

Beyond Leverage Ratios: A Strategic Approach to Blended Finance

April 12th 2023



| Beyond Leverage Ratios: A Strategic Approach to Blended Finance¹

April 12th, 2023

Matthieu Pegon
Head of Blended Finance, IDB Invest

Abstract

The purpose of this essay is to explore how and to what end blended finance mobilizes private investment towards the SDGs, moving away from an emphasis on private capital leverage as an efficiency metric, and relying instead on the concept of net social returns that incorporate the wider economic effects of blended finance and its cost to the taxpayer. In the first section, we start by addressing two preliminary questions, (i) what is the end goal for blended finance practitioners, and (ii) what can we infer from economics theory as to the justification and efficiency of blended finance? Through these lenses, we will assess in the second section some practical blended finance investment strategies: (i) creating knowledge spillovers that can affect markets' behaviors, (ii) fixing weak links in complementary production networks. These are not the only justifications for concessional blended finance, but they exemplify the approach based on starting with an idea about where large social returns on investment are likely to be found, and then allocating blended finance when needed to enable investments that have those characteristics.

¹ I am grateful to Ayesha Bery, Manuel Bueno, Paddy Carter, Neil Gregory, Kaylyn Fraser, Jozef Henriquez, Joan Larrea, Alessandro Maffioli, Paola Pedroza, Bjoern Struwer and Patricia Yanez-Pagans for the helpful comments and suggestions on earlier versions of the paper. Special thanks to Paddy Carter for the ongoing dialogue and exchange of ideas over the last years that led to this document, as well as Mengxue Tang for the background research. The paper also draws on the work from my colleagues at IDB Invest's Blended Finance team (Sofia Ahualli, Joan Miquel Carrillo, Pilar Carvajo, Eduardo Gutierrez, Elee Muslin, Mengxue Tang), including their review of the document.

Copyright © 2023 Inter-American Investment Corporation (IIC). This work is licensed under a Creative Commons IGO 3.0 Attribution-NonCommercial-NoDerivatives (CC-IGO BY-NC-ND 3.0 IGO) license (<http://creativecommons.org/licenses/by-ncnd/3.0/igo/legal-code>) and may be reproduced with attribution to the IIC and for any non-commercial purpose. No derivative work is allowed.

Any dispute related to the use of the works of the IIC that cannot be settled amicably shall be submitted to arbitration pursuant to the UNCITRAL rules. The use of the IIC's name for any purpose other than for attribution, and the use of IIC's logo shall be subject to a separate written license agreement between the IIC and the user and is not authorized as part of this CC-IGO license.

Note that link provided above includes additional terms and conditions of the license.

The opinions expressed in this publication are those of the author and do not necessarily reflect the views of the Inter-American Development Bank Group, its respective Boards of Directors, or the countries they represent.

| Key Messages

- The measure of success of blended finance is the extent to which the private investments it is enabling can induce sustainable and inclusive growth, unlocking the actions linked to the wider set of SDGs. Maximizing private capital participation in transactions may be relevant, but only to the extent that it contributes to this overarching objective.
- Blended finance is efficient where the ratio of causal social returns (direct and systemic) to the public cost necessary to generate those returns is maximized, factoring-in distributional considerations.
- A theory and evidence-based approach to allocating blended finance is not only feasible, but advisable to maximize the value for money of scarce ODA resources that are allocated within the constraints of finite information and organizational resources.
- Using blended finance to fill financing gaps may be justified when it is more efficient than the public sector simply financing the project itself, but this is not the only strategy for blended finance.
- There are common features between allocation strategies, but also opposing approaches in term of implementation, calling for a different set of investment practices, instruments, or players when deploying concessional finance.
- The prospect of high social returns that we want to justify the use of blended finance may often consist of dynamic systemic effects that are hard to estimate upfront. *Ex post* evaluation should be central to the practice of blended finance.

| Table of Contents

Introduction	6
1. Setting the Scene	8
1.1 Sustainable and Inclusive Growth. Meeting the SDGs in Developing Countries	8
1.2 Where is Blended Finance Justified and Effective?	10
2. Blended Finance Investment Strategies	17
2.1. Creating Knowledge Spillovers	18
2.2. Fixing Weak Links in Complementary Production Networks	21
Conclusion	26
References	27

| Introduction

A *leitmotif*² of blended finance is that the Sustainable Development Goals (SDGs) financing gap is a couple trillions of dollars per year, Official Development Assistance (ODA) revolves around \$250 billion per year, and private institutional capital is north of \$200 trillion. Therefore, why don't we leverage those scarce ODA resources to redirect the institutional investors' big bucks towards financing the SDGs in developing countries? One thing leading to another, it becomes tempting to think that the ratio of private to public money is the measure of success for blended finance transactions – the more private dollars, the better.

An overemphasis on leverage ratios will likely result in bad investment decisions. Leverage in and of itself does not translate into incremental sustainable development impact.³ Simply put, a project can have 20x private capital leverage but contribute little to poverty reduction, economic growth, inclusiveness, or sustainability. Even if it does, there could be alternative ways of arranging that investment which would generate more impact at a less public cost.

Rhetoric around mobilizing private capital can also omit the fact that there is a substantial and likely incompressible portion of SDGs financing that relates to public goods and social transfers, all requiring public funding.⁴ No amount of private dollars in private sector projects can make up for that, at least not directly. This is another reason to think more carefully about how blended finance can be used to stimulate inclusive and sustainable growth, which will increase the resources available to the state and reduce the burdens upon it.

The purpose of this paper is to help funders and implementers of blended finance develop strategies that are based on how blended finance can mobilize private investment that contributes the most towards the SDGs, moving away from an oversimplistic emphasis on private capital leverage as an effectiveness metric, and relying instead on the concept of net social returns that incorporates the wider economic effects of blended finance and its cost to the taxpayer.⁵

We take the approach of starting with principles first, before suggesting how theory can be applied in practice by development finance institutions (DFIs) and other actors who must allocate scarce blended finance within the constraints of limited information and organizational resources.

² A recurring melody.

³ Nor increased investment necessarily translate into sustainable development, see Easterly 2001 for a sobering reminder.

⁴ For ease of read, references to public goods also infer public services.

⁵ There are still valid arguments for using leverage as an effectiveness metric. Chief among them, it is relatively easy to measure.

In the first section, we start by addressing two preliminary questions, (i) what is the end goal for blended finance practitioners, and (ii) what can we infer from economics theory about when it is most likely to achieve that goal?

Through these lenses, we will assess in the second section some practical blended finance investment strategies: (i) creating knowledge spillovers that can affect markets' behaviors, (ii) fixing weak links in complementary production networks. These are not the only justifications for blended finance, but they exemplify the approach based on starting with an idea about where large social returns on investment are likely to be found, and then allocating concessional finance when needed to enable investments that have those characteristics.

| 1. Setting the Scene

1.1 Sustainable and Inclusive Growth. Meeting the SDGs in Developing Countries

Sustainable development is a complex notion that encapsulates economics, political and philosophical dimensions. In today's aid ecosystem, the United Nations' Sustainable Development Goals (SDGs) and the Paris climate agreement are considered the measures of success for sustainable development.⁶ The Addis Ababa Action Agenda (AAAA) is the mean of achieving the SDGs, although agreement over the financing of the SDGs – in particular climate finance – remains a work in progress.⁷ According to an IMF study, developing countries must spend an additional \$2.2 trillion per year by 2030 to meet the objectives of the SDGs.⁸ The gap accounts for 4% of GDP for emerging economies and 15.4% for low-income developing countries.⁹

The narrative around a single unified SDGs spending gap is a compelling one to draw attention to the challenge and the need for paradigm shift in development finance.¹⁰ However, as Homi Kharas and John McArthur at Brookings point out, *jumbling too many issues into the same debate leads to policy muddiness rather than practical breakthroughs.*¹¹ The belief that private capital holds the solution to filling the SDGs spending gap falls into that trap. A rough breakdown of SDGs spending shows that investments in infrastructure only account for 25% of the total, while social spendings (e.g. health, education) and social protection transfers (e.g. pensions) account for 75%.¹² A meaningful portion of SDGs spendings eventually relies on public expenses which are traditionally funded through government's revenues (e.g. taxes) and borrowing.¹³ Therefore, as many studies do actually point out, including the MDBs' own *Billions to Trillions* paper, meeting the objectives of the SDGs calls for action to raise finance from multiple sources.¹⁴ Underpinning all of this lies sustainable and inclusive

⁶ UN, 2015a.

