] Costa and Kohli (2012).
[167] Interview with Marcia Chong and Brian Beachkofski, Third Sector Capital Partners, October 9, 2015.

include an examination of the past evidence that the service provider can deliver the outcomes (see section 6.2.1 on the evidence behind outcomes). The financial sector has much more background in conducting due diligence of for-profit companies, and may require support to develop the capacity to conduct due diligence of social service providers' ability to deliver outcomes. In LMICs, the need for this support will likely be even greater.

6.2.4 Raise Capital

The upfront capital required for a given intervention will depend on whether the payment structure will allow for capital recycling. Capital recycling has been used in most impact bonds outside the U.S. so far, particularly in the impact bond funds in the U.K. where payments can be made as often as once per month. This mechanism helps ensure value for money for outcome funders. If the impact bond has been structured such that early payments are available, these payments can be reinvested to continue delivery of the service. Once the service has been funded for the agreed upon term, additional outcome payments are paid to investors to reimburse principal and possibly provide a return.

Impact bonds provide an excellent investment opportunity for impact investors based in LMICs. The process of raising capital can be arranged such that LMIC investors, particularly those in the intervention country, are not excluded from the social and financial value of impact bond investments.

6.2.5 Negotiate and Finalize Contracts

The process of negotiating and finalizing impact bond contracts is often the most challenging part of impact bond development. Each impact bond has a unique arrangement of contracts. Across the individual transaction impact bonds and impact bonds within funds, the contract structures can be divided into three rough categories based on the actor that holds the contract with the outcome funder and thus has the greatest responsibility in the deal. Often a special purpose vehicle (SPV) is created as a conduit for funds in the deal and the outcome payment contract is with the SPV. In these cases, the structure distinctions are based on the actor with majority control (the most board seats or greatest leadership role) of the SPV.

In the first type of contract structure, a managed impact bond structure, the outcome funder holds the contract with the intermediary, or a majority intermediary-controlled SPV, and plays an important leadership role throughout the process of the deal and is responsible for performance management of the service provision. In the second type, an intermediated impact bond structure, the outcome funder holds a contract with the investors or a majority investor-controlled SPV. The intermediary often still plays a large role in developing the deal and is contracted by the SPV for performance management. Finally, in a direct impact bond structure, the service provider contracts directly with the outcome funder. The service provider takes on a more central role, including in-house performance management. The difference in "ownership" of the SPV is significant because outcome payments often flow into the SPV from the outcome funder, and what remains in the SPV after investors have been repaid is kept by the "owner" of the SPV. Of the impact bonds contracted as of March 1, 2015, 14 are direct, 13 are intermediated, and 10 are managed (information is unavailable on one SIB).

The Educate Girls DIB is an intermediated DIB and has five main contracts: a framework agreement that establishes the basic relationships among all parties, a grant and services agreement between investor and service provider, an outcomes agreement between the outcome funder and investor, an outcomes evaluation agreement between the outcome payer and evaluator, and a project management agreement between the investor and the project manager. Each of these must be negotiated and function as a cohesive whole. Although a government actor may not be involved in the

principal contracts of a DIB, the Educate Girls DIB includes two memorandums of understanding (MOUs) with the state of Rajasthan—the evaluator, IDinsight, will sign an evaluation MOU and Educate Girls will sign an implementation MOU.[168] Involving the government as much as possible in the design, provision, and outcome payments could aid in the sustainability of the intervention.

There are two types of transaction costs in an impact bond: non-delivery costs built into the contract to run the program and the time, effort, and money spent to arrange the contracts. The first category of transaction costs in an impact bond includes the fees paid to the intermediary organizations, the evaluator, and possibly an auditor. The second category of transaction costs includes legal fees to arrange to contracts. Many have argued that the transaction costs in an impact bond are not worth the additional benefits in service quality and scale that impact bonds may facilitate. However, it is important to note that traditional contracting processes have transaction costs of their own, and that the negotiation process itself may be one of the most valuable parts of the process. Impact bonds often require a dedicated employee to coordinate data in government, which adds to expense but is incredibly important in coordinating and improving the quality of services.

For example, in the Chicago SIB, the project coordination and intermediary fees are approximately 4 percent of total capital commitment, legal and audit fees are approximately 4 percent of total capital commitment, and evaluation costs and other intermediation will be covered by foundations, the city, or other actors and are equivalent to 9 percent of the total capital commitment.[169] In the Educate Girls DIB, transaction costs were even higher; however, this transaction was designed to pilot the DIB concept. UBS Optimus' investment of $267,000[170] covers Educate Girls' service expansion, while the costs of bringing in this capital were four times as high through the DIB as through its traditional grant process.[171] Although the complexity of working across countries may increase transaction costs, impact bond developers in LMICs may be able to leverage more pro bono legal advice given the importance of the issues they address.

Even as contract negotiation, program management, and evaluation costs are often worthwhile, they are not insignificant. Some practitioners suggest that the additional costs may be worthwhile only for impact bonds that mobilize at least $3 million in outcome funding. Given the limited service provider capacity in some countries, some impact bonds may need to be smaller than this threshold initially.

[168] Instiglio (2015a).
[169] Office of the City Clerk (2014).
[170] Educate Girls (2015).
[171] Interview with Safeena Husain, Educate Girls, August 31, 2015.

Key Takeaways: Structuring the Deal

- In general outcome metrics should be:
  - Grounded in the social challenge that is the focus of the impact bond
  - Intrinsically or extrinsically meaningful
  - Simple and not costly to measure accurately
  - Measurable within a time frame acceptable to investors and outcome funders
  - Not create perverse incentives that may have a negative impact on program beneficiaries
- ECD-specific considerations for outcome metrics include:
  - Some ECD outcomes can be measured repeatedly starting from early childhood such as height, while others, such as schooling, cognition, and employment and labor market outcomes, can be measured only later in life
  - Language development, socio-emotional development, and schooling outcomes have the most robust impact evaluation evidence at a global level
  - Early stimulation and parent support interventions have the most robust evidence base
  - Global evidence on some ECD outcomes is mixed, indicating that context- or program-specific evidence would provide better estimates of expected impacts and costs
  - Inputs in early childhood care and education interventions that are known to be strongly correlated with outcomes may be a promising intermediate step where outcomes are difficult to measure
- Structuring payments for entire groups may be particularly useful in LMICs to balance risk factors across the target population. However, if an impact bond fund is established (which may allow for greater scale across multiple providers), individual outcomes may be easier to administer
- Transparency in procurement of service providers is recommended, though is not always possible
- Contract negotiation, with legal, political, and financial modeling considerations at the forefront, can be complex and time-consuming

6.3 Stage 3: Implementation

6.3.1 Provide Services

Service provision is the core of the impact bond contract. Once all of the effort has gone into designing the impact bond structure, the service provider is able to do what it does best—making impact in the lives of those who need it most. Ensuring that the appropriate individuals enroll in the program may pose the greatest challenge. Investors in particular have mentioned concern about low enrollment numbers. Depending on whether referrals are automatically generated or voluntary, dedicated staff may be needed in government offices to handle referral management. One design element that has proven to be helpful in the U.S. is a six- to 12-month "ramp-up" or "pilot" period for the service provider, government, and the evaluator to operationalize the referral processes, test intervention elements, hire and train staff, and try out other operations before the full project is launched and before any success payment-contingent measurements take place. The concept of the "ramp-up" period was originally developed and implemented by the Cuyahoga Partnering for Family Success Program team after FrontLine Service identified a need to operationalize several new intervention elements and Third Sector identified a need to operationalize the referral processes. The ramp-up period concept is now being adopted in SIB projects in the United States. In Ohio, the ramp-up period of provision required a budget outside of the SIB budget and was funded separately by a foundation.[172]

6.3.2 Manage Performance

One of the most important contributions of an impact bond to social service delivery is the potential to develop or improve performance management systems. Such systems are increasingly understood to be necessary when outcomes are at the center of contractual financial arrangements.[173] Without performance management, the traditional tools of monitoring and evaluation and impact evaluations often provide too little information too late. In this situation "funders, investors, and implementers of social impact [programs] navigate their goals with little clarity on whether or not they are on track."[174] Performance management, through real-time data collection on outcomes, seeks to empower service providers to engage in adaptive learning that improves performance and thereby impact. Social investors and donors are able to quickly gain insights into the extent to which their investments are achieving social outcomes by bringing in accountability.[175]

In an impact bond, performance management can be led within the service provider (usually an NGO but it can also be the public sector), by a government agency involved in the SIB, an intermediary, or some combination of those players. Each of the existing SIBs worldwide is unique in the extent to which performance management is built into the contract, what it looks like, and who leads it. The deals also differ in how much course adjustment is allowed to occur within the parameters of the contract. Not allowing flexibility in the service delivery can be detrimental to outcome achievement. In the case of the first SIB in the U.S., which was meant to reduce prison recidivism in Rikers Island, the inability to adjust implementation along the way was likely one of the reasons for the intervention's failure to reach targets, contributing to the early closure of the project.[176]

Across the SIBs focusing on ECD globally, we found a wide variation in the existence of performance management systems before the impact

[172] Interview with Marcia Chong and Brian Beachkofski, Third Sector Capital Partners, October 9, 2015.
[173] Tomkinson (2015a).
[174] Instiglio (2015b).
[175] Ibid.
[176] Galloway (2015).

bond was implemented. In some cases, the systems were already well developed and the stakeholders involved agreed that this was one of the key components that facilitated the willingness of investors to engage in the SIB. In Utah, for example, the Granite School District already had a data manager in place for nine years before the SIB began. It had also developed a system of analyzing child and teacher data so that course adjustment could take place during the school year driven by professional development or coaching. This system allowed for better targeting and identification of wraparound services for the vulnerable populations that the school district was serving, including refugee families and children affected by gang violence and other risk factors. This data collection also allowed for a rigorous impact evaluation, which facilitated the implementation of the SIB as well. In the Cuyahoga County SIB, by contrast, the introduction of the SIB changed business as usual in data management. As a result of the SIB, there is now a dedicated person at the county government monitoring both child services and housing systems.[177]

In the two SIBs in Australia, which focus on family preservation (avoiding foster care) or family restoration, the systems of data collection and performance management were also built up as a result of the SIB. In the Benevolent Society Bond for example, the state Department of Family and Community Services (with two appointed staff members) manages data related to referrals and the children in both the treatment and control groups. This provides the agency and the NGO delivering the services with longitudinal data, which can help track families and improve services. The Benevolent Society also collects a range of additional data, such as the frequency of home visits and the practices used with families. These data feed into summary reports that are reviewed by caseworkers on a regular basis and allow the organization to better understand and adjust the program as needed. This is the first time the Benevolent Society has ever had long-term data on how families are progressing after they have exited the program, and this information is providing important lessons for both the NGO and the government.[178]

How does performance management look in LMIC contexts? With a rise in focus on accountability and outcome delivery in development, in part due to increased use of PbR frameworks by development agencies such as the World Bank and DfID, performance management has begun to make its way into some systems of public service delivery. Performance management in international and local NGOs has expanded over the past decade due to increasing demands of donors and investors that outcomes be demonstrated. Nevertheless, there is still great room for improvement, and data monitoring systems will likely be a significant challenge in LMICs. Often NGOs are unaccustomed to delivering services based on an explicit theory of change using intermediate outcome indicators to measure failures and progress. While performance management capabilities could be a deciding factor in the selection of NGOs to be service providers in future impact bonds, impact bonds may also catalyze the development of such systems (as we've seen in the developed world to date).

