Blended Finance: Stakeholders, Structuring, and Alignment

Thierry Roncalli*, Mohamed Ben Slimane*, Jean-Marie Dumas* and Adnane Lekhel*

*Amundi Investment Institute, *Amundi Fixed Income, Amundi Asset Management[1], France

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[1]The opinions expressed in this presentation are those of the authors and are not meant to represent the opinions or official positions of Amundi Asset Management.

Definition of blended finance

Definition

Blended finance is "*the strategic use of* ***development finance*** *for the mobilisation of additional finance towards sustainable development in developing countries.*" (OECD, 2018, page 22).

Definition of blended finance

3 dimensions

1. Focus on sustainable development in developing countries: The ultimate goal is to support sustainable development initiatives in these regions
2. Strategic use: Blended finance is integrated into public policies, with an emphasis on intentionality and planning
3. Mobilization of additional finance: It aims to attract **new sources of funding** rather than substitute traditional investments, acting as a complementary mechanism

4^{th} dimension

4. The role of concessional finance: Concessional finance involves funding provided on terms that are more favorable than market conditions, such as below-market interest rates or extended repayment periods.

Blended finance: how does it work?

The problem

- Consider a DFI
- They have a funding of $150 mn
- They want to promote the market of EM green bonds
- We assume an expected return of 10%

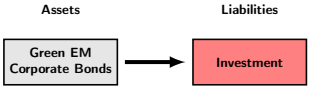
How can they make an impact on the green bond market in emerging markets?

Pass-through solution

First solution

- They directly invest $150 million in EM green bonds
- The expected revenues are $15 million per year (without defaults)
- The capital loss depends on the bond defaults

Figure: The direct investment solution

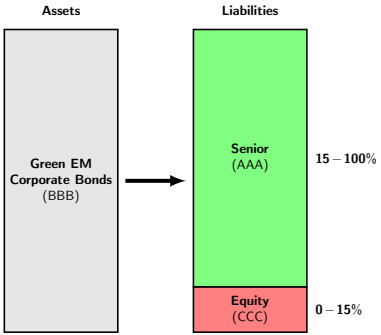


Pay-through solution

Second solution

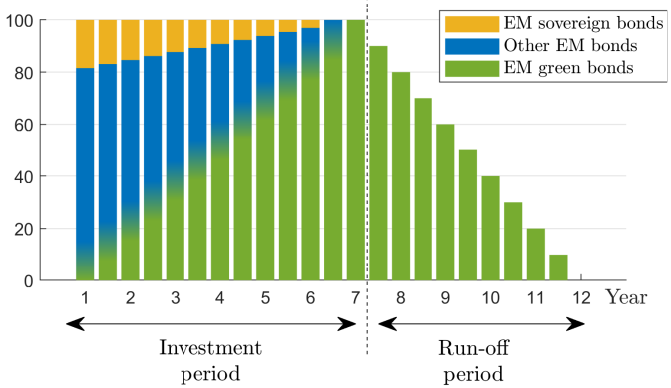
- They sponsor a structured blended finance fund
- They invest $150 mn in the equity tranche
- The size of the SBF fund is $1 billion (institutional investors = $850 million)
- The expected revenues are $100 mn/year (without defaults)
- The promised coupon for the senior tranche is 5% $\Rightarrow$ $42.5 mn/year for institutional investors
- The remaining ($57.5 mn) are for the junior investor (expected return = 38.33%)
- Both junior and senior investors may experience capital losses, but the $150 mn first losses are for the junior investors

Figure: The SBF solution



Pay-through solution

Figure: Life cycle of the AMUNDI/IFC AP EGO blended finance fund



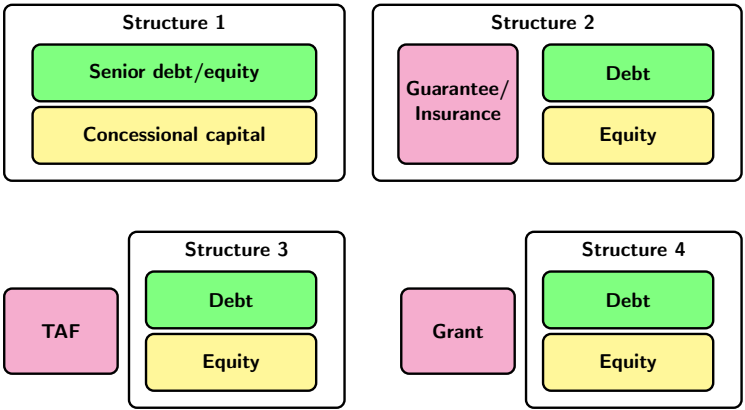
Source: Bolton *et al.* (2020, Figure 2, page 34).