⁷ UN, 2015b. The AAAA is incorporated by reference in the SDGs (in United Nation's resolution that set forth the SDGs to be specific). Incidentally, this is to our knowledge the first reference to the term blended finance in a document approved by the UN General Assembly.

⁸ Gaspar et al., 2019.

⁹ Nominally, the amount is larger for emerging economics, but when as a percentage of GDP, the challenge is heavier for low-income developing countries.

¹⁰ Kharas and McArthur, 2019.

¹¹ Kharas and McArthur, 2019.

¹² Calculation based on Sachs et al., 2019.

¹³ The bulk of social spendings and social protection transfers are public spending, as well as a portion of investment in infrastructure, see Sachs et al., 2019. Public spending may also be funded through international development assistance.

¹⁴ Schmidt-Traub, 2015; Manuel et al., 2018; Gaspar et al., 2019; Kharas and McArthur, 2019; Sachs et al., 2019; AfDB et al., 2015..

economic growth; economic growth raises tax revenues and shrinks public debt burdens.¹⁵

Productivity is the key ingredient to sustained economic growth.¹⁶ There are numerous mechanisms behind higher productivity, from technological advances, higher physical capital intensity, higher human capital (education and skills), greater market efficiency and better functioning public institutions.¹⁷ Growth is both the cause and consequence of private investment. A virtuous circle does not always operate, but when it does, anticipated growth causes investment, investment causes growth, and growth provides a return on investment.¹⁸

The nature of growth matters. Inclusive growth that contributes more towards poverty and inequality reduction will achieve more for multiple SDGs. Studies show that countries that score high both in terms of GDP per capita and income equality also feature a higher level of SDGs' achievement.¹⁹ In addition, sustainable growth is necessary for a durable improvement of living standards in developing countries.²⁰ Infrastructure that is built solely for the purpose of narrowly-conceived economic growth and does not internalize environmental externalities may have short-run benefits but ultimately contribute “less” to the SDGs and be more “expensive” to society in the long run.²¹

Private investment can contribute to a greater or lesser degree to sustainable and inclusive growth, as we will further explore in this paper. The true measure of success of blended finance should be the extent to which the private investments it is enabling will result in sustainable and inclusive growth. Maximizing private capital participation in transactions matters, but only to the extent it contributes to this overarching objective.

¹⁵ We are focusing on economic growth in developing countries (for reference, least developed countries have a GDP per capita that is only ~3% of developed countries measured in current US\$ according to UNCTADSTAT).

¹⁶ We are taking a bit of shortcut here for ease of reading. By productivity we mean total factor productivity.

¹⁷ Kim and Loayza, 2019.

¹⁸ Carter, 2015 and Carter, 2021.

¹⁹ Gaspar et al.,2019.

²⁰ Carter, 2021.

²¹ Kharas and McArthur, 2019.

1.2 Where is Blended Finance Justified and Effective?

DFIs activities – whether commercial or concessional – operate somewhere on a subsidy continuum, and so does blended finance through its different definitions.²² DFIs differentiate commercial from concessional finance, but this binary distinction is primarily a construct meant to address the incremental level of oversight required for transactions that are deemed concessional.²³ With the caveat that the boundaries between concessional and commercial are permeable, our focus for the remainder of the paper will be on concessional finance, defined as *resources extended on terms and/or conditions that are more favorable than those available from the market*.²⁴ We will use the term interchangeably with blended finance and subsidy. We are also limiting our scope to concessional financing extended to companies, as opposed to government entities, households, or individuals. We assume these companies are the prime beneficiary of any implied subsidy embedded in the financing.

DFIs have been comfortable to associate blended finance with subsidies and accompanying welfare economics rationale.²⁵ Public Economics justifies governments' interventionism for efficiency or equity purposes. An economy is efficient where available resources provide for the maximum amount of goods or services that are in demand. According to economics theory, perfectly competitive markets produce an efficient allocation of resources. In practice, markets are rarely competitive. Market failures, such as information asymmetry, externalities or government failures contravene the assumptions of competitive markets. This leads to an inefficient outcome which translates in lesser economic value generated. That same body of economics theory shows that there is an infinity of efficient outcomes an economy may achieved, including some that are utterly unfair.²⁶ The corollary is that upon a redistribution of initial endowments we can reach an outcome that is both efficient and equitable. In practice however, redistributing resources may generate distortions which in turn reduce efficiency. These precepts are broadly applicable to economic growth. Perfectively competitive markets can produce an efficient rate of growth absent any market failure but may also lead to an inequitable allocation of wealth.²⁷ It introduces two possible areas or intervention for governments and by extension DFIs: correct market failures to improve efficiency or redistribute to improve equity.

²² There are several arguments to defend the idea that even DFIs' commercial financing can be construed as a subsidy (even if the magnitude of that subsidy is low).

²³ This will hopefully be the purpose of another paper.

²⁴ AfDB et al., 2017.

²⁵ See Buiter and Schankerman, 2002 and AfDB, et al., 2013 for examples.

²⁶ For an entertaining description of an unfair equilibrium, see "Equilibrium in the Jungle" (Piccione and Rubinstein, 2007).

²⁷ Chapter 5 of Abelson, 2018 provides a comprehensive explanation.

Our starting point for extending subsidies to companies is the occurrence of positive externalities, a subset of market failures.²⁸ A positive externality occurs when an external party to a transaction benefits from an economic activity but does not pay for it.²⁹ For instance, a renewable energy plant generates electricity but also abates GHG emissions, the latter being beneficial to society. Because companies are not capturing these additional benefits, it may cause the economy to deliver an outcome that is suboptimal, in our example, less renewable energy generation. Corrective subsidies can be designed to rectify such an unsatisfactory outcome, by increasing the production and the consumption of a targeted good or service.³⁰ We will consider blended finance to be a subset of a corrective subsidy.

In principle, we could also justify the use of subsidies for equity purposes. However, we find it more challenging to use this argument as a starting point in our thinking process. DFIs have a limited reach to affect the distribution of wealth and may not be the most effective instrument to reduce extreme poverty.³¹ Nevertheless, efficiency and equity justifications are often interlinked. Improving market efficiency of goods and services that cater to low-income households may achieve redistributive objectives. In addition, some research suggests that inequality – the rationale for redistribution – can itself be construed as an externality and that tradeoffs between equity and efficiency may not exist in the long run.³² Thus, DFIs can reduce poverty by changing the economic environment.³³ In other words, we are not discarding redistributive objectives through blended finance even where our starting point is an efficiency rationale.

Under these premises, we can devise three conditions for justifying the use of blended finance in an investment, relying on the concept of social returns. Social returns measure the benefits and costs of an investment to society, including social, environmental, and financial returns. Thus, private returns are a subset of social returns. Therefore, where positive externalities arise, social returns exceed private returns. The first condition for the use of blended finance is that net social returns are positive and exceed private returns. Otherwise, there is no case for using public funds to enable the investment.

