Mobilizing Beyond Leverage: Exploring the Catalytic Impact of Blended Finance[1]

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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 effectiveness metric, and relying instead on the concept of net social returns that incorporate the wider economic effects of blended finance and its cost. 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 effectiveness of blended finance? Through these lenses, we will assess in the second section the prevailing narratives for the use of blended finance: (i) creating knowledge spillovers that can affect markets' behaviors, (ii) fixing weak links in complementary production networks and (iii) mobilizing institutional investors towards SDG-aligned investments. Throughout the paper, we will stress the assumptions, limitations, and unanswered questions in our argumentation, so as to conclude with several action items to strengthen the practice.

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Key Messages

- Blended finance effectiveness is a function of causal sustainable development outcomes and public costs, and should factor-in opportunity cost. The ratio of nominal blended resources to private capital mobilized does not capture blended finance effectiveness.
- The measure of success of blended finance is the extent in which the private investments it is enabling can induce sustainable and inclusive growth, unlocking the actions linked to the wider set of SDGs.
- A case of blended finance being catalytic is where it creates vertical or horizontal productivity spillovers while generating positive environmental or social externalities, or increasing the provision of goods and services to poor and vulnerable populations, thereby inducing sustainable and inclusive growth.
- Using blended finance to mobilize institutional investors towards SDG-aligned investments in developing countries is either a subset of creating productivity spillovers or can contribute to decreasing public costs. However, targeting cross-border institutional investors – who face capital adequacy constraints – limits spillover effects. Using blended finance for the sole purpose of increasing cross-border private capital participation remains a viable strategy, but only to the extent it results in a net decrease of public costs which can only be achieved by minimizing explicit subsidies passed on to investors.
- Blended finance investment strategies are complementary but may call for nuanced and sophisticated approaches requiring multidisciplinary capabilities, experience and discipline. Institutional capacity, governance, and track record are key success factors. Adherence to common project-level and institutional-level principles, and ensuring those principles are passed through to the entity(ies) that will ultimately allocate subsidies to the market, contribute to scarce donor resources being deployed effectively.
- The choice and terms of blended finance instruments are predominantly context specific. Allowing for flexibility in the choice of instrument (and it terms) improves the effectiveness of blended finance.

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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 billions of dollars per year, and institutional capital is north of 200 trillions of dollars. 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.

This emphasis on leverage poses several challenges. First, private capital leverage in and itself does not necessarily translate into incremental sustainable development impact.[3] Simply put, a project with a 20x private capital leverage but little contribution to poverty reduction, economic growth, inclusiveness, or sustainability might have a limited impact in contributing to the SDGs. Even if it does, there could be alternatives that generate more impact at a "cheaper" public cost. Second, there is a substantial and likely incompressible portion of SDGs expenses that relate to public goods[4] and social transfers, all requiring public funding. No amount of private dollars in private sector projects can make up for that, at least not directly. This is precisely the issue with leverage as an overarching measure of success. It fails to capture the wider catalytic impact that blended finance may have in stimulating sustainable and inclusive growth, and ultimately unlock the actions linked to the wider set of SDGs.

The purpose of this paper is to explore how and to what end blended finance mobilizes private investment towards the SDGs, moving away from an oversimplistic emphasis on private capital leverage as an effectiveness metric,[5] and relying instead on the concept of net social returns[6] that incorporate the wider economic effects of blended finance and its cost. 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 effectiveness of blended finance? Through these lenses, we will assess in the second section three blended finance investment strategies: (i) creating knowledge spillovers that can affect markets' behaviors, (ii) fixing weak links in complementary production networks and (iii) mobilizing institutional investors towards SDG-aligned investments. Throughout the paper, we will stress the assumptions, limitations, and unanswered questions in our argumentation, so as to conclude with several action items to strengthen the practice.

[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.

[6] Harvard's Policy Impact relies on the concept of Marginal Value of Public Funds which is quite similar (Hendren and Sprung-Keyser, 2022).

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)[7] is considered the measure of success of sustainable development, and the Addis Ababa Action Agenda (AAAA),[8] the means to achieve it.[9] According to an IMF study,[10] developing countries must spend an additional US$2.2 trillion per year by 2030 to meet the objectives of the SDGs. The gap accounts for 4% of GDP for emerging economies and 15.4% for low-income developing countries.[11]

The narrative around a single unified SDGs spending gap is a compelling one to draw attention to the challenges of sustainable development and the need for paradigm shift in development finance.[12] 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*.[13] The belief that private capital can make up for the entirety of the SDGs spending gap falls into that trap. A rough breakdown of SDGs spending shows that investments in infrastructure only account for 25%, while social spendings (e.g. health, education) and social protection transfers (e.g. pensions) account for 75%.[14] A meaningful portion of SDGs spendings ultimately relies on public expenses which are traditionally funded through government's revenues (e.g. taxes),[15] otherwise known as domestic resource mobilization (DRM).[16] Therefore, as most studies do actually point out,[17] including the MDBs' own *Billions to Trillions*[18] paper, meeting the objectives of the SDGs calls for various types of heterogeneous actions, from social protection transfers to increased private capital in infrastructure investments, all the way to investment and policy measures that support economic growth.