The India DIB for girls' education provides a useful example of collaborative performance management in a low-income context. In this model there is strong complementarity between the local NGO, Educate Girls, using its own close-to-the-ground knowledge and experience, and the intermediary in the DIB, which provides performance management expertise. The intermediary's process includes these steps: define a theory of change, define indicators, design a dashboard, design a monitoring process, and build capacity. The intention of the new system is to allow the NGO to "improve their

[177] Interview with Marcia Chong and Brian Beachkofski, Third Sector Capital Partners, October 9, 2015.
[178] Interview with Madly Bodin and Wendy Haigh, the Benevolent Society, September 20, 2015.

Table 10. Introducing Performance Management in Educate Girls Development Impact Bond

	System Prior to DIB	Performance Mgmt. with DIB
Focus	Inputs, activities, outputs, and selected outcomes	Outcomes
Objective	Manage resources and track project progress	Manage intermediate outcomes that lead to higher levels of enrollment and learning outcomes
Time frame	Short-term (during implementation)	Short- and medium-term (throughout implementation)
Questions it answers	Are we implementing according to plan?	Are we on track to impact and how to improve?

Source: Adapted from Instiglio (2015b).

impact model, learn from experience to promote intra-learning transfer, and optimize resource allocation by using a needs-based allocation system."[179] This differs from how the NGO previously worked, as shown in Table 10. It is very important to note, however, that the NGO on its own developed a complex mapping system of trial, error, and course adjustment in its day-to-day practice. This, together with weekly meetings of supervisory field staff (who manage the volunteers who deliver the messages to encourage girls to enroll in school) constitutes a strong feedback loop for the organization to be able to deliver outcomes.

In sum, the real-time data collection, adaptive learning, and flexibility that can be built into an impact bond through performance management can have huge implications for the delivery of promised outcomes. The lessons learned from this process can also be a key component in aiding the scale up of services to reach larger populations. While this type of performance management isn't by definition a must in an impact bond, stakeholders in the existing impact bonds have stressed the importance of the connection between performance management and outcome achievement.

Key Takeaways: Implementation Stage

- In some cases a "ramp-up" period may be appropriate for the service provider, government, and evaluator to operationalize the referral process, test intervention elements, hire and train staff, and try out other elements before the full impact bond is launched and before success payment-contingent measurements take place
- Performance management is a critical and potentially enormous contribution of the impact bond structure. Real-time data can allow for course adjustment, which can lead to improved performance and better results
- A variety of performance management models ranging from within the organization to external intermediary parties could be used
- Data collection and analysis are critical skills necessary to the performance management process

[179] Instiglio (2015b).

6.4 Stage 4: Evaluation and Repayment

6.4.1 Evaluate

There are a handful of evaluation methodologies from which to select for determining whether outcomes have been achieved in an impact bond contract.[180] The choice depends on a complex set of factors, including the social challenge that the impact bond aims to solve, the opinions and desires of the investors and outcome funders, the choice of outcome metrics, the availability of tools and/or systems with which to measure outcomes, the ability to determine a statistically similar control group, and the size of the budget for the evaluation. The most important requirement of any evaluation is that it be independent to avoid any potential risks of bias, data manipulation, cream skimming, or actions that might affect data purity or have harmful effects on beneficiaries. Having an independent validator of data and of the evaluation itself adds more credibility. The three broad categories of evaluation are experimental, quasi-experimental, and non-experimental methods.

Experimental and Quasi-experimental Design

An experimental design, or randomized controlled trial, considered the most robust of the methodologies, should be used if stakeholders in the impact bond need to determine with as much certainty as possible how a certain kind of intervention compares to the counterfactual (either no intervention or another kind of intervention) in its ability to deliver outcomes. This could be useful when attempting to make policy decisions about which program to fund or when testing an innovative mechanism about which there is no evidence.

A quasi-experimental design, generally considered second best in terms of attributing causality to the intervention, would be appropriate if randomization of the assignment of the intervention is not possible.[181] Necessary for quasi-experimental and experimental design are well-defined treatment and control groups, an evaluator with strong expertise in sampling design, population matching, and econometric techniques. For quasi-experimental design, pre- and post-data on individual, household, and community characteristics (including access to other potentially "contaminating" services) are best practice.

There are some outcomes and interventions within ECD for which using an experimental design would be particularly challenging, however. This would be the case when ethically or legally it would be impossible to exclude populations from interventions (such as immunizations) or for breastfeeding interventions where there may be a great deal of exogenous factors that could influence the physical development outcomes of an infant. Pre-primary, early stimulation, or deworming programs, meanwhile, would better lend themselves to quasi-experimental and experimental design, in particular with a clustered design.

Challenges and Limitations of Experimental and Quasi-experimental Design:

- It may be difficult to ensure that assignment is truly random in an RCT; for example, program implementers could exclude high-risk applicants to achieve better results
- Experimental and quasi-experimental designs are meant to test the model as defined by the program
- If not designed properly, the restrictions on the intervention plan in the evaluation could limit flexibility of the model or adaptive learning
- It can be costly and time-consuming depending on the type of data used (using administrative data can reduce

[180] Gertler et al. (2011).
[181] A variety of econometric methods can be used to address issues of selection bias. For more on this, see Khandker et al. (2010).

costs) and scale of data required for robust findings

- It can be burdensome to beneficiaries and non-beneficiaries
- Ethical issues and political hurdles such as excluding beneficiaries from receiving benefits may come into play
- Individuals in treatment or control groups may change during the experiment, thereby invalidating or contaminating the results
- A sufficient sample size is required for statistical significance

Non-experimental Design

Non-experimental design can be used when quasi-experimental or experimental design are either not possible or stakeholders deem that there is no need for causal evidence of outcome achievement. A non-experimental design (post-test or pre-test and post-test) would be used to evaluate a national program where no comparison group exists or where random assignment poses political or ethical challenges. In a post-test design, outcome data are collected after the intervention has been implemented and a historical baseline would be needed to price outcomes in the impact bond. For a pre-test and post-test, where data are collected before and after the intervention, some assumptions or estimations would have to be made about the counterfactual scenario. In a static group comparison where beneficiaries and non-beneficiaries are compared, matching between the two would help to control for selection bias (bias that arises from an unrepresentative sample). Some econometric techniques used with these non-experimental methods can improve rigor, but in the absence of an experimental or quasi-experimental design, it is difficult to exclude the possibility that outcomes could have been the result of some factors exogenous to the intervention.

Challenges and Limitations of Non-experimental Design:

- Less robust statistically so the reliability of results is weaker
- Difficult to correct for selection bias

How might the choice of methodology and impact evaluation process look in a LMIC? All of the evaluation tools described above are being used in developing country contexts. Increasingly, RCTs and quasi-experimental designs are being used as a result of an increased push toward evidence-based policymaking. The same limitations of each method will be present in developing country contexts, but some of the challenges could be greater depending on context for a variety of reasons related to identification of control groups, contamination from other interventions, migration, data collection challenges, and sampling decisions that could have life or death consequences for non-chosen beneficiaries.

Evaluation Methods in the Active Impact Bonds for ECD

The active impact bonds to date have used a variety of methodologies to determine outcome achievement. Out of 38 SIBs examined in Gustafsson-Wright et al. (2015a), four used an RCT and four used a quasi-experimental design with matched comparison groups. The remaining interventions were evaluated using non-experimental design: 28 using validated administrative data after the intervention (post-test) and six using historical comparison data.[182]

The SIB in Cuyahoga County is one of the four that use an RCT. The stakeholders in the project chose an RCT because they wanted to establish a rigorous evidence base in the SIB field. Limited funding for the program meant that it could not cover all of the needy population, which allowed for the creation of a control group. A separate process

[182] Some SIBs used multiple techniques, and data were not public for two of the SIBs.

evaluation examines the effectiveness of the various interventions used in the program.[183] In the Benevolent Society SBB, an RCT was also used and some important considerations were noted. To start, the government agency in charge of the collecting data noted the time commitment associated with identifying control group members.[184] In addition, not offering a service to the control group proved to be a challenge, and the Benevolent Society had to make the case that those families in any case would not have received the service because of the limited availability of a program. When families in the control group receive a similar intensive service to Resilient Families, they are substituted with a family that is not receiving a similar service.[185] In the India DIB, an RCT[186] is being used to measure learning outcomes on the ASER test, motivated by the desire for rigorous evaluation of the efficacy of the service provider.

The majority of the SIBs in the U.K. used validated administrative data. In these cases the impact bond fund structure of the deals focused around a rate card with a set of desired outcomes. The outcomes were based on data that were easily accessible and thereby relatively less expensive to collect, and the outcome funder was more interested in achieving outcomes than in the ability to attribute causality to the intervention alone. It is possible that beneficiaries self-selected into the program, which might result in higher likelihood of achievement of outcomes. It is also possible that some factors unrelated to the program could affect the achievement of outcomes.

The SIB for Pre-K in Utah also used a non-experimental design (see Box 2 for more on this SIB). SIB funded-students scoring below 70 on the PPVT prior to starting the Pre-K program were deemed likely to require special education services in primary school and were tracked for the SIB payments. The investors were paid for every student in this payment cohort that did not require special education services in Kindergarten through sixth grade. After reports in the fall of 2015 that only one of 109 students in the first payment cohort required special education services in Kindergarten,[187] there has been a great deal of media coverage and scrutiny of the evaluation design.[188] The elevated scrutiny is to be expected for an impact bond, because of fears that non-state investors will earn unwarranted returns as a result of social services. This scrutiny brings positive attention to the efficacy of social services, but stakeholders may need to design evaluations well and be prepared to correct any inaccurate portrayals of the program.

The scrutiny around the Utah SIB is in large part due to the lack of a counterfactual, a result of the fact that the evaluation is non-experimental. As mentioned above, the choice of evaluation method depends on whether stakeholders are interested in the value of the given outcomes alone, knowing whether the intervention has improved the outcomes versus similar groups without the intervention, or knowing whether the provider has been able to improve outcomes more than other providers. Quasi-experimental or experimental evaluations are required for the second and third options. In the case of the Utah SIB, the stakeholders were unable to conduct quasi-experimental or experimental evaluation to determine payments, but determined that there was sufficient value in low special education use for this target population. The determination was the result of historical data showing that 95% of similar low-income students in the district scoring below 70 on

[183] Interview with Marcia Chong and Brian Beachkofski, Third Sector Capital Partners, October 9, 2015.
[184] Anonymous interview, October 15, 2015.
[185] Interview with Madly Bodin and Wendy Haigh, the Benevolent Society, September 20, 2015.
[186] Some challenges to agree on this methodology were noted by stakeholders (anonymous interviewees).
[187] Innocenti (2015a).
[188] Popper (2015).

the PPVT required special education.[189] Based on this expectation, each year that similar students do not require special education has absolute value to the state, even if causality is not specified.

The degree of evaluation rigor needed to justify payments in an impact bond is a topic of debate in the field. Some argue that governments do not require any indication of causality in determining payments for services generally, so simply making payments based on outcome data is a sufficient improvement of the system. Others argue that since the payments go to external, for-profit investors with potential for returns, taxpayers deserve evidence that the intervention caused the outcomes. Further, if one of the intended outcomes of the impact bond mechanism is contribution to the knowledge base of what works—which is particularly necessary in the ECD sector—quasi-experimental or experimental evaluations may be worthwhile.