An investment might generate positive externalities and not require public support. Going back to our renewable plant, we may be able to secure adequate commercial financing that will fund capital expenditures and allow to generate satisfactory returns on equity. In this case the provision of blended finance is unnecessary because the investment would happen anyway, even if the project generates positive externalities. Thus, the second condition is that private returns without blended finance are lower

²⁸ There are market failures other than externalities (e.g. contract enforcement), but DFIs will typically focus on externalities (see Carter, 2021).

²⁹ Definition drawn from Abelson, 2018.

³⁰ Pigou, 1920.

³¹ Carter, 2021.

³² Stosad, 2019; Berg and Ostry, 2011.

³³ See section 3.4 of Carter, 2021.

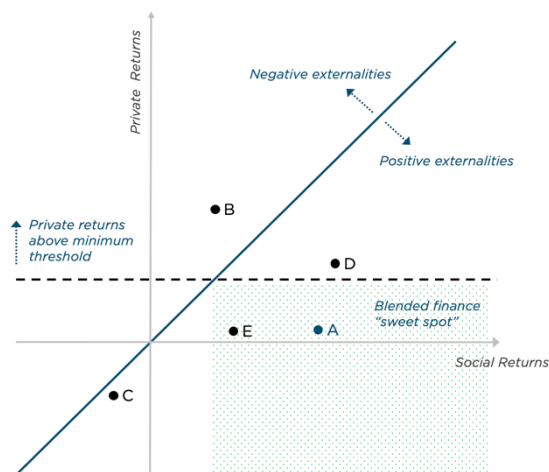
than risk-adjusted return thresholds. Back to our example, this could include inadequate financing available on the commercial bank market because of the perceived high risk of the business (even if it is intrinsically profitable, what matters here is the risk perception).

Concessional finance is primarily funded through scarce international development resources. Scarcity implies choice and choice implies opportunity cost. Our third condition for the use of blended finance is that there should be no other available use of public resources that would yield a higher ratio of social returns to public costs. Otherwise, the alternative with the highest ratio should be privileged. The opportunity cost of blended finance should factor in other means of deploying development finance, such as public sector financing, or a technical cooperation. We should also ensure that this condition is weighed against any distributional considerations. Where relevant, it might imply concentration limits, allocation targets, or some sort of weighting system.³⁴ Even so, the reader might rightfully object that determining the opportunity cost of the next readily available aid project within a set strategy is hardly implementable, but more on that later.

Box 1 provides a stylized representation of these three conditions.

³⁴ For an example, see Kenny 2021.

Box 1: Blended Finance Efficiency



The chart is adapted from Andrew Warner's Framework for Efficient Government Investments.³⁵ Blending – the mobilization of private capital by concessional public – is not explicit. The chart simply illustrates which projects merit public support, in some form. The vertical axis represents private returns and the horizontal axis social returns. The concept of returns is purposely undefined, it could refer to a rate of return, a present value calculation, etc. The dashed horizontal line represents the minimum private returns required by private investors. That threshold is also purposely undefined, it could represent perceived risk adjusted and cost of capital adjusted returns. The diagonal line is where social returns equate to private returns. Where private returns exceed social returns, we have negative externalities (since private returns are a part of social returns). Conversely, positive externalities arise where social returns exceed private returns.

In the chart, we show five potential projects. Only Project A meets all the necessary conditions. Project B has higher private returns than social returns and fail to meet the first condition. So does Project C by costing more to the taxpayer than it generates returns for society. In project D, private returns are above the private return threshold and the project does not require public financing to materialize. Finally, Project E is less attractive than Project A and therefore contradicts the third condition. It is worth noting that Project E is not necessarily excluded. If we hypothetically had resources to finance both, then both would be justified. While this all seems abstract, DFIs and other development finance practitioners have already developed principles, methodologies, and tools that allow to assess those conditions in some shape or form.³⁶

³⁵ Warner, 2013.

³⁶ For instance, projects ERR calculation can be used as a proxy for social returns while private returns can be derived by projects IRRs. The principles of additionality jointly agreed by MDBs and European DFIs (including those specific for concessional resources) are meant to ensure that blended finance is used where private finance does not operate.

We now begin the journey from a simple and abstract depiction of the problem towards something that can form the basis of pragmatic blended finance strategies and their execution. Before embarking, there are three areas where this simple diagrammatic depiction calls for some elaboration.

First, we want to support projects where the social benefits justify the public cost of providing blended finance. Where is that cost on the chart? It is represented by the distance a project is beneath the commercial risk-return threshold.³⁷ That public cost is part of the social return calculation, meaning that the location of the project on the x-axis is net of that cost. If project E was vertically beneath project A we would be indifferent between the two under our first and second conditions.³⁸ However, one of our assumptions is that blended finance operates within a finite amount of ODA resources, which led to our third conditions. Therefore, we would need to look at the public cost and the (gross) social benefit separately and weighing them against each other, and end up picking Project A.³⁹

Second, in a static setting, we would be allocating a finite pool of public finance resources to a known universe of investment opportunities that offer different combinations of private and social returns. If we abide to the three conditions, we would start with the project below the minimum private returns threshold that offers the highest social returns relative to its public costs. Then each additional investment to which we allocate public finance would feature a lower ratio, up to a point where either public finance resources are exhausted, or our ratio reach some minimum.⁴⁰ But we might also want to allocate blended finance with an eye on dynamic effects. Development finance is allocated in an evolving environment. Each investment may shift the positions of other projects on this chart and may also increase the resources available for blended finance (if there is a connection to government revenues and projects result in economic growth and higher revenues). Projects may perhaps move because previous investments have altered real or perceived risks, so that projects move above the commercial risk-adjusted return threshold. Or projects might move

³⁷ We are oversimplifying, as this ultimately depends on how we define public costs. For instance, if we consider public cost to be the subsidy that we are extending, then our assertion works. Conversely, if we are interested to look at this in term of budgetary cost for a donor, we might come up with a different number, depending on other factors such as cost of funding, etc. Or, if we take the view that in and itself a subsidy is a transfer, from future or current taxpayers to the beneficiary of a firm, it nets out to zero where there is no distributional impact (see Warner, 2013). Given the context of this essay, one proxy for public cost could be net ODAs. In such case, relying on the subsidy amount (akin to a grant equivalent) would appear to be relevant.

³⁸ Assuming that there are no distortions caused by the subsidies (or that both projects have the same distortionary effect), see Warner 2013 for more details.

³⁹ Here is a quick example. Suppose Project A has 10 of gross social returns and 5 of public costs, and Project E has 50 of gross social returns and 45 of public costs. Then net social returns are 5 for both projects. However, Project A yields 2 of social returns for 1 of public costs where Project E will only yield 1.1x.

⁴⁰ A diminishing marginal efficiency of subsidies of some sort. Carter, 2015 makes a comparable argument. The assumption that we would necessarily run out of money before all “good” projects are financed is intuitive but not straightforward. Certain studies indeed suggest that the financing gap for bankable or nearly bankable investments with positive social returns is significantly smaller (Gardner and Henry, 2021).

when investments are complements to or substitutes for them and change their private and social returns. Some of the social returns on investment that motivate the use of blended finance consist in how investments move other projects around on this chart.

