Debt Seniority and Sovereign Debt Crises

Anil Ari[1] Giancarlo Corsetti[2,4] Luca Dedola[3,4]

[1]International Monetary Fund

[2]University of Cambridge

[3]European Central Bank

[4]CEPR

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Motivation

Many examples of countries (implicitly) tranching their debt

- Reform proposals for the Euro area (blue-red bonds, ESBies, E-bonds)
- Bonds issued under English or US law
- Official lending

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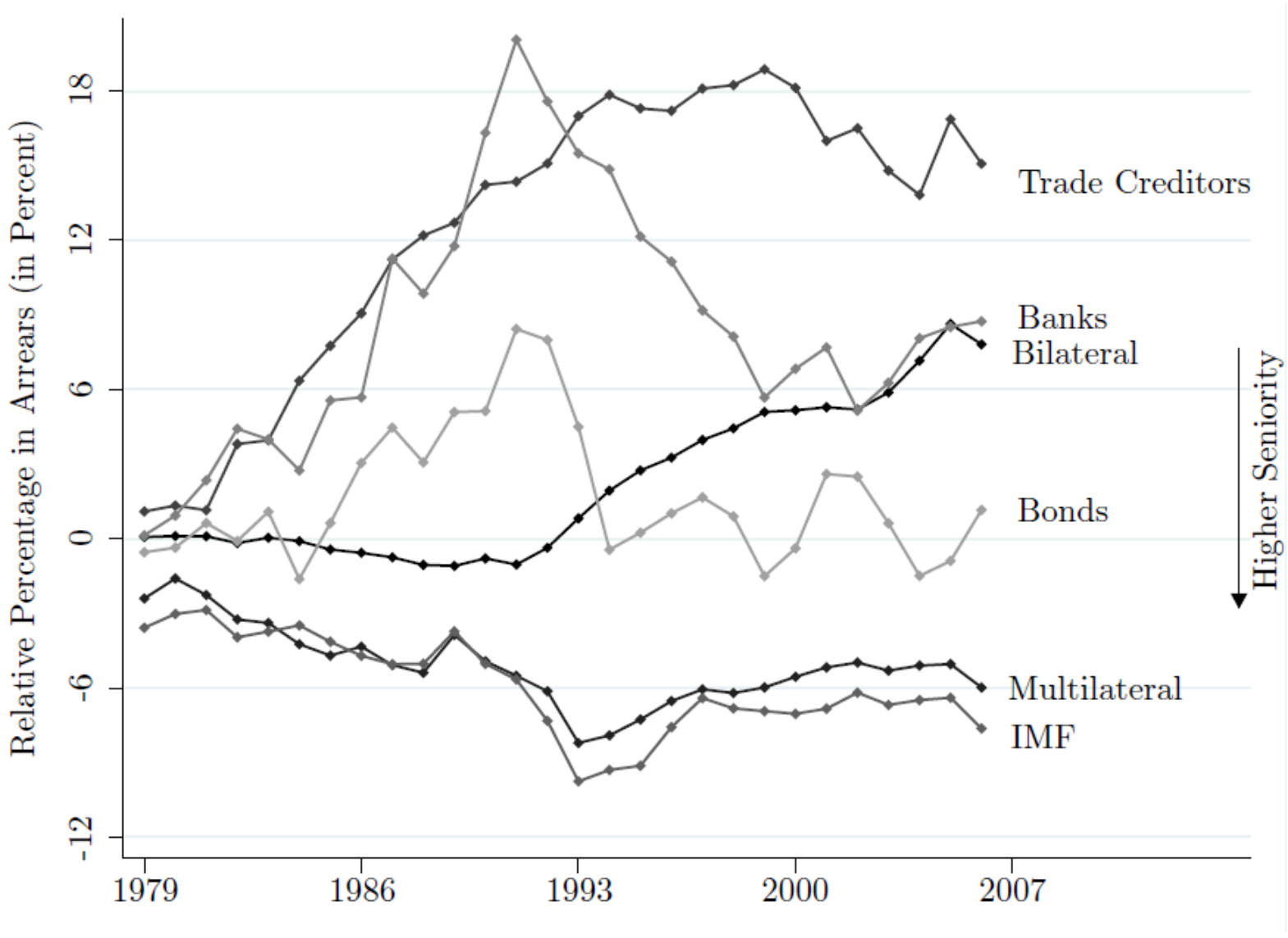
Seniority is often in tandem with differential commitment to repayment

- Exemption from (automatic) restructuring, stricter CACs
- More creditor-friendly jurisdiction
- Implications for support from international institutions

$\Rightarrow$ Higher costs for defaulting on "senior" debt

Evidence on seniority



Source: Schlegl, Trebesch & Wright (2019)

This Paper

Key questions

- Does the seniority structure of sovereign debt affect prospective primary deficits and debt sustainability?
- Is managing the seniority structure an instrument to reduce vulnerability to debt crises?

