The European Investment Bank and the Twin Investment Challenge: Closing the Green and Investment Gaps in the Euro Area

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Motivation

The Green Investment Gap

- €620bn additional annual investment needed for EU Green Deal targets (European Commission, 2023)
- Green investment persistently below 2030 and 2050-consistent levels
- Periphery economies face a disproportionately large shortfall (Guarascio et al., 2026)

The Investment Convergence Gap

- Persistent divergence in total capital formation between Core and Periphery within the monetary union
- Periphery: weaker financial systems, higher risk premia, shallower capital markets
- The green transition risks *compounding* existing economic divergences

The **European Investment Bank** finances projects across the EU, with an explicit mandate to support both **economic cohesion** and the **green transition**.

Research Question

Can the EIB simultaneously close the green investment gap and support investment convergence across Core and Periphery economies, **or do these two mandates fundamentally conflict?**

Our approach:

1. Two-country Monetary Union (MU) general equilibrium model (GE) with green–brown technologies, banking sector, and an explicit EIB block
2. An EIB loss function capturing the dual mandate across sectors, economies, and time horizons
3. Grid search over allocation strategies which minimise the EIB's loss function
4. Robustness over four different exercises

Position in the Literature

Environmental DSGE

- Annicchiarico and Di Dio (2015)
- Heutel (2012)
- Golosov et al. (2014)
- Ferrari and Landi (2024)

We extend to a two-country MU with financial frictions.

Two-Country MU DSGE

- Poutineau and Vermandel (2015)
- Poutineau and Vermandel (2017)
- Bernanke et al. (1999)

We add green–brown production and the EIB as an active institution generating endogenous cross-country spillovers.

Development Banks

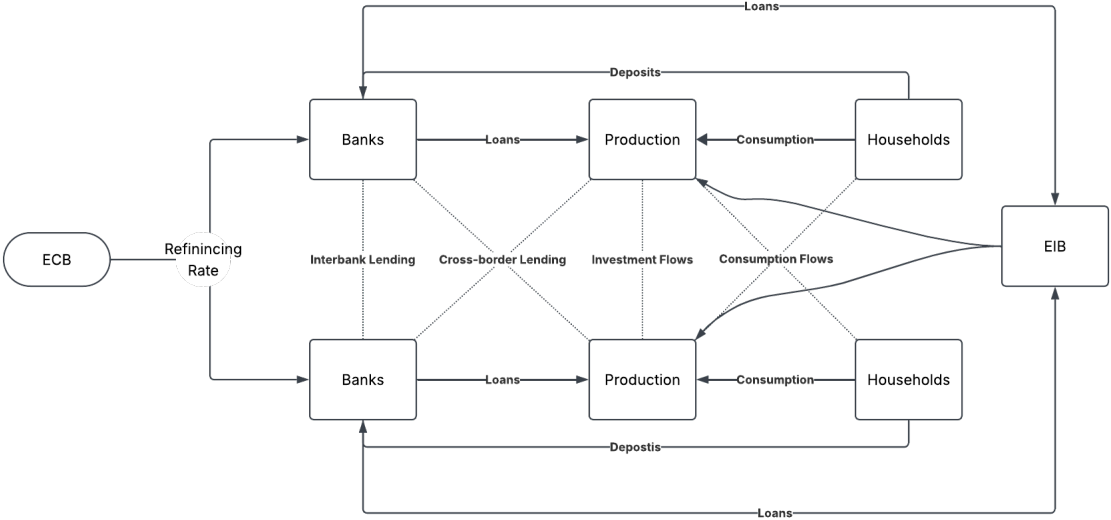
- Stiglitz (1993)
- Griffith-Jones et al. (2020)
- Galindo Gil and Montecinos (2024)
- Gatti et al. (2023)

First two-country GE model with the EIB as a genuine supranational institution with a dual mandate.

Our Approach

- We construct an Environmental Two-Country DSGE model in a MU, with a rich banking sector & cross-border lending and a supranational financial entity.
- We built upon the MU structure of Poutineau and Vermandel (2017) and incorporate the production framework of Ferrari and Landi (2024).
- The model features numerous nominal rigidities in: wage setting, prices, banking interest rates and habit formations in consumption, deposits activities and entrepreneurial loans
- Calibration:
  1. MU features is based on the empirical estimation of Poutineau and Vermandel (2017) extended to capture country heterogenous features
  2. Production block is based on Ferrari and Landi (2024)
  3. Environmental features based on the latest estimations of pollution and emissions
  4. EIB features on our own estimations

Model Overview



Entrepreneurs and the conduct of EIB Policy

Entrepreneurs hold a portfolio of **green** and **brown** capital projects, financed through three distinct sources.

