Journal of Financial Economics 183 (2026) 104321

Contents lists available at ScienceDirect

Journal of Financial Economics

journal homepage: www.elsevier.com/locate/jfec

Blended finance☆

Caroline Flammer[a,b,c,d,e,*], Thomas Giroux[f,g], Geoffrey M. Heal[a,b]

[a] Columbia University, New York, NY 10027, USA
[b] National Bureau of Economic Research (NBER), Cambridge, MA 02138, USA
[c] Asian Bureau of Finance and Economic Research (ABFER), Singapore 117592, Singapore
[d] Centre for Economic Policy Research (CEPR), London EC1V 0DG, UK
[e] European Corporate Governance Institute (ECGI), Brussels 1180, Belgium
[f] ETH Zurich, Zurich, Switzerland
[g] Swiss Finance Institute (SFI), Zurich, Switzerland

ARTICLE INFO

Dataset link: Replication Package BF (Original data)

Keywords:
Blended finance
Catalytic capital
Development finance institutions (DFIs)
Sustainable finance
Sustainable development goals (SDGs)
Public-private partnerships

ABSTRACT

Blended finance—the use of public and philanthropic funding to crowd in private capital—has emerged as a potential tool for financing sustainable development. Yet little is known about the design of blended finance contracts. We develop a conceptual framework in which development finance institutions (DFIs) allocate concessional capital across projects to maximize societal impact while crowding in private investors. Our framework highlights a trade-off between sustainability impact and the amount of concessionality required to make projects commercially viable and characterizes how DFIs optimally combine different instruments, including concessional debt, junior equity tranches, and risk management facilities. We then provide empirical evidence on blended finance using deal-level data from a major DFI. Consistent with our conceptual framework, projects with higher anticipated sustainability impact receive greater concessionality. Moreover, concessionality is higher in countries with greater political risk and information asymmetries, and these projects are more likely to include risk management provisions. Our findings provide new evidence on how DFIs deploy catalytic capital to mobilize private investment in sustainable development.

1. Introduction

Governments and international organizations have increasingly emphasized the need for investment in projects related to climate mitigation, environmental protection, biodiversity conservation, and poverty alleviation. Historically, such investments have been primarily financed through public funding and private philanthropic giving. Yet, a large financing gap remains, especially in the Global South.[1] One approach that has emerged in response to this financing gap is the practice of blended finance. In blended finance, private capital is "blended" with public or philanthropic capital, which is used to subsidize and de-risk private capital. As such, the blending can serve as a catalyst for private capital investments in projects that create societal value but would otherwise not be financed. Blended finance has helped fund a broad range of projects on renewable energy, climate technology, nature-based solutions, and social inclusion, among others.

While blended finance is not novel, it is still in its infancy and not well understood. In particular, little is known on how the degree of concessionality is optimally determined, and how different financial instruments are combined within deals to crowd in private investment.

☆ Toni Whited was the editor for this article. We are grateful to the editor, and anonymous referee, seminar participants at the 2025 American Economic Association (AEA) Meetings, the 2025 European Finance Association (EFA) Meetings, the 2025 HKU Summer Finance Conference (Hong Kong), the 26th Bioecon Conference (Cambridge), the 2026 Stanford Conference on Environmental Entrepreneurship, Columbia, Wharton, Erasmus, ESCP Business School, ETH Zurich, Imperial, Indiana University, Insper, Ivey Business School, LSE, Maastricht University, the Norwegian School of Economics (NHH), Syracuse University, Tilburg University, UC Boulder, the University of Illinois Urbana-Champaign, the University of South Carolina, the University of Virginia, the University of Zurich, and S&P Global, as well as Chiara Colesanti Senni, Matthieu Pegon, Ludovic Phalippou, and José Scheinkman for helpful comments and suggestions. We thank Chandana Yelkur for excellent research assistance.

* Corresponding author at: Columbia University, New York, NY 10027, USA.
E-mail address: caroline.flammer@columbia.edu (C. Flammer).

[1] According to the Inter-American Development Bank, the financing gap to meet the objectives of the United Nations' Sustainable Development Goals (SDGs) is several trillions of dollars per year (IDB, 2023).

https://doi.org/10.1016/j.jfineco.2026.104321
Received 13 September 2025; Received in revised form 30 May 2026; Accepted 5 June 2026
Available online 18 June 2026

In fact, there is a near complete lack of academic research studying blended finance. In this paper, we aim to fill this gap. First, we provide a conceptual framework that characterizes how development finance institutions (DFIs) allocate concessional capital across projects to crowd in private investment. Our framework highlights the trade-off between sustainability impact and the concessionality required to make projects commercially viable. We further extend our framework to allow DFIs to deploy different instruments—such as concessional debt, junior equity tranches, and risk management facilities—and characterize the optimal mix of these instruments. Second, we provide empirical evidence on blended finance using data on the blended finance deals of a major DFI, namely the World Bank's International Finance Corporation (IFC).

To fix ideas, let us first describe an example of a blended finance deal. In a deal that was finalized on October 7, 2023, the IFC provided a concessional loan that helped finance a €100 million project whose goal is to promote sustainable cocoa sourcing in Côte d'Ivoire. The project is conducted by the Ivorian subsidiary of the company Sucden (Sucres et Denrées), who received the funding in the form of a €100 million syndicated loan. The IFC's share was a loan of €40 million at a concessional rate (that is, a below-market interest rate), while the remaining €60 million was provided by other lenders at market rates. In their description of the deal, the IFC notes that "[w]ithout the support of the blended finance co-investment, the Project will not go ahead due to heightened project risk, political risk, and low expected return. As a result, the Project would not be carried out as planned and the subsequent benefits for the smallholder farmers, as well as on the market competitiveness will not be achieved." This deal is representative of blended finance deals in that it combines (i.e., blends) concessional funding with private capital, with the explicit objective of improving the risk-return profile of private capital. By doing so, the concessional funding serves as a catalyst for private investments in a project that creates societal value but would otherwise not be financed. In this example, the blending is done in the form of a loan at a below-market interest rate. This is one of many ways in which blended finance deals can be structured. Others include the provision of a junior equity tranche, the provision of risk management facilities (such as cross-currency swaps, first loss guarantees, risk-sharing facilities, and interest rate buydowns), and the provision of performance-based incentives (in which additional payments are made conditional on the achievement of key performance indicators). Blended finance deals can include multiple blending provisions (e.g., a concessional loan combined with cross-currency swaps to hedge currency risks).

In this paper, we first introduce a conceptual framework that formalizes the decision-making of DFIs that engage in blended finance. Our framework takes the perspective of a DFI (such as the IFC) that has a limited budget obtained from governments and philanthropic donors. The DFI invests in projects with the objective of adding the greatest possible societal value. By providing concessionality (e.g., in the form of loans at below-market interest rates), the DFI is able to crowd in private capital in projects that create societal value, but whose private returns would otherwise not be competitive enough to attract private investments. In selecting projects, the DFI faces a trade-off between societal impact and concessionality. The main prediction from this framework is that the greater the public goods and positive externalities associated with the project—that is, the higher the anticipated sustainability impact—the more the DFI is willing to provide concessionality. Intuitively, since concessionality is costly to DFIs, the expected societal returns need to be sufficiently high to justify the cost. Another prediction from our framework is that the higher the risk of the projects (e.g., due to political risks or information asymmetries in the country of the projects), the higher the concessionality that DFIs need to provide to appeal to private investors. Moreover, as risk management is likely more effective in mitigating project risk, we expect risk management provisions (e.g., first loss guarantees) to be more prevalent among riskier projects.

We then provide empirical evidence on blended finance. One challenge of studying blended finance is the scarcity of the data, as financial institutions rarely disclose information on their blended finance deals. A notable exception is the IFC. The IFC is the private-sector arm of the World Bank, whose mission is to advance sustainable development by investing in for-profit and commercial projects. In recent years, the IFC started disclosing detailed information about their blended finance deals. As part of their disclosure, they report the degree of concessionality. The latter is computed by the IFC as the subsidy from the blending (taking into account all blending provisions), expressed as a percentage of the total project cost. For example, a concessionality of 5% implies that the subsidy from the blending is 5% of the total investment cost. The degree of concessionality is the key information that we use in our empirical analysis.[2,3]

Our dataset consists of 173 blended finance deals from 2018 to 2023. About half of these deals finance projects in Africa (50.9%). The remaining projects are primarily in Asia and the Pacific (22.0%), Latin America and the Caribbean (11.6%), Eastern Europe (6.9%), and the Middle East (5.2%). These projects span various industries, both in the industrial and financial sectors. Within the industrial sector, the more prevalent industries are agribusiness and forestry (15.6% of the deals), infrastructure (8.7%), and manufacturing (7.5%).

We first examine the relationship between the project's anticipated sustainability impact and the degree of concessionality. To do so, we use two different measures of anticipated sustainability impact. First, the IFC computes a metric called AIMM ("Anticipated Impact Measurement and Monitoring"). This metric compiles the assessment of the IFC across a series of criteria based on a scorecard developed by the World Bank. This metric is described in IFC (2024) and aims to "enable[s] IFC to better define, measure, rate, and monitor the development impact of each investment project" (p. 54). We follow the IFC methodology to construct this metric using the information provided in the project's description. Using this metric, we find evidence of a positive association between the project's anticipated sustainability impact and the degree of concessionality. Specifically, we find that a one-standard deviation higher AIMM corresponds to a blending subsidy that is higher by 2.0 to 2.6 percentage points.

Second, as an alternative metric of anticipated sustainability impact, we count the number of Sustainable Development Goals (SDGs) to which the project contributes. We again find evidence of a positive association between sustainability impact and the level of concessionality. Our estimates imply that a one-standard deviation increase in the count of SDGs corresponds to a blending subsidy that is higher by 1.9 to 2.3 percentage points.

Taken together, these findings indicate that DFIs provide a higher degree of concessionality for projects that have higher anticipated sustainability impact, which is consistent with the main prediction from our conceptual framework. Naturally, we caution that this inference is correlational and hence need not warrant a causal interpretation. Establishing causality would be difficult since the IFC does not randomly select projects. Rather, our objective is to characterize the association between the project's anticipated sustainability impact and the degree of concessionality in order to (1) gain insights into how DFIs (such as the IFC) set the degree of concessionality, and (2) benchmark the empirical

[2] To our knowledge, the IFC is the only blended finance provider that discloses information on concessionality levels, which was part of the IFC's recent effort to enhance their disclosure. As the IFC notes, "[i]n 2019, IFC announced it would hold itself to the highest standards of transparency when deploying concessional resources: IFC now discloses in its Summary of Investment Information, the subsidy levels for each proposed project along with justification for why it is necessary. IFC is the only DFI or blended finance implementer taking this step to date" (IFC, 2025).

[3] While this paper uses data disclosed by the World Bank's IFC, we conducted the analysis independently and without any involvement from the IFC or the World Bank. We had full discretion over the research design, analysis, and conclusions, and no pre-publication review or approval was required.

evidence against our theoretical framework.

We further examine how the concessionality varies depending on political risk and information asymmetries in the country of the projects. To the extent that private investors worry about political risk and information asymmetries, DFIs may need to provide higher concessionality when financing projects in higher-risk countries. We find that this is indeed the case. That is, the degree of concessionality is higher for projects in countries with a higher degree of political risk (measured using data from the World Bank's world development indicators) and information asymmetries (measured using data from the Open Data Inventory). We further document that the deal structure is significantly more likely to include risk management provisions for projects that are conducted in these countries. These findings are again consistent with our conceptual framework that predicts higher concessionality, and a higher reliance on risk management provisions, for riskier projects.