Economic growth[19] is a necessary fuel to improving standards of living in developing countries.[20] Not only does it contribute to raising DRM, but also to increasing production and wages, which are all

[7] UN, 2015a.
[8] 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.
[9] This sentence is an ascertainment that it is the most widely referred benchmark. There is plenty of literature that address the SDGs and the AAAA advantages and limitations, which are beyond the scope of this paper.
[10] Gaspar et al.,2019.
[11] Nominally, the amount is larger for emerging economics, but when as a percentage of GDP, the challenge is heavier for low-income developing countries.
[12] Kharas and McArthur, 2019.
[13] Kharas and McArthur, 2019.
[14] Calculation based on Sachs et al., 2019.
[15] Or alternatively international development assistance.
[16] 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.
[17] Schmidt-Traub, 2015; Manuel et al., 2018; Gaspar et al.,2019; Kharas and McArthur, 2019; Sachs et al.,2019.
[18] AfDB et al., 2015
[19] Without trying to ignore the debate on growth vs. degrowth in developed countries, it is worth underlining that least developed countries have a GDP per capita that is only ~3% of developed countries measured in current US$ (according to UNCTADSTAT), so stakes are different when we think of growth in the context of developing countries.
[20] Carter, 2021.

conducive to social development. Naturally, the sequencing and nature of growth matter equally.[21] For instance, infrastructure that is built solely for the purpose of economic growth and does not internalize environmental externalities such as physical or transitional climate risk may contribute "less" to the SDGs, on top possibly being more "expensive" to society in the long run. Conversely, growth measures that are also designed to contribute to poverty and inequality reduction are expected to have a stronger impact in meeting the SDGs. Studies show that countries that score high both in terms of GDP per capita and income equality, will also feature a higher level of SDG's achievement.[22]

Productivity is a key ingredient to sustained economic growth.[23] There are numerous mechanisms driving productivity increase, from technological advance, human capital and markets' efficiency, all the way to functioning institutions.[24] Private investment that contributes to these mechanisms supports economic growth, as we will further explore in this paper. Similarly, there are multiple instances where private investment generates positive environmental and social externalities or support the provision of good and services to poor and vulnerable populations. Therefore, the measure of success of blended finance is the extent in which the private investments it is enabling can induce sustainable and inclusive growth. Maximizing private capital participation in transactions matters, but only to extent it contributes to this overarching objective.

1.2 Where is Blended Finance Justified and Effective?

DFIs activities – whether commercial or concessional – operate in a subsidy continuum, and so does blended finance through its different definitions. The binary distinction between commercial and concessional finance is a construct meant to address the incremental level of oversight required for transactions that are deemed concessional.[25] 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*.[26] We will use the term interchangeably with blended finance and subsidy. For the sake of simplicity, we assume blended finance is extended through standalone donor[27] facilities referred to as blended finance programs.

DFIs have been comfortable to associate blended finance with subsidies[28] as it supports a welfare economics rationale.[29] There are several applied research papers that explore economics justification

[21] Kharas and McArthur, 2019.
[22] Gaspar et al.,2019.
[23] We are taking a bit of shortcut here for ease of reading. By productivity we mean total factor productivity.
[24] Kim and Loayza, 2019.
[25] This will hopefully be the purpose of another paper.
[26] AfDB et al., 2017.
[27] Is this context, donor would refer to a government, multilateral organization (e.g. GCF) or a philanthropy that is entrusting concessional resources in the form of blended finance programs.
[28] See Buiter and Schankerman, 2002 and AfDB, et al., 2013 for example.
[29] Welfare economics justifies the use of subsidies for efficiency or redistributive purposes. The paper's emphasis on externalities implies that we are focusing on the efficiency leg as we found that there is a larger and stronger body of literature that support the use of blended finance for efficiency purposes. We are not discarding the redistributive argument, but it is beyond the scope of this paper. It is however worth underlying that efficiency measure, such as targeting to good and services that cater to low-income households, may

for the use of concessional finance in private sector development projects.[30] Based on these, we can derive three overarching theoretical conditions to justify a given blended finance investment:

- Net social returns are positive and exceed private returns: social returns for society are higher than both costs for society and private returns for investors.[31]
- Private returns do not meet risk-adjusted return thresholds (whether perceived and real risks coincide or not): The investment is not profitable (or perceived not to be profitable) for investors and therefore would not occur without concessional finance.[32]
- Social opportunity cost is negative: there are no other investments that would yield better net social returns. This is because if there are other interventions that generate higher net social returns, we should prioritize those. The reader might rightfully object that this is unimplementable. [33] We will tackle this issue when discussing practical implications.

Box 1 provides a stylized representation of these three conditions.

achieve redistributive objectives. There is also research that suggest that inequality can itself be construed as an externality (Stosad, 2019) or that trade-off between equality and efficiency may not exist in the long run (Berg and Ostry, 2011).