Two-stage Problem:

1. Takes as given the allocation by the EIB
2. Rely on own wealth (insufficient) and banking loans to finance the remaining investment needs

Channel 1: Direct portfolio tilt

EIB loans are project-specific and *non-fungible*. This co-financing is netted out *before* the entrepreneur optimises the privately-financed mix, directly tilting the portfolio toward the EIB-funded technology beyond what market incentives alone would deliver.

Channel 2: Financial accelerator

The entrepreneur's break-even threshold $\bar{\omega}$ depends on *total* external obligations. Since the EIB charges lower rates, expanding EIB funding **lowers** $\bar{\omega}$, raising survival probability. Private banks observe this and lower the external finance premium - crowding *in* additional private investment. Financial Accelerator

What distinguishes the EIB from private banks:

- **Lends at the policy rate**, below private lending rates.
- **Non-fungible loans**: funds allocated to green investment cannot be redirected to brown projects.
- **Not a profit maximiser**: balance sheet funded through member state contributions and borrowing from liquid banks in both economies; 85% of profits are re-invested.
- **Supranational**: operates simultaneously in Core and Periphery, generating cross-country spillovers.

Allocation rule:

EIB loans are split across sectors and countries, according to shares (s_C^G, s_C^B, s_P^G, s_P^B).
These shares are the central policy instrument.

The EIB Loss Function

Rather than maximising profits, the EIB minimises a welfare loss that reflects its institutional nature. Two pairs of weights govern the optimisation.

$$\mathcal{U}^{EIB} \;=\; \gamma_1\big(\alpha_1\,\mathcal{G}_{\text{inv}}^{CMT} + \alpha_2\,\mathcal{G}_{\text{grn}}^{CMT}\big) \;+\; \gamma_2\big(\alpha_1\,\mathcal{G}_{\text{inv}}^{LT} + \alpha_2\,\mathcal{G}_{\text{grn}}^{LT}\big)$$

Mandate Targets

Mandate weights $\alpha_1 + \alpha_2 = 1$

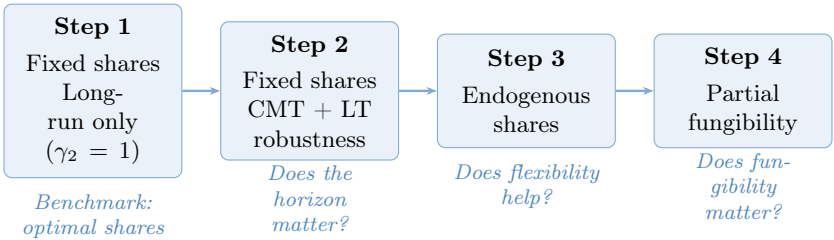
α_1 governs the weight on investment convergence; $\alpha_2 = 1 - \alpha_1$ on the green transition.

Horizon weights $\gamma_1 + \gamma_2 = 1$

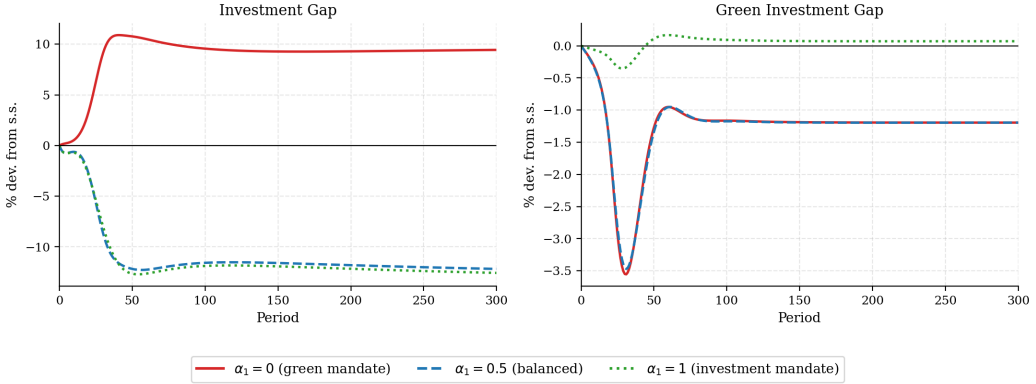
γ_2 weights the *long-run* structural outcome; γ_1 weights the *medium-term* transition dynamics.