In LMICs, there may be even fewer resources available for quasi-experimental or experimental evaluations and less data for historical comparison. In cases where rigorous evaluations are not possible, historical comparison data or at least pre- and post- tests of the same metric would help establish a minimum indication of program impact.

In sum, a great deal of care should be taken when deciding on the impact evaluation methodology. Engaging experts in evaluation, in the specific type(s) of ECD intervention, and the ECD-related measurement tools may be advisable to ensure that that it serves the aims of the investors and outcome funders and that there are no unintended consequences as a result of the methodology chosen. Furthermore, evaluation costs, time required for impact measurement, the quality of existing historical data, political factors, and the potential for exogenous factors to influence outcomes should all be factored into the evaluation method choice. Finally, with any evaluation design, program implementation data add rigor to the evaluation findings. In cases where real-time data collection and adaptive learning is part of the impact bond design (which in theory it should be), a process evaluation would help to ensure that learnings are captured for policy purposes.

6.4.2 Achieve Outcomes and Repay Investors

Once the evaluation is complete, all stakeholders will be informed of the outcomes achieved. If this information is public, which it will often be, there needs to be a well-developed communication strategy to put the outcomes, or lack thereof, into context. Early outcome measurement may indicate a need to amend metrics to more accurately measure outcomes, as in the case of the Newpin SBB, but great caution needs to be exercised so that investors or outcome funders are not allowed to manipulate the outcome metrics to influence their returns after initial results are achieved. Outcome information will also need to be fed back into the performance management system, to help improve services for the next measurement period. In LMICs, there could be more variability in outcome achievement over time, in which case investors would bear the risk that they may be paid back in some payment periods and not in others.

[189] Innocenti (2015b).

Key Takeaways: Evaluation and Repayment Stage

- Selection of evaluation method should take into consideration pragmatic issues such as cost, simplicity, capacity, and time as well as issues related to impact on beneficiaries and intended goals of the impact bond
- In ECD, some types of outcomes and interventions may be more amenable to quasi-experimental or experimental evaluation design than others
- It is important to have a well-developed communication strategy regarding the intended aim of the impact bond, the evaluation method, and repayment terms. This will help to avoid potential unintended consequences for the project or the ECD sector.

6.5 After the Impact Bond

6.5.1 Plans for Continuation

As the first impact bonds come to a close, some impact bonds may be taken over as traditionally funded government contracts, some as government-funded outcomes-based contracts, and some as new impact bonds. Some practitioners have argued that the ideal scenario is that contracts are transitioned into outcome-based contracts, particularly where flexibility and adaptability are still be needed.[190] It is also crucial that planners think about continuation of the program in the impact bond from the design stage. Designers could write contingent continuation plans into impact bond contracts.[191] In LMICs, the contract could be progressively transitioned from third-party outcome payments to government outcome payments.

6.5.2 Systems to Facilitate Learning among Other Providers

One of the most important considerations for the end of an impact bond contract is how to share lessons learned with other service providers. After all, the ultimate goal of this work is a diverse ecosystem of high-quality service providers that reach as many individuals as possible. There has been a debate as to whether impact bonds encourage service providers that are not funded by the impact bond to improve their quality. One side has argued that they reduce motivation for other providers,[192] while others suggest other providers are inspired to improve their services.[193] Regardless, mechanisms can be put in place to encourage maximum sharing of lessons learned.

Some service providers, particularly in impact bond funds, may be forced to close if they have poor outcomes. However, it may not necessarily be bad for good providers to take up larger market share—they have previously competed on much less "fair" basis.[194] There is some concern, however, that outcome payments will be pushed down in the future as NGOs become more competitive for pay-for-success contracts,[195] though this point is likely far away.

Utah provides an interesting example of how learning could be shared among providers. The state issued grants to share learning and improve the quality of preschools in the same appropriation

[190] Schaeffer et al. (2015).
[191] Ibid.
[192] Rangan and Chase (2015).
[193] Palidijian and Shumway (2015).
[194] Ibid.
[195] Rangan and Chase (2015).

as the impact bond funding. In addition, an advocacy organization received a grant from a foundation to facilitate learning through public-private partnerships in early education. Sharing lessons across contexts is challenging, and there needs to be space for adaption of the model to specific contexts and course adjustment as lessons are learned. Some advocates have suggested a collective impact[196] infrastructure to build a collaborative, not competitive, learning infrastructure and increased parental accountability to scale quality preschool.[197] In LMICs, donors could play an important role in developing this learning network infrastructure.

Impact bonds also provide an excellent learning opportunity for governments, foundations, investors, and intermediaries. Not only do these parties have the opportunity to learn about the effectiveness of various interventions, but they can also learn a great deal from one another about best practices in impact bonds.

[196] See Collective Impact Forum (2015).
[197] Interview with Bill Crim and Chris Ellis, United Way of Salt Lake, September 15, 2015.

7. CONCLUSIONS

The confluence of the recent agreement on 17 SDGs and the increased attention being paid to the role of nontraditional actors in contributing to shared prosperity provide a unique opportunity to focus attention on attempts to identify promising new solutions to the barriers that impede the full development of the world's youngest citizens. Given that domestic resources and international aid will be insufficient to meet the estimated costs of these goals, private and nontraditional finance for development and the associated investment opportunities for the private sector in support of the longer-term agenda of the SDGs could be considered. Leveraging these new sources of funding and linking financing and results through innovative financing mechanisms is also crucial to the achievement of the Global Goals.

Impact bonds have the potential to address some of the main financing and delivery constraints faced in ECD. By providing upfront private capital, impact bonds could help to address service provider liquidity constraints and leverage public capital by allowing the government to connect preventive programs with future benefits to individuals, society, and the economy. Impact bonds also have the potential to drive performance management, support monitoring and evaluation, and create accountability, which all help to address quality and capacity constraints. By fostering innovation, experimentation and adaptive learning in service delivery, cost-effective solutions could be identified through impact bonds. By producing evidence of outcome achievement, impact bonds could shift the focus toward effective ECD programs. Finally, collaboration across stakeholders—a necessary component of impact bonds—has the potential to allow for alignment of interests and a win-win situation for investors, outcome funders, and program beneficiaries alike.

The high participation of non-state actors and potentially significant returns in ECD make it a promising sector for impact bonds. Unlike other services that may have entrenched interests, the multitude of agencies and non-state entities financing and providing ECD services potentially allows for more experimentation. The preventive nature of ECD programs also fits well with the core feature of SIBs, which is that preventive investments will result in valuable short- and potentially long-term outcomes. There is evidence that ECD interventions can have immense effects on later-life outcomes. For example, a longitudinal study of a program in Jamaica, in which participants received weekly visits from community health workers over a two-year period, was found to increase the earnings of participants by 25 percent, 20 years later.[198]

[198] Versus peers who did not participate in the program. The program consisted of teaching parents of 3-year-olds parenting skills, and encouraging mothers and children to interact in ways that develop cognitive and socioemotional skills. (Gertler et al. 2014).

There may, however, be some particular challenges associated with applying impact bonds in the ECD sector. Impact bonds (and other PbR mechanisms tied to outcomes) require meaningful outcomes that are measureable within a time frame that is reasonable to the outcome funder (and investors in the case of an impact bond). Meaningful outcomes are outcomes that are intrinsically or extrinsically valuable. Intrinsically valuable outcomes that are measureable within a reasonable time frame could be extrinsically valuable if they are proxies for long-term benefits to individuals, society, or the economy. The delay between ECD interventions and later-life results may prove an impediment in some cases. By identifying appropriate interim measures such as language development, socioemotional development, and schooling outcomes that may proxy for desirable longer-term outcomes, the issue of delay could be mitigated. For example, there is evidence that early stimulation and social protection programs can have statistically significant effects on socioemotional development outcomes in the short-run. Cognitive development is a statistically significant short-term outcome of health and social protection interventions. Finally, schooling outcomes are a significant short-term outcome of health and early stimulation programs.[199] An increase in focus on the intrinsic value of short-term outcomes that result from ECD interventions, such as child survival, is also important.

Another potential challenge may be the inability to quantify outcomes or to assign attribution of impacts to specific interventions. This may be the case in circumstances where robust evaluation is not possible or when there is the potential for a multitude of confounding factors that may influence outcomes. Particularly challenging interventions for quantification of impact may be birth registration or child protection interventions. In these cases, simple outputs with intrinsic value or evidence linking to positive outcomes may be more appropriate.

In addition, the lack of open-source tools that are appropriate to use in LMIC settings for some development outcomes may also be a hindrance to applying impact bonds to some outcomes. As evidence increases and more measurement tools become available, these two issues will become less of an obstacle.[200] An alternative solution, at least in an intermediate phase, would be to focus on inputs that are known to strongly correlate with development outcomes. In center-based care (day-care and preschool) interventions, these could include measures of process quality i.e., the interaction between teachers and students. Structural quality is also important as it can relate to the physical and mental health of children but in general it is shown to have less correlation with schooling and socioemotional development. Furthermore, monitoring and evaluation can be costly, though less expensive methods such as data collection through cellphones could reduce the costs and improve the efficacy of data collection and service adaptation.

Another challenge in ECD could be its multi-sectoral nature. This would be the case only if outcomes are chosen that are linked to multiple ministries both on the cost and the benefit side, given the need to coordinate across stakeholders in an impact bond. At the same time, this could provide an opportunity to improve coordination between those agencies with a common focus on outcome achievement. Experience from developed country impact bonds has shown that the coordination of joint data systems that has resulted from impact bonds has been well worth the effort.

Societal resistance to government interference in parenting in the early years of a child's life may

[199] Tanner et al. (2015).

[200] Current efforts include for example the Measuring Early Learning Quality and Outcomes (MELQO) project which is a multi-agency project aiming to develop tools to measure school readiness across a variety of domains as well as quality of center-based preprimary programs. The effort aims to develop a tool with consistent core measures and locally adaptable additional measures (Anderson et al. 2015).

also prove challenging; however, impact bonds may be a relatively helpful tool to address this challenge if they can clearly demonstrate these programs' positive impact on society. Finally, adequate service provider capacity could be a particular challenge for ECD impact bonds in LMICs.

Impact bonds (and other PbR financing mechanisms tied to outcomes) are best suited to contexts where the relationship between inputs and outcomes is unclear and the guarantee of value for money is necessary for policymakers to fund the program. Impact bonds may make sense in circumstances where there are gaps in knowledge about what works and a desire to learn more, but an unwillingness to take a risk to gain that information. If a government agency is willing to fund a proven intervention without external support and continuously monitor outcomes, then the transaction costs associated with impact bonds may not be worthwhile. Despite the high potential impacts of ECD interventions, the evidence base from developing countries is still relatively thin. Evaluation results from impact bonds could help contribute to the evidence base and the flexibility in an impact bond for live service adaptation could help accelerate the learning process.