While our main analysis focuses on differences in concessionality among blended finance deals (that is, the intensive margin of blending), another relevant dimension is the decision to blend vs. not to blend (that is, the extensive margin). Since the IFC also invests in projects at market rates without partnering with others, we can contrast their blended vs. non-blended deals. When doing so, we obtain results that mirror those at the intensive margin. Specifically, we find that blended finance deals are more prevalent among projects that have a higher anticipated sustainability impact, and in countries with a higher degree of political risk and information asymmetries.

We caution that, while our results indicate that higher concessionality is granted to projects with higher anticipated sustainability impact, this need not imply that DFIs select the most impactful projects. For example, donor-imposed restrictions (e.g., in terms of SDGs or regions) may distort the project selection. These considerations are beyond the scope of our study, since we do not have data on the pool of projects that are available to DFIs (including those they are not pursuing). Relatedly, our measures of anticipated sustainability impact are ex-ante measures. Essentially, they capture information that is available to DFIs at the time of their decision-making about whether or not to undertake the investment and how much concessionality to use. Assessing the ex-post (i.e., realized) sustainability impact of the projects is a different question that would require post-completion data. Such data are not available since the projects in our sample are still ongoing.

This study makes several contributions to the literature. First, by studying the economics of blended finance, our study adds to the literature on sustainable finance (e.g., Bolton and Kacperczyk, 2021, 2023; Cao et al., 2026; Coqueret et al., 2025; Flammer, 2021; Garel et al., 2024, 2026; Giglio et al., 2026; Hong et al., 2020; Pastor et al., 2022; Sautner et al., 2023), as well as the literature that studies investors' attitude toward sustainability (e.g., Gibson Brandon et al., 2022; Heeb et al., 2023; Ilhan et al., 2023; Krueger et al., 2020). This literature focuses on the role of pure private capital (in the form of debt, equity, and venture capital investments), but does not consider the role of DFIs and private-public partnerships.

Second, our study contributes to the nascent literature that studies blended financing structures. In this regard, the most closely related papers are Flammer et al. (2025) and Kotchen and Vogt (2025). Flammer et al. (2025) examine how private capital can help finance the protection and restoration of biodiversity. They compare biodiversity projects that are financed by pure private capital vis-à-vis blended financing structures. Kotchen and Vogt (2025) examine the co-financing objectives of environmental multilateral funds such as the Global Environment Facility (GEF) and the Green Climate Fund (GCF). They show that co-financing objectives can backfire, as they may tilt the project selection toward projects with higher co-financing ratios as opposed to higher environmental impact.

Our paper differs from these two studies in several ways. First, unlike Flammer et al. (2025), we study investment decisions from the perspective of DFIs as opposed to private investors. The decision-making of DFIs is inherently different, as DFIs aim to support development objectives by financing projects with positive externalities and by providing catalytic capital intended to crowd in private investment. Second, in contrast to both papers, we delve into the "black box" of blended finance deals and characterize their degree of concessionality as well as their mix of concessional instruments. This goes beyond the consideration of co-financing ratios in Kotchen and Vogt (2025). Indeed, co-financing targets emphasize the share of external capital mobilized alongside the fund's own resources, while our study examines the use of concessional instruments (e.g., below-market loans, junior equity tranches, or guarantees) which aim to alter the project's risk-return profile and crowd in private investors. Third, our study is broader in scope as it goes beyond the mitigation of climate change and biodiversity loss. Instead, we consider blended finance solutions that contribute to the full range of SDGs.

The remainder of this paper is organized as follows. Section 2 presents our conceptual framework. Section 3 describes the data and provides a characterization of the blended finance deals. Section 4 describes the methodology. Section 5 presents the results. Section 6 compares blended vs. non-blended deals. Finally, Section 7 concludes.

2. Conceptual framework

In this section, we provide a conceptual framework that formalizes the decision-making of a development finance institution (DFI) that provides concessional capital in a blended finance deal in order to crowd in private capital. The concessional capital is used to finance projects that create societal value, in keeping with the DFI's mission. In what follows, we first provide the intuition in the form of figures, and then formalize this intuition in a model.[4]

2.1. Intuition

Let us consider a set of investment projects indexed by i. Each project has a private return R_i and a societal return S_i. Both dimensions are displayed in Panel A of Fig. 1, in which the X-axis plots the societal returns, and the Y-axis the private returns. The figure also displays the 45-degree line. Projects that are above the 45-degree line have negative externalities or produce public bads ($R_i > S_i$), while projects that are below have positive externalities or produce public goods ($R_i < S_i$). The figure displays the private investors' hurdle rate H (horizontal dashed line), such that private investors only invest in projects with $R_i \geq H$. Similarly, the figure displays the DFI's societal hurdle rate D (vertical dashed line) that captures the minimum societal return a project needs to deliver to meet the DFI's mission statement.

The relevant set of projects for blended finance are those that (a) have positive externalities (that is, projects that are below the 45-degree line), (b) are not financed by private markets (that is, projects whose private returns are below the private investors' hurdle rate H), and (c) have societal returns above the DFI's societal hurdle rate D. In other words, the set of relevant projects for blended finance is given by the shaded area spanned by the 45-degree line (dotted line), the private investors' hurdle rate H (horizontal dashed line), the DFI's societal hurdle rate D (vertical dashed line), and the X-axis. This area is marked as "set of relevant projects for blended finance" in the figure.

How do DFIs select and finance projects within the relevant set? To illustrate their decision-making, let us assume that a DFI has identified three potential projects within the shaded area. These three projects are displayed in Panel B of Fig. 1. To crowd in private capital, the DFI needs to provide concessional funding that would enhance the project's private return from R_i to H. The extent of concessionality needed until the

[4] This conceptual framework draws from the practitioner literature that discusses the considerations and trade-offs faced by DFIs when undertaking blended finance investments (IMF, 2013; IDB, 2023).

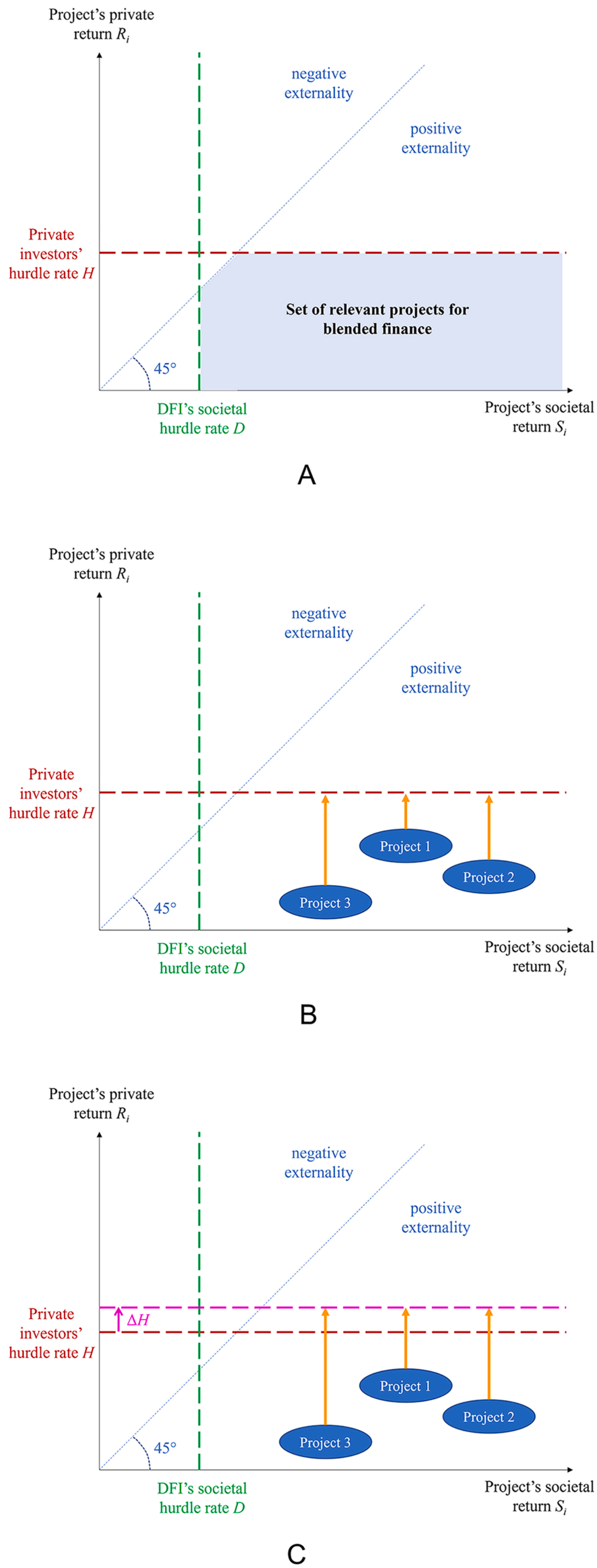

Fig. 1. Conceptual framework.

project is commercially viable is given by the return shortfall $\Delta_i = H - R_i$, which is represented by the orange arrows in the figure. If the DFI faces no budget constraints, the DFI would invest in all three projects, as each of them fulfills the relevant criteria for blended financing. However, DFIs only have limited budgets due to the scarcity of donations, government grants, and other sources of concessional capital. If the projects are of the same size and the DFI only has budget for two of the projects, the DFI would optimally select projects 1 and 2. This is because project 3 is strictly dominated by projects 1 and 2, as project 3 has both a lower societal return and a lower private return (and hence requires a higher degree of concessionality to be commercially viable).

If the DFI only has budget for one of the three projects, the DFI will pick between project 1 and project 2. This decision entails a trade-off between societal impact and concessionality. That is, project 2 has higher societal returns, but also requires a higher degree of concessionality. In contrast, project 1 requires less concessionality, but yields lower societal returns. Ultimately, the decision between projects 1 and 2 depends on the extent of the societal benefits relative to the concessionality requirements. Accordingly, a testable prediction is that, all else equal, DFIs provide a higher degree of concessionality for projects that have higher anticipated sustainability impact. This is the main hypothesis that we examine empirically.

In Panel C of Fig. 1, we consider a situation in which the risk of the projects, or the extent to which they are subject to information asymmetries, increases. In this case, private investors require a higher hurdle rate, which corresponds to an upward shift of the horizontal dashed line in the figure. As a result, the concessionality requirements (represented by the orange arrows) increase. Intuitively, the lower the appeal of the projects to private investors—e.g., due to higher political risk or a higher degree of information asymmetries—the more the DFI needs to enhance the projects' appeal through concessionality, which provides another testable prediction that we will bring to the data.

Finally, concessionality can be provided in a variety of ways. One way is to co-invest at below-market rates. Another way is to use concessional capital to finance risk management provisions (e.g., first loss guarantees). As risk management is likely more effective in mitigating project risk, we expect risk management provisions to be more prevalent among riskier projects. This provides an additional testable prediction that we explore empirically.

2.2. Model

In what follows, we formalize the intuition from Section 2.1 in a model. In keeping with the setup outlined above, we consider a set of possible investment projects that are indexed by $i, i \in [0, I]$. We assume that each project costs \$$C$. The societal return on project i is $S(i)$ and the private return is $R(i)$, where $S(i) \geq R(i)$. We are only considering projects with positive externalities. We assume that projects are ranked by the index i in decreasing order of private returns, so that $dR(i)/di \leq 0$. All projects have the same societal return $S(i) = S$. Finally, the private hurdle rate is H, so that the private sector will invest in any project for which $R(i) \geq H$. We assume that $S \geq H$. We let i^* be the value of i at which $R(i^*) = H$, that is, project i^* is the marginal privately-profitable project. Projects with $i > i^*$ will only be executed if additional incentives are provided to private investors, which can be achieved through blended finance.