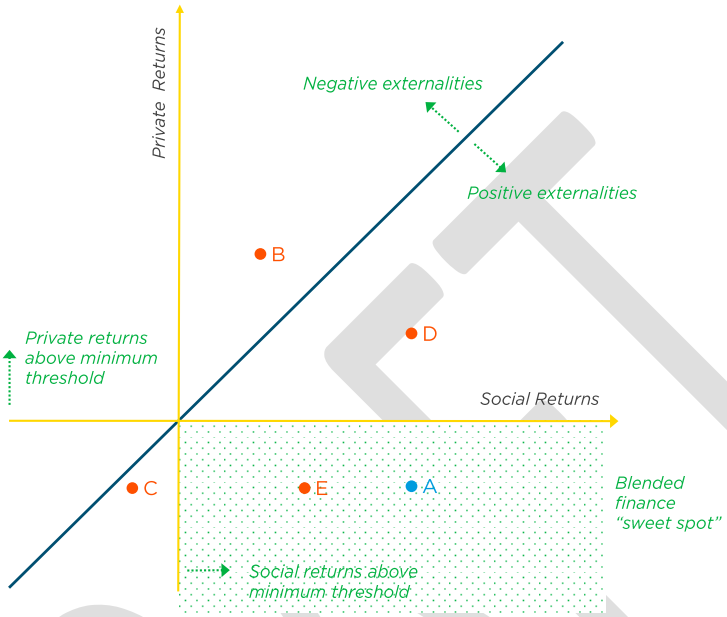
[30] By no mean exhaustive: Buiter and Schankerman, 2002; Warner, 2013; Carter, 2015; Kenny, C. 2019, Mutambatsere and Schellekens, 2020.

[31] E.g. an agroforestry project restoring degraded lands and mitigating GHG emission as a byproduct of its business model without being compensated for the GHG emissions it is mitigating, and where the social value of these mitigated emissions exceed the public cost of the intervention. Conversely, if the company were to received carbon credit earnings equal to the social cost of carbon, or the public cost of the intervention exceeded the social cost of carbon, the conditions would not be met. This condition applies for both commercial and concessional operations.

[32] E.g. if that same agroforestry project could legitimately receive commercial financing and still be profitable, then the additionality of public resources is not met: the positive externalities generated by the project would happen anyway, causal impact is unestablished.

[33] In practice, determining the marginal subsidy cost of the next readily available project is unrealistic. Also, the condition should not prevent us from supporting projects that are achieving social returns that are generally deemed attractive.

Box 1: Blended Finance Effectiveness



The chart is adapted from Andrew Warner's Framework for Efficient Government Investments.[34] The vertical axis represents private returns and the horizontal axis social returns. The concept of returns is purposedly undefined, it could refer to a rate of return, a present value calculation, etc. The axes intersect where returns fall below a minimum threshold. That threshold is also purposedly 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 blended finance 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 thresholds 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 up to two projects, then both Project A and E 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.[35]

[34] Warner, 2013.

[35] For instance, all IDB Invest projects include an ERR calculation which is 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. Finally, opportunity cost analysis forms an integral part of IDB Invest blended finance assessment.

We now explore the implications of these three conditions. Consider the following thought experiment. In a static setting, we need to allocate a finite pool of public finance resources to a larger known universe of investment opportunities[36] that require public finance in order to materialize. If we abide to the three conditions, each additional investment for which we allocate public finance will feature lower social returns, up to a point where either public finance resources are depleted, or net social returns become negative.[37]

Needless to say, development finance evolves in a dynamic environment. Each investment materializing – coupled with other endogenous or exogenous variables – may have an impact on the supply and demand for investments. For example, minimum return thresholds may decrease due to shifting risk perception, and therefore a portion of investments may no longer require public finance. Or, those additional investments may have contributed to economic growth, thereby increasing the supply of public finance available, allowing us to tackle the "less" socially profitable investments that we could not attend previously. We therefore deduce that blended finance trends towards ineffectiveness unless it can cause systemic changes that alter the fundamentals of the market.[38]

We can infer three guiding principles for the use of blended finance that follow from the prior three conditions. First, an assessment of social returns should factor-in wider economic effects and the public cost of achieving these, thus cost benefit analysis is the way to go. The intuitive but significant logical conclusion is that high public costs would only be justified in the face of systemic impact.[39] Relatedly, investments with limited systemic impact may still clear the hurdle provided public costs remain low.[40] Second, the opportunity cost of blended finance should also factor-in other means of deploying development aid towards investments. Nothing in the above tells us that the provision of blended finance is the most competitive use of public resources. It may very well be the case that a public financing or a technical cooperation have a more compelling cost benefit ratio. Third, any reliable cost benefit analysis should focus on causal impact,[41] which we define as the social returns that would only materialize as a result of the intervention. Causality in blended finance is a contentious topic[42] that poses both theoretical and practical challenges. We will address some of those, but admittedly this is a topic that deserves a paper of its own.

The above principles may read like self-evident truths but have relevant practical implications. First, capturing public costs,[43] sustainable development impact and causality is necessary to ensuring a sound investment decision, but challenging to assess in practice. Blended finance practitioners need

[36] That assumption seems intuitive but is not straightforward at it seems. 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).
[37] A diminishing marginal efficiency of subsidies of some sort. Carter, 2015 makes a comparable argument.
[38] Or an exogenous factor alters the fundamentals, but this is outside of our scope.
[39] It might be tempting to infer that a condition for extending explicit subsidies is that investments should achieve meaningful systematic because of our opportunity cost condition but there is not sufficient evidence for this.
[40] Obviously the most attractive investment would be the one with systemic changes at a low public cost.
[41] The corollary is causative subsidy, which relates to the topic of minimum concessionality.
[42] Bayliss et al., 2020; Carter, 2017; Carter et al., 2018.
[43] Which by extension requires determining private return thresholds (part of the public cost of blended finance is the level concessionality which is a function of private returns). From a blended finance perspective, one added value for DFIs to have commercial operations is to provide an idea of what that boundary looks like.

to strike the right balance between developing and running adequate investment decision making tools and the costs of doing so. Second, it is impossible to map and rank all possible investments opportunities requiring public finance at any given point in time. The next best alternative is to devise investment strategies where there are reasonable expectations of generating the most attractive social return to public cost ratio (and obviously assess those against its investment decision tools when deploying funds).