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Model of debt seniority and sovereign default

- Government chooses haircut optimally but cannot pre-commit
- Trade-off: default costs vs. tax distortions

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Model of debt seniority and sovereign default

- Government chooses haircut optimally but cannot pre-commit
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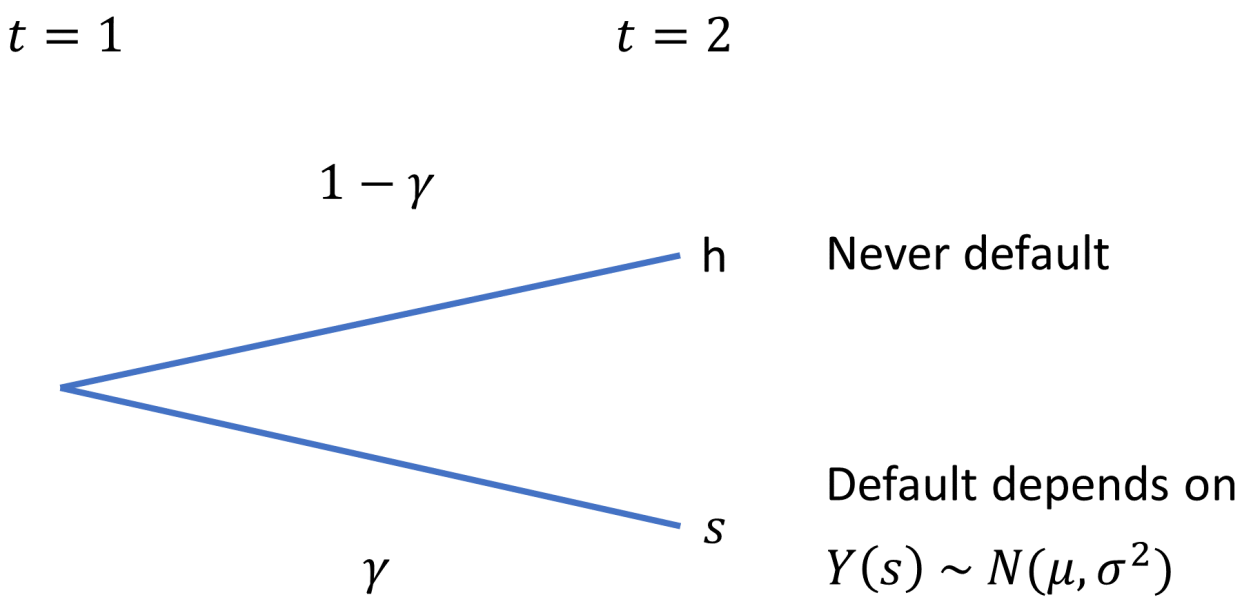
Preview of results

- No additional commitment: seniority irrelevant (Modigliani-Miller)
- Default on senior (marginally) more costly: limited commitment device
- Trade-off between injecting commitment vs allowing for state-contingent adjustment through debt restructuring
- Appropriate levels of tranching can raise welfare and resilience to debt crises, even for junior debt

Model

- Agents: households and government
- Two periods: uncertainty about fundamentals in period 2

- State h: Never default (high output or government type)
- States s: Output $Y(s)$ is stochastic,
  Government optimally decides whether to default



Period 1: Debt financing & household portfolios

- Government: start with (exogenous) financing need B_0
  - Market financing by selling discount bonds B
  - Share ω is senior at price $\widetilde{q}_b$, remaining junior at price q_b

$$\left((1-\omega)q_b + \omega\widetilde{q}_b\right)B = B_0$$

- Households: start with endowment W_0
  - Allocate between safe asset K at price q and government bonds
  - Risk neutral: government bonds priced at expected return

$$q_b = q\left(1-\gamma E\left[\theta(s)\right]\right) \ , \ \widetilde{q}_b = q\left(1-\gamma E\left[\widetilde{\theta}(s)\right]\right)$$

$\Rightarrow$ Senior debt will have higher price $\widetilde{q}_b \geq q_b$

Period 2: Taxation & default

- Govenment has (state-contingent) choice set

  1. Haircut on sovereign bonds: $0 \leq \theta(s) \leq 1$, $0 \leq \widetilde{\theta}(s) \leq 1$

     - Fixed default costs: $\Phi > 0$, $\widetilde{\Phi} > 0$

  $\Rightarrow$ Defaulting on senior debt has additional cost

     - Fractional budgetary cost: $0 \leq \alpha \leq 1$

  2. Taxation $T(s)$ with deadweight loss $Z(T(s), Y(s))$

     - Convex in taxation, marginal loss decreases in output

- Budget constraint

$$T(s) - G = (1-\omega)(1-(1-\alpha)\theta(s))B + \omega\left(1-(1-\alpha)\widetilde{\theta}(s)\right)B$$