Let us assume that a DFI, or a sustainable investment fund, has a total sum of \$$K$ to invest and wants to invest this capital to add the greatest possible societal value. The DFI will clearly not invest in any project for which $i \leq i^*$ for the private sector will invest in these. It will focus on projects for which $i > i^*$ and will seek a strategy that leads to the maximum number of these being executed. It could just invest in the first K/C projects for which $i > i^*$ but it can do better than this by leveraging private investment and using its capital to raise the return on projects for which $i > i^*$ up to the hurdle rate.

There are several ways in which the DFI can raise the returns to private investors. In this section, we assume that the DFI uses concessional capital to co-invest at a below-market rate (that is, a rate that is less than the private hurdle rate).[5] In the extended model of Section 2.3, we then consider different forms of concessionality.

For simplicity, and without loss of generality, we assume that the concessional capital used for the co-investment seeks a zero rate of return. Consider project i' with $i' > i^*$ and hence $R(i') < H$. We let $\Delta(i') = H - R(i')$ be the shortfall between the commercial hurdle rate and the private return on project i'. Suppose the DFI provides an amount of capital $K(i')$ to this project at a zero rate of return. Then the modified return $R_m(i')$ to a commercial investor who provides the balance of $C - K(i')$ is

$$R_m(i') = R(i')\frac{C}{C - K(i')}$$

and for this modified return to equal the hurdle rate the provision of concessional capital has to satisfy

$$K^*(i') = C\left[1 - \frac{R(i')}{H}\right] = C\left[\frac{H - R(i')}{H}\right] = C\frac{\Delta(i')}{H}. \tag{1}$$

The concessional contribution has to equal the cost (\$$C$) times the shortfall as a proportion of the hurdle rate. So if, for example, the shortfall is 20% of the hurdle rate, the concessional contribution has to be 20% of the project cost.

The optimal policy for the DFI is to spend its capital K leveraging private funds in this fashion. It will fund projects from i^* to $\hat{i}$ where $\hat{i}$ is given by

$$\int_{i^*}^{\hat{i}} K^*(i)di = K,$$

that is,

$$\int_{i^*}^{\hat{i}} K^*(i)di = \frac{C}{H}\int_{i^*}^{\hat{i}} \Delta(i)di = K.$$

To simplify, we assume that $R(i)$ is a linear function of i with slope coefficient $-\beta$, $\beta > 0$. Moreover, since we are not interested in projects for which $i < i^*$, we set $i^* = 0$. Then the shortfall $\Delta(i) = \beta i$ and

$$\frac{C}{H}\int_{i^*}^{\hat{i}} \Delta(i)di = \frac{C}{H}\int_{0}^{\hat{i}} \beta i di = \frac{C}{2H}\beta\hat{i}^2 = K,$$

so that the last project funded, the $\hat{i} - th$, is given by

$$\hat{i} = \sqrt{\frac{2HK}{C\beta}}.$$

The main insight from this analysis is that it establishes a relationship between the degree of concessionality and the deficit from the hurdle rate, $K^*(i') = \Delta(i')\frac{C}{H}$, as conveyed in Eq. (1). We can think of the deficit from the hurdle rate as a measure of the extent to which the societal benefits from the project are non-monetizable, that is, the extent to which they are positive externalities or public goods. Accordingly, a testable prediction is that the more public or external the benefits of a project, the more will DFIs be willing to provide concessionality through blended finance. As mentioned above, this is the main hypothesis that we will bring to the data.

[5] As we document in Section 3.2.2, the provision of concessional capital at a below-market rate is the more prevalent form of blending in our sample of blended finance deals.

Our model is also helpful to think about how concessionality would respond to private investors being more reluctant to invest in blended finance projects. For example, consider a situation in which the risk of the projects, or the extent to which they are subject to information asymmetries, increases. In this case, investors would require a higher hurdle rate H. Using the expression from Eq. (1), we obtain:

$$\frac{\partial K^*(i')}{\partial H} = C\frac{R(i')}{H^2} > 0,$$

that is, the degree of concessionality increases. Intuitively, the lower the appeal of the projects—e.g., due to higher political risk or a higher degree of information asymmetries—the more the DFI needs to enhance the projects' appeal through concessionality, which provides another testable prediction that we will bring to the data.

2.3. *Extension with different forms of concessionality*

2.3.1. *Model*

In the baseline model of Section 2.2, we assumed that the concessional capital was in the form of a co-investment that seeks a zero rate of return. In practice, however, concessional capital comes in many flavors. As we show in Section 3.2.2, the most common forms of concessional capital are concessional debt (e.g., debt at below-market rates), concessional equity (e.g., a junior tranche), and risk management facilities (e.g., first loss guarantees). To account for these different forms of concessional capital, we extend our baseline model by assuming that the DFI investing in project i can provide concessional capital in three different ways: (1) concessional debt $K_i^D \geq 0$, (2) concessional equity $K_i^E \geq 0$, and (3) risk management facilities $K_i^R \geq 0$. For risk management facilities to be meaningful, we further assume that the project's returns are risky, that is, $R(i)$ now denotes the project's expected return. The total capital provided by the DFI for project i is then given by

$$K_i \equiv K_i^D + K_i^E + K_i^R.$$

As in the baseline model, the DFI has a limited budget K and maximizes societal value net of the cost of concessionality. That is, the DFI solves:

$$\max_{\{K_i^D, K_i^E, K_i^R\}} \sum_i S(i) - \sum_i C_i\left(K_i^D, K_i^E, K_i^R\right) \text{ s.t. } \sum_i K_i \leq K,$$

where $C_i\left(K_i^D, K_i^E, K_i^R\right)$ is the DFI's grant-equivalent cost of providing concessional financing to the project.

To solve the model, we assume that the financing costs are convex. This follows the corporate finance literature that often assumes convex costs of external financing (e.g., Hennessy and Whited, 2007). Under this assumption, the cost function is given by

$$C_i\left(K_i^D, K_i^E, K_i^R\right) = \sum_{j \in \{D,E,R\}} \frac{c_i^j}{2}\left(K_i^j\right)^2, c_i^j > 0,$$

where c_i^j is the grant-equivalent marginal cost to the DFI of providing a given amount of capital K_i^j through instrument j for project i. For simplicity, we set $c_i^j = 1$.

Under this formulation, the marginal cost of deploying instrument j increases with its scale, capturing the diminishing returns to scale in the use of any single instrument. This ensures that the optimal concessional package generally involves a combination of debt, equity, and risk-mitigation instruments.

Finally, as in our baseline model, private investment is crowded in if and only if the project's modified private return $R_m(i)$ meets the private investors' hurdle rate H. We model the modified private return as

$$R_m(i) = R(i) + a_i^D K_i^D + a_i^E K_i^E + a_i^R K_i^R, \tag{2}$$

where $a_i^j > 0$, $j \in \{D, E, R\}$, captures the marginal effectiveness of instrument j in improving the project's expected return.

Eq. (2) can be interpreted as a reduced-form representation of how different financial instruments relax different participation constraints. In standard contract theory, debt, equity, and risk management provisions differ in their payoff structure, risk allocation, and sensitivity to informational frictions. Here, these differences are summarized by instrument-specific effectiveness parameters a_i^j rather than modeled explicitly.

Private investors then invest if the modified private return exceeds their hurdle rate (viability constraint):

$R_m(i) \geq H.$

2.3.2. Solution

As in our baseline model, we define the private-return shortfall as

$\Delta_i \equiv H - R(i).$

The viability constraint can then be written as

$a_i^D K_i^D + a_i^E K_i^E + a_i^R K_i^R \geq \Delta_i.$

For a given project i, the DFI minimizes the cost of meeting the viability constraint:

$$\min_{K_i^D, K_i^E, K_i^R} \sum_j \frac{\left(K_i^j\right)^2}{2} \quad \text{s.t.} \sum_j a_i^j K_i^j \geq \Delta_i.$$

The first-order conditions imply

$$\left(K_i^j\right)^* = \mu_i a_i^j, \; j \in \{D, E, R\},$$

where $\mu_i > 0$ is the Lagrange multiplier on the viability constraint. Rearranging, we obtain

$$\left(K_i^j\right)^* = \frac{\Delta_i}{A_i} a_i^j, \; A_i = \sum_j \left(a_i^j\right)^2 > 0, \; \frac{\left(K_i^j\right)^*}{\left(K_i^l\right)^*} = \frac{a_i^j}{a_i^l}, \tag{3}$$

and the cost of providing the optimal amount of concessional financing is given by

$$C_i^* = \sum_j \frac{\left(\left(K_i^j\right)^*\right)^2}{2} = \frac{\Delta_i^2}{2A_i}.$$

The key insight is that the DFI allocates concessional financing by trading off the marginal effectiveness of each instrument against its marginal cost. The first-order condition then conveys the usual economic intuition that DFIs set the mix of concessional instruments such that their marginal benefits equal their marginal costs, as captured by the expression on the right-hand side of Eq. (3). This implies that, if a specific instrument is more effective in addressing a given participation constraint of private investors, relatively more of this instrument will be used.

2.3.3. Predictions

a. Risk management.

By construction, risk management provisions are designed to reduce the riskiness of project returns. Consequently, riskier projects are characterized by a higher a_i^R. As per Eq. (3), a higher a_i^R implies that the DFI allocates a larger share of its budget to risk management provisions.

Intuitively, when a_i^R is higher, risk management provisions are more effective at closing the private-return gap, leading the optimal allocation to place more weight on K_i^R and relatively less on other instruments. A direct prediction is therefore that risk management provisions should be more prevalent in riskier projects.

b. Equity* vs. *debt.

The optimal mix of concessional equity K_i^E and concessional debt K_i^D depends on a_i^E and a_i^D, that is, the extent to which these instruments are effective in addressing specific participation constraints of private investors. Accordingly, the optimal mix depends on the potential determinants of a_i^E and a_i^D. In this regard, the literature on contract theory and security design highlights the role of information asymmetries and project risk in shaping the optimal mix of equity and debt.[6]

While this literature provides a helpful basis to think about the DFI's choice between equity and debt, it is important to emphasize two critical distinctions from standard contract theory. Standard contract theory focuses on (1) value maximization and (2) contracting between a firm (or entrepreneur) and outside investors. In contrast, blended finance aims to mobilize private capital and involves contracting among heterogeneous investors, in which public DFIs and private investors assume distinct roles based on their risk-bearing capacities and mandates. DFIs, characterized by higher risk tolerance, longer investment horizons, and development-oriented objectives, can absorb project risk that private investors are less willing to bear. Private investors, in contrast, face tighter risk-return constraints and generally prefer safer, debt-like instruments or senior tranches, particularly in contexts of high information asymmetry or project risk.

From this perspective, DFIs can more effectively mobilize private capital—and hence address the private investors' participation constraints—by taking subordinate, equity-like positions. When projects are risky, such positions are more effective at absorbing first losses, thereby de-risking senior claims held by private investors. When information asymmetries are high, such positions are more effective in signaling confidence to private investors. In terms of the model, one would therefore expect a_i^E to be higher than a_i^D—and hence the DFI's financing to be tilted toward equity—for projects with higher risk and greater information asymmetries. In Section 5.4, we empirically examine the extent to which DFIs use debt and equity in blended finance structures and how this relates to project risk and information asymmetries.

3. Data and summary statistics

3.1. Data

The data on blended finance deals are obtained from the International Finance Corporation (IFC). The IFC is the private-sector arm of the World Bank. The IFC's mission is to advance sustainable development by investing in for-profit and commercial projects. While the IFC invests in a variety of ways, several of their investments are in the form of blended finance investments.