2. Assessing Blended Finance Strategies

In this section, we discuss three investment strategies for the use of blended finance: (i) creating knowledge spillovers that can affect markets' behaviors, (ii) fixing weak links in complementary production networks and (iii) mobilizing institutional investors towards SDG-aligned investments. The first two are derived from Paddy Carter's *Economics of Development Finance*[44] where they are presented as the primary channels to catalyze economics growth. Both seek to achieve productivity spillovers, either horizontal or vertical. Our paper will focus on the applicability of these channels to blended finance. The third strategy is currently the prevailing narrative for the use of blended finance outside of DFIs circles.[45] 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 and overlaps between the various approaches.

2.1. Creating Knowledge Spillovers

From an economics standpoint, knowledge can be construed as an externality:[46] once created, and unless patented, it is "freely" reusable without being depleted.[47] There are therefore limited incentives for companies to invest in knowledge which would freely benefit its competitors.

A typical illustration is underinvestment in R&D and its negative effects on productivity and growth. A corollary is that investment in innovation brings substantial social returns,[48] which would in turn justify public support.

We can expand the concept to knowledge gaps in production functions[49] where entrepreneurs and financiers are disincentivized to implement and finance untested investments, especially in developing countries.[50] The early mover would indeed be the only one to bear the downside in case the investment is unsuccessful, but freely "share" that discovery with competitors if it is successful. This may apply to the adoption of known innovations in new jurisdictions. The uncertain outcome may affect financiers and entrepreneurs risk perception, slowing down or preventing the investment from occurring. A concrete case has been the adoption of non-conventional renewable energy, a proven and competitive technology that however have been largely depending on local factors such as regulation, energy mix, renewable resources, market dynamics, etc. Paraphrasing economists Dani

[44] Carter, 2021.

[45] The rationale of blended finance for DFIs is *pioneering technology, creating markets, reaching underserved beneficiaries, and addressing environmental externalities emerged as the main rationales for the use of blended concessional finance* (AfDB et al., 2017). Crowding-in private capital is part of the DFIs' principles for blended finance but is not included in the rationale.

[46] An externality is the byproduct cost or benefit of an economic activity imposed to a bystander.

[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] Jones and Summers, 2020.

[49] The relationship between input (e.g. capital, labor, etc.) and output (e.g. production).

[50] Innovation – as a broad concept – is largely tacit. Even where it is in theory "patentable", developing countries may lack appropriate intellection property mechanisms which exist in developed countries (Hausmann and Rodrik, 2002).

Rodrik and Ricardo Hausmann, incentivizing a process of "self-discovery" may therefore have a meaningful impact on productivity and growth in developing countries.[51]

The concrete application to blended finance is that it can be used to encourage entrepreneurs and financiers to implement and finance new technologies, business models or financing structures in untested geographies, for the immediate benefit of increasing the firms' bottom line, but with the developmental goal of generating knowledge spillovers that are beneficial to the entire economy. The underlying expectation is that through that initial blended finance intervention,[52] if the investment is ultimately profitable, we may reach a tipping point where entrepreneurs and financiers are comfortable to undertake similar investments without public support. The resulting knowledge spillovers improve firms' productivity thus contributing to growth.

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. It is worth stressing that we are not necessarily looking to internalize those other externalities, but rather generating enough knowledge spillovers so that investments' returns meet private returns thresholds. For instance, we may use blended finance to demonstrate the commercial viability of electromobility projects, so that the investments would be profitable even without carbon pricing schemes.

Reverting to our theoretical framework, the strategy implicitly ticks the boxes of positive externalities as well as private returns thresholds. Because we rely on the idea that an upfront public investment can ultimately lead to systemic change, we can expect that not only net social returns are positive, but also that the strategy is a competitive use of development aid.

There are several practical nuances to consider when implementing the strategy. We choose to focus on four of them:[53]

- Firstly, if the purpose of blended finance is to encourage self-discovery, the outcome of which is unknown, the institution that extends blended finance may not necessarily be "aware" of that opportunity before encountering a concrete project opportunity brought by prospective clients. Perhaps counterintuitively, overly prescriptive blended finance programs may thus lead to an inefficient allocation of scarce donor resources (while also generating perverse incentives that further contribute to the inefficiency). Borrowing from economist William Easterly,[54] this is more about *searching* for transactions that generate the desired knowledge spillovers rather than

[51] *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).

[52] Which may not necessarily be limited to one transaction.

[53] The paper is meant to be an introduction and explanation to the predominant narratives that are being used to justify the use of blended finance. It is however worth noting that the knowledge spillovers strategy has the dual characteristic of relying on a solid body literature and operationalization parameters that are the closest to DFIs prevailing business model. The author believes there is a relative consensus within the DFIs community that it is one of the most compelling rationales for blended finance (not that it is exempt of challenges) and would thus benefit from a more in-depth assessment.