Government's Problem

- Maximize social welfare, equivalent to expected consumption
- Period 1: Government chooses senior share ω. Taken as given for now
- Period 2: Discretionary, cannot pre-commit (take $q_b, \widetilde{q}_b$ as given)

$$\max_{T(s),\theta(s),\widetilde{\theta}(s)} Y(s) - Z(T(s), Y(s)) - T(s) + K + \Big(1 - (1-\omega)\,\theta(s) - \omega\widetilde{\theta}(s)\Big)\,B$$
$$- \mathbb{1}_{\{\theta(s)>0\}}\Phi - \mathbb{1}_{\left\{\widetilde{\theta}(s)>0\right\}}\widetilde{\Phi}$$

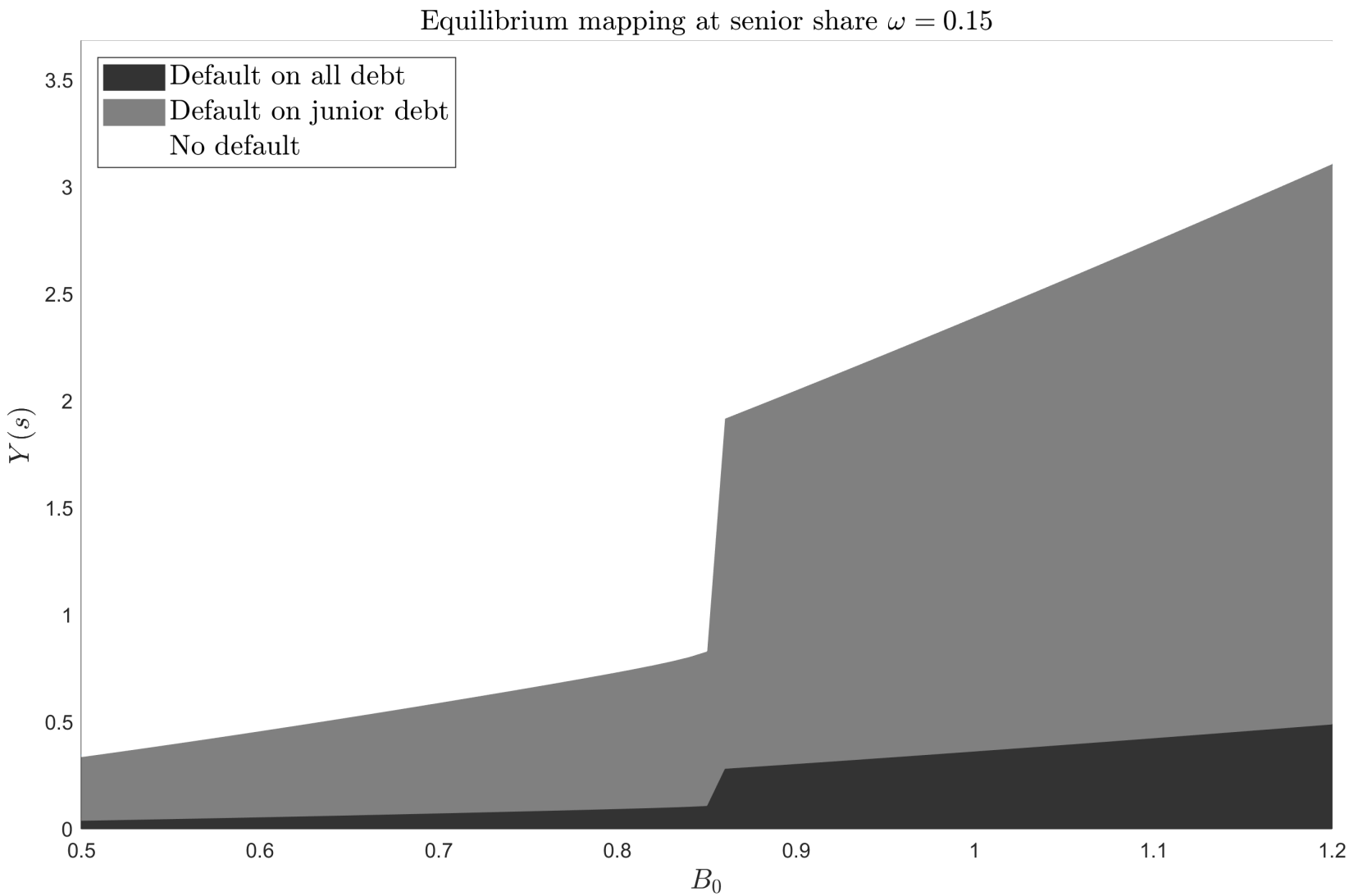
$$T(s) - G = \Big(1 - (1-\alpha)\Big((1-\omega)\,\theta(s) + \omega\widetilde{\theta}(s)\Big)\Big)\,B \quad \text{(Budget constraint)}$$

$$0 \leq \theta(s) \leq 1\ ,\ 0 \leq \widetilde{\theta}(s) \leq 1 \quad \text{(Boundary constraints)}$$

- Optimal haircut increases with $B/Y(s)$ unless at boundary
- Raising senior share $\uparrow \omega$ has non-linear effects on junior debt

