

Debt and Defence

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Motivation: Debt and Defence

- **Rising Military Threats in Europe:**

- Russian invasion of Ukraine bringing war to the EU border.
- Conflicts in the Middle East disrupting global trade.
- Direct US pressure on NATO members to increase military spending.

→ Pressure across European countries to **increase defence budgets**.

A Fragile Fiscal Backdrop

- **High Sovereign Debt:** European government debt-to-GDP ratios started high and have risen sharply post-pandemic.
- **Low Growth, Adverse Demographics:** Long-run strain on public finances.

Externalities in a (Fiscal) Union of Countries

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 - Expectation of bailouts, transfers, including via unconventional monetary policy.
 - Costs of high debt spill over to other union members.
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Research Question

How should a union of countries regulate national borrowing in the face of a common military threat?

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- **Results**
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 - Higher borrowing alters private/public composition of expenditure,
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 - Heterogeneous strength of the externality:
 - **Loose** limits on **border** countries,
 - **Tight** on **interior** countries.

Preferences

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Household optimality

$$-\frac{u_n}{u_c} = 1 - \tau \quad (\text{labour supply}), \quad q u_{c,1} = \beta \mathbb{E}[u'_2(c_2)] \quad (\text{Euler})$$

Default and Mutualisation

Default: each country repays with prob. π , defaults with prob. $1 - \pi$

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Mutualisation $\Rightarrow$ volatile consumption

Government (Over-)Borrowing

Government only cares about utility in repayment state. Euler:

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Government borrows to the limit even with $\pi = 1$, because financing g via debt is akin to lump-sum taxation when $\bar{b}$ is not too big.

Ramsey Problem Given Borrowing Limit

The Ramsey planner chooses the allocation (c, g, n) and tax rate τ , takes as given borrowing limit $\bar{b}$ and the union spending $\bar{g}$:

$$\begin{aligned} \max_{c, g, n, \tau} \quad & u_1(c, g, \bar{g}, n) \\ \text{s.t.} \quad & c = (1 - \tau) n - X \quad (\text{household budget}) \\ & g = \tau n + X \quad (\text{government budget}) \\ & n = c + g \quad (\text{resource constraint}) \\ & u_l / u_c = 1 - \tau \quad (\text{household optimality}) \end{aligned}$$

$X \equiv q \bar{b}$ is the **revenue from borrowing**.

Ramsey²: Choosing the Borrowing Limit

Ramsey: chooses (τ, g, b)
s.t. borrowing limit $\bar{b}$
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National Ramsey² takes $\bar{g}$ as given. **Union** Ramsey² internalises $\bar{g} = g$.

First Best: National vs Union

National first best takes $\bar{g}$ as given:

$$\max_{c, g, n} u_1(c, g, \bar{g}, n)$$

$$\text{s.t. } n = c + g$$

First-order conditions:

$$u_c = u_g \quad (\text{composition}), \quad -u_n = u_c \quad (\text{no labour wedge})$$

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Composition condition gains an extra term:

$$u_c = u_g + u_{\bar{g}} \quad (\text{composition})$$

Resource constraint and labour/leisure condition are unchanged.

GHH Preferences

$$u_1(c, g, \bar{g}, n) = \log\left(c - \frac{n^{1+\psi}}{1+\psi}\right) + \chi \log g + \chi_g \log \bar{g}, \quad u_2(c_2) = \log c_2$$

GHH Preferences

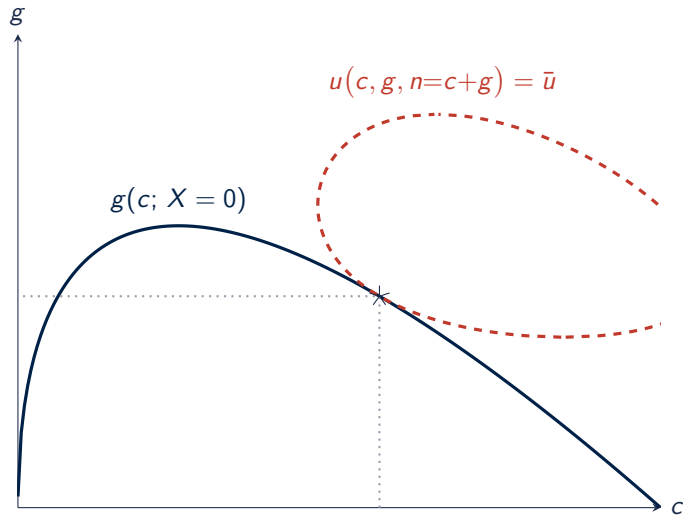
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Fiscal Frontier: $g = G(c; X)$ embeds all Ramsey constraints.