[54] Easterly, 2006.

planning for what the projects and their financing structure would look like. Pushing the argument further, a healthy dose of heterogenous interventions from the different development actors may even be beneficial. Experimenting and testing different models may allow for the most efficient solution to prevail. The approach may also justify "bespoke" subsidies,[55] as opposed to auctioning subsidies which might otherwise be preferred.[56] It aligns well with the predominant business model of DFIs, which operate within strategically defined mandates, but are ultimately demand driven.

- Secondly, the strategy is predicated on intertemporal spillovers, which are challenging to determine *ex-ante*. This touches the topic of causality in blended finance interventions, discussed in §1.2. An *ex-ante* solution is to conduct a breakeven analysis to determine the minimum gross social returns required to justify the subsidy. If the project's direct impact – easier to capture – is sufficient, then any systemic impact is upside.[57] Alternatively, if systemic impact is necessary to meet breakeven, we can build forward-looking scenarios that achieve the required social returns, then ascertain the likelihood of achieving them. We can also improve the intervention's effectiveness through mechanism design that mitigate the downside for the financier or the entrepreneur but share the upside.[58] *Ex-post*, assessing systemic impact and the causal link to blended finance should be a central theme in blended finance programs' intermediary or final evaluations, and we have seen a number of donors moving towards that direction.

- Thirdly, 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.[59] Relatedly, because the strategy targets untested investments, it generally requires an additional level of due-diligence where complementary technical cooperation resources are often necessary (to fund feasibility studies[60] for example). Finally, although spillovers would generally be aimed at entrepreneurs or financiers, it worth noting that governments or development organizations may also be targeted.[61]

- 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

[55] Kenny, 2019.
[56] Lee, 2017.
[57] We still need to assess causality at the project level, but this is arguably easier.
[58] Carter and Plant, 2020.
[59] This does not necessarily require wide publicity. For instance, for each financing practice (e.g. project finance), there are generally a dozen legal firms specialized, with ample rotation from one company to another. We have seen cases where successful financing templates are passed-on and replicated from one firm to another.
[60] Which to the extent possible should be made public per the argument developed in this paragraph.
[61] 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.

as the targeted knowledge externalities are internalized.[62] 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.[63] 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 with donors.[64]

2.2. Fixing Weak Links in Complementary Production Networks

Another argument for the use of blended finance revolves around the thesis that economies function as series of intertwined production networks. For instance, the production of an intermediate good will rely on the availability and competitiveness of several other intermediate goods or raw material as input and affect the availability and competitiveness of subsequent goods as output, and so on and so forth. If the increase of productivity of one company increases the productivity of another, the two firms are complementary. If we apply the same logic to the entire production network, an increase of productivity in one firm may have a multiplier impact on the overall productivity of the value chain. Conceptually, that multiplier effect is a function of the good's relevancy as input,[65] how many firms it is affecting throughout the value chain, and the point in which the production chain is constrained by the under-provision of another good. For example, a functioning financial sector is central to the efficient allocation of investments which is why it is traditionally a key focus area for DFIs. Looking at another sector, eliminating power outages in sub-Saharan Africa could result in a 25% increase in workers' output.[66] We will refer to these firms or sectors as "central area".[67]

A corollary is that the under-provision of certain intermediary outputs in central areas may have negative ripples effects throughout its production network. This links to the idea of resiliency externalities that may be particularly relevant in areas such as climate adaptation.[68] For instance, a firm in a central area may partly benefit from investments in climate resiliency but may not fully capture its economics benefit, and the other way round in case of under-investment. Looking at a concrete case, the physical damages to Bahamian water utilities from Hurricane Dorian amounted to US$ 15 million out of US$ 2.5 billion in total damages. However, delays in restoration of service impacted public health and economic recovery. Total losses to the economy were estimated at US$

[62] Internalization of externalities refers to all measures (public or private) that guarantee that unpaid benefits or costs are taken into account in the composition of goods and services prices (Ding et al., 2014).
[63] 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, which would imply an intriguing notion of "failure sweet spot" of some sort.
[64] For instance, some blended finance programs managed by IDB Invest have a weighted average minimum rating at entry.
[65] Using the example of office stationery: *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.
[66] Fried and Lagakos, 2020.
[67] Borrowing from the terminology used in Carter, 2021
[68] World Bank, 2018a.

717 million.[69] Which percentage can be attributed to the unavailability of water infrastructures is a complex question. However, the difference in orders of magnitude, and the well documented linkage[70] between basic services such as water or electricity and economic activity illustrate the likely strong positive externalities on the whole economy of investing in climate resiliency, post-disaster planning and disaster risk insurance schemes in utilities.[71]

Identifying[72] and addressing the binding constraints or improving the resiliency of central areas within complementary production networks unlock or preserve productivity throughout the value chain, thereby having a "multiplier" impact on investments and growth.

Similar to the first strategy, investing in the development or resiliency of central areas in productions 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 cost benefit ratio.

We focus on four 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 requires meaningful *ex ante* planning, likely in conjunction with policy work. This could include policy and regulatory design, designing an allocation mechanism, and ultimately 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. Auctioning subsidies – if any – would be recommended.[73]
- Second, systemic change likely requires scale which would necessitate coordination among DFIs (and 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 central area at any given point in time. This may be insufficient when implementing the strategy and would require coordinating actions. Relatedly, DFIs would need to balance between ensuring homogeneous terms and conditions and the heterogeneity of projects developers, which may imply variability in the terms and conditions of the financing, up to possibly excluding some developers because they fail to meet DFIs minimum requirements.[74]
- 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. It is

[69] Deopersad et al., 2020.
[70] For example, Stern et al., 2019 and World Bank, 2016.
[71] This example is drawn from initial work conducted at IDB Invest then transferred to IDB for the establishment of a Caribbean Water Utility Insurance Company.
[72] Such as through growth diagnostics, popularized by economists Hausmann, Rodrik and Velasco.
[73] Lee, 2017.
[74] E.g. environmental, social, governance and integrity requirements.