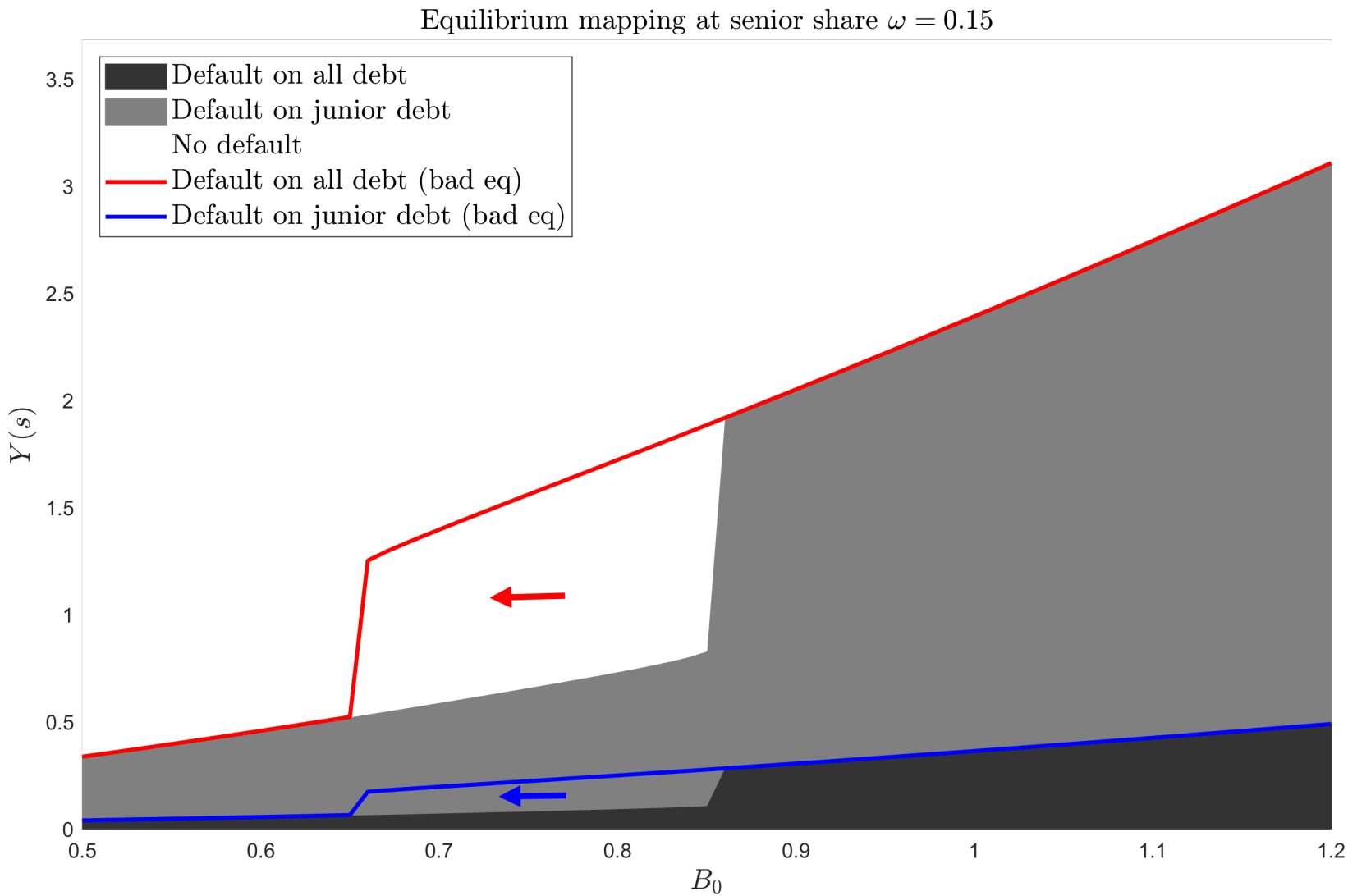
Rational Expectations Equilibrium

- "Good equilibrium" as a function of depend on financing need B_0 and output realization $Y(s)$