The regions with the least robust evidence base include the Middle East and North Africa (with no robust evaluations identified) and East Asia and the Pacific (three evaluations). Sub-Saharan Africa, South Asia, and East Africa also had fewer evaluations combined relative to the Europe and Central Asia, as well as Latin America. The outcome domain with the fewest number of unique projects evaluated was socioemotional development. Given the increased importance placed on this aspect of development and evidence of its link to labor market outcomes, this would be an area where more evaluation and experimentation could be highly beneficial to government and society more broadly. Interventions where more robust evidence could be developed related to ECD include micronutrient supplementation, water and sanitation interventions, delivery and ante- and post-natal-related interventions, and disease treatment. An impact bond that builds on a strong system of performance management and adaptive learning could provide an opportunity to test an intervention or service provider in their ability to deliver outcomes.

Impact bonds may be best suited to areas of ECD and countries where there is a relative proliferation of non-state providers of ECD services. Outcome funders may be particularly concerned about value for money and there may be more gaps in knowledge about outcome achievement with non-state providers. For pre-primary education, in particular, non-state providers comprise a large portion of service delivery. In the 100 countries worldwide with available data, an average of 31 percent of students enrolled in pre-primary education were enrolled in private institutions in 2012, including not-for-profit and for-profit schools not owned by the government.[201] However, there is large variation between countries. In Morocco, 90 percent of pre-primary services are provided by non-state actors, while in Ghana, 22 percent are provided by the non-state sector.[202] Across East Asia and the Pacific region, many countries have specific policies encouraging non-state provision of pre-primary education. If an impact bond is designed to improve outcomes for individuals in the lower-income quintiles through non-state providers, the stakeholders must ensure that the impact bond does not exclusively finance for-profit non-state providers that cater to the wealthy.

Impact bonds are likely to be best suited to mezzanine financing, rather than initial pilot or nationwide programming. In impact bonds, investors must be willing to bear the risk of outcome achievement; therefore, impact bonds are unlikely to be the best tool for completely untested pilot interventions (a grant would be more applicable).

[201] UNESCO (2015)
[202] Data for 2012, UNESCO Institute for Statistics (2015).

Table 11. A Comparison of Potential Benefits, Challenges and Costs for Payment by Results Mechanisms

		Social Impact Bonds	Development Impact Bonds	Results-based Financing	Results-based Aid
Potential Benefits	Provides upfront capital for service providers	●	●	○ / ●*	○ / ●*
	Drives performance management	●	●	●	●
	Improves quality of programs	●	●	● / ●†	● / ●†
	Incentivizes collaboration between public and private sector	●	●	●	●
	Creates government accountability	●	○	● / ●‡	●
	Shifts government focus to outcomes	●	●	● / ●†‡	● / ●†
	Reduces risk for government	●	●	○ / ●‡	○
	Reduces risk for non-state service provider	●	●	○ / ●‡	●
	Builds a culture of monitoring and evaluation	●	●	●	●
	Improves local/global knowledge of what works	●	●	●	●
Potential Challenges and Costs	Intermediary/transaction costs	●	●	●	●
	Evaluation costs	●	●	●	●
	Legal fees	●	●	●	●
	Risk of corruption in provider procurment, investor selection or terms	●	●	●	●
	Risk that underestimation of outcomes discourages investment in the sector	●	●	●	●
	Appropriation risk	●	○	○	○
	Perverse incentives	●	●	●	●
	Sustainability risk	●	●	●	●

● highly likely ● somewhat or potentially ○ unlikely

* Dependent on case or instrument
† Dependent on if contingency is related to outputs or outcomes
‡ Dependent on whether contingency is for providers or local government
Source: Authors' research.

As mentioned above, impact bonds are best suited to interventions where there is a gap in knowledge about the efficacy of service provision, an indication that this mechanism is not optimal for funding nationwide provision. In ECD, mezzanine financing for nutrition programs could be appropriate—there is high potential for success but still a great deal of learning needed.

Impact bonds can only be used in countries where legal conditions exist that allow the mechanism to operate, and they will likely be much easier to implement in countries that have demonstrated political commitment to the sector. Impact bonds will only be possible where particular legal conditions are in place, such as legislation that allows government to appropriate funds ex-ante for achieved outcomes. It would also not make sense to set up impact bonds where there are immitigable risks of corruption in procurement, outcome payment design, or evaluation. Nor would it make sense where it is impossible to ensure the outcome funder's ability to repay investors, as with a government with a poor credit rating. Legislation supporting public-private partnerships and improving the tax status of impact investing may also facilitate the development of impact bonds. These conditions are more likely to be met in middle-income countries; however, there may be cases of low-income countries where these conditions are fulfilled. Impact bonds (in particular SIBs) may make sense when there is already some political interest at the country, regional, or municipal level to expand early childhood services, but insufficient political or constituent support for adequate budget allocation. In the regions where a great deal of evidence exists—Europe, Central Asia, and Latin America, for example—impact bonds could be used to highlight the importance of early childhood development.

Impact bonds may be preferable to other types of PbR mechanisms if full upfront capital is needed to finance service provision or service providers are unwilling to take on the risk of outcome achievement. The involvement of non-state investors in an impact bond may also increase political will, performance management, or help reorganize a government system of data sharing or provision, beyond what other types of PbR financing may be able to accomplish. Non-state investors may also be able to encourage the establishment of integrated systems of ECD provision across sectors.

The appropriate financing mechanism is dependent on the social challenges and legal opportunities in a given country. Table 11 provides a comparison of some of the potential challenges and benefits associated with SIBs and DIBs, as well as with results-based financing and results-based aid, the most similar alternate mechanisms (see Table 3 for a detailed description of each). None of the mechanisms are conclusively superior to the others; rather these considerations are intended to inform the selection of a financing mechanism for a given context.

As the global community moves beyond the Millennium Development Goals to a set of Global Goals and associated targets linked to measurable outcomes, there is an opportunity to demonstrate a commitment to invest in future generations. Leveraging upfront funding, focusing on outcomes through adaptive learning and testing new ways to deliver early childhood interventions more effectively are all means of achieving the ECD-related goals. Despite the hype around all of the new financing mechanisms, the keys to creating high-quality, locally appropriate programs remain simple—real-time collection of outcome data, the freedom to fail, and the flexibility to course-adjust. In some circumstances social service provision based on outcomes and adaptive learning may require mechanisms like impact bonds or other variations of PbR financing. In other circumstances it may not. As this very nascent field continues to grow, more research will be needed to capture lessons learned, contextualize them within the larger landscape of ECD financing and service provision, and apply them to real-world social challenges with the world's youngest and most disadvantaged populations at the forefront of the conversation.

APPENDIX 1: Contributors

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Table 1.1. Impact Evaluations Investigating Physical Development

	Study	Country (Project)	Average Age at Intervention (Years)	Average Length of Exposure (Years)[c]	Age at Evaluation (Years)	Evaluated Intervention	Reviewed Outcomes
Nutrition	Kramer and others 2007[a]	Belarus (Promotion of Breastfeeding Intervention Trial [PROBIT])	0	1	6	breastfeeding promotion	BMI; head circumference*; height; MUAC
	Martin and others 2013	Belarus (Promotion of Breastfeeding Intervention Trial [PROBIT])	0	1	11	breastfeeding promotion	BMI; head circumference; height; MUAC
	Stewart and others 2009[a]	Nepal (maternal nutritional supplementation)	in utero	0.75	6–8	vitamins, micronutrients, or fortified food for pregnant women (folic acid, iron, and zinc)	height (folic acid+iron+zinc)*; height (folic acid, folic acid+iron, multiple micronutrient)
	Stewart and others 2009[b]	Nepal (maternal multivitamin supplementation)	in utero	0.75	6–8	vitamins, micronutrients, or fortified food for pregnant women (folic acid, iron, and zinc)	BMI (folic acid, folic acid+iron, folic acid+iron+zinc, multiple micronutrient)
	Devacumar and others 2014	Nepal (maternal nutritional supplementation)	in utero	0.17	8.5	vitamins, micronutrients, or fortified food for pregnant women (multivitamin supplement)	BMIZ; HAZ; head circumference; height; MUAC; WAZ; weight (z-scores based on WHO standards)
	Hawkesworth and others 2008	Gambia, The (maternal supplementation)	in utero	0.5 (DR1)	11–17	vitamins, micronutrients, or fortified food for pregnant women (protein biscuits)	BMI; height***; weight
	Hawkesworth and others 2011	Gambia, The (maternal supplementation)	in utero	0.5 (DR1)	11–17	vitamins, micronutrients, or fortified food for pregnant women (protein biscuits)	BMI
	Alderman and others 2014	Gambia, The (maternal supplementation)	in utero	0.5 (DR1)	16–22	vitamins, micronutrients, or fortified food for pregnant women (protein biscuits)	height
	Walker and others 1996[a]	Jamaica (stimulation and supplementation to stunted children)	1.55	2	7–8	supplementary feeding	HAZ; WAZ (z-scores based on NCHS standards)
	Walker and others 2000[a]	Jamaica (stimulation and supplementation to stunted children)	1.55	2	11–12	supplementary feeding	BMI; HAZ (z-scores based on NCHS standards)
	Pongcharoen 2010 [	Thailand (micronutrient supplementation to children)	0.5	0.5	9	micronutrients and fortified food for children (iron and/or zinc supplementation)	BMIZ; HAZ*; MUAC; WAZ (z-scores based on WHO standards)

	Study	Country (Project)	Average Age at Intervention (Years)	Average Length of Exposure (Years)[c]	Age at Evaluation (Years)	Evaluated Intervention	Reviewed Outcomes
Early Learning/Childcare	Martínez, Naudeau, and Pereira 2012	Mozambique (preschool)	3.45	1.5	5–9	quality early childhood and preprimary program	fine motor skills*; HAZ; WAZ (no information given on reference population used for calculating the z- score)
	Walker and others 1996[a]	Jamaica (stimulation and supplementation to stunted children)	1.55	2	7–8	stimulation	HAZ; WAZ (z-scores based on NCHS standards)
	Levin and others 2014	Romania (Bucharest Early Intervention Project)	1.88	2.7	8	stimulation (foster care)	motor skills
	Walker and others 2000[a]	Jamaica (stimulation and supplementation to stunted children)	1.55	2	11–12	stimulation	BMI; HAZ (z-scores based on NCHS standards)
Health	Barham 2012[b]	Bangladesh (Matlab)	NA	continuous	8–14	well child visits	HAZ** (normalized using comparison areas means and standard deviation)
	Ozier 2013	Kenya (primary school deworming project)	0	1	8–15	deworming	HAZ; height (z-scores based on WHO standards)
	Barham 2012[b]	Bangladesh (Matlab)	NA	continuous	15–19	family planning	HAZ (normalized using comparison areas means and standard deviation)
Social Protection	Behrman and others 2008	Mexico (Progresa)	1.5	1.5 (DR2)	7–11	CCT	BMIZ; height (z-scores based on WHO standards)
	Manley, Fernald, and Gertler 2012	Mexico (Progresa)	1	1.5 (DR2)	8–10	CCT—conditionalities	BMIZ; HAZ (z-scores based on WHO standards)
						CCT—cash	BMIZ; HAZ*** (z-scores based on WHO standards)

	Study	Country (Project)	Average Age at Intervention (Years)	Average Length of Exposure (Years)[c]	Age at Evaluation (Years)	Evaluated Intervention	Reviewed Outcomes
Social Protection	Barham and others 2014	Nicaragua (Red de Protección Social)	in utero	3 (DR2)	10 (boys)	CCT	HAZ; WAZ (no information given on reference population used for calculating the z-score)
	DSD, SASSA, and UNICEF 2012	South Africa (Child Support Grant)	1	2.5	10	unconditional or targeted income support	HAZ (no information given on referencepopulation used for calculating the z-score)

BMI = body mass index; BMIZ = body mass index z-score; CCT = conditional cash transfer; DR = dose response; DSD = Department of Social Development; HAZ = Height-for-age z-score; MUAC = mid-upper arm circumference; NA = not applicable; NCHS = National Center for Health Statistics; SASSA = South African Social Security Agency; UNICEF = United Nations Children's Fund; WAZ = weight-for-age z-score; WHZ = weight-for-height z-score; WHO = World Health Organization.

a. Jamaica studies have a multiple intervention arm, and each intervention type has a separate row for these studies.

b. Bangladesh Matlab study has "NA" on intervention age and length of exposure because of the nature of the family planning intervention.

c. DR in the length of exposure means the intervention period in terms of the dose response. DR is either randomized rotation (DR1) or phase-in (DR2). In terms of dose response, for instance, DR1 indicates that The Gambia study where treatment group receives protein biscuit only in utero whereas control group receives it only in postpartum, and length of exposure is the length of intervention for treatment. DR2 describes the dose response where early and late treatment effect is compared, and length of exposure is the difference of the intervention period between treatment and control group. "Continuous" indicates that the program effect could continue over time.