In their blended finance practices, the IFC follows five principles, known as the "DFI enhanced principles for blended concessional finance

[6] Under information asymmetries, uninformed investors tend to prefer debt because its fixed payoff is less sensitive to private information about project fundamentals and therefore less exposed to adverse selection (e.g., Myers and Majluf, 1984). By contrast, equity is more information-sensitive, and equity retained by informed investors can serve as a credible signal of project quality (e.g., Leland and Pyle, 1977). When projects are risky, firms may favor equity because its state-contingent payoff structure better absorbs risk, whereas debt can generate financial distress and inefficient investment distortions (e.g., Jensen and Meckling, 1976; Myers, 1977). In models of costly state verification, however, debt may be optimal when outcomes are difficult to verify, since it minimizes expected verification costs by triggering monitoring only in default states (e.g., Gale and Hellwig, 1985; Townsend, 1979). More generally, optimal contracting models emphasize that capital structure should allocate risk to agents best able to bear it while limiting distress costs and preserving incentives (e.g., Allen and Gale, 1988; Bolton and Scharfstein, 1990). Finally, security design theory shows that junior (equity-like) tranches absorbing first losses can increase the value of senior claims by reducing information sensitivity and broadening the investor base (e.g., DeMarzo, 2005).

for private sector projects" (IFC, 2025). These principles aim to ensure that the financing is "additional" (that is, it contributes to projects that would otherwise not be funded), that it contributes to the crowding-in of private capital, and that the project adheres to high standards in terms of corporate governance, social and environmental impact, transparency, and disclosure.[7]

In keeping with these principles, the IFC discloses information on their blended finance deals on an ongoing basis. We obtained the deal information from the IFC website.[8] To be included in our sample, deals needed to (a) be labeled as blended finance deals, (b) include information about the financing of the deal, and (c) include information about the level of concessionality (that is, the "subsidy" from the blended finance co-investment). These criteria yield a sample of 173 deals from 2018 to 2023.

3.2. Descriptive statistics

3.2.1. Deals by country and industry

We start our empirical analysis with a characterization of the deals in our sample of 173 blended finance deals from 2018 to 2023. Table 1 provides a breakdown of the deals by countries. As can be seen, about half of the deals are in Africa (50.9%), followed by Asia and the Pacific (22.0%), Latin America and the Caribbean (11.6%), Eastern Europe (6.9%), and the Middle East (5.2%). The location of these projects is further illustrated in Fig. 2. In that figure, the darker-shaded areas indicate countries with a higher number of blended finance deals.

In Table 2, we provide a breakdown of the deals by industries, using the industry classification of the IFC. As can be seen, about half of the deals are in the industrial sector (Panel A), while the other half is in the financial sector (Panel B).[9] Within the industrial sector, the more prevalent industries are agribusiness and forestry (15.6% of the deals), infrastructure (8.7%), and manufacturing (7.5%). Within the financial sector, the more prevalent industries are commercial banking with respect to general credits (12.7%) and trade and supplier credits (6.4%).

3.2.2. Types of blending

Table 3 provides a breakdown of the blended finance deals by the type of blending. The blending can be in the form of a concessional loan (that is, a loan at a below-market interest rate), a junior equity tranche, a risk management provision (such as cross-currency swaps, first loss guarantees, risk-sharing facilities, and interest rate buy-downs), or performance-based incentives (in which additional payments are made conditional on the achievement of key performance indicators). These provisions can be cumulative. For example, the IFC can provide a concessional loan combined with cross-currency swaps to provide cheaper capital (through the concessional loan) while hedging the currency risk faced by private investors (through the provision of cross-

Table 1
Blended finance deals by countries
This table reports the number and percentage of blended finance deals by countries in our sample of 173 blended finance deals of the IFC from 2018–2023.

Country	# Deals	% Deals
Africa	88	50.9%
Burkina Faso	2	1.2%
Cabo Verde	1	0.6%
Cameroon	4	2.3%
Côte d'Ivoire	6	3.5%
Egypt	3	1.7%
Ethiopia	2	1.2%
Gabon	1	0.6%
Ghana	3	1.7%
Guinea	1	0.6%
Kenya	7	4.0%
Liberia	1	0.6%
Malawi	1	0.6%
Mali	3	1.7%
Mauritania	2	1.2%
Morocco	1	0.6%
Mozambique	1	0.6%
Nigeria	9	5.2%
Senegal	4	2.3%
Sierra Leone	1	0.6%
South Africa	2	1.2%
South Sudan	1	0.6%
Tanzania	1	0.6%
Tunisia	2	1.2%
Uganda	4	2.3%
Zambia	1	0.6%
Multiple countries	24	13.9%
Asia and the Pacific	38	22.0%
Bangladesh	8	4.6%
Cambodia	4	2.3%
India	4	2.3%
Indonesia	3	1.7%
Kazakhstan	1	0.6%
Kyrgyz Republic	2	1.2%
Laos	1	0.6%
Mongolia	1	0.6%
Myanmar	2	1.2%
Nepal	1	0.6%
Philippines	3	1.7%
Turkey	1	0.6%
Uzbekistan	4	2.3%
Vietnam	3	1.7%
Eastern Europe	12	6.9%
Azerbaijan	1	0.6%
Kosovo	4	2.3%
Moldova	1	0.6%
Romania	2	1.2%
Ukraine	4	2.3%
Latin America and the Caribbean	20	11.6%
Brazil	3	1.7%
Colombia	2	1.2%
Ecuador	2	1.2%
El Salvador	2	1.2%
Guatemala	1	0.6%
Honduras	1	0.6%
Nicaragua	1	0.6%
Panama	1	0.6%
Peru	4	2.3%
Multiple countries	3	1.7%
Middle East	9	5.2%
Iraq	1	0.6%
Jordan	2	1.2%
Pakistan	2	1.2%
Palestine	2	1.2%
Yemen	2	1.2%
World (multiple regions)	6	3.5%
Total	173	100.0%

[7] More precisely, the five principles are (1) rationale for blended concessional finance (that is, the financing goes beyond what is available from the market and should not crowd out the private sector); (2) crowding-in and minimum concessionality (that is, the financing contributes to catalyzing market development and mobilization of private sector resources, with concessionality not greater than necessary); (3) commercial sustainability (that is, the impact achieved by each operation should aim to be sustainable and contribute toward commercial viability); (4) reinforcing markets (that is, the financing addresses market failures effectively and efficiently minimizes the risk of market distortion or crowding out private finance); and (5) promoting high standards (that is, adherence to high standards, including in areas of corporate governance, environmental impact, integrity, transparency, and disclosure). See IFC (2025) for details.

[8] This information can be accessed at https://disclosures.ifc.org/.

[9] Deals in industrial sectors are in the form of project finance, in which a private company invests in a specific project that yields sustainability benefits. Deals in the financial sector are investments in financial institutions who then provide financing to companies whose activities yield sustainability benefits.

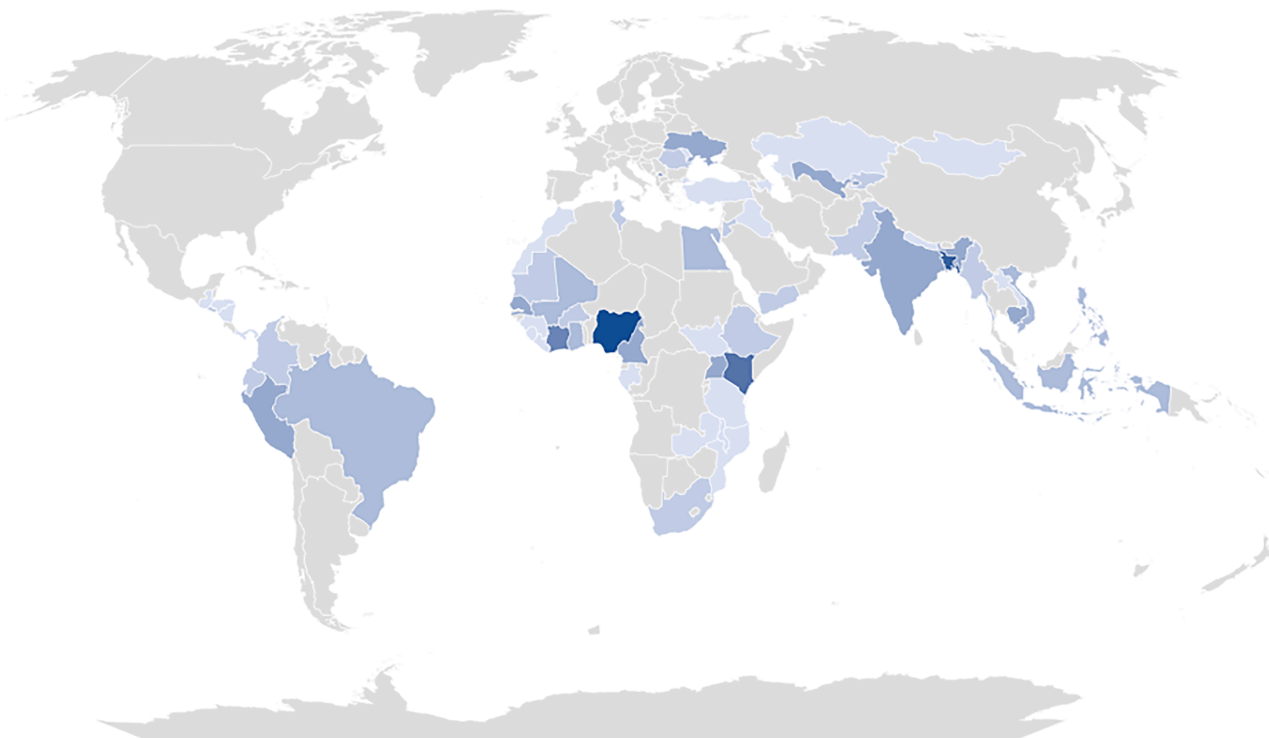

Fig. 2. Blended finance deals by countries
This figure plots the number of blended finance deals by countries in our sample of 173 blended finance deals of the IFC from 2018–2023. Darker-shaded areas indicate countries with a higher number of deals.

currency swaps). While the type of blending can differ, the objective is always the same, namely to improve the risk-return profile of the project and hence help crowd in private capital.

Since blended finance deals can have multiple concessionality provisions, the percentages in Table 3 add up to >100%. As can be seen, about half of the deals receive concessional funding, either in the form of a concessional loan (32.9% of the deals) or a junior equity tranche (16.8%). About one-third of the deals have risk management provisions (33.5%), out of which the more prevalent ones are cross-currency swaps (15.0%) and first loss guarantees (13.3%). In addition, about one fourth of the deals have performance-based provisions (24.3%).

We further note that about half of the projects (52.0%) have technical assistance provisions. These provisions typically include advisory, training, and capacity-building services designed to improve the project's viability. Finally, we note that in a few instances (5.8% of the deals), the IFC co-invests with other DFIs.

3.2.3. Contribution to the sustainable development goals

In their description of the deals, the IFC provides information on the anticipated sustainability impact of each project. Using this information, we determine to which of the United Nations' 17 Sustainable Development Goals (SDGs) each project contributes.[10]

In Table 4, we report the number and percentage of blended finance deals that contribute to each of the 17 SDGs. Note that, since blended finance projects typically contribute to multiple SDGs, the percentages add up to >100%.