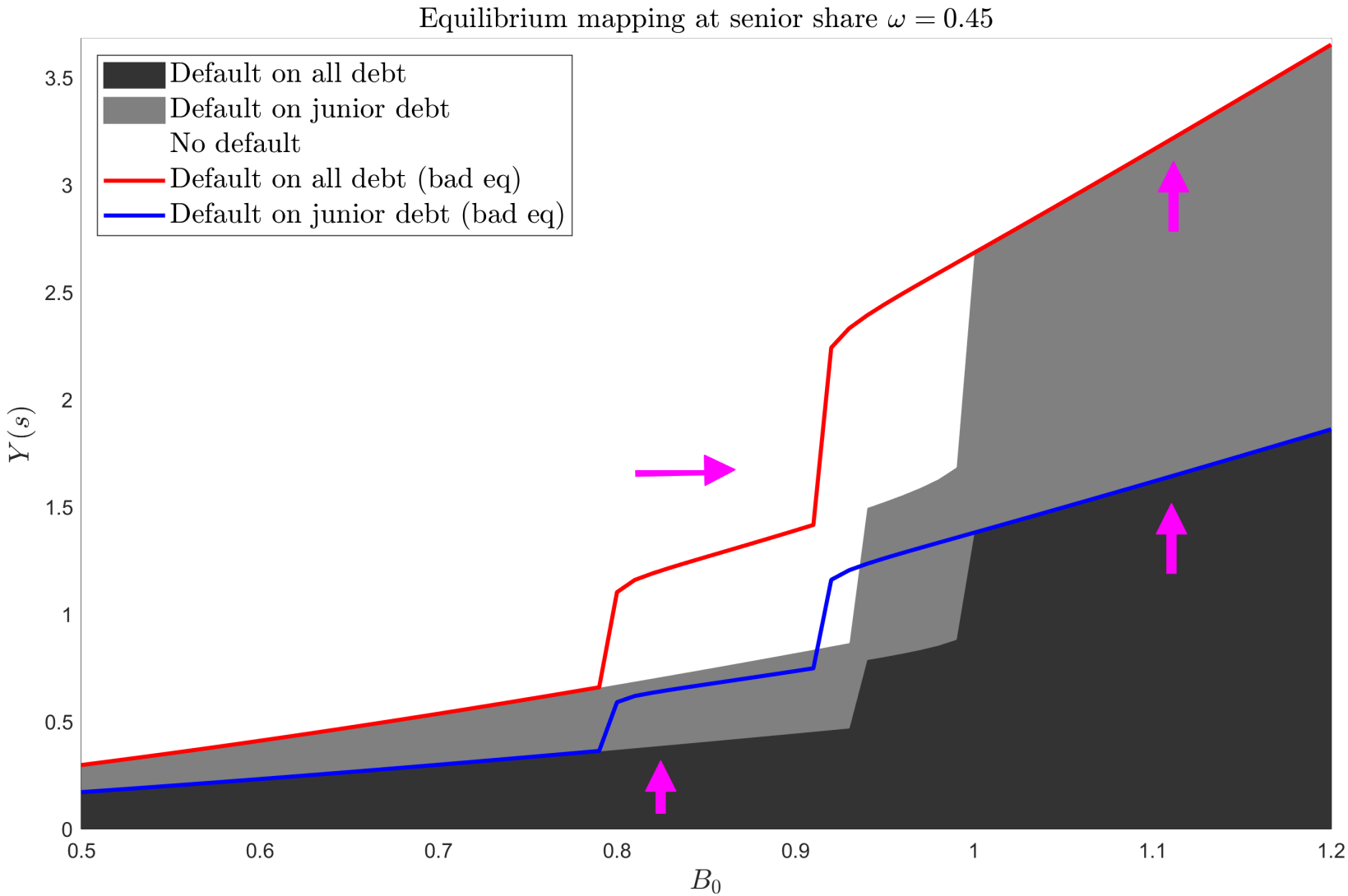
"Good" vs "bad" equilibria

- Anticipation of default reduces sovereign bond prices q_b, $\widetilde{q}_b$
- Govt sells more bonds B to meet financing need, raising default risk