* Statistically significant at 10 percent.

** Statistically significant at 5 percent.

*** Statistically significant at 1 percent.

Source: Tanner et al. (2015).

Table 1.2. Impact Evaluations Investigating Cognitive Development

	Study	Country (Project)	Average Age at Intervention (Years)	Average Length of Exposure (Years)[a]	Age at Evaluation (Years)	Evaluated Intervention	Reviewed Outcomes
Nutrition	Kramer and others 2008[a]	Belarus (Promotion of Breastfeeding Intervention Trial [PROBIT])	0	1	6	breastfeeding promotion	abbreviated IQ (total score)*; abbreviated performance IQ; nonverbal subscales
Nutrition	Pongcharoen 2010	Thailand (micronutrient supplementation to children)	0.5	0.5	9	micronutrients and fortified food for children (Iron and/or zinc supplementation)	executive function (processing speed); full-scale IQ; performance IQ; nonverbal cognition (Raven's matrices)
Nutrition	Alderman and others 2014	Gambia, The (maternal supplementation)	in utero	0.5 (DR1)	16–22	vitamins, micronutrients, or fortified food for pregnant women (protein biscuits)	executive function (backward digit span); nonverbal cognition (Raven's matrices)
Nutrition	Walker and others 2005[b]	Jamaica (stimulation and supplementation to stunted children)	1.55	2	17–18	supplementary feeding	full-scale IQ; performance IQ; nonverbal cognition (Raven's matrices)
Nutrition	Walker and others 2011[b]	Jamaica (stimulation and supplementation to stunted children)	1.55	2	22	supplementary feeding	full-scale IQ; performance IQ
Nutrition	Maluccio and others 2009[c]	Guatemala (INCAP supplementary feeding to children)	0	5.3	25–42	supplementary feeding	nonverbal cognition (Raven's matrices)**
Early Learning/Childcare	Walker and others 2010	Jamaica (stimulation to low birthweight infants)	0	2	6	stimulation	executive function (short-term memory)***; full-scale IQ; performance IQ**
Early Learning/Childcare	Fox and others 2011	Romania (Bucharest Early Intervention Project)	1.88	2.7	8	stimulation (foster care)	executive function (processing speed); executive function (working memory); perceptual organization full-scale IQ*
Early Learning/Childcare	Bos and others 2009	Romania (Bucharest Early Intervention Project)	1.88	2.7	8	stimulation (foster care)	executive function (spatial working memory); executive function (stockings of Cambridge)
Early Learning/Childcare	Walker and others 2000	Jamaica (stimulation and supplementation tostunted children)	1.55	2	11–12	stimulation	executive function (processing speed); full-scale IQ**; nonverbal cognition (Raven's matrices)**; performance IQ*

	Study	Country (Project)	Average Age at Intervention (Years)	Average Length of Exposure (Years)[a]	Age at Evaluation (Years)	Evaluated Intervention	Reviewed Outcomes
Early Learning/Childcare	Walker and others 2005[b]	Jamaica (stimulation and supplementation to stunted children)	1.55	2	17–18	stimulation	full-scale IQ**; nonverbal cognition (Raven's matrices)*; performance IQ*; working memory
	Gertler and others 2013	Jamaica (stimulation and supplementation to stunted children)	1.55	2	22	stimulation	cognitive factor score***
	Walker and others 2011[b]	Jamaica (stimulation and supplementation to stunted children)	1.55	2	22	stimulation	full-scale IQ***; performance IQ***
Health	Cas 2012	Indonesia (Safe Motherhood program)	in utero	3	11–14	access to obstetric and child health care	nonverbal cognition (Raven's matrices)***
	Ozier 2013	Kenya (primary school deworming project)	0	1	8–15	deworming	cognitive factor score**; nonverbal cognition (Raven's matrices)***
Social Protection	Behrman and others 2008	Mexico (Progresa)	1.5	1.5 (DR2)	7–11	CCT	abbreviated performance IQ
	Manley, Fernald, and Gertler 2012	Mexico (Progresa)	1	1.5 (DR2)	8–10	CCT–conditionalities	abbreviated cognitive performance IQ
						CCT– cash	abbreviated cognitive performance IQ*
	Barham and others 2014	Nicaragua (Red de Protección Social)	in utero	3 (DR2)	10 (boys)	CCT	executive function (processing speed)**; cognitive factor score***; nonverbal cognition (Raven's matrices)**

CCT = conditional cash transfer; DR = dose response; INCAP = Instituto de Nutrición de Centroamérica y Panamá; IQ = intelligence quotient.
a. DR in the length of exposure means the intervention period in terms of the dose response. DR is either randomized rotation (DR1) or phase-in (DR2). In terms of dose response, for instance, DR1 indicates The Gambia study where treatment group receives protein biscuit only in utero whereas control group receives it only in postpartum, and length of exposure is the length of intervention for treatment. DR2 describes the dose response where early and late treatment effect is compared, and length of exposure is the difference of the intervention period between treatment and control group.
b. Jamaica each has a multiple intervention arm, and each intervention type has a separate row for these studies.
c. INCAP provided supplementation to pregnant and lactating women but could not isolate effects as children could also receive the supplement after birth, and the study lacked power to evaluate the intervention by developmental period.
* Statistically significant at 10 percent.
** Statistically significant at 5 percent.
*** Statistically significant at 1 percent.
Source: Tanner et al. (2015).

Table 1.3. Impact Evaluations Investigating Language Development

	Study	Country (Project)	Average Age at Intervention (Years)	Average Length of Exposure (Years)[a]	Age at Evaluation (Years)	Evaluated Intervention	Reviewed Outcomes
Nutrition	Kramer and others 2008a	Belarus (Promotion of Breastfeeding Intervention Trial [PROBIT])	0	1	6	breastfeeding promotion	reading ability*; verbal abilities (abbreviated test)**; vocabulary**
	Pongcharoen 2010	Thailand (micronutrient supplementation to children)	0.5	0.5	9	micronutrients and fortified food for children (iron and zinc supplementation)	verbal abilities
	Alderman and others 2014	Gambia, The (maternal supplementation)	in utero	0.5 (DR1)	16–22	vitamins, micronutrients, or fortified food for pregnant women (protein biscuits)	vocabulary (expressive and receptive)
	Walker and others 2000[a]	Jamaica (stimulation and supplementation to stunted children)	1.55	2	11–12	supplementary feeding	receptive vocabulary; verbal abilities; vocabulary
	Walker and others 2005[a]	Jamaica (stimulation and supplementation to stunted children)	1.55	2	17–18	supplementary feeding	reading abilities; receptive vocabulary; verbal abilities; verbal analogies
	Walker and others 2011[a]	Jamaica (stimulation and supplementation to stunted children)	1.55	2	22	supplementary feeding	reading abilities; verbal abilities
	Maluccio and others 2009	Guatemala (INCAP supplementary feeding to children)	0	5,3	25–42	supplementary feeding	reading abilities**
Early Learning/Childcare	Martínez, Naudeau, and Pereira 2012	Mozambique (preschool)	3.45	1.5	5–9	quality early childhood and preprimary program	receptive vocabulary
	Walker and others 2010	Jamaica (stimulation to low birthweight infants)	0	2	6	stimulation	reading abilities; receptive vocabulary; verbal abilities
	Fox and others 2011	Romania (Bucharest Early Intervention Project)	1.88	2.7	8	stimulation (foster care)	verbal abilities**
	Walker and others 2000[a]	Jamaica (stimulation and supplementation to stunted children)	1.55	2	11–12	stimulation	receptive vocabulary; verbal abilities**; vocabulary**

	Study	Country (Project)	Average Age at Intervention (Years)	Average Length of Exposure (Years)[a]	Age at Evaluation (Years)	Evaluated Intervention	Reviewed Outcomes
Early Learning/Childcare	Walker and others 2005[a]	Jamaica (stimulation and supplementation to stunted children)	1.55	2	17–18	stimulation	reading***; receptive vocabulary**; verbal abilities**; verbal analogies**
Early Learning/Childcare	Walker and others 2011[a]	Jamaica (stimulation and supplementation to stunted children)	1.55	2	22	stimulation	reading abilities***; verbal abilities***
Health	Ozier 2013	Kenya (primary school deworming project)	0	1	8–15	deworming	receptive vocabulary*
Social Protection	Secretariat of Social Development 2008 [8]	Mexico (Progresa)	1.5	1.5 (DR2)	7–11	CCT	reading comprehension; verbal abilities (abbreviated test)**
Social Protection	Manley, Fernald, and Gertler 2012	Mexico (Progresa)	1	1.5 (DR2)	8–10	CCT–conditionalities	verbal abilities (abbreviated test)
						CCT–cash	verbal abilities (abbreviated test)***
Social Protection	Barham and others 2014	Nicaragua (Red de Protección Social)	in utero	3 (DR2)	10 (boys)	CCT	receptive vocabulary**
Social Protection	Rackstraw 2014	Honduras (Programa de Asignación Familiar)	1.5	2	13–15	CCT	reading abilities*
Social Protection	DSD, SASSA and UNICEF 2012	South Africa (Child Support Grant)	1	2.5	10	unconditional or targeted income support	reading abilites
Water	Spears and Lamba 2013	India (Total Sanitation Campaign)	0	continuous	6–8	adequate sanitation	reading*
Other	Pathak and Macours 2013[c]	India (women's political reservation)	pre-birth birth	3 (DR1)	8	governance (women's political reservation)	reading abilities (in utero)*; reading abilities (0–5 years); receptive vocabulary

CCT= conditional cash transfer; DR=dose response; INCAP=Instuto de Nutrición de Centroamérica y Panamá

a. Jamaica has a multiple intervention arm, and each intervention tyope has a separate row for these studies.

b. DR in the length of exposure means intervention period in terms of the Dose Response. DR is either randomized rotaation (DR1) or phase-in (DR2). In terms of dose response, for instance, DR1 indicaates that the Gambia study where treatment group receives protein biscuit only in utero whereas control group receives in only in postpartum, and lenght of exposure is the length of intervention for treatment. DR2 describes the dose response where early and late treatment effect is compared, and length of exposure is the difference of the intervention period between treaatment and control group. "Continuous" indicat3es that program effect contiues over time.

c. India study 8426 has multiple experimental arms. One treatment group is in utero when the political seats were randomized for women, and the other treatment group is between the ages of newborn and five years old during the reservation. The control group was children who were not exposed to reserved seats until 6 yeaars and beyond,

* Statistically significant at 10 percent.