We refer to two of the SDGs as "economics-related SDGs" (namely, SDG #8 on decent work and economic growth, and SDG #9 on industry, innovation, and infrastructure), while we refer to the other 15 SDGs as "society- and environment-related SDGs." As can be seen from Table 4, many blended finance deals contribute to the economics-related SDGs (41.0% and 58.4% of the deals contribute to SDGs #8 and #9, respectively), in keeping with the IFC's objective to contribute to economic development in low-income countries. Importantly, they also contribute to the society- and environment-related SDGs. The more prevalent ones are SDG #5 on gender equality (31.8%), SDG #13 on climate action (31.2%), and SDG #7 on affordable and clean energy (13.9%). As these are typically public goods, their benefits are more difficult to monetize.[11]

3.2.4. Deal characteristics

In Table 5, we provide summary statistics for various deal characteristics. The statistics in Panel A refer to the financing of the deal and the blending provisions. Those in Panel B refer to the project's sustainability impact.

***a. Project financing and blending provisions*.**

Project financing. The upper rows of Panel A of Table 5 provide information on the project cost along with a breakdown of how the project is being financed. As can be seen, the average deal size (total project cost) is $107.9M.[12] On average, 8.6% of the project cost is financed through concessional loans and 2.5% through concessional equity (that is, a junior tranche) provided by the IFC. It is common for the IFC to also provide financing at market rates in the form of regular (that is, non-concessional) debt and equity. On average, 44.3% and 3.5%,

[10] Table A of the Online Appendix provides a description of each SDG based on United Nations (2023).

[11] Note that, by definition, all blended finance projects contribute to SDG #17 on "partnerships for the goals," as they all strengthen the means of implementation for sustainable development and foster global partnerships to this end.

[12] Some of the deals are quoted in Euros, which we convert into U.S. dollars using annual exchange rates from the Federal Reserve Economic Data (FRED) of the St. Louis Fed (https://fred.stlouisfed.org/).

Table 2
Blended finance deals by industries
This table reports the number and percentage of blended finance deals by industries in our sample of 173 blended finance deals of the IFC from 2018–2023.

Industry	# Deals	% Deals
Panel A. Industrial sector		
Agribusiness and forestry	27	15.6%
Coffee, cocoa, tea	3	1.7%
Dairy products	1	0.6%
Diversified edible agricultural crops production	2	1.2%
Fruits and vegetables	2	1.2%
Furniture and related products	1	0.6%
Grain processing (milling, starch, flour, malt)	3	1.7%
Grains and beans	2	1.2%
Natural fibers (cotton, sisal, jute, etc.)	1	0.6%
Poultry farming	6	3.5%
Soft drink	3	1.7%
Other	3	1.7%
Health and education	4	2.3%
Medical and diagnostic services	3	1.7%
Other	1	0.6%
Infrastructure	15	8.7%
Distribution business	1	0.6%
Gas - thermal power generation	1	0.6%
Large hydro - renewable energy generation	1	0.6%
Port and harbor operations	1	0.6%
Rural electrification	1	0.6%
Solar - renewable energy generation	7	4.0%
Storage (including agricultural products)	1	0.6%
Waste to energy - waste	1	0.6%
Water and wastewater utilities	1	0.6%
Manufacturing	13	7.5%
Cement	2	1.2%
Finishing (dyeing, printing, finishing, etc.)	1	0.6%
Garment and apparel (with primary textile operations, excluding footwear)	1	0.6%
Garment and apparel (without fabric, excluding footwear)	1	0.6%
Petrochemical	1	0.6%
Plastics material and resin	1	0.6%
Other	6	3.5%
Telecommunications, media, and technology	2	1.2%
Mobile telephony	1	0.6%
Other	1	0.6%
Tourism, retail, and property	3	1.7%
City and business hotel	2	1.2%
Resort hotel (including lodges)	1	0.6%
Other	12	6.9%
Panel B. Financial sector		
Financial institutions	74	42.8%
Commercial banking - general	22	12.7%
Commercial banking - housing finance	6	3.5%
Commercial banking - microfinance	4	2.3%
Commercial banking - risk management facility	1	0.6%
Commercial banking - SME finance	10	5.8%
Commercial banking - trade	1	0.6%
Commercial Banking - trade and supply chain	11	6.4%
Finance companies	2	1.2%
Finance companies - consumer finance	1	0.6%
Leasing services	1	0.6%
Microfinance and small business - non-commercial banking	7	4.0%
Primary mortgage institutions	2	1.2%
Secondary mortgage institutions	3	1.7%
Small business fund	1	0.6%
Other	2	1.2%
Funds	23	13.3%
Growth equity fund	4	2.3%
Small business fund	3	1.7%
Venture capital fund	9	5.2%
Other	7	4.0%
Total	173	100.0%

Table 3
Blended finance deals by blending type
This table reports the number and percentage of blended finance deals by type of concessionality in our sample of 173 blended finance deals of the IFC from 2018–2023. Note that the percentages add to >100% since blended finance deals can have multiple concessionality provisions.

Blending type	# Deals	% Deals
Financing	86	49.7%
Concessional debt	57	32.9%
Concessional equity	29	16.8%
Risk management	58	33.5%
Cross-currency swap	26	15.0%
First loss guarantee	23	13.3%
Risk-sharing facility	6	3.5%
Interest rate buy-down	4	2.3%
Performance-based incentives	42	24.3%
Technical assistance	90	52.0%
Co-financing with other DFIs	10	5.8%

Table 4
Blended finance deals' contribution to SDGs
This table reports the number and percentage of blended finance deals that contribute to each of the 17 United Nations' Sustainable Development Goals (SDGs) in our sample of 173 blended finance deals of the IFC from 2018–2023. A description of the 17 SDGs is provided in Table A of the Online Appendix. Note that the percentages add up >100% since blended finance deals can contribute to multiple SDGs.

SDG	# Deals	% Deals
1 - No poverty	23	13.3%
2 - Zero hunger	15	8.7%
3 - Good health and well-being	11	6.4%
4 - Quality education	16	9.2%
5 - Gender equality	55	31.8%
6 - Clean water and sanitation	1	0.6%
7 - Affordable and clean energy	24	13.9%
8 - Decent work and economic growth	71	41.0%
9 - Industry, innovation, and infrastructure	101	58.4%
10 - Reduced inequalities	20	11.6%
11 - Sustainable cities and communities	19	11.0%
12 - Responsible consumption and production	23	13.3%
13 - Climate action	54	31.2%
14 - Life below water	1	0.6%
15 - Life on land	2	1.2%
16 - Peace, justice, and strong institutions	0	0.0%
17 - Partnerships for the goals	173	100.0%

respectively, of the project cost is funded in this fashion. Summing up these numbers, 58.9% of the project cost is financed by the IFC. The remaining 41.1% is financed by other investors. Overall, these statistics reflect the prevalence of debt financing among the blended finance deals in our sample. Even among the 29 deals for which the IFC provides concessional equity, the share of this financing is on average only 15.1% of the total project's financing.

Other blending provisions. The next rows in Panel A provide statistics on the other blending provisions. Each provision is coded as a 1/0 dummy. As can be seen, 33.5% of the projects have risk management provisions, 24.3% have performance-based provisions, 52.0% have technical assistance provisions, and 5.8% are co-financed with other DFIs, as noted in Section 3.2.2.

Concessionality (blending "subsidy"). The next variable is the project's concessionality, which captures the "subsidy" from the blending (as a percentage of the total project cost). This variable is computed by the IFC, taking into account the various blending provisions. For example, if the blending is in the form of a concessional loan, the concessionality captures the interest rate subsidy relative to the market rate, expressed as a percentage of the project cost. The calculation is more involved for projects that feature other blending provisions. For example, if the project also includes a first loss guarantee, the IFC uses their own pricing

Table 5

Characteristics of blended finance deals

This table reports means and standard deviations for various characteristics of the 173 blended finance deals of the IFC from 2018–2023. In Panel A, total project cost is expressed in millions of U.S. dollars. Concessional loan, concessional equity, non-concessional loan, and non-concessional equity refer to financing provided by the IFC. Risk management provisions, performance-based provisions, and technical assistance are 1/0 indicator variables that are equal to one if the IFC provides the corresponding provisions. Co-financing with other DFIs is a 1/0 indicator variable equal to one if the project is co-financed with other DFIs. Concessionality is the "subsidy" from the blended financing (expressed as a percent of the total project cost). This variable is computed by the IFC, taking into account the various concessionality provisions of the project. In Panel B, sustainability impact (AIMM) is the project's anticipated impact measurement and monitoring (AIMM), computed following the IFC methodology. Sustainability impact (AIMM, society and environment) is computed similarly, but only considers the four categories of "stakeholders," "environmental and social effects," "inclusiveness," and "sustainability." # SDGs is the count of SDGs to which the project contributes. # SDGs (society and environment) is computed similarly, but only includes the fifteen SDGs that are society- and environment-related. These variables are reported in levels and scaled by the total project cost (in $M).

	N	Mean	Std. Dev.
Panel A. Project financing and blending provisions			
Total project cost ($M)	173	107.85	213.76
% Concessional debt	173	8.63%	14.99%
% Concessional equity	173	2.52%	9.42%
% Non-concessional debt	173	44.26%	37.21%
% Non-concessional equity	173	3.51%	12.34%
% Non-IFC financing	173	41.08%	34.78%
% Concessional debt (only deals with this financing)	57	26.18%	14.92%
% Concessional equity (only deals with this financing)	29	15.05%	18.71%
% Non-concessional debt (only deals with this financing)	132	58.01%	31.85%
% Non-concessional equity (only deals with this financing)	29	20.92%	23.62%
Project has risk management provisions (1/0)	173	0.335	0.473
Cross-currency swap (1/0)	173	0.150	0.358
First loss guarantee (1/0)	173	0.133	0.341
Interest rate buy-down (1/0)	173	0.023	0.151
Risk-sharing facility (1/0)	173	0.035	0.184
Project has performance-based provisions (1/0)	173	0.243	0.430
Project has technical assistance (1/0)	173	0.520	0.501
Project has co-financing with other DFIs (1/0)	173	0.058	0.234
Concessionality ("subsidy", % of total project cost)	173	5.15%	7.45%
Panel B. Anticipated sustainability impact			
Sustainability impact (AIMM)	173	6.244	0.594
Sustainability impact (AIMM, society and environment)	173	6.242	0.729
Sustainability impact (AIMM per $M)	173	0.283	0.370
Sustainability impact (AIMM per $M, society and environment)	173	0.286	0.382
# SDGs	173	3.520	1.134
# SDGs (society and environment)	173	2.526	1.174
# SDGs (per $M)	173	0.159	0.212
# SDGs (per $M, society and environment)	173	0.112	0.163

model to quantify the expected payment, adding it as part of the subsidy. We caution that, since the algorithm used to compute the subsidy is proprietary to the IFC, we do not know for sure how it is computed.[13] That being said, even if the underlying model is inaccurate, this metric does capture the degree of concessionality from the perspective of the DFI (namely, the IFC). As such, this metric is likely to be informative in explaining DFIs' decision-making. Another benefit of the concessionality measure is that it takes into account the various blending provisions, summarizing them into one metric that can be interpreted as a subsidy (or, similarly, as a "grant equivalent"). As can be seen from Table 5, the average project in our sample has a concessionality of 5.15%, and there is considerable variation across projects (the standard deviation is 7.45%).

b. Anticipated sustainability impact.

The variables in Panel B of Table 5 are metrics that capture the anticipated sustainability impact of the projects, and hence the extent to which the projects generate public goods and positive externalities that are not easily monetizable. We use two different metrics of anticipated sustainability impact.