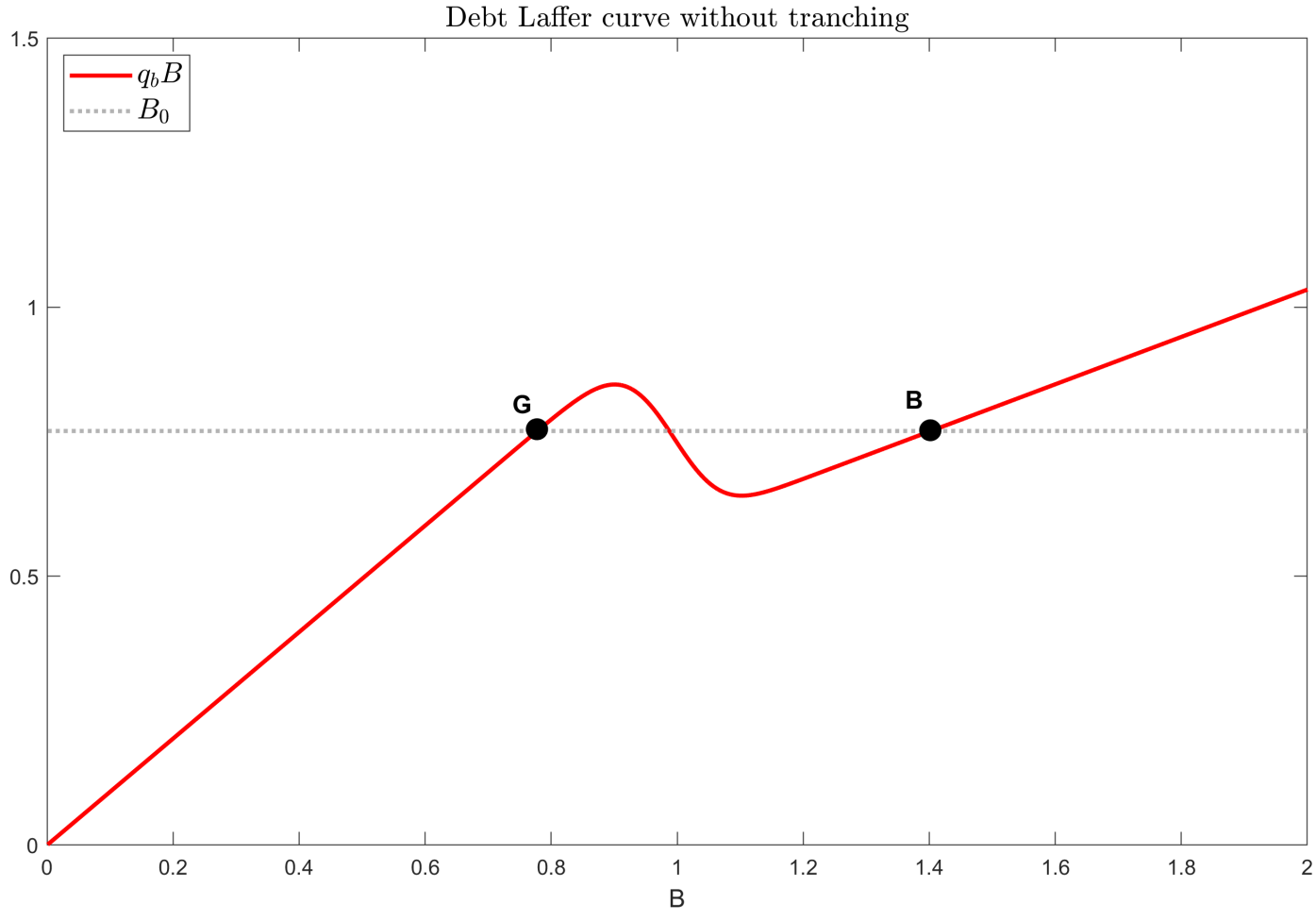
Higher share of senior debt

- With higher senior share ω, default on senior debt at higher output
- Tightens multiplicity region, less default at low B_0 but more at high B_0



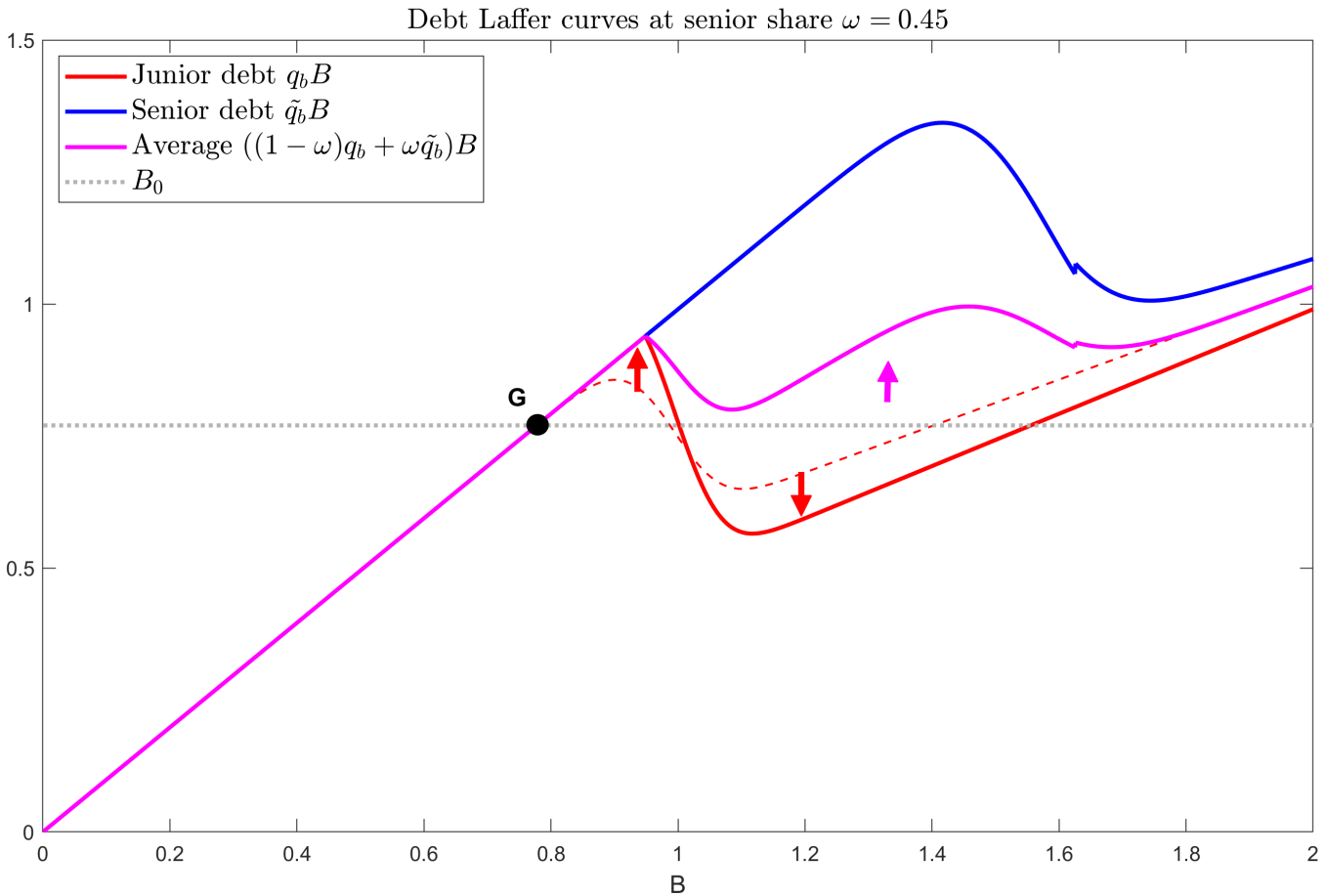
Debt Laffer curve: without any senior debt ($\omega = 0$)