What makes it a blended finance deal?

"Blended finance is a ***structuring approach*** *that allows organizations with different objectives to invest alongside each other while achieving their own objectives (whether financial return, social impact, or a blend of both)." (Convergence, 2024,* `https://www.convergence.finance/blended-finance`*).*

Blended finance structures

Figure: Common blended finance structures



Source: `www.convergence.finance/blended-finance`.

The market of blended finance

Table: Junior/mezzanine/senior structure of some blended finance funds

Fund	Junior	Mezzanine	Senior	Fund term	Asset manager & investors
Amundi Planet EGO Fund	6.25%	3.75%	90%	12	Amundi/IFC
Amundi Planet II	8%		92%	10	Amundi
Asia Climate Strategy	15%		85%	10	responsAbility Investments AG
Beyond the Grid (BTG) Solar Fund	10%	22%	68%	5	Mirova (SunFunder)
Emerging Africa Infrastructure Fund	32%		68%	Open-end	Ninety One/PIDG
Emerging Market Climate Action Fund	30%		70%	17	Allianz GI/EIB
GAIA	21%		79%	30	MUFG/FinDev Canada/CFM/Pollination
IFC & Sida MCPP Infrastructure Fund	10%		90%	25	IFC/Sida/Alliance/Axa/Prudential
Land Degradation Neutrality (LDN) Fund				15	Mirova/EIB
Mirova Gigaton Fund	15%	35%	50%	15	Mirova
SDG Loan Fund	10%		90%	25	Allianz GI/FMO
Vertelo/GCF	13%	14%	73%	10	Macquarie

Source: Sustainable Markets Initiative (2024), EIB Knowledge Lab (2024) & Authors' research.

The market of blended finance

Standardization vs. **bespoke**?

Collateral assets

Table: List of bonds used in structured blended finance funds

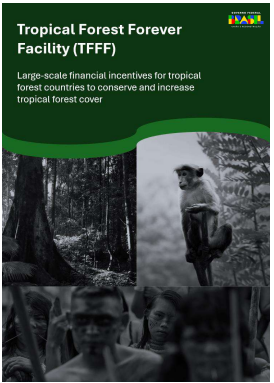
Bond Type	Purpose
Development impact bonds (DIBs)	Finance development projects with outcomes-based repayment linked to social or environmental impact
Social impact bonds (SIBs)	Finance social programs with repayment based on achieving predefined social outcomes
Green bonds	Finance projects with environmental benefits, such as renewable energy or pollution control
Sustainability bonds	Finance projects addressing both environmental and social challenges
Climate bonds	Raise funds for projects that mitigate or adapt to climate change
Senior/mezzanine debt bonds	Provide capital for blended finance projects with varying risk/return profiles between senior and mezzanine debt
Project/infrastructure bonds	Finance specific infrastructure or development projects with a social or environmental focus
Impact-linked finance bonds	Link bond repayment or return to achieving specific impact targets
Concessional bonds	Provide affordable financing for development projects with a social impact, often at favorable terms

- Bonds/notes (14%)
- Direct private equity and debt financing to companies (21%)
- Facilities* (3%)
- Limited partnership private equity and debt funds (27%)
- Greenfield and brownfield infrastructure projects (36%)

*A facility is an earmarked allocation of public development resources combined with private capital at the vehicle level for deployment to a specific recipient or intervention

Tropical Forest Forever Facility (TFFF)

Figure: Tropical Forest Forever Facility (TFFF)