Anticipated Impact Measurement and Monitoring (AIMM). The first metric of anticipated sustainability impact is the AIMM of the project, which is compiled by the IFC using a scorecard developed by the World Bank. This metric is described in IFC (2024). It aims to "enable[s] IFC to better define, measure, rate, and monitor the development impact of each investment project" (IFC, 2024, p. 54). To construct this metric, the IFC staff rates each project along the eight categories described in World Bank (2019) and assigns a composite AIMM score that ranges from 1 to 4 (low, satisfactory, good, excellent).[14]

Since the AIMM is confidential to the IFC, we were not granted access to these data. Instead, we reconstruct their AIMM by using a large language model (LLM) algorithm. The algorithm is described in Online Appendix A. In a nutshell, the algorithm processes the description of each project and provides a 1 to 4 rating of how the project contributes to each of the eight categories of the World Bank, following the methodology in World Bank (2019). We then compute the composite AIMM score by averaging the category-specific scores across all categories, and normalize it from 0 to 10. As can be seen from Panel B of Table 5, the average AIMM score is 6.24 with a standard deviation of 0.59. In the table, we further report summary statistics for the AIMM scaled by the total project cost (in $M). The latter will be used in the analysis to facilitate comparisons across projects of different size.

In robustness checks, we consider a variant of the AIMM metric that is based on fewer categories. Out of the eight categories that enter the AIMM, several of them combine economic considerations with societal and environmental impact (e.g., the category "resilience" refers to the project's contribution to the mitigation of both economic shocks and climate-related shocks). To ensure that our results do not purely reflect economic considerations, we construct a variant of the AIMM—labeled "AIMM (society and environment)" in Table 5—that only includes those categories that are unambiguously related to societal and environmental impact. Those are the four categories "stakeholders," "environmental and social effects," "inclusiveness," and "sustainability."

Number of Sustainable Development Goals (# SDGs). Our second metric of anticipated sustainability impact is the number of SDGs to which the project contributes, which we infer from the project description. As can be seen from Panel B of Table 5, the average project contributes to 3.52 SDGs, with a standard deviation of 1.13. To account for the fact that larger projects might mechanically contribute to more SDGs, we further report summary statistics for the number of SDGs scaled by the total project cost.

As with the AIMM metric, we also consider a variant of the number of

[13] IFC (2025) describes the computation as follows: "Concessionality figures are based on the difference between (i) a 'reference price' (which can be a market price, if available; the price calculated using IFC's pricing model, which comprises three main elements of risk, cost and net profit; or a negotiated price with the client) and (ii) the 'concessional price' being charged by the blended concessional finance co-investment."

[14] Out of the eight categories, three are related to project outcomes ("stakeholders," "economy-wide effects," and "environmental and social effects") and five are related to market outcomes ("competitiveness," "resilience," "integration," "inclusiveness," and "sustainability"). These criteria are described in Online Appendix A.

SDGs that only considers the 15 SDGs that are unambiguously society- and environment-related, as discussed in Section 3.2.3. This variable is labeled "# SDG (society and environment)" in Table 5. The average project contributes to 2.53 society- and environment-related SDGs, with a standard deviation of 1.17.

4. Methodology

In our baseline specification, we examine whether the degree of concessionality is higher for projects that have a higher anticipated sustainability impact, in keeping with the main prediction of our conceptual framework of Section 2. To conduct this analysis, we estimate the following regression in our sample of 173 blended finance deals from 2018–2023:

$$\textit{Concessionality}_i = \alpha_t + \alpha_r + \alpha_j + \beta \times \textit{ Sustainability impact}_i + \epsilon_i, \quad (4)$$

where $\textit{Concessionality}_i$ is the degree of concessionality (that is, the "subsidy" from the blended financing, expressed as a share of the total project cost) of project *i*. On the right-hand side, α_t are year fixed effects (referring to the project's disclosure year), α_r are region fixed effects (referring to the six regions listed in Table 1), α_j are industry fixed effects (referring to the nine industry sectors listed in Table 2), $\textit{Sustainability impact}_i$ is the anticipated sustainability impact of project *i* (such as the AIMM metric and the number of SDGs), and ϵ_i is the error term. We use heteroskedasticity-robust standard errors throughout. The coefficient of interest is β that captures the association between the project's anticipated sustainability impact and the degree of concessionality.

Naturally, we caution that the inference that can be drawn from Eq. (4) is correlational and hence need not warrant a causal interpretation. Our objective is to capture the association between anticipated sustainability impact and concessionality. A positive estimate of β would imply that DFIs (such as the IFC) tend to provide a higher degree of concessionality for projects that are expected to have higher sustainability impact.

5. Results

5.1. Sustainability impact and concessionality

Table 6 presents estimates of regression (4), in which we regress the degree of concessionality on various metrics of anticipated sustainability impact.

In Panel A, the project's anticipated sustainability impact is measured using the project's AIMM (per $M of project cost). In column (1), the regression is estimated without fixed effects. In columns (2)-(4), we sequentially include more layers of fixed effects. In column (2), the regression includes year fixed effects; in column (3), it includes year and industry fixed effects; and in column (4), it includes year, industry, and region fixed effects. The latter is the tightest specification we consider, in which we enforce that comparisons be made between deals within the same year, same industry, and same region.

As can be seen, we obtain similar estimates in all four specifications. The point estimates range from 0.055 to 0.071, and are highly significant with *p*-values from 0.000 to 0.005. They are economically significant as well. Specifically, they imply that a one-standard deviation increase in the AIMM per $M of project cost (0.370) corresponds to a higher concessionality rate by 0.020 to 0.026 (that is, a subsidy that is higher by 2.0 to 2.6 percentage points), which accounts for 27% to 35% of a one-standard deviation in the concessionality rate (0.075). Importantly, the fact that the point estimates are positive and significant indicates that DFIs provide a higher degree of concessionality for projects that have higher anticipated sustainability impact, consistent with the main prediction of our conceptual framework.

Table 6
Anticipated sustainability impact and level of concessionality (blending "subsidy")
This table reports estimates of regression (4). The dependent variable, concessionality, is the "subsidy" from the blended financing (expressed as a share of the total project cost). This variable is computed by the IFC, taking into account the various concessionality provisions of the project. The right-hand side variables are metrics that capture the project's anticipated sustainability impact. In Panel A, sustainability impact (AIMM) is the project's anticipated impact measurement and monitoring (AIMM), computed following the IFC methodology. Sustainability impact (AIMM, society and environment) is computed similarly, but only considers the four categories of "stakeholders," "environmental and social effects," "inclusiveness," and "sustainability." In Panel B, # SDGs is the count of SDGs to which the project contributes. # SDGs (society and environment) is computed similarly, but only includes the fifteen SDGs that are society- and environment-related. These variables are scaled by the total project cost (in $M). Years refer to the project's disclosure year, regions refer to the six regions listed in Table 1, and industries refer to the nine industry sectors listed in Table 2. The sample includes the 173 blended finance deals of the IFC from 2018–2023. Standard errors (reported in parentheses) are heteroskedasticity-robust. *, **, and *** denotes significance at the 10%, 5%, and 1% level, respectively.

Panel A. Anticipated impact measurement and monitoring (AIMM)

	Concessionality (1)	(2)	(3)	(4)	(5)
Sustainability impact (AIMM per $M)	0.0614***	0.0714***	0.0580***	0.0548***	
	(0.0216)	(0.0220)	(0.0158)	(0.0157)	
Sustainability impact (AIMM per $M, society and environment)					0.0532***
					(0.0152)
Year fixed effects	No	Yes	Yes	Yes	Yes
Industry fixed effects	No	No	Yes	Yes	Yes
Region fixed effects	No	No	No	Yes	Yes
R-squared	0.093	0.135	0.290	0.333	0.331
Observations	173	173	173	173	173

Panel B. Number of Sustainable Development Goals (SDGs)

	Concessionality (1)	(2)	(3)	(4)	(5)
# SDGs (per $M)	0.0930***	0.109***	0.0882***	0.0911***	
	(0.0342)	(0.0371)	(0.0293)	(0.0277)	
# SDGs (per $M, society and environment)					0.164***
					(0.0411)
Year fixed effects	No	Yes	Yes	Yes	Yes
Industry fixed effects	No	No	Yes	Yes	Yes
Region fixed effects	No	No	No	Yes	Yes
R-squared	0.070	0.107	0.274	0.326	0.365
Observations	173	173	173	173	173

In column (5), we use the variant of the AIMM metric that is based on the four categories that are unambiguously related to social and environmental impact (categories “stakeholders,” “environmental and social effects,” “inclusiveness,” and “sustainability,” see Section 3.2.4). As can be seen, we obtain similar results when using this finer metric.

In Panel B, the measure of anticipated sustainability impact is the number of SDGs (per $M of project cost) that the project contributes to. The results are similar to those based on the AIMM metric in Panel A. Specifically, the point estimates in columns (1)-(4) range from 0.088 to 0.109, and are highly significant with *p*-values from 0.001 to 0.007. They imply that a one-standard deviation increase in the number of SDGs per $M of project cost (0.212) corresponds to a higher concessionality rate by 0.019 to 0.023 (that is, a subsidy that is higher by 1.9 to 2.3 percentage points), which accounts for 25% to 31% of a one-standard deviation in the concessionality rate. In column (5), instead of considering the full set of 17 SDGs, we consider the 15 SDGs that are society- and environment-related (see Section 3.2.3). As can be seen, our results are robust when using this refined measure.

In sum, the results in both panels of Table 6 indicate that DFIs provide higher concessionality for projects that have higher anticipated sustainability impact, consistent with the main prediction of our conceptual framework in Section 2.

In Table B of the Online Appendix, we examine how our estimates vary over time. Arguably, as the DFI develops more expertise about blended finance and learns from previous deals, one might expect the relationship between the anticipated sustainability impact and the level of concessionality to differ in the later years of the sample (e.g., if the DFI becomes more effective at raising funding at lower concessionality levels). To examine this question, we distinguish between earlier and later deals using a 2021 cutoff and re-estimate our baseline specification from Table 6, interacting the sustainability impact measure with an indicator for deals occurring in or before 2021. As can be seen, we find that the interaction term is statistically insignificant and small in economic terms regardless of the metric of sustainability impact, suggesting that the relationship between sustainability impact and concessionality is somewhat stable over our sample period.

In Table C of the Online Appendix, we further examine how our estimates vary depending on the IFC’s experience in the project’s region and industry. To do so, we interact the measure of sustainability impact with the number of past projects the IFC conducted in the project’s region and industry. Both measures capture the experience—and hence the cumulative learning—of the IFC in specific regions and industries. The interaction terms are insignificant, suggesting that experience does not significantly moderate our results. Naturally, we caution that the findings in Tables B and C of the Online Appendix need not imply the absence of learning, as learning dynamics may manifest themselves over longer time horizons that extend beyond our sample period.

Finally, in Table D of the Online Appendix, we show that our results are similar if we distinguish between deals in the industrial and financial sectors. Specifically, we interact the metric of sustainability impact with an indicator variable for financial sector deals. As can be seen, we find that the interaction term is insignificant regardless of the metric of sustainability impact.

5.2. Potential biases

5.2.1. Voluntary disclosure

One potential challenge is that, since the IFC voluntarily decided to make their blended finance deals available on their webpage, they may have chosen to do so because they felt comfortable that their deals contribute positively to sustainability outcomes. Nevertheless, according to the IFC’s Access to Information Policy (IFC, 2012), which went into effect on January 1, 2012 and hence pre-dates our sample period, the IFC systematically publishes information on its investment projects, subject to standard confidentiality exceptions, which mitigates the possibility of selective disclosure based on sustainability impact.