Third, we need to think carefully about causality. In the figure above, the projects we want to support with concessional finance are those with private returns beneath the minimum return threshold. They would not occur without public intervention. How can we make that determination (or in development practitioners' lingo, how do we establish the counterfactual)? Arguably, the best way to know is to do nothing. If the investment eventually goes through, then public support was unwarranted. This is hardly a viable option, as we end up penalizing the investments that did require support. To complicate the matter further, we might be interested in using blended finance to accelerate markets' transitions, even where those may eventually occur without public support. For instance, markets may switch to electric cars (powered by clean electricity) without governments' interfering. However, accelerating that transition may generate enough incremental social returns to justify public intervention. In short, causal attribution is a hard problem, but it cannot be avoided. It forces us to think in terms of probabilities not binaries. Blended finance must be justified by the (expected) social returns that would not occur in its absence.⁴¹

Bringing it all together, a conceptual measure of blended finance efficiency is the ratio of causal social returns (direct and systemic) to the public cost necessary to generate those returns.⁴² As mentioned earlier, we would want to carefully balance any efficiency ratio thinking against distributional considerations. A simple mathematical depiction would look as follows:

$$BF_{Eff} = \frac{\text{Causal social returns (direct and systemic)}}{\text{Public costs}}$$

Consequently, capturing public costs, society-wide sustainable development impacts while careful thinking about causality, opportunity cost and distribution is necessary to ensuring a sound investment decision. This poses several operational challenges. A cost benefit analysis would intuitively be the way to go, but these can be heavily influenced by the choice of parameters for which different analysts may make different choices with equal justification, meaning the results are not always compelling. Furthermore, the prospect of high social returns that we want to justify the use of blended finance may often consist of dynamic systemic effects that are especially hard to model convincingly. We will also often be interested in social and environmental benefits that are hard to quantify. Another issue is that it is practically impossible to map and rank all possible investments opportunities requiring public finance at any

⁴¹ Bayliss et al., 2020; Carter, 2017; Carter et al., 2018.

⁴² The metric is comparable to the Marginal Value of Public Funds function, see <https://policyimpacts.org/> for an introduction of the concept or Hendren and Sprung-Keyser, 2022.

given point in time. Investment opportunities arrive sequentially, and we require tools to guide the acceptance or rejection of proposals as they come. Finally, we need to consider the cost of performing these various assessments. There might be a tipping point where the increased due-diligence cost results in an overall less attractive value proposition.⁴³ Blended finance practitioners need to strike the right balance between developing and running adequate investment decision making tools and the costs of doing so.

The approach we advocate in the next section is to devise investment strategies where there are reasonable expectations of generating the most attractive social return to public cost ratio, and to take decisions by assessing potential blended finance transactions against these. No method is perfect, include that which we propose in this paper. Some practitioners will find cost benefit analysis more useful or even perform both.⁴⁴

⁴³ Here is one way to illustrate this argument: Suppose we have an investment generating 100 of social returns for a public cost of 10, with a 90% probability on being additional. The probability weighted cost benefit ratio is $100 * 90\% / 10 = 9$. We want to be 100% sure that this project is being additional, but it is going to cost us an additional 10 in due diligence. The resulting probability weighted cost benefit ratio is $100 * 100\% / (10 + 10) = 5$. Now suppose we are dealing with a thousand projects with these characteristics. Does spending the extra 10 for each of the thousand projects an effective use of resources?

⁴⁴ The author's recommendation would be to undertake a combination of both approaches.

| 2. Blended Finance Investment Strategies

In this section, we discuss two investment strategies for the use of blended finance that are designed to give practitioners confidence that the social returns on investment are likely to be sufficiently large to justify the use of concessional finance. Analysis of whether the project would be viable for private commercial capital, and hence whether public support is necessary, should be undertaken separately. Assessing additionality in this way should be a standard part of DFIs' operations. The same applies to ensuring compliance with other principles for the use of concessional finance, such as minimum concessionality.⁴⁵

These strategies are intended to exemplify a theory and evidence-based rationale for classifying investments as having high likely social returns. Other strategies are possible.

The two strategies are: (i) creating knowledge spillovers that can affect markets' behaviors and (ii) fixing weak links in complementary production networks. These are derived from Paddy Carter's *Economics of Development Finance* where they are presented as the primary ways in which private investment can generate outsized social returns by catalyzing sustainable economic growth.⁴⁶ Both seek to achieve productivity spillovers, by either tangible or intangible means. Our paper will focus on the applicability of these channels to blended finance.

Reverting to our theoretical framework, the strategies seek to identify investments with the likelihood of generating large positive externalities in areas where the risk-adjusted financial returns are not currently commercially appealing and there is evidence of under-investment or under-production (from a social point of view). If blended finance can be used to support investments with a good chance of leading to systemic change, that strategy is likely to be a competitive use of development aid.

For each strategy, we will explain its underlying thesis, explore how it may contribute to sustainable and inclusive growth, assess it against our theoretical blended finance framework, and discuss practical implications. We will also look at the complementarities, overlap and distinctions between the approaches.

⁴⁵ AfDB, et al., 2017

⁴⁶ Carter, 2021.

2.1. Creating Knowledge Spillovers

From an economics standpoint, knowledge is a public good that can be construed as an externality: once created, and unless patented, it is “freely” reusable without being depleted.⁴⁷ Because knowledge creators are not financially rewarded for the benefits others freely obtain, there are limited incentives for companies to invest in knowledge generation which would freely benefit their competitors.

A typical illustration is private underinvestment in R&D, which depresses growth.⁴⁸ A corollary is that investment in innovation brings substantial social returns, which would in turn justify public support.⁴⁹

We can expand the concept to knowledge gaps about production functions where entrepreneurs and financiers are disincentivized to implement and finance untested technologies or business models, especially in developing countries.⁵⁰ The early mover bears the downside when their investment is unsuccessful, but freely “shares” its discoveries with competitors if it is successful. The uncertain outcome of an investment may affect financiers and entrepreneurs risk perception, slowing down or preventing it from occurring. Sometimes first-mover advantages may outweigh that risk, so private markets do create pioneering firms, but there would be more pioneers if they were financially rewarded for the social value of the knowledge they create. It’s easy to see this applying for untested technologies, but the same logic may be at work for known technologies that are being implemented in untested jurisdictions. An example would be the adoption of non-conventional renewable energy in the last decade in developing countries: a proven and gradually competitive technology that was however dependent on local factors such as regulation, energy mix, renewable resources, access to financial markets, etc.⁵¹

Paraphrasing economists Dani Rodrik and Ricardo Hausmann, incentivizing a process of “self-discovery” may have a meaningful impact on productivity and growth in developing countries.⁵² The application to blended finance is that an allocation

⁴⁷ Economist Paul Romer won the Nobel prize in economics for his work on knowledge generation as a factor of economics growth (Jones, 2018).

⁴⁸ Grossmann et al., 2013.

⁴⁹ Jones and Summers, 2020.

⁵⁰ A production function is the relationship between input (e.g. capital, labor, etc.) and output (e.g. production). Innovation – as a broad concept – is largely tacit. Even where it is in theory “patentable”, developing countries may lack appropriate intellectual property mechanisms which exist in developed countries (Hausmann and Rodrik, 2002). In addition, the increasing scarcity of a wide array of factors complementary to innovation, such as quality of research, managerial quality, physical and human capital, leads to low expected returns to innovation in the low-income countries and thus the lack of convergence to the technological frontier (Goñi et al., 2017).

⁵¹ BloombergNEF, 2019.

⁵² *There is great social value to discovering that cut flowers, soccer balls, or computer software can be produced at low cost [in a country], because this knowledge can orient the investments of other entrepreneurs. But the initial entrepreneur who makes the “discovery” can capture only a small part of the social value that this knowledge generates* (Hausmann and Rodrik, 2002).

strategy can be built around encouraging entrepreneurs and financiers to implement new technologies, business models or financing structures in untested jurisdictions. Blended finance can be necessary to raise expected risk-adjusted returns from pioneering investments up to satisfy private actors' participation constraints', motivated by the developmental goal of generating knowledge spillovers that are beneficial to the entire economy. In order to generate outsized social returns, we would seek to help markets reach a tipping point whereafter entrepreneurs and financiers are comfortable to undertake similar investments without public support.