- Equilibrium where market financing curve (red) crosses financing need
- Multiple (stable) equilibria if anticipations of default become self-fulfilling via impact on financing costs



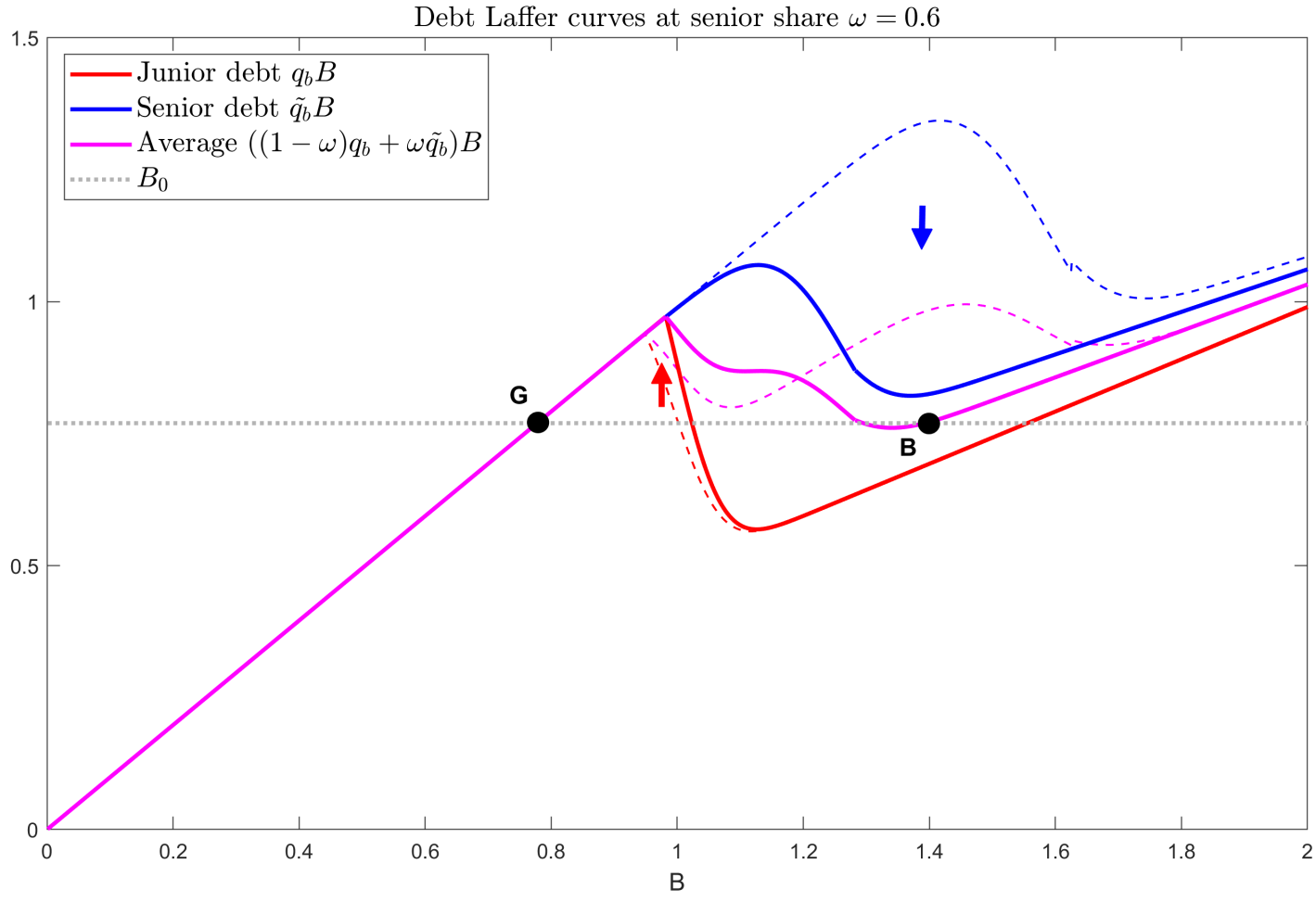
Debt Laffer curve: with senior debt ($\omega = 0.45$)