Evaluation Strategy

We introduce a permanent +10% shock to the EIB balance sheet and search over the space of EIB allocation parameters to find, for each mandate configuration (α_1, γ_1), the allocation that minimises $\mathcal{U}^{EIB}$. The analysis proceeds in four steps, each adding one layer of institutional realism.



Results I: Impulse Responses: Fixed Shares, Non-fungible



Red (Green Mandate): Investment gap rises +10.9% at peak; green gap falls −3.6%.
Blue (Balanced Mandate): Both gaps fall simultaneously throughout the entire transition path.
Green (Investment Gap): Investment gap −13.0% LT; green gap +0.07% LT (marginal reversal only).

Results I: Optimal Fixed Shares, Long-run ($\gamma_1 = 0$, $\gamma_2 = 1$)

α_1	α_2	s_C^G	s_C^B	s_P^G	s_P^B	$\mathcal{G}_{\text{inv}}^{LT}$	$\mathcal{G}_{\text{grn}}^{LT}$	$\mathcal{U}$
0.0	1.0	**0.70**	0.10	0.10	0.10	1.098	0.988	0.988
0.5	0.5	0.10	0.10	**0.70**	0.10	0.870	0.988	**0.929**
1.0	0.0	0.10	0.10	0.20	**0.60**	0.866	1.001	0.866

- Under the **pure green mandate** ($\alpha_1 = 0$), the investment gap *worsens* by $+9.8\%$
- Under the **dual mandate** ($\alpha_1 = 0.5$), both gaps fall simultaneously (-13.0% and -1.2%)
- Under the **pure investment mandate** ($\alpha_1 = 1$), the green gap only marginally worsens by $+0.07\%$.

The trade-off is therefore **highly asymmetric**: abandoning the green objective is far more costly for investment convergence than the reverse.

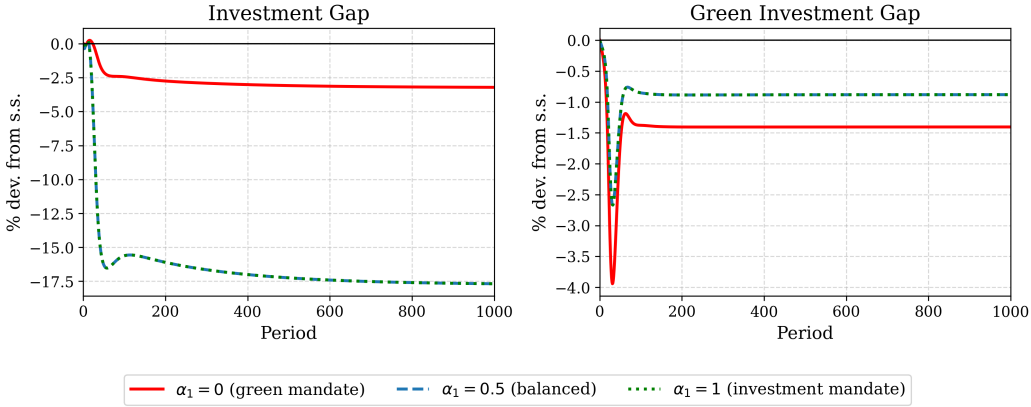
Step III: Endogenous Allocations

- We relax the assumption of fixed shares and allow the EIB to endogenously respond.
- Strategy:
  1. We search over three different values of endogenous preferences $\lambda \in [0.5, 1, 2]$
  2. Preferences over investment allocations:

$$s_{C,t}^{EIB,G} = \frac{\lambda_{G,C}^{EIB} / i_{C,t}^{G}}{\lambda_{G,C}^{EIB} / i_{C,t}^{G} + \lambda_{B,C}^{EIB} / i_{C,t}^{B} + \lambda_{G,P}^{EIB} / i_{P,t}^{G} + \lambda_{B,P}^{EIB} / i_{P,t}^{B}}$$

  3. A higher preference weight $\lambda_{s,j}^{EIB}$ relative to the others translates into a larger share of EIB funds directed to that category

Results III: Impulse Responses: Endogenous Share, Non-fungible, Long-run



Red (Green Mandate): Investment gap -3.2% ; green gap falls at -1.4%.
Blue (Balanced Mandate): Investment gap -17.7% ; green gap at -0.9%.
Green (Investment Mandate): Response is virtually identical to the balanced case.

Results III: Key Take-outs

- The trade-off ceases to exist, irrespective of the EIB's mandate.
- The results are not sensitive to EIB's preferences.
- **Key take-out:** Irrespective of its preferences, when allocations are endogenously determined, the EIB acts as both the Cohesion and the Green Bank of the EU.