The strategy may explicitly target investments that also generate positive environmental, climate or social externalities, or improve the provisions of goods and services to poor and vulnerable populations. For instance, we may use blended finance to demonstrate the commercial viability and competitiveness of silvopasture projects. Once we reach that tipping point, we would not only contribute to economic growth, but also to climate mitigation.

There are several practical nuances to consider when implementing the strategy. We choose to focus on three of them:

- Firstly, if the purpose of blended finance is to encourage self-discovery, the institution that extends blended finance may not necessarily be “aware” of that opportunity before encountering a tangible project opportunity brought by prospective clients. Executing a blended finance allocation strategy based on supporting innovation requires market knowledge and discipline – most firms seeking investments can lay claim to be doing something innovative. In the absence of a means to measure knowledge spillovers, a blended finance strategy based on innovation should be focused on those projects likely to generate the largest social returns. It may be advisable to discipline allocation by pre-selecting specific early-stage and high-impact technologies or business practices where capital is scarce (e.g. grid scale long-term energy storage technologies). But we want to retain some ability to be opportunistic. Overly prescriptive blended finance programs may lead to an inefficient allocation of scarce donor resources. Borrowing from economist William Easterly, we want to search for transactions that will generate the large knowledge spillovers rather than only planning for what the projects and their financing structure would look like.⁵³ Pushing the argument further, a healthy dose of heterogenous interventions from the different development actors may be beneficial. Experimenting and testing different models may allow for the most efficient solution to prevail. This approach may also justify “bespoke” subsidies, as opposed to auctioning subsidies which might otherwise be preferred.⁵⁴ It aligns well with the predominant business model of DFIs, which operate within strategically defined mandates, but are fundamentally demand driven.

⁵³ Easterly, 2006.

⁵⁴ Kenny, 2019; Lee, 2017.

- Secondly, ensuring that knowledge does spillover is an integral part of the equation. For instance, empirical evidence from IDB Invest blended finance portfolio suggests that multiple interventions – typically two to four – might be required to reach the desired tipping point. Contractual agreements should include appropriate provisions to facilitate the diffusion of knowledge. For example, if the desired knowledge spillover is developing and testing a carbon credit methodology for the simultaneous closure of fossil-fuel power plants and investment in renewable capacity, that methodology should be made available to the relevant players.⁵⁵ If the hope is that others will learn from the experience of firms experimenting with new ideas, it makes sense to invest some resources to explaining what is being done and communicating that to the market. Relatedly, because the strategy targets untested investments, it generally requires an additional level of due diligence where complementary technical cooperation is often necessary (to fund feasibility studies for example).⁵⁶ Finally, although spillovers would generally be aimed at entrepreneurs or financiers, it is worth noting that governments or development finance organizations may also be targeted.⁵⁷
- Last, but not least, there are several operational dilemmas to consider. The strategy implies a dynamic allocation of concessional resources, moving from one area of focus to the next frontier after the greatest targeted knowledge externalities have occurred and diminishing social returns have set in. This requires exercising a level of discipline which is likely only enforceable under a dedicated governance. In the same vein, there is a thin line between seeking investments that can ultimately achieve commercial sustainability and having the necessary risk appetite to experiment new practices. A concrete implication is that within a portfolio of investments, we should expect a handful to fail.⁵⁸ There is no straightforward solution, other than ensuring that practitioners have the required skillsets, that there is enough flexibility embedded in blended finance programs to walk that line, but also that risk appetite is clearly defined between funders and implementers.⁵⁹

⁵⁵ This does not necessarily require wide publicity. For instance, for each financing specialty (e.g. project finance), there are generally a dozen of active legal firms, with ample staff rotation from one company to another. We have seen cases where successful financing structures circulated from one firm to another and were embedded into new investments.

⁵⁶ We would want those studies to be made public per the argument developed in this paragraph.

⁵⁷ For instance, an outcome-based incentive structure might be piloted through blended finance at transaction level and a government may decide to replicate it more systematically upon success (see Roots of Impact, 2021). We can apply the same argument for DFIs that may be reluctant to invest their own capital in untested sector. The path to commercial sustainability could be to start with blended finance, then DFIs capital, and finally private capital.

⁵⁸ In her review of the paper, Kaylyn Fraser made the interesting point that where failure rates always hover around zero or conversely are too high, the use of concessional finance may be suboptimal or not the right tool, introducing the idea of a “failure sweet spot” of some sort.

⁵⁹ For instance, some blended finance programs managed by IDB Invest have a weighted average minimum rating at entry.

2.2. Fixing Weak Links in Complementary Production Networks

Our second blended finance allocation strategy revolves around the thesis that economies function as series of intertwined production networks, and that fixing problems in central ‘nodes’ in those networks can generate outsized social returns.

The case for a subsidy here is more nuanced. The private benefits that firms derive from a reliable supply of electricity, for example, are to a great extent priced into their willingness to pay for it (in contrast to knowledge when it is free to use and generates no revenues for its creator). So, the case for using blended finance to reduce the cost of reliable electricity would rest on the idea that the full benefit to society is not adequately captured in the demand that electricity suppliers face based on private benefits. In other words, there is still an externality.

The possibility of large social returns from fixing “weak links” in production chains relies on the idea of complementarities in production networks, which means that the productivity of one firm is increasing the productivity of another.⁶⁰ Some firms produce goods and services that are inputs to other firms (intermediate goods). Firms always benefit from cheaper and higher quality inputs, but that is not quite the same thing as complementarity in production. A firm that makes nails would like to buy metal more cheaply, but while cheaper metal should result in cheaper nails it won’t necessarily increase the quantity of nails produced per worker at the nail factory.⁶¹ But cheaper and better intermediate goods can sometimes change production possibilities. Fertilizer is an obvious example of an input that affects productivity, and it is easy to imagine that the total social benefits of more productive farmers is not fully captured by the prices that farmers are willing to pay for it. But there are less obvious examples. Some business models are impossible without fast and reliable logistics. Some contracting arrangements cannot be sustained without well-developed legal systems. And so on.

Anything that prevents a market from obtaining its efficient configuration is called a “distortion” by economists, and the case for subsidizing “central” nodes in production networks requires both complementarities and distortions.⁶² So in addition to identifying complementarities, a blended finance allocation strategy should also be built on a case that something is stopping the market from supplying the right quantity and quality of those goods and services that complement others.

⁶⁰ Jones, 2011.

⁶¹ *Firms that use office stationery will benefit if it becomes cheaper, but they are unlikely to become more productive themselves as a result. [...] It is unlikely that reducing the price of office stationery will prompt a round of productivity-increasing investments across the economy.* Carter, 2021.

⁶² Liu, 2019.

All the above is similar in spirit to growth diagnostic exercises that seek to identify “binding constraints” on growth – it could be seen as a theoretical explanation for the existence of binding constraints. The idea here is that many things matter for growth, but not everything matters equally at all times. At a specific time and place, there may be one or two deficiencies that are really holding growth back. A blended finance strategy could be built around subsidizing investments in areas that have been identified as binding constraints on growth.