** Statistically significant at 5 percent.

*** Statistically significant at 1 percent.

Source: Tanner et al. (2015).

Table 1.4. Impact Evaluations Investigating Socioemotional Development

	Study	Country (Project)	Average Age at Intervention (Years)	Average Length of Exposure (Years)[a]	Age at Evaluation (Years)	Evaluated Intervention	Reviewed Outcomes
Nutrition	Kramer and others 2008b	Belarus (Promotion of Breastfeeding Intervention Trial [PROBIT])	0	1	6	breastfeeding promotion	strength and difficulties questionnaire (total difficulties)
	Pongcharoen 2010	Thailand (micronutrient supplementation to children)	0.5	0.5	9	micronutrients and fortified food for children	freedom from distractibility index
	Walker and others 2011[a]	Jamaica (stimulation and supplementation to stunted children)	1.55	2	22	supplementary feeding	anxiety; depression; involved in a physical fight; involved in a violent crime; social inhibition; weapon use
Early Learning/Childcare	Walker and others 2010	Jamaica (stimulation and supplementation to stunted children)	0	2	6	stimulation	attention (map search, opposite-same (switching)); strength and difficulties questionnaire (total difficulties)**
	Humphreys and others 2015	Romania (Bucharest Early Intervention Project)	1.88	2.7	12	stimulation (foster care)	externalizing behavior**; hyperactivity; internalizing behavior
	Walker and others 2006	Jamaica (stimulation and supplementation to stunted children)	1.55	2	17–18	stimulation	anxiety***; attention deficit**; depression**; hyperactivity; oppositional behavior*; self-esteem**
	Raine and others 2003	Mauritius (Child Health Project)	3	2	17	quality early childhood and preprimary program	anxiety; attention problem; hyperactivity**
	Gertler and others 2013	Jamaica (stimulation and supplementation to stunted children)	1.55	2	22	stimulation	externalizing behavior factor; internalizing behavior factor**
	Walker and others 2011[a]	Jamaica (stimulation and supplementation to stunted children)	1.55	2	22	stimulation	anxiety; depression**; involved in a physical fight*; involved in a violent crime**; social inhibition*; weapon use
	Raine and others 2003	Mauritius (Child Health Project)	3	2	23	quality early childhood and preprimary program	court-reported criminal offenders*; self-reported criminal offenders**

	Study	Country (Project)	Average Age at Intervention (Years)	Average Length of Exposure (Years)[a]	Age at Evaluation (Years)	Evaluated Intervention	Reviewed Outcomes
Social Protection	Behrman and others 2008	Mexico (Progresa)	1.5	1.5 (DR)	7–11	CCT	strength and difficulties questionnaire**
	Manley, Fernald, and Gertler 2012	Mexico (Progresa)	1	1.5 (DR)	8–10	CCT—conditionalities	strength and difficulties questionnaire**
						CCT—cash	strength and difficulties questionnaire

CCT = conditional cash transfer; DR = dose response; INCAP = Instituto de Nutrición de Centroamérica y Panamá.
a. Jamaica has a multiple intervention arm, and each intervention type has a separate row for this study.
b. DR in the length of exposure means intervention period in terms of the Dose Response. Specifically, DR here describes the dose response where early and late treatment effect is compared, and length of exposure is the difference of the intervention period between treatment and control group.
* Statistically significant at 10 percent.
** Statistically significant at 5 percent.
*** Statistically significant at 1 percent.
Source: Tanner et al. (2015).

Table 1.5. Impact Evaluations Investigating Schooling Outcomes

	Study	Country (Project)	Average Age at Intervention (Years)	Average Length of Exposure (Years)[a]	Age at Evaluation (Years)	Evaluated Intervention	Reviewed Outcomes
Nutrition	Kramer and others 2008[a]	Belarus (Promotion of Breastfeeding Intervention Trial [PROBIT])	0	1	6	breastfeeding promotion	math achievement; other subjects; reading**; writing**
Nutrition	Pongcharoen 2010	Thailand (micronutrient supplementation to children)	0.5	0.5	9	micronutrients and fortified food for children (iron and/or zinc supplementation)	English; math achievement; on-time primary school enrollment; science; Thai
Nutrition	Alderman and others 2014	Gambia, The (maternal supplementation)	in utero	0.5 (DR1)	16–22	vitamins, micronutrients, or fortified food for pregnant women (protein biscuits)	school years completed
Nutrition	Walker and others 2005[a]	Jamaica (stimulation and supplementation to stunted children)	1.55	2	17–18	supplementary feeding	math assessment
Nutrition	Walker and others 2011[a]	Jamaica (stimulation and supplementation to stunted children)	1.55	2	22	supplementary feeding	general exams; math assessment; school years completed
Nutrition	Maluccio and others 2009	Guatemala (INCAP supplementary feeding to children)	0	5.3	25–42	supplementary feeding	school years completed (men, women**)
Health	Cas 2012	Indonesia (Safe Motherhood program)	in utero	3	11–14	access to obstetric and child health care	math assessment***; on-time primary school enrollment; school years completed**
Early Learning/Childcare	Martínez, Naudeau, and Pereira 2012	Mozambique (preschool)	3.45	1.5	5–9	quality early childhood and preprimary program	on-time primary school enrollment**
Early Learning/Childcare	Berlinski, Galiani, and Gertler 2009	Argentina (preprimary education)	4	1	8	quality early childhood and preprimary program	math achievement**; Spanish**
Early Learning/Childcare	Valdes 2011	Chile (Early Childhood Care and Education)	2.9	1.8	10	quality early childhood and preprimary program	math achievement***

	Study	Country (Project)	Average Age at Intervention (Years)	Average Length of Exposure (Years)[a]	Age at Evaluation (Years)	Evaluated Intervention	Reviewed Outcomes
Early Learning/Childcaere	Berlinski, Galiani and Manacorda 2008	Uruguay (preschool)	4	1.5	7–15	quality early childhood and preprimary program	school years completed***
	Walker and others 2005[a]	Jamaica (stimulation and supplementation to stunted children)	1.55	2	17–18	stimulation	math assessment
	Gertler and others 2013	Jamaica (stimulation and supplementation to stunted children)	1.55	2	22	stimulation	general exams*; probability of attending post-secondary school*; school years completed*
	Walker and others 2011[a]	Jamaica (stimulation and supplementation to stunted children)	1.55	2	22	stimulation	general exams*; math assessment**; school years completed**
Social Protection	Todd and Winters 2011	Mexico (Progresa)	2	2.8 (DR1)	6–9	CCT	on-time primary school enrollment*
	Secretariat of Social Development 2008	Mexico (Progresa)	1.5	1.5 (DR2)	7–11	CCT	school years completed
	Behrman, Parker, and Todd 2009	Mexico (Progresa)	1.5	1.5 (DR2)	6–14	CCT	on-time primary school enrollment (boys); on-time primary school enrollment (girls)*; school years completed***
	Rackstraw 2014	Honduras (Programa de Asignación Familiar)	1.5	2	13–15	CCT	school years completed***
	DSD, SASSA, and UNICEF 2012	South Africa (Child Support Grant)	1	2.5	10	unconditional/targeted income support	numeracy; on-time primary school enrollment (boys); on-time primary school enrollment (girls)**; school years completed**
Childcare	Attanasio and Vera-Hernández 2004	Colombia (Hogares Communitarios)	3	1.2	8–17	childcare/daycare	probability of attending secondary school**

	Study	Country (Project)	Average Age at Intervention (Years)	Average Length of Exposure (Years)[a]	Age at Evaluation (Years)	Evaluated Intervention	Reviewed Outcomes
Water and Sanitation	Spears and Lamba 2013	India (Total Sanitation Campaign)	0	continuous	6–8	adequate sanitation	numeracy (6 years old)**; numeracy (7–8 years old)
Water and Sanitation	Xu and Zhang 2014	China (rural drinking water program)	1	1	18–25	access to safe water	school years completed (exposed to 0–2 years)***; school years completed (exposed to 3–5 years)
Other	Pathak and Macours 2013[c]	India (women's political reservation)	pre-birth birth	3 (DR1)	8	governance (women's political reservation)	numeracy

CCT = conditional cash transfer; DR = dose response; INCAP = Instituto de Nutrición de Centroamérica y Panamá.

a. Jamaica each has a multiple intervention arm, and each intervention type has a separate row for these studies.

b. DR in the length of exposure means intervention period in terms of the Dose Response. DR is either randomized rotation (DR1) or phase-in (DR2). In terms of dose response, DR1 indicates the treatment and control group received the intervention for the same period of time but at different ages. DR2 describes the dose response where early and late treatment effect is compared, and length of exposure is the difference of the intervention period between treatment and control group.

c. India study has multiple experimental arms. One treatment group is in utero when the political seats were randomized for women, and the other treatment group is between the ages of newborn and five years old during the reservation. The control group was children who were not exposed to reserved seats until six years and beyond.

* Statistically significant at 10 percent.

** Statistically significant at 5 percent.

*** Statistically significant at 1 percent.

Source: Tanner et al. (2015).

Table 1.6. Impact Evaluations Investigating Employment and Labor Market Outcomes

	Study	Country (Project)	Average Age at Intervention (Years)	Average Length of Exposure (Years)[a]	Age at Evaluation (Years)	Evaluated Intervention	Reviewed Outcomes
Early Learning	Gertler and others 2013 [18] Gertler and others 2014 [19]	Jamaica (stimulation and supplementation to stunted children)	1.55	2	22	stimulation	earnings***; migration*; employment

CCT = conditional cash transfer; DR = dose response; INCAP = Instituto de Nutrición de Centroamérica y Panamá.
* Statistically significant at 10 percent.
** Statistically significant at 5 percent.
*** Statistically significant at 1 percent.
Source: Tanner et al. (2015).

APPENDIX 3. Outcome Measurement Tools

Outcome Metrics for the Social Impact Bonds for Preschool Education in the United States

Chicago Child-Parent Center (CPC) Pay for Success Initiative
Payment cohort *defined as having attended a partially or fully SIB-funded CPC (including students in SIB-funded slots and city-funded slots in the case of partially SIB-funded CPCs), enrolled in half- or full-day pre-K, have not already been identified as having a severe disability, are eligible for free- and reduced-price lunch (based on family income and a commonly used measure of economic disadvantage in the U.S. school system), are four years of age or older on September 1 entering pre-K (one year before kindergarten), and attend the CPC classroom for 66 percent of the days in a year.*
Special education avoidance: difference in rate of special education usage for children that attend any CPC with SIB funding (but with no permanent special education need, such as autism or deafness) and a comparison group matched on key demographic characteristics that did not attend any form of preschool through Chicago Public Schools (there are multiple programs apart from CPC) and do not have a CPC associated with the school they attend.
Kindergarten readiness: measured by Teaching Strategies Gold instrument, completed at the end of preschool, defined as being at or above the national trends across at least five of the six domains included. If norm-references cut-offs are not available from the district and/or company, the evaluator will consult with experts to determine appropriate cut-offs.
Third grade reading: scoring above 25th percentile-rank on the Partnership for Assessment of Readiness for College and Careers (PARCC) exam in third grade. The test will be regularly administered beginning in the spring of 2015. There is some concern around the 25th percentile accurately reflecting reading "on grade level." Modifications may be made before the first cohort starts third grade, and must be approved by the core program stakeholders.