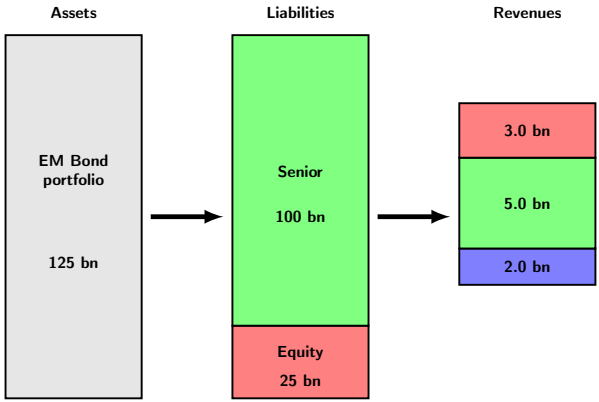


- A fund to preserve global tropical forests
- UN COP30 (November 2025, Brazil)
- The fund would help pay around 74 developing countries \$4/ha for preserving tropical forests (annual adjustment for inflation)
- The goal is to raise about \$125bn to preserve tropical forests globally
- Structured blended finance (SBF) fund?
  - 20% from developed countries and philanthropic entities (\$25 billion)
  - 80% from institutional and retail investors (\$100 billion)
  - Assume a coupon of 5% on average over 30 years

Tropical Forest Forever Facility (TFFF)

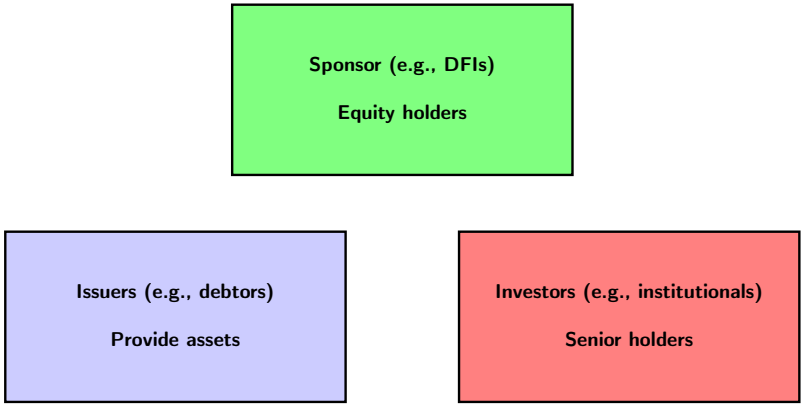
- With an expected return of 8%, the fund could generate $8\% \times 125 = \$10$ bn of revenues
- The cost for preserving tropical forests could be 500 million ha $\times$ \$4 per ha $=$ \$2 bn
- The investors in the senior tranche could receive $5.0\% \times 100 = \$5.0$ bn
- The investors in the junior tranche could receive $10 - 2 - 5 = \$3$ bn, corresponding to an expected return of $\frac{3}{25} = 12\%$
- The concessionality rate is 20%, the leverage ratio is 4

Figure: Cash flow analytics (without defaults)



The stakeholders

Figure: Three stakeholders



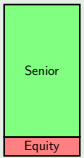
What is the objective of each stakeholder?

Issuers

- Maximize the concesionnal rate ⇒ They want to issue debt below market rates
- Benefit from guarantees, technical assistance facilities, credit enhancement, etc.

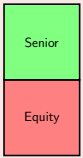
Sponsor

- Maximize the leverage ratio



Investors

- Optimize the risk/return profile



Concessional rate

$$\mathcal{CR} = \frac{\text{Market price} - \text{Concessional price}}{\text{Total project cost}}$$

Leverage ratio

$$\mathcal{LR} = \frac{\text{Size of the senior tranche}}{\text{Size of the junior tranche}}$$

What is the difference with a CLO?

SBF

- Investing in new assets
- EM debt (BBB−/BB+)
- Two-tiered structure
- Sponsors want to invest in junior tranches
- Impact investing & SDGs

CLO/CDO

- Risk transfering of old assets
- IG debt (BBB+)
- Three-tiered structure
- Sponsors want to invest in senior tranches
- Regulatory capital arbitrage

Modeling of the structured blended finance fund

Credit risk modeling

- Default time $\Rightarrow$ Transition probability + Markov generator + survival function
- Default correlation $\Rightarrow$ Copula function + factor model
- Recovery rate $\Rightarrow$ Fined-grained portfolio + beta distribution

Cash flow modeling

- Investment phase
- Uninvested capital
- Income generation
- Asset maturity and reinvestment
- Fees
- Run-off period

Liability modeling

- Tranche structure
- Attachment points
- Senor protection mechanisms
  - Loss carryfoward
  - Dividend sponsorship
  - Dedicated cash reserve account

Calibration methods

What are the calibration parameters?