The idea that under-provision in central areas may have negative ripple effects throughout a production network links to the idea of resiliency externalities that may be particularly relevant in areas such as climate adaptation.⁶³ For instance, a firm in a central area may only partly benefit from investing in climate resiliency, and not fully capture the total social benefits. Looking at a concrete case, the physical damages to Bahamian water utilities from Hurricane Dorian amounted to \$ 15 million, a relatively small amount compared to \$2.5 billion in total damage and \$717 million in economic losses for Bahamas.⁶⁴ How much of these economic losses we can attribute to interruptions in water services is a tricky question. Nevertheless, the linkage between economic activity and basic services such as water or electricity is well established.⁶⁵ We can reasonably infer that investing in climate resiliency, post-disaster planning and disaster risk insurance schemes in water utilities may not only reduce the damage and economic losses to the utility, but also the economic losses in other sectors of the economy.

Similar to the first strategy, investing in the development or resiliency of central areas in production networks fits well within our theoretical framework. Productivity and resiliency spillovers provide for the positive externalities. The “multiplier” impact we achieve by targeting central areas suggests an attractive social cost benefit ratio.

We focus on five practical considerations for implementing the strategy:

- First, identifying the central areas in each market or countries, and ensuring that we are not limited by other unaddressed binding constraints might require meaningful ex ante planning, likely in conjunction with policy work. This could include policy and regulatory design, designing an allocation mechanism, and finally providing financing, all of them requiring mapping the different players, conducting iterative multi-stakeholder dialogues, etc. Given the likely higher upfront costs, a critical size of investment would be required, so that it remains an attractive value proposition for deploying blended finance resources.

⁶³ World Bank, 2018a.

⁶⁴ Deopersad et al., 2020.

⁶⁵ For example, Stern et al., 2019 and World Bank, 2016.

- Second, systemic change likely requires scale which would necessitate coordination among DFIs (including where relevant local development banks). DFIs generally operate under sectorial and geographical concentration limits which in practice limit them to a handful of investments in any targeted sector at any given point in time. This may be insufficient when implementing the strategy and could require coordinated actions from multiple players to overcome.
- Third, preliminary policy and upstream work would also require cooperation between DFIs and their sister public sector organizations (and relevant authorities, of course). Incidentally, this would be a relevant area of focus for DFIs that have been developing upstream capabilities and reminds us of the complementarity between blended finance and other instruments.⁶⁶ It is important to recognize that this two-dimensional coordination (with peer DFIs and public sector organizations) generates its own complexities. Implementing the strategy is likely a protracted process where tangible investment opportunities may only arise after several years, while costs are incurred from the onset. There might also be cases where no concessional finance is required down the line because of adequate policy and regulation being implemented along the way. This requires aligning incentives so that such an outcome would be considered a success and not a failure to deploy funds.
- Fourth, as with a strategy based on knowledge creation, a strategy based on complementarities in production could combine some pre-defined ideas about what these central nodes are, ideally based on empirical evidence from researchers, with some ability to consider proposals opportunistically. We know, for example, that eliminating power outages in sub-Saharan Africa could result in a 25% increase in workers' output.⁶⁷ But we will not always have compelling evidence to hand, especially for more niche cases. A more flexible approach to allocating blended finance would be based on looking for a credible claim that the proposed investment will result in many other firms investing and raising their productivity. Flexibility is also desirable because fundraising for concessional resources may occur several years before the targeted investments materialize and markets may evolve in the meantime. For example, when Colombia developed its utility scale renewable tender, the financing community expected that the structure of the power purchase agreements (PPA) – which pooled several utilities – would affect the bankability of the investments.⁶⁸ Blended finance programs rightfully contemplated de-risking mechanisms targeting the weaker credits.⁶⁹ However, a consolidation in the

⁶⁶ Fernández-Arias et al., 2019.

⁶⁷ Fried and Lagakos, 2020.

⁶⁸ A first tender was launched in February 2019 but did not award any contracts. The second auction, launched in October 2019, secured around 1.3 gigawatts (GW) of new wind and solar photovoltaic (PV) capacity. IRENA and USAID, 2021.

⁶⁹ World Bank, 2018b.

utilities market resulted in a healthier risk profile of the PPAs. This was no longer an issue holding back private investment, however the relatively shorter tenor of the PPAs and the exposure to the spot market at the tail of the financing remained a constraint.⁷⁰ In these instances, operating under the principle of minimum concessionality is a must, to avoid subsidizing things that no longer need it, which in turn requires baked-in flexibility within the blended finance program so that the terms and conditions of the concessional financing (including the type of instrument) can be adjusted to market conditions.

- Fifth, if the investment can be structured like a procurement that many firms could bid for, auctioning subsidies would be recommended.⁷¹ This would still pose implementation challenges where the subsidies are imbedded in a financing. For instance, if we were to auction a subsidy, say on the basis of hectares of reforested land, a DFI would still need to determine its lending price off the winning bidder's credit worthiness, then apply the subsidy in the form of an interest rate reduction.⁷² This creates a chicken and egg dilemma where companies would need to know their financing costs ahead of bidding to ensure they meet their private returns thresholds. This shouldn't be a problem in a liquid market which is unfortunately seldom the case when operating in developing countries, especially in underserved sectors. We are not necessarily suggesting it is an insurmountable issue, but at the very least, it increases operational complexity and in turn has an impact on public costs.

In some cases, it may be impractical to assess central areas and binding constraints prior to each blended finance intervention. The strategy may however still be implemented in conjunction with the first one targeting knowledge spillovers. Many DFIs rely on country-level or even regional-level strategic assessments – in complement to countries' own national development plans – that include growth diagnostics which already identify those weak linkages.⁷³ This opens the possibility of blended finance operations generating knowledge externalities within those previously identified priority areas, further increasing its development impact potential. The justification for blended finance may be primarily assessed under the first strategy, with the additional benefit that it would also likely strengthen those central areas.

⁷⁰ IRENA and USAID, 2021.

⁷¹ Lee, 2017.

⁷² We would not necessarily refer to creditworthiness in the case of equity, but the underlying reasoning remains the same: if we invest in a riskier venture, we do so because the potential for returns is higher.

⁷³ The limitation to this approach is that addressing an individual binding constraint works to the extent you are not limited by the next binding constraints. Carter, 2021 provides additional insight on the matter.

Box 2: Bringing it All Together – The Uruguay Case Study

In 2013, the Government of Uruguay launched a 200MW tender to attract private sector participation for the development of solar power plants (in conjunction with tenders for other technologies). A total of \$41.4 million of blended finance resources from the Canadian Climate Fund for the Private Sector in the Americas (C2F) together with IDB Invest loans contributed to the financing of the first five plants from 2014 to 2016. Concessionality was extended in the form of tenors unavailable in the commercial market, and a subsidized interest rate. At the end of 2020, all projects had been refinanced on the bond or the commercial bank market. For the first refinancing, C2F maintained its participation – at a lower subsidy level – to reach Investment Grade rating.⁷⁴ In all the subsequent refinancings, C2F was fully prepaid.

The initial projects supported by IDB Invest and C2F contributed to this transition, producing a demonstration effect for how to attract and structure private sector and cross-border investment in a novel asset class for the country. Due to the change in the risk perception of the asset class, not only long-term commercial financing was available, but it was cheaper than the then subsidized rate provided by the C2F, an illustration that Uruguay reached a tipping point shift towards competitive commercial financing for clean electricity.

At the outset of the 2013 solar tender, private ownership of renewable energy assets in Uruguay stood at just 5%. By 2018, \$4.5 billion of private sector investment flowed to the clean energy sector. Between 2005-2018, the share of non-renewable sources in Uruguay's energy supply fell from 58% to 37% and energy imports (primarily fossil fuel based) declined to virtually zero. This eased the country's dependence on strained hydroelectric power generation and costly, high-emission fossil fuel imports, thus improving the industry's productivity and resilience.