- Equilibrium now determined by average financing curve (purple)
- Senior debt injects "commitment" to more primary surplus, when debt relief from defaulting on senior tranche not worth added default cost
- Reduces financing costs and more than offsets dilution of junior debt
- Eliminate bad equilibrium, preventing default on junior debt as well



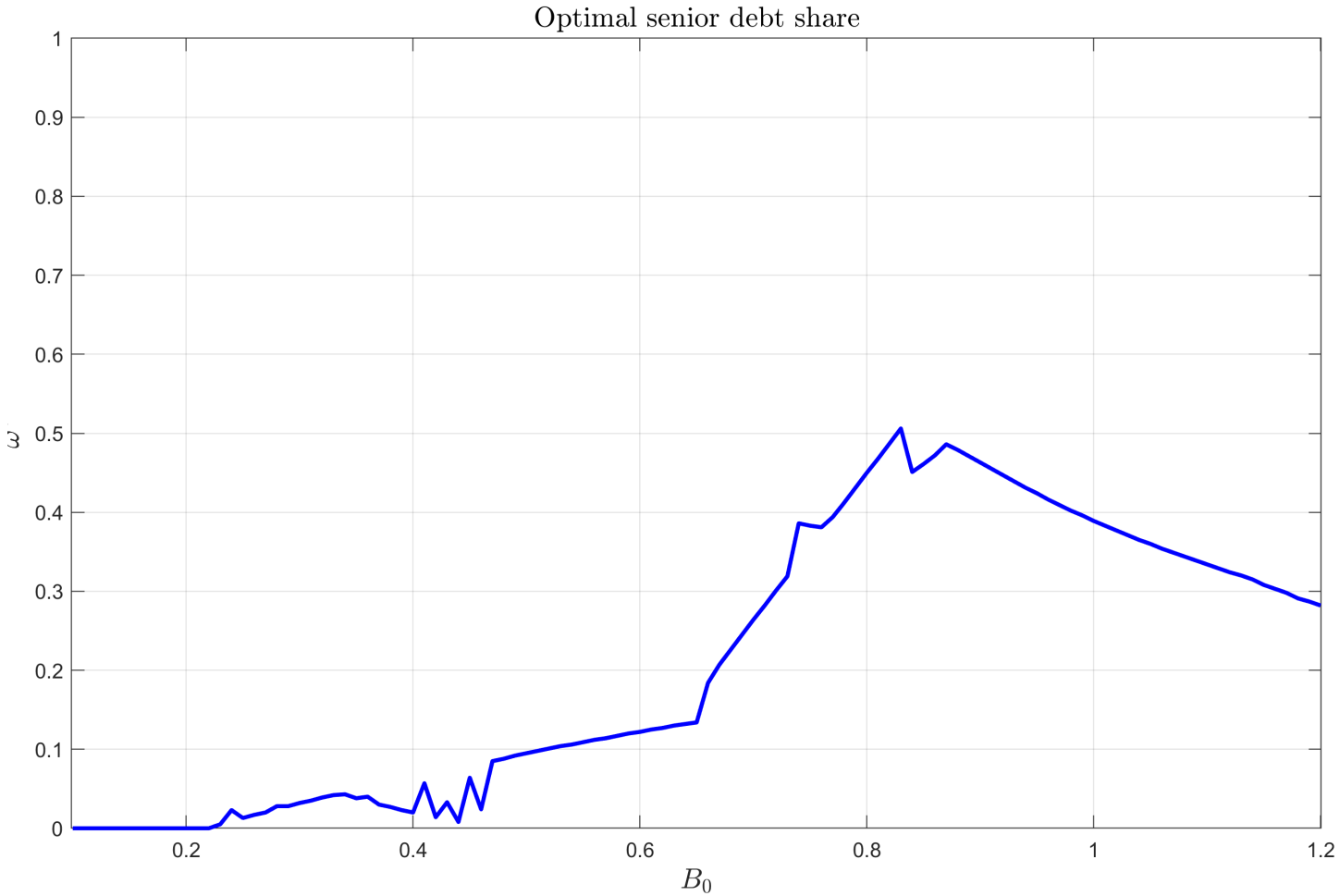
Debt Laffer curve: with senior debt ($\omega = 0.6$)

- Too much senior debt can be destabilizing
- Stronger incentives to default on senior raise avg. financing costs



Welfare analysis

- Period 1: government chooses ω to maximize expected consumption
- Form of limited commitment: $T^*(B, Y(s), \omega)$, $\theta^*(B, Y(s), \omega)$
- Trade-off: less vulnerability to debt crises vs. costly default on senior
- Optimal senior share highest when vulnerable to multiplicity



Conclusion

- Model of debt seniority and sovereign default
  - Government chooses haircut optimally but cannot pre-commit
  - Default can be due to fundamentals or self-fulfilling expectations
  - Default on senior debt (marginally) more costly
- Seniority as a limited commitment device
  - Non-linear effects on vulnerability to debt crises
  - Trade-off between injecting commitment vs state-contingent adjustment through debt restructuring
  - Optimal senior share highest when vulnerable to adverse market dynamics