- **Detachment point of the equity tranche**
- **Coupon level of the senior tranche**
- Two-tranche or three-tranche structure?
- P&L sharing
- **Senior protection mechanism**
- Concessionality

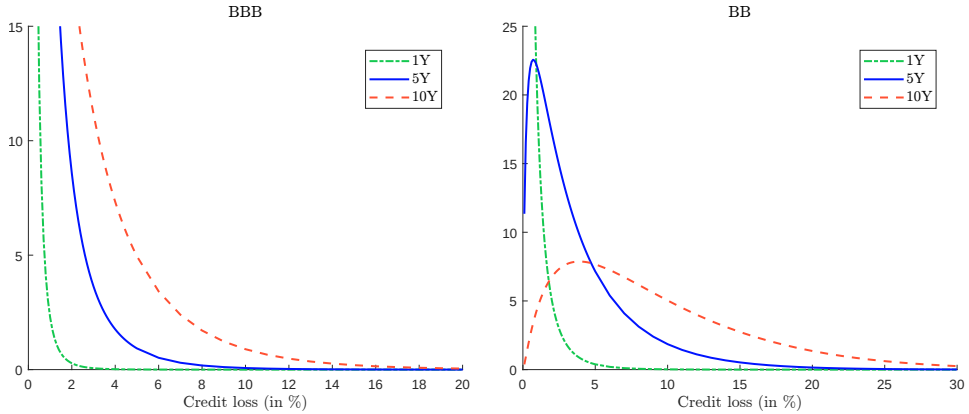
Which metrics to monitor?

- Internal rate of return
- Credit loss
- Coupon
- 95% and 99% value-at-risk

Monte Carlo simulations + Scenario Analysis

The BB rating issue

Figure: Probability density function of portfolio loss by credit rating ($\mathcal{R} = 40\%$ and $\rho = 20\%$)



Investor-required risk premium

- Historical default intensity:

$$\lambda_i^{(\text{historical})} = \frac{-\ln\left(1 - \mathbf{e}_i \exp(\tau\Lambda)\mathbf{e}_K\right)}{\tau}$$

- Risk-neutral default intensity:

$$\lambda_i^{(\text{risk}-\text{neutral})} = \frac{y_i - r}{1 - \mathcal{R}}$$

- Risk premium multiplier:

$$\alpha_i := \frac{\lambda_i^{(\text{risk}-\text{neutral})}}{\lambda_i^{(\text{historical})}} \approx \frac{\text{EL}_i^{(\text{risk}-\text{neutral})}}{\text{EL}_i^{(\text{historical})}}$$

Table: Real world and risk neutral default intensities (1997–2024)

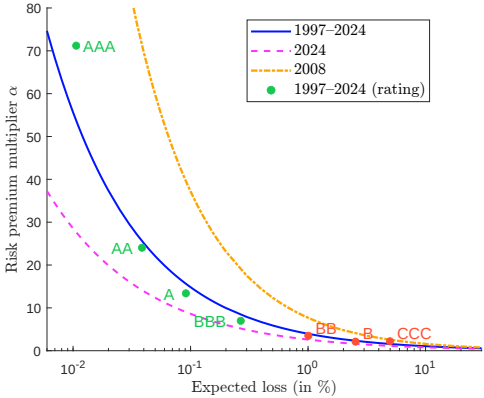
Rating	$\lambda_i^{(\text{historical})}$ (in bps)	$\lambda_i^{(\text{risk}-\text{neutral})}$ (in bps)	α_i
AAA	1.77	126.19	**71.20**
AA	6.43	154.64	24.04
A	15.22	203.72	13.39
BBB	44.57	311.00	6.98
BB	167.63	584.77	3.49
B	422.81	897.88	2.12
CCC	829.95	1 822.43	**2.20**

Investor-required risk premium

Risk premium multiplier

$$\alpha = \left(\frac{\gamma}{\mathrm{EL}}\right)^{\beta}$$

Figure: Risk premium multiplier α



Source: ICE BOFA US Corporate Bonds, Moody's & Authors' calculations.