Source: Adapted from SRI International (2015).

Utah High Quality Preschool Program
Payment cohort *defined as having scored at or below 70 percent on the Picture Peabody Vocabulary Test (PPVT) entering pre-K (one year before kindergarten) and attended 5 out of 9 months of the year.*
Special education avoidance: payments are made for each year kindergarten through sixth grade that a child in the treatment group is not identified as needing an individual education plan (special education).

Source: Authors' research.

Outcome Metrics for Early Childhood Development (Global)

Tool	What Does the Tool Measure?	What Age Range?	Estimate of Implementation Cost[203]	Use in LMICs?
Measurement Tools for Physical Development (isolated)				
1. Body Mass Index (BMI)/ BMI z-score (BMIZ)	Physical development	Age 2 yrs and above	Dependent on enumerator/nurse costs by context	Yes
2. Head circumference	Physical development	Age 0-6 mos	Same as above	Yes
3. Height/height for age z-score (HAZ)	Physical development	Age 0-5 yrs	Same as above	Yes
4. Mid-upper-arm circumference (MUAC)	Physical development	Age 6 mos. and above	Same as above	Yes
5. Weight/weight for age z-score (WAZ)	Physical development	Age 0-5 yrs	Same as above	Yes
6. Weight for height z-score (WHZ)	Physical development	Age 0-5 yrs	Same as above	Yes
Measurement tools for Schooling (isolated)				
1. Gross Enrollment Rate/Net Enrollment Rate	School enrollment rates	Pre-Primary Primary Secondary	Dependent on country context	Yes
2. School Attendance	School attendance	Pre-Primary Primary Secondary	Same as above	Depending on locality
3. Age at first grade entry	Probability of enrolling in primary school at appropriate age in a given country		Same as above	
4. School Completion/Highest grade completed/ Years of schooling	School completion	Pre-Primary Primary Secondary	Same as above	Yes
5. Grade Repetition/Appropriate grade for age	Grade repetition	Pre-Primary Primary Secondary	Same as above	Yes
6. Cohort Survival Rate	Ex. Percentage of Grade 1 students reaching Grade 5	Primary	Same as above	Yes
7. Remedial Education use	Remedial education use	Pre-Primary Primary Secondary	Same as above	Depending on locality
9. Transition Rate to Secondary School	Probability of attending secondary school	Secondary	Same as above	Yes
10. International and Regional Assessments (ex. PISA, TIMSS, PIRLS, PIRLS Literacy, SACMEQ, PASEC, LLECE) *(See Profiles of International, Regional, and Cross-National Assessment Instruments and Initiatives for more information)*	Achievement of international learning standards	Pre-Primary Primary Secondary	This varies – for TIMSS and PIRLS the cost is US $250,000 + EURO $250,000 to participate.	Yes

[203] There are several factors that should be considered in the cost of assessments. One is the actual cost of the testing materials, which is charged by the publisher. Often the cost includes some type of technical assistance. Some assessments are free of charge, while others cost thousands of dollars. Some companies allow users to make photocopies of scoring sheets while others require purchasing them from the company, etc. Next is the cost of training enumerators, for which some assessment tools require training by certified professionals from the assessment company. Finally, the implementation costs of materials, salaries, and transportation costs of enumerators are typically the largest expenses. Because the training and implementation costs vary widely depending on the size of the population assessed, this table covers the cost of the training materials only unless otherwise specified.

Tool	What Does the Tool Measure?	What Age Range?	Estimate of Implementation Cost[2]	Use in LMICs?
11. National Assessments (ex. EDI, EGRA, national surveys of learning achievement)	Achievement of national learning standards	Pre-Primary Primary Secondary	Dependent on country context	Yes
12. District/State Assessments	Achievement of local government learning standards	Pre-Primary Primary Secondary	Same as above	Yes
Measurement tools integrating Physical, Language, Cognitive, and/or Socioemotional development				
1. African Child Intelligence Test	Based on Revisie Amsterdamse Kinder Intelligentie Test - Perceptual reasoning, verbal learning, spatial orientation, verbal fluency	4 years 2 months - 11 years 1 month		Yes
2. Ages and Stages Questionnaire (ASQ)	Communication, gross motor, fine motor, problem solving, and personal-social	4 months - 60 months	$199 for 19 questionnaires and scoring sheets	Yes
3. Batelle Development Inventory Test	Personal-social, adaptive, motor, communication, and cognitive ability	Birth - 7 years 11 months		Yes
4. Bayley Scales of Infant Development (BSID) includes the Mental Development Index (MDI)	Cognitive, motor, behavioral	1 month - 42 months	$1,045 for Bayley-III comprehensive kit and screening test kit combo	Yes
5. Bracken Basic Concepts Scale (BBCS)	Basic concept development, cognitive, language development, academic achievement	3 years - 6 years 11 months	$353 for a complete kit	Unknown
6. British Ability Scales	Core: verbal, visual/spatial, and non-verbal; Subscales for differential abilities; achievement tests for the older group	2.6 years - 17.2 years	Around £650 (about $982), but depends on number of subtests administered	Yes
7. Cambodian Development Assessment Test	Cognitive, social, motor, and academic development for program evaluation based on country-specific standards		Not for sale, available from UNICEF Cambodia	Yes
8. Center for Epidemiologic Studies Depression Scale (CES-D)	Depression in caregivers	18 years +	Free and available online	Unknown
9. Child Behavior Checklist (CBCL)	Depression in children	4 years - 18 years	$160 for a starter kit	Unknown
10. Child Behavior Rating Scale (CBRS)	Mental health	6 years - 18 years	$349 for a complete kit	Unknown
11. Classroom Assessment Scoring System (CLASS)	Classroom quality	Group programs serving infants through secondary school students	$50 for a manual; training costs are $850 per enumerator	Unknown
12. Corsi blocks test	Visuo-spatial short-term working memory			Yes
13. Denver Developmental Screening Test (DDST)	Personal-social, fine motor-adaptive, language, gross motor	Birth - 6 years	$100 for test kit, $2.25 for each test	Unknown

Tool	What Does the Tool Measure?	What Age Range?	Estimate of Implementation Cost	Use in LMICs?
14. Deveraux Student Strengths Assessment (DESSA)	Social-emotional	4 years - 14 years	$115 for a complete kit	Unknown
15. Development Profile II (DPII)	Physical age, self-help age, social age, academic age, and communication age	Birth - 9.5 years	No longer available. WPS offers other developmental tests.	Unknown
16. Dimensional Change Card Sort (DCCS)	Attention	2.5 years - 7 years	Free and directions available online	Unknown
17. Early Development Instrument (EDI)	Physical health and well-being, social competence, emotional maturity, language and cognitive development, communication skills and general knowledge	4 years - 5 years	Approximately $300	Yes
18. Early Reading Assessment	Core subtests: written word vocabulary, rapid orthographic naming, silent orthographic efficiency; supplemental subtests: phonological awareness, receptive vocabulary	4 years - 7 years 11 months	$275 for a complete kit	Yes
19. Early Childhood Environment Rating Scale (ECERS-R)	Space and furnishings, personal care routines, language-reasoning, activities, interactions, program structure, parents and staff	Group programs serving 2 years - 5 years	$22 for kit	Unknown
20. Emotion Recognition Questionnaire (ERQ)	Emotional development			Unknown
21. Expressive Vocabulary Test (EVT)	Expressive vocabulary, word retrieval	2 years - 6 years	$61.50 for 25 tests	Unknown
22. Eyberg Child Behavior Inventory (ECBI)	Behavior	2 years - 16 years	$241 for kit	Unknown
23. Forward and Backward Digit Span Test (DS)	Working memory	6 years - 11 years	Available from the Wechsler Intelligence Scale for Children.	Unknown
24. Group Reading Test 2	Early reading comprehension	3 years – 8 years		Yes
25. Home Observation for Measurement of the Environment (HOME)	Home environment	Birth - 10 years	$50+ for manuals and forms	Unknown
26. Infant/Toddler Environment Rating Scale (ITERS-R)	Space and furnishings, personal care routines, Listening and talking, activities, interactions, program structure, parents, and staff	Group programs serving birth - 2.5 years	$22 for kit	Unknown
27. Infant Toddler Social Emotional Assessment (ITSEA)	Socioemotional skills	1 years - 3 years	$187 for kit	Unknown

Tool	What Does the Tool Measure?	What Age Range?	Estimate of Implementation Cost[2]	Use in LMICs?
28. Iowa Test of Basic Skills (ITBS)	Vocabulary, word analysis, listening, reading comprehension, language, mathematics, social studies, science	5 years - 14 years	$50 + for single copy	Unknown
29. Kaufman Assessment Battery for Children (KABC)	Cognitive	3 years - 18 years	$935 for complete kit	Unknown
30. Parenting Locus of Control (PLOC)	Degree to which parents feel in control of their child's behavior			Unknown
31. Parenting Sense of Competence (PSOC)	Parental competence			Unknown
32. Peabody Individual Achievement Test (PIAT)	Academic achievement	5 years - 18 years		Unknown
33. Peabody Picture Vocabulary Test (PPVT)	Receptive vocabulary, screening test for verbal ability	2.5 years - 90+ years	$379.99 for a complete kit	Yes
34. Peg Tapping Test (Pencil Tapping)	Self-regulation		Free and directions available online	Unknown
35. Perceived Maternal Self-Efficacy Scale (PMP S-E)	Parenting self-efficacy			Unknown
36. Penn Interactive Peer Plays Scale (PIPPS)	Effective relationships	3 years - 5 years		Unknown
37. Preschool and Kindergarten Behavior Scales (PKBS)	Social skills, problem behavior	3 years - 6 years	$133 for kit	Unknown
38. Preschool Language Scale (PLS)	Language skills	Birth - 7 years 11 months	$299 for basic kit	Unknown
39. Raven's Colored Progressive Matrices Test	Non-verbal intelligence, logical reasoning	5 years - 11 years, elderly persons, and mentally and physically impaired persons	$256 for one kit	Yes
40. Research-Based Early Mathematics Assessment (REMA)	Mathematics			Unknown
41. Strengths and Difficulties Questionnaire (SDQ)	Socioemotional skills	3 years - 16 years	Free and available in public domain in many languages	Yes
42. Stanford-Binet Intelligence Scale	Verbal reasoning, abstract visual reasoning, quantitative comprehension and short-term memory	2 years +	$937 for complete test kit	Yes
43. Task Orientation	Self-regulation, attention			Unknown
44. Teaching Strategies GOLD	Comprehensive	Birth - 5 years	$200 for basic kit	Unknown
45. Test of Everyday Attention for Children	Differential attentional capacities	6 years - 15 years 11 months	$497 for manual, 25 record forms, administration book, 2 CDs, stimulus cards and maps	Yes

Tool	What Does the Tool Measure?	What Age Range?	Estimate of Implementation Cost	Use in LMICs?
46. Wechsler Abbreviated Scales of Intelligence	Verbal IQ, performance IQ, full-scale IQ	6 years - 89 years 11 months		Yes
47. Wechsler Adult Intelligence Scale	Verbal IQ, performance IQ, full-scale IQ	16 years - 90 years 11 months		Yes
48. Wechsler Intelligence Scale for Children (WISC)	Verbal scale IQ, performance scale IQ, full-scale IQ	6 years - 16 years	$875 for entire kit	Yes
49. Wecshler Preschool and Primary Scales of Intelligence (WPPSI)	Intellectual giftedness, cognitive intellectual delays, and mental retardation	2.5 years - 7 years 3 months	$850 for all stimulus and manipulative materials, Examiner Manual, Technical Manual, 25 Record Forms for ages 2:6 - 3:11, 25 Record Forms for ages 4:0 - 7:3, and 25 Response Booklets	Yes
50. Wide Range Achievement Test for Mathematics	Word reading, sentence comprehension, spelling, math computation	5 years - 94 years		Yes
51. Woodcock Johnson III Tests of Achievement (WJ-III)	Academic achievement	2 years +	$860 for basic kit	Unknown

Source: Authors' research.