Naturally, it could still be that the entire portfolio of IFC projects is not representative of the universe of blended finance deals, which is harder to assess due the lack of comprehensive data on blended finance deals. The lack of data and transparency is a well-known challenge in blended finance (e.g., Convergence, 2023; OECD, 2018a). While this is an inherent limitation of our analysis, we note that, at the very least, our analysis sheds light on the blended finance practices of one of the largest actors in the blended finance market.

5.2.2. Ex-ante vs. ex-post sustainability impact

Another challenge is that our analysis relies on ex-ante (as opposed to ex-post) measures of sustainability impact. In this regard, the private equity literature suggests that ex-ante performance metrics might be upward-biased due to (1) strategic incentives of the general partners to inflate the investment’s prospects during fundraising periods (e.g., Barber and Yasuda, 2017; Brown et al., 2019), and (2) the fact that the data underlying such projections may be subject to survivorship bias, as poorly performing funds are less likely to report data or remain in databases (e.g., Harris et al., 2014; Phalippou and Gottschalg, 2009).

Arguably, similar concerns arise in the context of blended finance since (1) IFC analysts may have incentives to artificially increase the project’s expected impact to justify a higher concessionality, and (2) their projections may be based on the ex-post performance of completed deals, and hence may be overly optimistic due to survivorship bias. In both cases, our estimate of the relationship between sustainability impact and concessionality would be biased upward.

Nonetheless, this concern is mitigated for two reasons. First, several institutional features of the IFC help alleviate concerns about such biases. In particular, the IFC evaluates projects using the Anticipated Impact Measurement and Monitoring (AIMM) framework, which applies standardized sector methodologies and links ex-ante projections to indicators that are monitored during project supervision (IFC, 2024; World Bank, 2019). In addition, IFC projects are subject to ex-post evaluation by the Independent Evaluation Group (IEG) of the World Bank Group, which compares realized outcomes with initial development objectives (IEG, 2021). These institutional features help discipline ex-ante projections and reduce the scope for purely discretionary or overly optimistic impact estimates.

Second, using the description of each project, we counted the number of words as well as the share of positive words using an LLM algorithm—as a way to capture the “sentiment” conveyed by IFC analysts—to examine whether the way the project is presented is a significant predictor of the degree of concessionality and/or the ex-ante sustainability impact of the project. This analysis is reported in Table E of the Online Appendix, where we regress the level of concessionality (columns (1)-(2)) and the anticipated sustainability impact (AIMM in columns (3)-(4) and the number of SDGs in columns (5)-(6)) on the logarithm of the number of words and the share of positive words. As can be seen, the metrics of “sentiment” are insignificant in 5 out of 6 regressions. The only significant estimate is in column (2), but it has a negative sign, and hence does not point toward IFC analysts strategically embellishing the description of projects that receive more concessionality.

5.3. Political risk and information asymmetries

Since blended finance projects are predominantly conducted in low-income countries (see Table 1 and Fig. 1), one concern is that country-level attributes, such as political risk (as a form of project risk) and a lack of transparency (as a source of information asymmetries) may deter private investors from contributing to the projects. This was explicitly mentioned in the example featured in the introduction (referring to sustainable cocoa sourcing in Côte d’Ivoire), whose project description stated that “[w]ithout the support of the blended finance co-investment, the Project will not go ahead due to heightened project risk, political risk, and low expected return.” Arguably, in such instances, the DFI may have to offer additional concessionality and rely on targeted tools (e.g., risk management provisions) to crowd in private capital. These predictions followed from our conceptual framework in Section 2.

To shed light on this question, we use country-level measures of political risk and opacity. We measure political risk using the metric of "political stability and absence of violence/terrorism" from the World Bank.[15] This measure captures perceptions of the likelihood of political instability and/or politically-motivated violence, including terrorism. The World Bank reports this measure in units of a standard normal distribution (that is, it ranges from approximately −2.5 to 2.5). We take the reverse of this measure to obtain a country-level metric of political risk, which we assign to the blended finance deals based on the project's country.[16]

To capture the degree of information asymmetries at the country level, we use the composite openness score compiled by the Open Data Inventory (ODIN).[17] This score ranges from 0 to 100. Since this is a measure of transparency, we compute opacity as 100 minus the openness score, and scale it by 100 to obtain a metric that is normalized between 0 and 1. We then assign this metric to the blended finance deals based on the project's country.

We then estimate variants of regression (4) in which we use the measures of political risk and opacity as independent variables. Note that we do not include region fixed effects due to the regional nature of the two measures. The results for political risk are provided in columns (1)-(3) of Table 7. Column (1) refers to the specification without fixed effects. In column (2), we include year fixed effects. In column (3), we further include industry fixed effects. As can be seen, we find evidence for higher concessionality rates when political risk is higher. The point estimates range from 0.017 to 0.019, and are statistically significant with *p*-values from 0.028 to 0.055. Since political risk is recorded in units of a standard normal distribution, these estimates imply that a one-standard deviation increase in political risk is associated with a higher concessionality rate by 0.017 to 0.019 (that is, a subsidy that is higher by 1.7 to 1.9 percentage points), which accounts for 23% to 25% of a one-standard deviation in the concessionality rate (0.075).

In columns (4)-(6), we examine the relationship between opacity and the concessionality rate. As is shown, the point estimates range from 0.105 to 0.132 and are significant with *p*-values from 0.001 to 0.007. These estimates imply that a one-standard deviation increase in opacity (0.119) corresponds to a higher concessionality rate by 0.012 to 0.016 (that is, a subsidy that is higher by 1.2 to 1.6 percentage points), which accounts for 16% to 21% of a one-standard deviation in the concessionality rate.

In column (7), we include both variables in the more conservative specification with year and industry fixed effects. As can be seen, the point estimates remain large in economic terms and both variables remain significant at conventional levels.

Overall, these findings indicate that DFIs tend to provide higher concessionality for projects that are subject to higher risk and information asymmetries. This higher concessionality may reflect the use of risk management provisions, which we examine in the next subsection.

5.4. *Structure of blended finance deals*

In Table 8, we examine how the project attributes considered in Tables 6 and 7 (that is, the anticipated sustainability impact, political risk, and opacity) correlate with the structure of blended finance deals—specifically, the use of risk management provisions (column (1)), the choice between concessional debt and equity (columns (2)-(5)), the co-financing with other DFIs (column (6)), and the use of technical assistance provisions (column (7)).

5.4.1. *Risk management provisions*

In column (1) of Table 8, we examine whether DFIs are more likely to add risk management provisions to the blended finance deal when they face a higher degree of political risk and information asymmetries. To do so, we use as dependent variable a 1/0 indicator that is equal to one if the project includes a risk management provision.

As is shown, we find that blended finance deals are significantly more likely to entail risk management provisions for projects exposed to higher political risk. The point estimate is 0.156, which is significant at all conventional levels (*p*-value = 0.007). It implies that a one-standard deviation higher political risk corresponds to a higher probability by 15.6% of including risk management provisions to the blended finance deal. Similarly, the point estimate for opacity is 0.95, which is highly significant as well (*p*-value = 0.001), and implies that a one-standard deviation higher opacity corresponds to a higher probability by 11.3% of including risk management provisions. These findings are consistent with the predictions from our conceptual framework in Section 2, according to which DFIs find it optimal to include risk management provisions to riskier projects.

We also note that the anticipated sustainability impact is not a significant predictor of the use of risk management provisions, suggesting that risk management provisions are used first and foremost to address risk considerations.[18]

5.4.2. *Equity vs. debt*

In columns (2)-(5) of Table 8, we examine how project attributes correlate with the DFI's choice between equity and debt. In column (2), the dependent variable is an indicator variable equal to one if the deal uses concessional equity. In column (3), it is the ratio of concessional equity divided by the total project financing ("concessional equity share"). In column (4), it is an indicator variable equal to one if the deal uses either concessional or non-concessional equity. Finally, in column (5), it is the ratio of concessional and non-concessional equity divided by the total project financing ("equity share").

As can be seen, in all four columns, we find that neither political risk nor opacity are significant predictors of the choice between equity and debt. The absence of systematic patterns is intriguing. Indeed, as per our conceptual framework of Section 2, one would expect DFIs to rely more intensively on equity for projects that are subject to higher risk and greater information asymmetries. The lack of significant estimates points toward a potentially suboptimal design of such contracts in practice and might explain the DFIs' difficulties in mobilizing private capital at scale. This insight is consistent with the recent survey by Flammer et al. (2026), which highlights several frictions and potential areas for improvement in scaling private investments through blended finance structures—optimizing contract design is one of them. It is also consistent with numerous calls by policymakers and practitioners arguing that DFIs need to scale up their equity investments (especially in the form of junior equity tranches) in order to mobilize more private capital at scale (e.g., British International Investment, 2025; CGD, 2023; Convergence, 2023). Finally, note that we also find no significant association between the project's anticipated sustainability impact and the reliance on equity vs. debt.

[15] The data are obtained from the World Bank's world development indicators, which can be accessed at https://databank.worldbank.org/source/world-development-indicators.

[16] For projects covering multiple countries within a region or located in countries without available data, we use the median political risk within the region (based on the regions in Table 1). For those covering multiple regions (category "World" in Table 1), we use the average political risk. We apply the same convention to the opacity measure described below.

[17] The data can be accessed at http://www.opendatawatch.com.

[18] In Table F of the Online Appendix, we re-estimate the regressions from Table 8 using the count of SDGs in lieu of the AIMM as independent variable. All results are very similar when using this alternative covariate.

Table 7
Political risk and information asymmetries
This table reports variants of the regressions in Table 6. The dependent variable, concessionality, is the "subsidy" from the blended financing (expressed as a share of the total project cost). This variable is computed by the IFC, taking into account the various concessionality provisions of the project. On the right-hand side of the regressions, political risk is a country-level measure of political risk that is obtained from the World Bank's world development indicators. It is recorded in units of a standard normal distribution. Opacity is a country-level measure of opacity that is obtained from the Open Data Inventory (ODIN). It is recorded as a score that is normalized from 0 to 1. The sample includes the 173 blended finance deals of the IFC from 2018–2023. Standard errors (reported in parentheses) are heteroskedasticity-robust. *, **, and *** denotes significance at the 10%, 5%, and 1% level, respectively.

	Concessionality (1)	(2)	(3)	(4)	(5)	(6)	(7)
Political risk	0.0167*	0.0188**	0.0192**				0.0175*
	(0.00863)	(0.00848)	(0.00961)				(0.00991)
Opacity				0.132***	0.128***	0.105***	0.0946**
				(0.0384)	(0.0385)	(0.0385)	(0.0371)
Year fixed effects	No	Yes	Yes	No	Yes	Yes	Yes
Industry fixed effects	No	No	Yes	No	No	Yes	Yes
R-squared	0.024	0.050	0.245	0.044	0.062	0.244	0.264
Observations	173	173	173	173	173	173	173

Table 8
Deal structure
This table reports variants of the regressions in Table 6. In column (1), risk management provision is an indicator variable equal to one if the project includes risk management provisions. In column (2), the dependent variable is an indicator variable equal to one if the project is financed using concessional equity. In column (3), it is the ratio of concessional equity divided by the total project financing ("concessional equity share"). In column (4), it is an indicator variable equal to one if the project is financed using either concessional or non-concessional equity. In column (5), it is the ratio of concessional and non-concessional equity divided by the total project financing ("equity share"). In column (6), co-investment with other DFIs is an indicator variable equal to one if the project is co-financed with other DFIs. In column (7), technical assistance is an indicator variable equal to one if the project includes technical assistance provisions. On the right-hand side of the regressions, sustainability impact (AIMM) is the project's anticipated impact measurement and monitoring (AIMM), computed following the IFC methodology and scaled by the total project cost (in $M). Political risk is a country-level measure of political risk that is obtained from the World Bank's world development indicators. It is recorded in units of a standard normal distribution. Opacity is a country-level measure of opacity that is obtained from the Open Data Inventory (ODIN). It is recorded as a score that is normalized from 0 to 1. The sample includes the 173 blended finance deals of the IFC from 2018–2023. Standard errors (reported in parentheses) are heteroskedasticity-robust. *, **, and *** denotes significance at the 10%, 5%, and 1% level, respectively.