Economic rationale behind tranching structures

Tranche	Size (in %)	Expected Loss	EL/Size	Rating	Multiplier	Risk Premium
Portfolio	100%	1.200%	1.20%	BBB	5.00	**6.00%**
Senior	90%	0.018%	0.02%	AAA	20.00	0.40%
Junior	10%	1.182%	11.82%	CC	3.08	36.41%
Total	100%	1.200%	1.20%			**4.00%**
Difference						**2.00%**

- For the portfolio, $\text{EL} = 1.2\%$ which corresponds to a BBB rating. If the multiplier is 5, the risk premium required by investors is $5 \times 1.2\% = 6\%$
- For the senior tranche, $\text{EL} = 0.018\%$ which corresponds to a AAA/AA+ rating. If the multiplier is 20, the risk premium required by investors is $\dfrac{20 \times 0.018\%}{90\%} = 40$ bps
- For the junior tranche, $\text{EL} = 1.182\%$ which corresponds to a CC rating. If the multiplier is 3.08, the risk premium required by investors is $\dfrac{3.08 \times 1.182\%}{10\%} = 36.41\%$
- **Investors in the tranching product require a global risk premium[2] of 4%, not 6%**

[2] $90\% \times 0.40\% + 10\% \times 36.41\% = 4\%$

Economic rationale behind tranching structures

Structure viability condition

$$\pi_{\text{portfolio}} > \pi_{\text{tranching}} \Leftrightarrow \text{EL}_{\text{portfolio}} > \left(\sum_{k=1}^{m} \omega_k \, \text{EL}_k^{1-\beta} \right)^{\frac{1}{1-\beta}}$$

Structuring $\approx$ Manufacturing of risk premium and security design

$\Rightarrow$ **Excess risk premium**

Junior-senior structure

We consider two structures: a fixed structure and an optimized tranche structure

In the case of the optimized structure, we maximize the leverage ratio subject to a rating constraint on the senior tranche:

$$D^{\star}_{\text{junior}} = \arg\max \mathcal{LR} = \frac{D_{\text{senior}} - A_{\text{senior}}}{D_{\text{junior}} - A_{\text{junior}}}$$

$$\text{u.c.} \quad \begin{cases} \boldsymbol{R}_{\text{senior}} \succeq \boldsymbol{R}_{\text{min}} \\ D_{\text{junior}} = A_{\text{senior}} \end{cases}$$

Remark

$\max \Delta\pi \Leftrightarrow \max \mathcal{LR}$ in a junior-senior structure

Junior-senior structure

Figure: Fixed 30/70 structure

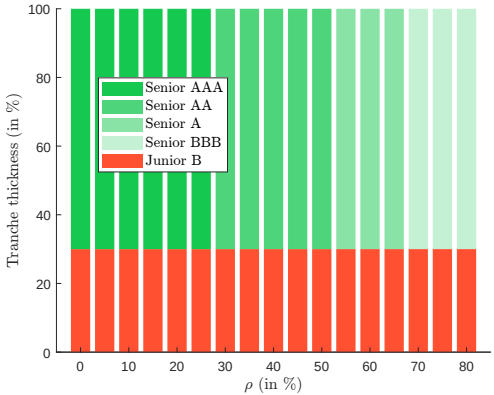
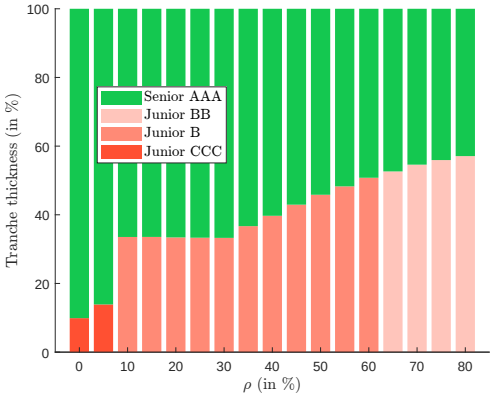