International, Regional, and Cross-National Education Assessment Instruments and Initiatives

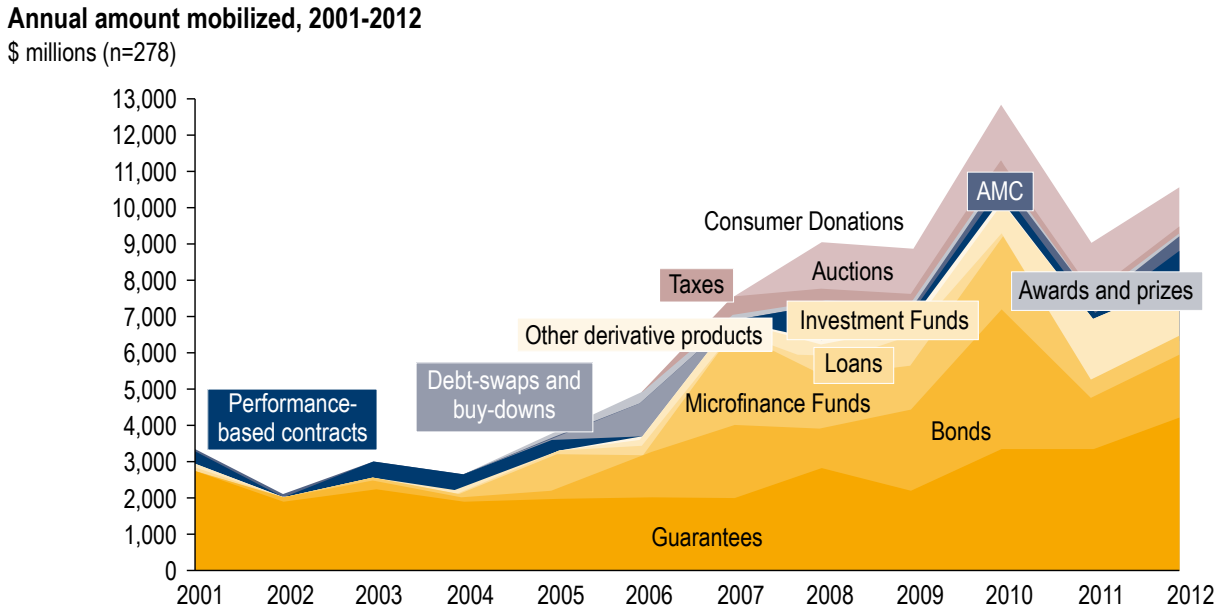
Instrument/Initiative	Age or Grade	Subjects	Frequency	Location	Countries (in latest round, unless otherwise noted)	Administered by	Data Availability
Multiple Indicator Cluster Survey (MICS) Fourth Round: Early Child Development Index (ECDI)	Age 0–5	Early childhood development (literacy, numeracy, physical development, social-emotional, and approaches to learning domains)	MICS was conducted in 1995, 2000, 2005, and 2009-11. The 2009-11 round includes the ECDI	Household	55 countries, 50 developing	Government organizations, with technical assistance from UNICEF	Full data sets available for download online: http://www.childinfor.org/mics4_surveys.html
Young Lives	Age 4–17	Language, literacy, numeracy, social/emotional	2002, 2006, 2010	Household	4 developing countries (Ethiopia, India, Peru, Vietnam)	Universities, independent, research institutes, government research institutes, overseen by University of Oxford	Full data set available for download online: http://www.younglives.org.uk/what-we-do/access-our-data
Early Development Instrument (EDI)	Age 4–6 (school entry)	Physical development, social, emotional, language, cognitive, communication	Sice 1998; varies by country	School	24 countries, 14 developing	Varies by country	Data held by governments, World Bank and Aga Khan University; some reports available upon request
Early Grade Reading Assessment (EGRA)	Grade 1–4	Basic literacy	Since 2008; varies by country	School	61 developing countries	Varies by country (primarily RTI International)	Reports available online: https://www.eddataglobal.org/reading/index.cfm
Early Grade Math Assessment (EGMA)	Grade 1–4	Basic math	Since 2011; varies by country	School	12 developing countries	RTI International and partners	Reports available online: https://www.eddataglobal.org/math/index.cfm
Literacy Boost	Grade 1–4	Basic literacy	Since 2009; varies by project	School	15 developing countries	Save the Children	Reports available upon request
Annual Status of Education Report (ASER)	Age 6–16	Reading, Math	Annually since 2005 in India, 2008 in Pakistan	Household	2 developing countries (India and Pakistan)	Civil society organizations	Public reports online disaggregated by district. Inida: http://www.asercentre.org/?p=143; Pakistan: http://www.aserpakistan.org/
Uwezo	Age 5–16	Reading, Math	Annually since 2010	Household	3 developing countries (Kenya, Tanzania, Uganda)	Civil society organizations	Public reports online disaggregated by district: http://www.uwezo.net/publications/reports/

Instrument/Initiative	Age or Grade	Subjects	Frequency	Location	Countries (in latest round, unless otherwise noted)	Administered by	Data Availability
Latin American Labratory for Assessment (LLECE)	First study; Grade 3 and 4; Second study; grades 3 and 6	Math, Reading, Science (second study only)	1997, 2006	School	First study: 13 developing countries in Latin America; Second study: 16 developing countries in Latin America	National governments	Data available for download online: http://www.llece.org/public/content/view/12/10/lang.en
Progress in International Reading Literacy Study (PIRLS)	Grade 4	Reading comprehension	2001, 2006, 2011	School	48 countries, 12 developing	National research partners	Data available for download online: http://timssandpirls.bc.edu/pirls2011/internationaldatabase.html
Pre-PIRLS	Grades 4–6	Basic reading comprehension	2011	School	3 developing countries	National research partners	Data available for download online: http://timssandpirls.bc.edupirls2011/internationaldatabase.html
Trends in International Mathematics and Science Study (TMSS)	Grades 4 and 8	Math, Science	`1995, 1999, 2003, 2007, 2011	School	63 countries, 27 developing	National research paartners	Data available for download online: http://timssandpirls.bc.edupirls2011/internationaldatabase.html
Analysis Programme of the CONFEMEN Education Systems (PASEC)	Grades 2 and 5	Math, Reading (French and local languages)	1993–2010 (1–3 countries assessed each year)	School	Since 1993, 19 developing countries—Francophonen Africa plus Lebanon	National governments	Data available for download online: http://www.confemen.org/lepasec/access-aux-donneesdu-pasec/
Southern and Eastern Africa Consortium for Monitoring Educational Quality (SACMEQ)	Grade 6	Math, Reading (English)	1995, 2000, 2007	School	14 developing countries—Anglophone Africa	National governments	Reports available for download online: http://www.sacmeq.org/reports
Programme for International Student Assessment (PISA)	Age 15	Literacy, Math, Science	2000, 2003, 2006, 2009	School	73 countries, 32 developing	International contractors, national governments	Data available for download online: http://pisa2009.acer.edu.au/
International Civics and Citizenship Study (ICCS	Grade 8 (mean age of children at least 13.5 years)	Civics, Citizenship	2009, 2016	School	38 countries, 12 developing	National research partners	Data available for download online: http://rms.iea-dpc.org/
Literacy Assessment Monitoring Programme (LAMP)	Age 16–64	Literacy	Varies by country	Household	12 developing countries	National governments	Varies by country.

Adapted from: Anderson (2013).

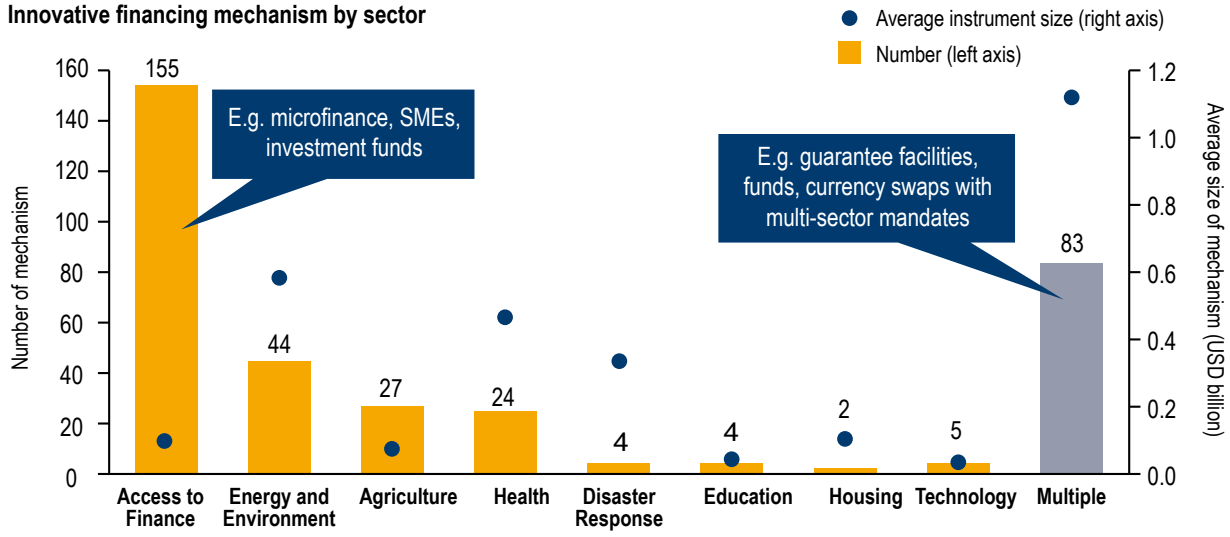
APPENDIX 4: Innovative Financing Mechanisms

Figure 3.1: Innovative Financing Has Grown Through the Introduction of New Instruments



Note: Annual mobilized data was not available for 141 instruments. For these instruments, we assumed that the entire amount mobilized was mobilized in the launch year.
Source: Guarnaschelli et al. (2014).

Figure 3.2 Innovative Financing Mechanisms Have Focused on a Range of Development Challenges



Source: Guarnaschelli et al. (2014).

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