Conclusions

No fundamental trade-off. The EIB can simultaneously close the green investment gap and support investment convergence. A genuine conflict arises only at the polar extremes.

Green Periphery investment is the key. Directing EIB resources toward green investment in the Periphery simultaneously expands capital formation. Both dimensions of the mandate are served by the same allocation.

Allocation flexibility dominates fungibility. An adaptive, endogenous allocation rule achieves materially better outcomes.

Robust to time horizon. Results hold whether the EIB prioritises long-run structural goals or incorporates short-run counter-cyclical concerns.

The EIB's dual mandate is **strategically coherent**. It can act as the EU's investment bank *and* its Climate Bank simultaneously, provided it maintains a deliberate and asymmetric focus on **green investment in lower-income member states**.

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Appendix: Financial Accelerator Channel

$$\omega^C_{c,t}(1+R^K_{c,t})\varrho_{c,t-1}(i,\omega^C_{c,t}) = (1+P^L_{c,t-1})L^H_{c,t-1}(i,\omega^C_{c,t}) + (1+R_{t-1})A^{EIB}_{c,t-1}(i,\omega^C_{c,t})$$

$$\max_{\{\varrho^{priv}_{c,t}(i)\}} \quad \mathbb{E}_t\left\{\eta^E_{c,t+1}\left[g(\bar{\omega}_{c,t+1})(1+R^K_{c,t+1})\varrho_{c,t}(i) - (1+P^L_{c,t})L^H_{c,t}(i) - (1+R_t)A^{EIB}_{c,t}(i)\right]\right\}$$

$$1+MC^{ill}_{c,t} = \frac{1+P^{IB}_{c,t}}{1-\mu^B(1-\mathbb{E}_t(\eta_{c,t+1}))}$$

$$\begin{aligned}\Pi^{ill}_{c,t}(b) = &\left[1-\mu^B(1-\mathbb{E}_t\left\{\eta_{c,t+1}\right\})\right](1+R^L_{c,t}(b))L^{S,ill}_{c,t}(b) - (1+P^{IB}_{c,t})IB^H_{c,t}(b)\\ &-(1+R^D_{c,t})D_{c,t}(b) - (1+R_t)liab^{ill}_{c,t}(b)\end{aligned}$$

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Appendix: Measuring the Two Gaps

Investment Gap:

$$\mathcal{G}^{LT}_{\text{inv}} = \left| \frac{I_C - I_P}{(I_C - I_P)_{SS}} \right|$$

A value *below zero* means EIB funding has narrowed the Core–Periphery investment divergence. A value *above zero* means it has widened.

Why the absolute value? The mandate is *symmetric*: widening the gap in either direction is equally undesirable.

Green Investment Gap:

$$\mathcal{G}^{LT}_{\text{grn}} = \frac{(I^B_C + I^B_P) - (I^G_C + I^G_P)}{\left[(I^B_C + I^B_P) - (I^G_C + I^G_P)\right]_{SS}}$$

A value *below zero* means the brown–green investment differential has narrowed: EIB funding has induced a greening of the investment mix.

Why no absolute value? The mandate is *one-sided*: a greener outcome than the baseline should always reduce the loss. Penalising excess greening would contradict a net-zero commitment, and the linear form values each improvement equally.

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Appendix: Results II: Incorporating Medium-term Dynamics

- We allow the EIB to focus on both the long-run and the short-run, reflecting the EIB's role in reacting to short-run fluctuations.
- The main conclusions are qualitative unchanged as in the long-run analysis.
- Small differences in the optimal allocations, over the preference mandate, reflecting its role in adjusting to short-run deviations.
- Time-horizon does not differentiate our results

Key Insights:

- Relax the fungibility assumption and treat the EIB as a partial profit maximiser institution.
- We perform the same analysis as previous, over fixed and endogenous shares, both in the long-run and a combination of the two time horizons.

Allocation Rule:

$$x^s_{j,t} = (1 - \phi^{EIB})\overline{x^s_j} + \phi^{EIB} f^s_{j,t}$$

$$f^s_{j,t} = \left[\frac{\psi^{EIB,s,j}(1 + r^K_{s,j,t})^{\nu^{EIB}}}{\psi^{EIB,s,j}(1 + r^K_{s,j,t})^{\nu^{EIB}} + \psi^{EIB,\tilde{s},j}(1 + r^K_{\tilde{s},j,t})^{\nu^{EIB}}} \right]$$

Main Results:

- The results are qualitatively unchanged to the previous results.
- The non-fungibility assumption does not drive the results of our analysis