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, notwithstanding the above, retaining flexibility at program level remains relevant. Fundraising for concessional resources may occur several years before the targeted investments materialize and markets may evolve in the meantime. In addition, private return thresholds will be in part linked to regulation which may be undefined at the time of fundraising. For example, when Colombia developed its utility scale renewable tender,[75] the financing community expected that the structure of the power purchase agreements (PPA) – which pooled several utilities – would affect the bankability of the investments. Blended finance programs rightfully contemplated de-risking mechanisms targeting the weaker credits.[76] However, a consolidation in the utilities market resulted in a healthier risk profile of the PPAs. This was no longer an issue to attract 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.[77] In these instances, operating under the principle of minimum concessionality is a must, 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.

In some instances, it may be unpractical 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.[78] This opens the possibility of blended finance operations generating knowledge externalities within previously identified central 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 strengthen central areas in productions networks.

2.3. Mobilizing Institutional Investors

The prevailing narrative for the use of blended finance outside of DFI circles is that it can be used to "leverage" institutional capital to bridge the SDGs investment gap. We will initially focus on cross-

[75] 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.
[76] World Bank, 2018b.
[77] IRENA and USAID, 2021.
[78] 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.

border investors and expand on local investors towards the end of the subsection. We will also assume that there is a linear relationship between the impact of an investments at its credit risk.[79]

The aggregate amount of financial assets held by pensions, insurance companies and investment funds in the OECDs have exceeded 100 trillion dollars in 2019. However, capital flows to Emerging Markets (EM) and non-Investment Grade (IG) debts are very limited. For insurance companies in Europe, only 3-4% of insurer capital goes to EM assets and about 1-2% of total bond exposure is to non-IG issuers.[80] Financial regulation is the main structural constraint for institutional investors to scale investment in EM. The higher the risk of a particular investment, the greater the amount of capital that an institution must keep in its balance sheet. For instance, US Insurers capital requirements increase 5.1x when investing in single-B relative to BBB assets.[81] Unfortunately, EMs offer limited investment grade opportunities. 91% of countries eligible to Official Development Assistance (ODA) have non-IG rating.[82] Half of ODA countries are unrated or in selective default.[83] The question at hand is can blended finance be used to improve the credit profile of these investments thereby catalyzing private capital, always under the overarching premise that it meets our theoretical framework?

There are two important considerations to derive from our theoretical framework:

- Firstly, many DFIs already mobilize private capital through two primary channels and can themselves be construed as blended finance vehicles. They issue highly rated corporate bonds, and they seek to crowd-in private capital in their individual financings (the latter being defined as "direct mobilization").[84] Annex I provides additional details on how DFIs mobilize private capital, focusing on MDBs for the sake of simplicity.[85] The main takeaway is that any private leverage calculation for DFIs should factor-in those two channels, especially since there can tradeoffs involved. For instance, if a DFI has a leverage ratio of 1:4 on its balance sheet and a direct mobilization ratio of 1:1, then total leverage of private capital is 1:8. DFIs also generally pursue an inflation adjusted capital preservation mandate. Simplistically, if a shareholding government were to recoup its equity in a DFI,[86] it would not lose money. Thus, not only DFIs mobilize private capital but they arguably do so at a relatively cheap public cost. Translated to our framework, it

[79] In other words, if we assume investments are fully financed by the DFI, riskier investments will result in more impact but would be compensated by less resources available due to capital adequacy ratio. This is obviously a debatable assumption, but it simplifies our reasoning going forward.

[80] According to European Insurance and Occupational Pensions Authority (EIOPA) 2020 Data, at the end of year 2019, European insurers invest 71% of total capital on debt securities, among which only 3.5% goes to EM, and 16% of total capital on equity, among which 4.8% goes to EM. In terms of credit quality of bond portfolio, sub-IG bond holdings are 1.4% of total bond exposure, or 1.7% of the rated.

[81] According to 2021 National Association of Insurance Commissioners (NAIC) guidance.

[82] We include unrated countries as non-IG.

[83] Author's assessment.

[84] AfDB et al., 2018.

[85] MDBs are more homogenous in their capital structure whereas there is more heterogeneity among the larger set of DFIs (e.g. some DFIs do not issue corporate debt). The most recent studies also focus on MDBs specifically (see Leautier et al, 2022 for example).

[86] This does not happen in practice which may be a rationale for donors to invest in other blended finance vehicles where they can receive reflows.

suggests that theoretically speaking, an opportunity cost of using blended finance to mobilize institutional investors is to capitalize a DFI.