Figure: Optimised AAA structure



Junior-senior structure

Figure: Leverage ratio of fixed and optimized structures

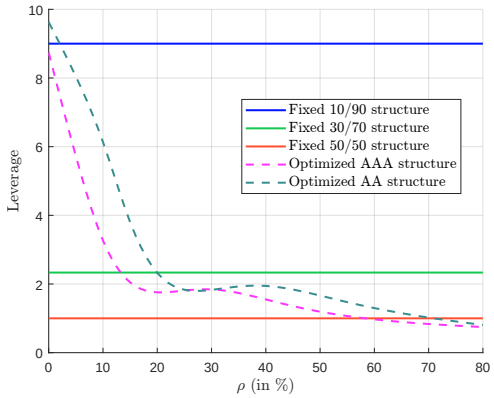
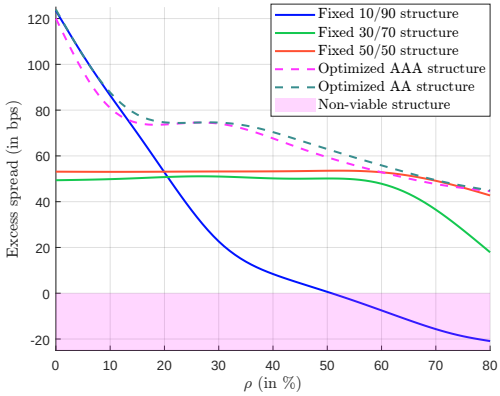


Figure: Excess risk premium in bps



The case of the mezzanine tranche

$$\left\{D^{\star}_{\text{junior}}, D^{\star}_{\text{mezzanine}}\right\} = \arg\max \Delta\pi$$

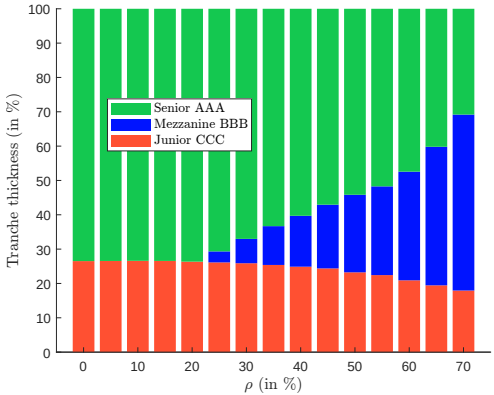
$$\text{u.c.} \quad \begin{cases} \boldsymbol{R}_{\text{senior}} \succeq \boldsymbol{R}^{(\text{senior})}_{\text{min}} \\ \boldsymbol{R}_{\text{junior}} \succeq \boldsymbol{R}^{(\text{junior})}_{\text{min}} \\ D_{\text{junior}} = A_{\text{mezzanine}} \\ D_{\text{mezzanine}} = A_{\text{senior}} \end{cases}$$

where:

$$\begin{cases} \Delta\pi = \omega_{\text{junior}}\pi_{\text{junior}} + \omega_{\text{mezzanine}}\pi_{\text{mezzanine}} + \omega_{\text{senior}}\pi_{\text{senior}} \\ \omega_{\text{junior}} = \dfrac{D_{\text{junior}} - A_{\text{junior}}}{D_{\text{senior}} - A_{\text{junior}}} \\ \omega_{\text{senior}} = \dfrac{D_{\text{senior}} - A_{\text{senior}}}{D_{\text{senior}} - A_{\text{junior}}} \\ \omega_{\text{mezzanine}} = 1 - \omega_{\text{junior}} - \omega_{\text{senior}} \end{cases}$$

The case of the mezzanine tranche

Figure: Optimised CCC/AAA structure



Rationale for a mezzanine tranche:

- The asset portfolio is poorly diversified
- The average rating of the asset portfolio is low (below BB+)

Conclusion

- 3 stakeholders
- Can the 3 objectives be matched?
- This depends on the structure viability and the excess risk premium generated by the tranching
- Default correlation is not the friend of blended finance funds

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