		Equity vs. debt					
	Risk management provision (1/0 dummy)	Concessional equity (1/0 dummy)	Concessional equity share	Equity (1/0 dummy)	Equity share	Co-investment with other DFIs (1/0 dummy)	Technical asisstance (1/0 dummy)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Sustainability impact (AIMM per $M)	0.0349	−0.0254	−0.00166	−0.0419	0.0634	0.0235	0.0200
	(0.101)	(0.0409)	(0.0108)	(0.0390)	(0.0599)	(0.0412)	(0.100)
Political risk	0.156***	0.0164	0.00567	0.0355	0.00783	−0.00369	−0.0278
	(0.0570)	(0.0192)	(0.00825)	(0.0268)	(0.0170)	(0.0255)	(0.0579)
Opacity	0.950***	0.00522	0.0158	−0.0131	0.00806	−0.148	0.138
	(0.287)	(0.0985)	(0.0251)	(0.0969)	(0.0472)	(0.161)	(0.351)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.202	0.701	0.375	0.722	0.525	0.120	0.245
Observations	173	173	173	173	173	173	173

5.4.3. *Co-investment with other DFIs*

In Section 3.2.2, we noted that there are 10 deals (5.8% of our sample) in which the IFC co-invests with other DFIs. To examine whether co-investing with other DFIs is more prevalent for deals with higher anticipated sustainability impact (e.g., as it might be easier to mobilize more DFIs in such cases) or for deals with higher political risk (e.g., as the benefits of diversification across DFIs might be greater) or higher opacity (e.g., as drawing from multiple DFIs' expertise might alleviate information asymmetries), we estimate a variant of the previous regressions where the dependent variable is an indicator equal to one if the IFC co-invests with other DFIs.

The estimates are provided in column (6) of Table 8. As is shown, none of the three covariates (sustainability impact, political risk, and opacity) are significant predictors of the propensity to co-invest with other DFIs, suggesting that the above motives may not be of first-order importance. That said, we caution that this analysis need not be conclusive due to the small number of deals that involve co-investment with other DFIs.

5.4.4. *Technical assistance*

In Section 3.2.2, we further noted that about half of the projects (52%) have technical assistance provisions. To shed light on potential determinants of technical assistance, we estimate a variant of the regressions from Table 8 but using as dependent variable an indicator variable equal to one if the project includes technical assistance provisions.

The results are provided in column (7) of Table 8. As can be seen, the anticipated sustainability impact is positively associated with the use of technical assistance. However, the estimate is small in economic terms and statistically insignificant. Similarly, we find that neither political risk nor opacity is a significant predictor of the reliance on technical assistance. The latter is not surprising, as technical assistance is not primarily designed to address political risk and opacity. Rather, technical assistance is typically used to build the technical capacity of investees and key constituencies critical for the successful implementation of the project. It is also used for targeted training and skill development programs in areas such as business model development, impact monitoring and evaluation, and compliance with sustainability standards (e.g., Convergence, 2023; Flammer et al., 2025).

6. Blended vs. non-blended deals

The analysis presented so far focused on the *intensive* margin of blended finance (that is, whether DFIs use a higher or lower degree of blending). Another important dimension is the *extensive* margin (that is, DFIs' decision to blend or not). Since the IFC also invests in projects at market rates without partnering with others, we can contrast the IFC's blended finance deals with their non-blended deals.

We conduct this analysis in Table 9. To do so, we download the set of non-blended deals from the IFC website. There is a total of 595 non-blended deals that have non-missing information for the characteristics that are considered in the table. For each characteristic, we report the mean and standard deviation across the 173 blended finance deals and the 595 non-blended deals. The last column reports the *p*-value of the difference in means between the two groups.

As can be seen, the evidence is in line with what we observed at the intensive margin. First, blended finance deals tend to have higher sustainability impact. On average, blended finance deals have a higher AIMM and a higher number of SDGs. They also have a higher AIMM based on society and environment criteria and a higher number of society- and environment-related SDGs. Most of these differences are highly significant. This underscores the importance of the project's expected sustainability impact for the blending decision.

Second, blended finance deals are more prevalent in Africa relative to the other regions (50.9% of the blended deal are in African countries compared to only 18.8% of the non-blended deals). Looking at country characteristics, the blended finance deals are significantly more common in countries with higher political risk and higher opacity, which is again consistent with our findings at the intensive margin.

Overall, the findings from Table 9 indicate that blended finance solutions are more likely to be used by DFIs for projects that have a higher anticipated sustainability impact and in countries where political risk and opacity might deter private capital investments. This is in line with what we observed at the intensive margins when studying the determinants of the concessionality level. Collectively, these findings are consistent with the predictions from our conceptual framework in Section 2.

7. Conclusion

Blended finance has emerged as a financing mechanism to mobilize private capital for projects with sustainability-oriented objectives. Several practitioners highlight the potential of blended finance. For example, the Chairman and CEO of Bank of America stated that "[a] single project can benefit from the combining of different investor risk tolerances and expected rates of return. That's what blended finance is about. There's the potential to mobilize vast amounts of capital without sacrificing private capital returns" (Bank of America, 2023). Despite its increasing use, systematic evidence on how blended finance is structured and how concessional capital is allocated remains limited. In this paper, we study these questions both conceptually and empirically.

Our contribution is threefold. First, we develop a conceptual framework that characterizes how DFIs allocate concessional capital across projects in order to crowd in private investment while maximizing societal impact. Our framework highlights the trade-off between sustainability impact and the amount of concessionality required to make projects commercially viable. Second, we extend our framework to allow DFIs to deploy different instruments of concessional

Table 9

Characteristics of blended vs. non-blended deals

This table provides means and standard deviations for various characteristics of the IFC's blended and non-blended deals. The variables listed under "Deals by regions" are 1/0 indicator variables that are equal to one if the project is conducted in the respective region. The variables listed under "Deals by industry" are defined analogously with respect to the project's industry. Political risk is a country-level measure of political risk that is obtained from the World Bank's world development indicators. It is recorded in units of a standard normal distribution. Opacity is a country-level measure of opacity that is obtained from the Open Data Inventory (ODIN). It is recorded as a score that is normalized from 0 to 1. The other variables are described in Table 5. The last column provides the *p*-value of the difference in means between the two groups. *, **, and *** denotes significance at the 10%, 5%, and 1% level, respectively.

	Blended deals			Non-blended deals			*p*-value of difference in means
	N	Mean	Std. Dev.	N	Mean	Std. Dev.	
Deals by region							
Africa	173	0.509	0.501	595	0.188	0.391	0.000***
Asia and the Pacific	173	0.220	0.415	595	0.331	0.471	0.003***
Eastern Europe	173	0.069	0.255	595	0.126	0.332	0.017**
Latin America and the Caribbean	173	0.116	0.321	595	0.262	0.440	0.000***
Middle East	173	0.052	0.223	595	0.066	0.248	0.493
World (multiple regions)	173	0.035	0.184	595	0.027	0.162	0.614
Deals by industry							
Industrial sector							
Agribusiness and forestry	173	0.156	0.364	595	0.077	0.267	0.008***
Health and education	173	0.023	0.151	595	0.055	0.229	0.029**
Infrastructure	173	0.087	0.282	595	0.224	0.417	0.000***
Manufacturing	173	0.075	0.264	595	0.025	0.157	0.018**
Telecommunications, media, and technology	173	0.012	0.107	595	0.015	0.122	0.709
Tourism, retail, and property	173	0.017	0.131	595	0.018	0.135	0.920
Other	173	0.069	0.255	595	0.047	0.212	0.293
Financial sector							
Financial institutions	173	0.428	0.496	595	0.304	0.460	0.003***
Funds	173	0.133	0.341	595	0.234	0.423	0.001***
Total project cost ($M)	173	107.85	213.76	595	192.87	277.58	0.000***
Sustainability impact (AIMM)	173	6.244	0.594	595	6.203	0.610	0.432
Sustainability impact (AIMM, society and environment)	173	6.242	0.729	595	6.189	0.773	0.409
Sustainability impact (AIMM per $M)	173	0.283	0.370	595	0.155	0.300	0.000***
Sustainability impact (AIMM per $M, society and environment)	173	0.286	0.382	595	0.155	0.311	0.000***
# SDGs	173	3.520	1.134	595	2.227	0.886	0.000***
# SDGs (society and environment)	173	2.526	1.174	595	0.758	0.904	0.000***
# SDGs (per $M)	173	0.159	0.212	595	0.053	0.104	0.000***
# SDGs (per $M, society and environment)	173	0.112	0.163	595	0.019	0.055	0.000***
Political risk (in the project's country)	173	0.817	0.689	595	0.550	0.593	0.000***
Opacity (in the project's country)	173	0.516	0.119	595	0.449	0.119	0.000***

finance—including concessional debt, junior equity tranches, and risk management facilities—and characterize the optimal mix of these instruments. Third, we provide empirical evidence on blended finance using deal-level data from the IFC that contain detailed information on the degree of concessionality and deal structure.

These contributions notwithstanding, more research is needed to better understand the opportunities and challenges of blended finance. First, our analysis relies on a relatively small sample of 173 blended finance deals initiated by one specific DFI. While this sample is informative, especially since the IFC compiles information on the concessionality of each deal, it may not be representative of the universe of blended finance deals. As more data become available, future work could examine the extent to which our findings generalize to other blended finance providers. Second, while blended finance is intended to channel private capital toward sustainability-oriented projects, more work is needed to understand the potential bottlenecks. Those might include the perceived lack of investable projects, the lack of qualified personnel to assess these projects, and the lack of familiarity with the relevant countries, among others. Understanding the bottlenecks that may prevent DFIs from channeling more funding toward the achievement of the SDGs is important to effectively scale up the global marketplace for blended finance. Third, the evolution of blended finance constitutes an important and understudied area, particularly in the presence of informational frictions. For example, the survey by Flammer et al. (2026) identifies such frictions—most notably limited in-house expertise in structuring and evaluating blended finance transactions—as key barriers to scaling sustainable investment, and argues that these knowledge gaps contribute to the persistence of "trapped capital." As the blended finance market matures and more comprehensive datasets become available, future research could examine the dynamic evolution of blended finance structures. Such work would provide insights into the role of learning, capability building, and market development in shaping blended finance outcomes. Fourth, more work is needed to understand the effectiveness and system-level implications of blended finance. In this regard, several commentators have raised concerns that blended finance may backfire if, for example, it disproportionately benefits certain industries or regions at the expense of others (e.g., Capital Monitor, 2022; OECD, 2018b). A more aggregated analysis of blended finance could help shed light on this potential "dark side" of blended finance. These are important avenues to explore for future research on blended finance.

CRediT authorship contribution statement

Caroline Flammer: Writing – review & editing, Writing – original draft, Methodology, Formal analysis, Conceptualization. **Thomas Giroux:** Writing – review & editing, Writing – original draft, Methodology, Formal analysis, Data curation, Conceptualization. **Geoffrey M. Heal:** Writing – review & editing, Writing – original draft, Methodology, Formal analysis, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.jfineco.2026.104321.

Data availability

Replication Package BF (Original data) ((Mendeley Data).)

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