- Secondly, increasing private capital participation in a given development project has limited incremental development impact in and itself, unless the purpose of increasing private participation is to generate knowledge spillover (e.g. address financiers' risk misperception) which falls within of our first strategy. In the case of cross-border investors, the effects of knowledge spillovers are ultimately "capped" by capital adequacy restrictions. Using a hypothetical investment as illustration, bringing-in an international investor in an electric vehicle charging infrastructure in a B-rated country will have limited impact on that investor's ability to finance the next piece of infrastructure, without the continued provision of de-risking.[87] Thus, the potential for incremental[88] systemic impact is constrained. Reverting to our cost benefit ratio, this is a strategy where social benefits are constant, but public costs may decrease thanks to private capital replacing public capital (and ultimately that "saved" public money can be used in other projects).[89]

Bringing those two considerations together, using blended finance for the sole purpose of increasing cross-border private capital participation in an investment is theoretically justified where (i) the opportunity cost of investing in a DFI is negative and (ii) public costs must be at the lower end of the spectrum (otherwise it would make more sense to invest in the previous two strategies that bring systemic impact). Admittedly, this is a statement that relies on a number of assumptions, but has meaningful operational consequences. We discuss those below:

- First, the benchmark to capitalizing a DFI only holds where there is an overlap in the underlying investments. One reason why DFIs themselves invest in impact funds is that there is a subset of investments where they are not the most suitable direct investor. Further, recapitalizing a DFI, especially an MDB, is a heavy process that occurs one or twice every decade, so the benchmark is somewhat theoretical. Also, a donor that only wishes to provide de-risking solutions[90] or seek to capture reflows[91] might prefer investing in an ad hoc blended finance program. Long story short, there are many justifiable reasons for favoring the route of blended finance vehicles for mobilizing investors as opposed to capitalizing a DFI. It is however a benchmark worth taking into consideration when assessing these vehicles: what is it that we are getting out of it that we would not by capitalizing a DFI?

- Second, explicit subsidies to institutional investors are justifiable where it leads to systemic impact. A blended finance program targeting local investors that combines regulatory reforms and

[87] Obviously, the resulting investments, by contributing to sustainable and investment growth, can support an improvement in the countries' credit fundamentals, but this occurs in the long run.

[88] The underlying investment may already generate systemic impact, but we focus on the incremental systemic impact that derives from mobilizing cross-border institutional investors.

[89] Incidentally, this creates a challenge for impact measuring tools. Unless the tool accounts for the decreased public cost in one shape or form, the average impact is unchanged and the marginal impact is zero.

[90] E.g. SIDA's (SIDA, 2021) or the European Union's guarantee programs (European Union, 2022).

[91] E.g. Finland's Development policy investments (Ministry for Foreign Affairs of Finland, 2019).

financial incentives to address risk misperceptions may be warranted in line with the first strategy on knowledge spillovers. However, in the case of cross-border investors that are constrained by credit adequacy limits, there should be a higher level of scrutiny for blended finance vehicles that extend explicit subsidies to investors.

- Third, the choice of de-risking blended finance instruments is largely context specific.[92] Applied economics research is largely inconclusive: some research argues that guarantees are the most effective instrument,[93] other conclude the opposite.[94] Based on empirical evidence, the choice of instrument is driven by two variables: project specific factors and programs restrictions. For example, a first loss guarantee may seem an optimal tool for a large de-risking platform with institutional investors but may trigger securitization treatment which would increase the complexity of the transaction and be less efficient than a funded junior participation. Conversely, a guarantee may be the only way to go when wanting to de-risk a local bond issuance where regulation makes funded participations from third-party funds challenging. [95] Embedding flexibility in the choice of instrument within blended finance programs ultimately allows arbitrating in favor of the most effective instrument.

In summary, using blended finance to mobilize institutional investors towards SDG-aligned investments is either a subset of creating productivity spillovers or can contribute to decreasing public costs. However, targeting cross-border institutional investors – who face capital adequacy constraints – limits spillover effects. Using blended finance for the sole purpose of increasing cross-border private capital participation remains a viable strategy, but only to the extent it results in a net decrease of public costs which can only be achieved by minimizing explicit subsidies passed on to investors.

2.4. Bringing it All Together – an Example

Combining the three approaches multiplies impact. In 2013, the Government of Uruguay launched a 200MW tender program to attract private sector participation for the development of solar power plants (in conjunction with tenders for other technologies). US$ 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.[96] 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

[92] This is the point we can generalize for all blended finance instrument, not just de-risking.
[93] Hainz and Hakenes, 2012.
[94] Barder and Talbot, 2015.
[95] In case you are wondering; these are all based on concrete cases.
[96] 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.

novel renewable energy technology. 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 of Uruguay's 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, US$ 4.5 billion of private sector investment flowed to the clean energy sector. Foreign investors were also playing a larger role. In 2018, they accounted for 75% of all capital invested in renewable energy. 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.[97]

[97] Convergence, 2022.

Conclusion

Blended finance effectiveness is a function of causal sustainable development outcomes and public costs, and should factor-in opportunity cost. Its measure of success is the extent in which the private investments it is enabling can induce sustainable and inclusive growth, unlocking the actions linked to the wider set of SDGs.

Blended finance is catalytic where it creates vertical or horizontal productivity spillovers while generating positive environmental and social externalities, or increasing the provision of good and services to poor and vulnerable population, thereby inducing sustainable and inclusive growth.

Using blended finance to mobilize institutional investors towards SDG-aligned investments is either a subset of creating productivity spillovers or can contribute to decreasing public costs. However, targeting cross-border institutional investors – who face capital adequacy constraints – limits spillover effects. Using blended finance for the sole purpose of increasing cross-border private capital participation remains a viable strategy, but only to the extent it results in a net decrease of public costs which can only be achieved by minimizing explicit subsidies passed on to investors.