Convergence Blended Finance conducted an exhaustive case study available on their website.⁷⁵

⁷⁴ Rating is a function of debt service coverage ratios. Maintaining a subsidized level of interest rate for the C2F tranche allowed for reaching the desired debt service coverage ratio.

⁷⁵ Convergence, 2022.

| Conclusion

We argued in this essay that the measure of success for blended finance is best thought of as the extent in which the private investments it is enabling will contribute to sustainable and inclusive growth.

Drawing from economics theory, we proposed a conceptual measure of blended finance efficiency that aligns to this objective. Blended finance is efficient where the ratio of causal social returns (direct and systemic) to the public cost necessary to generate those returns is maximized, factoring-in distributional considerations.

We selected two strategies to exemplify a theory and evidence-based rationale for allocating blended finance that are likely to feature the necessary high social returns required to justify the use of concessional finance. Those strategies could be applied based on screening projects against criteria, to select investments likely to produce large tangible and intangible productivity spillovers. Other strategies – possibly complementary – may be based on increasing the provision of goods and services to poor and vulnerable population, achieving important environmental outcomes or crowding-in private investment in DFIs-led transactions.

Through these two examples, we draw the following recommendations for the benefit of both funders and implementers of blended finance:

- A theory and evidence-based approach to allocating blended finance is not only feasible, but advisable to maximize the value for money of scarce ODA resources that are allocated within the constraints of finite information and organizational resources.
- Using blended finance to fill financing gaps may be justified when it is more efficient than the public sector simply financing the project itself but is not the only strategy for blended finance.
- There are common features between allocation strategies, but also opposing approaches in term of implementation, calling for a different set of investment practices, instruments, or players when deploying concessional finance. Auctioning subsidies may or may not be the best approach. Guarantees may or may not be the best instrument. Coordination between DFIs may or may not be warranted. And so on.
- The prospect of high social returns that we want to justify the use of blended finance may often consist of dynamic systemic effects that are hard to estimate upfront. *Ex post* evaluation should be central to the practice of blended finance.

| References

- Abelson, P. 2018. “*Public Economics: Principles and Practice*”. The online (fourth) edition. <https://appliedeconomics.com.au/publications/>
- AfDB, AsDB, EBRD, EIB, IDBG, IMF, and World Bank. 2015. “*From Billions to Trillions: Transforming Development Finance Post-2015 Financing for Development*”. Multilateral Development Finance Development Committee Discussion Note, April. <https://thedocs.worldbank.org/en/doc/622841485963735448-0270022017/original/DC20150002EFinancingforDevelopment.pdf>
- AfDB, AsDB, EBRD, EIB, IDBG and IFC. 2013. “*Private Sector Roundtable: DFI Guidance for Using Investment Concessional Finance in Private Sector Operations*.” Working Group Note. March 15th. <https://www.ebrd.com/downloads/news/roundtable.pdf>
- AfDB, AsDB, AIIB, EBRD, EDFI, EIB, IDBG, ICD, and IFC. 2017. “*DFI Working Group on Blended Concessional Finance for Private Sector Projects Summary Report*.” October. https://www.ifc.org/wps/wcm/connect/a8398ed6-55d0-4cc4-95aa-bcbabe39f79f/DFI+Blended+Concessional+Finance+for+Private+Sector+Operations_Summary+R....pdf?MOD=AJPERES&CVID=npes1Dq
- Bayliss, K., Bonizzi, B., Dimakou, O., Waeyenberge, E., Laskaridis, C., and Sial, F. 2020. “*The use of development funds for de-risking private investment: how effective is it in delivering development results?*” Policy Department for External Relations. European Union. [https://www.europarl.europa.eu/RegData/etudes/STUD/2020/603486/EXPO_STU\(2020\)603486_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/STUD/2020/603486/EXPO_STU(2020)603486_EN.pdf)
- Berg, A. and Ostry, J. 2011. “*Inequality and Unsustainable Growth: Two Sides of the Same Coin?*”. IMF Staff Discussion Note. April 8. SDN/11/08. <https://www.imf.org/external/pubs/ft/sdn/2011/sdn1108.pdf>
- BloombergNEF. 2019. “*The Clean Technology Fund and Concessional Finance: Lessons Learned and Strategies Moving Forward*”. February. https://assets.bbhub.io/professional/sites/24/BNEF_The-Clean-Technology-Fund-and-Concessional-Finance-2019-Report.pdf
- Buiter, W. and Schankerman, M. 2002. “*Blended Finance and Subsidies: Implications for Technical Cooperation Policy and Operations*”, EBRD mimeo, May.
- Carter, P. 2015. “*Why subsidize the private sector? What donors are trying to achieve, and what success looks like*.” ODI, November. <https://cdn.odi.org/media/documents/9948.pdf>

- Carter, P. 2021. *“The economics of development finance: practical thinking on investing for development.”* CDC Group Insights Series. Impact Study 024. <https://assets.bii.co.uk/wp-content/uploads/2021/11/04120151/The-economics-of-development-finance-1.pdf>
- Carter, P. and Plant, M. 2020. *“The Subsidy Sorting Hat.”* CGD Note. February. Washington, DC: Center for Global Development. <https://www.cgdev.org/publication/subsidy-sorting-hat>
- Carter, P. 2017. *“Wanted: a mechanism for additionality”*. <https://carterpaddy.medium.com/wanted-a-mechanism-for-additionality-87fe136e3820>
- Carter, P., Van de Sijpe, N., and Calel, R. 2018. *“The Elusive Quest for Additionality.”* CGD Working Paper 495. Washington, DC: Center for Global Development. <https://www.cgdev.org/sites/default/files/elusive-quest-additionality.pdf>
- Convergence, 2022 *“Developing the Solar Market in Uruguay - Case Study”*. <https://www.convergence.finance/resource/3fff876b-606d-4b9e-9aec-4680683e0d0f/view>
- Deopersad, C., Persaud, C., Chakalall, Y., Bello, O., Masson, M., Perroni, A., Carrera-Marquis, D., Fontes de Meira, L., Gonzales, C., Peralta, L., Skerette, N., Marcano, B., Pantin, M., Vivas, G., Espiga, C., Allen, E., Ruiz, E., Ibarra, F., Espiga, F., Gonzalez, M., Marconi, S., Nelson, M. 2020. *“Assessment of the Effects and Impacts of Hurricane Dorian in the Bahamas”*. Inter-American Development Bank and United Nations ECLAC. <https://publications.iadb.org/en/assessment-of-the-effects-and-impacts-of-hurricane-dorian-in-the-bahamas>
- Easterly, W. 2006. *“Planners versus Searchers in Foreign Aid”*. Asian Development Review, Asian Development Bank, vol. 23(2), pages 1-35. [http://users.nber.org/~rdehejia/!@\\$devo/Lecture%2002%20Aid/Easterly_Searchers_vs_Planners.pdf](http://users.nber.org/~rdehejia/!@$devo/Lecture%2002%20Aid/Easterly_Searchers_vs_Planners.pdf)
- Fernández-Arias, E., Hausmann, R., and Panizza, U. 2019. *“Smart Development Banks”*. IDB Working Paper No. IDB-WP-1047. <http://dx.doi.org/10.18235/0001845>
- Fried, S. and Lagakos, D. 2020. *“Electricity and Firm Productivity: A General Equilibrium Approach.”* National Bureau of Economic Research Working Paper 27081. https://www.nber.org/system/files/working_papers/w27081/w27081.pdf
- Gardner, C. and Henry, P. 2022. *“The Global Infrastructure Gap: Potential, Perils, and a Framework for Distinction”*. Journal of Economic Literature (Forthcoming). <https://www.peterblairhenry.com/wp-content/uploads/Potential-Perils-3-15-21.pdf>