These investment strategies are complementary but may call for a different set of investment practices, instruments, or players. In practice, this calls for nuanced and sophisticated approaches such as the succession of different steps in the Uruguay case study (see §2.4).

The use of blended finance needs to be anchored in sound development economics. It requires additional multidisciplinary research and education, bridging the fields of finance, sustainable development, and economics.[98]

Practitioners should develop and promote publicly available quantitative and qualitative methodologies to measure effectiveness (e.g., grant equivalent calculators, social cost of externalities, additionality measurements, etc.). Relatedly, blended finance programs should emphasize market-level outcomes (in addition to project outcomes) in programs' evaluation.

Blended finance operates in conjunction with several other instruments such as public sector development finance, technical cooperation, etc. Understanding the complementarity but also the opportunity cost between these different approaches is a key success factor.

Deploying concessional resources requires multidisciplinary capabilities, experience and discipline. Institutional capacity, governance, and track record are key success factors. Adherence to common project-level and institutional-level principles and ensuring those principles are passed through to the entity(ies) that will ultimately allocate subsidies to the market contributes to scarce donor resources being deployed effectively.

[98] While this paper emphasizes welfare economics, further investigating blended finance through the lens of behavioral economics may be a promising research topic.

Annex I: How MDBs Mobilize Institutional Investors

MDBs are capitalized by shareholding governments. It allows them to issue highly rated bonds to institutional investors. To achieve this, MDBs are subject to capital adequacy ratios deriving from rating requirements, amongst others.[99] MDBs also mobilize private capital in their underlying investments. Providing de-risking solutions to private investors increases mobilization at project level but may affect MDB's capital adequacy ratios. All else been equal, any attempt to increase MDBs' de-risking solutions to leverage institutional capital is conceptually a zero-sum game.[100] This leaves us with at least four possibilities for MDBs to increase shareholder's value for the buck by crowding-in institutional capital participation.

First, increase mobilization without changing MDBs fundamentals. For example, instead of lending US$ 40 million to one single BB+ project with a given impact we could lend US$ 10 million to four of the same projects and crowd-in institutional capital on the back of the MDB's mobilization products and halo effect.[101] There is so much upside here because you soon hit institutional investors' maximum risk appetite, but it is a proven and successful strategy, always subject to internal incentives being aligned (i.e. volumes incentives should also include direct mobilization). There are other possibilities, such as packaging uncorrelated assets to benefit from a rating uplift through diversification, active portfolio management, or simply developing new mobilization products such as unfunded credit protections[102] that may cater to untapped pockets of capital. In other words, we should not disregard the opportunity to increase mobilization without arbitrating MDB's capital structure but be mindful that so much can be achieved on that basis (and also that product development, agency management, etc. generate costs of their own which may affect the relevancy of these approaches).

Second, look for arbitrages between the different capital structures of MDBs and institutional investors. In the event MDBs have looser capital adequacy ratio than institutional investors, it may make sense for them to move towards de-risking and "tranching" solutions, even if that implies a reduction in their balance sheet leverage. We have mentioned that US Insurers capital requirements increase 5.1x when investing in single-B relative to BBB assets. If MDBs' capital requirements are lower, there is an opportunity to arbitrate and MDBs should focus on de-risking even if it might imply lesser volumes. Here again, there is only so much additional mobilization one may achieve as it is an arithmetic function of the difference in the various capital adequacy models. Conversely, where there are no arbitrage opportunities, MDBs might be better off by provide direct financing without seeking to subordinate themselves to institutional capital. This is rather theoretical. There are several

[99] Because this is topical matter, it is worth noting that there is an ongoing debate within the development finance community on whether MDBs are fully taking advantage of their leverage capacity at the balance sheet level (without affecting their rating or capital adequacy ratio).

[100] In other words, any attempt to tranche a B-rated portfolio into an institutional investors IG tranche and a low B / CCC de-risking MDB tranche is going to affect one way or the other the MDB's ability to leverage its own capital.

[101] Brocolini et al., 2021.

[102] Those solution can free-up capital for MDBs but they may be capped by internal policies or rating agency requirements.

operational complexities (e.g. capital adequacy requirements vary from investor class to the other) which may ultimately justify a middle ground.

Third, a more radical approach would be to arbitrate between different capital adequacy models for MDBs. It may be the case that operating under a single-A rating instead of AA/AAA allows for more sustainable development impact for the same amount of capital.[103] This could be a path worth looking at, but it is an even more complex one that would not only require shareholders buy-in, but would also have considerable organizational consequences that should be factored in.

Fourth, increase the quantum of public capital available, with the specific intent of increasing mobilization. This could be achieved through a capital increase exercise, but then you are still operating within the parameters discussed above. An alternative is to rely on off-balance sheet or capital relief structures, which are generally considered to be in the realm of blended finance. There are many proven models available, from trust funds, [104] to dedicated asset management companies,[105] or mobilization platforms.[106] Those are discussed in the main body of the paper.

[103] Humphrey, 2021.
[104] Such as Global Affairs Canada and IDB Invest's Canadian Climate Fund for the Private Sector in the Americas (link).
[105] Such as EDFI Management Company (link).
[106] Such as IFC's MCPP (link).

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