- Gaspar, V., Amaglobeli, D., Garcia-Escribano, M., Prady, D., and Soto, M., 2019. *“Fiscal Policy and Development: Human, Social, and Physical Investment for the SDGs.”* IMF Staff Discussion Notes No. 19/03. January. Washington, DC: International Monetary Fund. <https://www.imf.org/-/media/Files/Publications/SDN/2019/SDN1903.ashx>
- Goñi, E., Maloney, W., and Cirera, X. 2017. *“Why poor countries invest too little in R&D”*. VoxEU Column. <https://cepr.org/voxeu/columns/why-poor-countries-invest-too-little-rd>
- Grossmann, V., Steger, T., Trimborn, T. 2013. *“Dynamically Optimal R&D Subsidization.”* Journal of Economic Dynamics and Control, Volume 37, Issue 3, Pages 516-534, ISSN 0165-1889. <https://doi.org/10.1016/j.jedc.2012.10.007>
- Hausmann, R. and Rodrik, D. 2002. *“Economic Development as Self-Discovery.”* National Bureau of Economic Research Working Paper 8952. <https://www.nber.org/papers/w8952>
- Hendren, N, and Sprung-Keyser, B. 2022. *“The Case for Using the MVPF in Empirical Welfare Analysis.”* National Bureau of Economic Research, working paper Series, 30029. DOI: 10.3386/w30029. https://www.nber.org/system/files/working_papers/w30029/w30029.pdf
- IRENA and USAID, 2021. *“Renewable energy auctions in Colombia: Context, design and results.”* International Renewable Energy Agency, Abu Dhabi. https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2021/March/IRENA_auctions_in_Colombia_2021.pdf
- Jones, B. and Summers, L. 2020. *“A calculation of the social returns to innovation.”* National Bureau of Economic Research, Working Paper 27863. <http://www.nber.org/papers/w27863>
- Jones, C. 2018. *“New ideas about new ideas: Paul Romer, Nobel laureate.”* VoxEU. <https://voxeu.org/article/new-ideas-about-new-ideas-paul-romer-nobel-laureate>
- Jones, C. 2011. *“Intermediate Goods and Weak Links in the Theory of Economic Development.”* American Economic Journal: Macroeconomics, 3 (2): 1-28. <https://www.aeaweb.org/articles?id=10.1257/mac.3.2.1>
- Kenny, C. 2019. *“Five Principles for Use of Aid in Subsidies to the Private Sector.”* CGD Policy Paper 157 October. <https://www.cgdev.org/sites/default/files/PP157-Kenny-DFI-Principles.pdf>
- Kenny, C. 2021. *“We Should Be Spending More of Available Aid in Poorer Countries, Not Less.”* CGD Working Paper 564. <https://www.cgdev.org/sites/default/files/WP564-Kenny-Aid-Utility-Full.pdf>

- Kharas, H. and McArthur, J. 2019. *“Building the SDG economy: Needs, spending, and financing for universal achievement of the Sustainable Development Goals.”* Global Economy and Development at Brookings, working paper 131, October. <https://www.brookings.edu/wp-content/uploads/2019/10/building-the-sdg-economy.pdf>
- Kim, Young Eun; Loayza, Norman V. 2019. Productivity Growth: Patterns and Determinants across the World. Policy Research Working Paper;No. 8852. World Bank, Washington, DC. © World Bank. <https://openknowledge.worldbank.org/handle/10986/31710> License: CC BY 3.0 IGO.”
- Lee, N. 2017. *“Billions to Trillions? Issues on the Role of Development Banks in Mobilizing Private Finance.”* Center for Global Development Essay. <https://www.cgdev.org/publication/billions-trillions-issues-role-development-banks-mobilizing-private-finance>
- Liu, E. 2019. *“Industrial Policies in Production Networks”*. The Quarterly Journal of Economics, Volume 134, Issue 4, November 2019, Pages 1883-1948, <https://scholar.princeton.edu/sites/default/files/ernestliu/files/qjz024.pdf>
- Manuel, M., Desai, H., Samman, E., and Evans, M. 2018. *“Financing the End of Extreme Poverty.”* ODI Report, September. <https://cdn.odi.org/media/documents/12411.pdf>
- Piccione and Rubinstein, 2007. *“Equilibrium in the Jungle.”* The Economic Journal, Vol. 117 (July), pp. 883-896. <https://economics.northwestern.edu/docs/events/nemmers/2004/nemmers-05-rubinstein-paper1.pdf>
- Pigou, A. C. 1920. *“The Economics of Welfare.”* MacMillan, London.
- Roots of Impact. 2021. *“Empowering Clínicas del Azúcar to Attract Investment and Create Impact at Scale: A SIINC Case Study after Final Results 2020”*. <https://www.roots-of-impact.org/wp-content/uploads/2021/04/SIINC-Case-Studies-CDA-Final-Results-2021.pdf>
- Sachs, J., G. McCord, N. Maennling, T. Smith, V. Fajans-Turner, and S. Sam Loni. 2019. *“SDG Costing and Financing for Low-Income Developing Countries.”* Sustainable Development Solutions Network. IMF Working Papers WP/21/236. Washington, DC: International Monetary Fund. <https://resources.unsdsn.org/sdg-costing-financing-for-low-income-developing-countries>
- Schmidt-Traub, G. 2015. *“Investment Needs to Achieve the Sustainable Development Goals: Understanding the Billions and Trillions”*. SDSN Working Paper Version 2. <http://unsdsn.org/resources/publications/sdg-investment-needs/>

- Stern, D., Burke, P., and Bruns, S. 2019. *“The Impact of Electricity on Economic Development: A Macroeconomic Perspective”*. UC Berkeley: Center for Effective Global Action. <https://escholarship.org/uc/item/7jb0015q>
- Stostad, M. 2019. *“Inequality as an Externality: Existence and Consequences. Economics and Finance”*. <https://dumas.ccsd.cnrs.fr/dumas-02407577/document>
- UN. 2015a. *“Transforming Our World: The 2030 Agenda for Sustainable Development.”* New York: United Nations. <https://sustainabledevelopment.un.org/post2015/transformingourworld/publication>
- UN. 2015b. *“Addis Ababa Action Agenda of the Third International Conference on Financing for Development”*. New York: United Nations. <https://sustainabledevelopment.un.org/index.php?page=view&type=400&nr=2051&menu=35>.
- Warner, A. 2013. *“A Framework for Efficient Government Investment”*. IMF Working Paper No. 13/58, Available at SSRN: <https://ssrn.com/abstract=2233761>
- World Bank. 2018a. *“Strategic Use of Climate Finance to Maximize Climate Action : A Guiding Framework.”* World Bank, Washington, DC. © World Bank. <https://openknowledge.worldbank.org/handle/10986/30475> License: CC BY 3.0 IGO.
- World Bank. 2018b. *“International Bank for Reconstruction and Development Project Appraisal Document on a Proposed IBRD Guarantee in the Amount of US\$41 Million and a Proposed CTF Guarantee in the Amount of US\$40 Million to the Republic of Colombia for a Colombia Clean Energy Development Project.”* June 22. <https://documents1.worldbank.org/curated/en/716071531971041230/pdf/PAD-06222018.pdf>
- World Bank. 2016. *“High and Dry: Climate Change, Water, and the Economy”*. World Bank, Washington, DC. © World Bank. <https://openknowledge.worldbank.org/handle/10986/23665> License: CC BY 3.0 IGO.”

**Let's continue
the conversation**

-  idbinvest.org/blog
-  idbinvest.org/linkedin
-  idbinvest.org/twitter
-  idbinvest.org/facebook



www.idbinvest.org