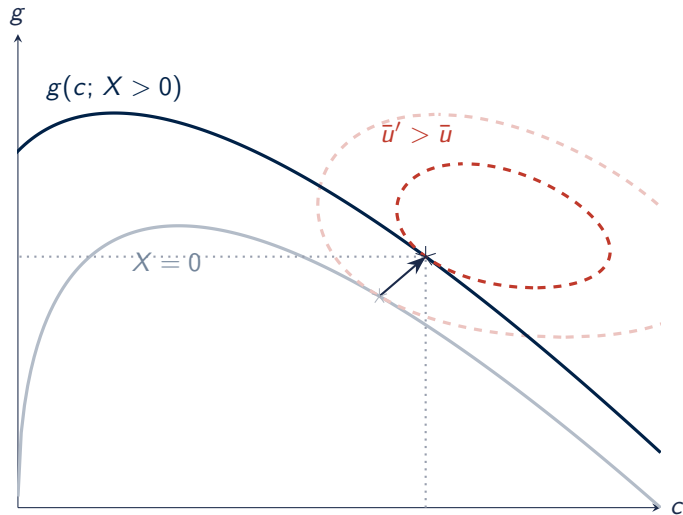
$$g(c, X) = (c + X)^{\frac{1}{1+\psi}} - c$$

Ramsey allocation is the tangency of the indifference curve with the fiscal frontier.

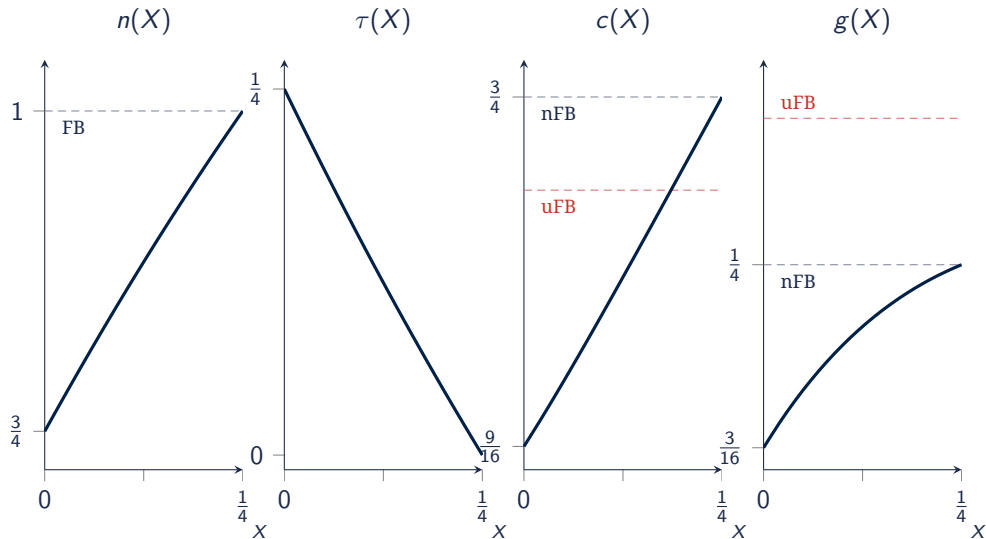
Ramsey Allocation: Tangency



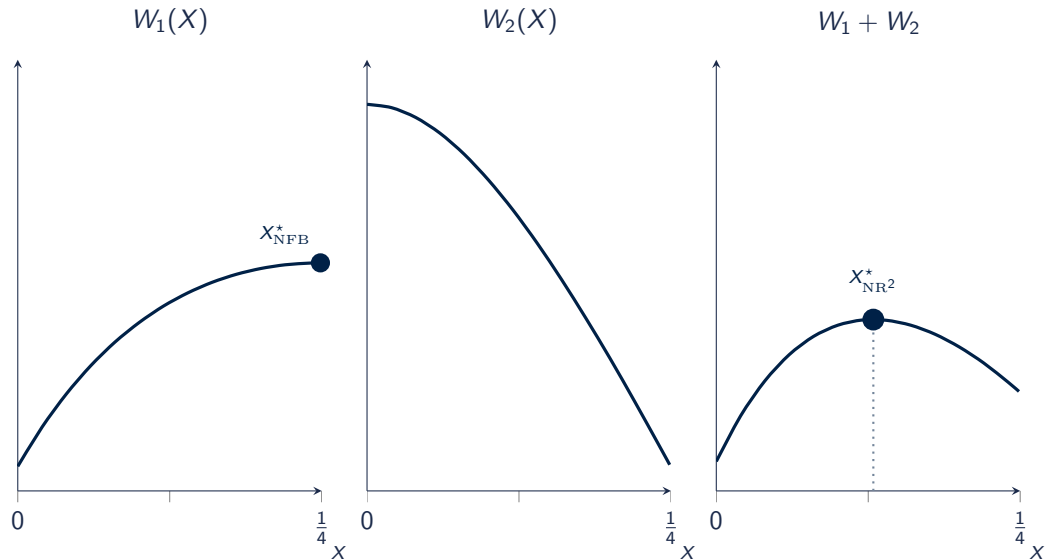
Higher Borrowing Limit: $X > 0$



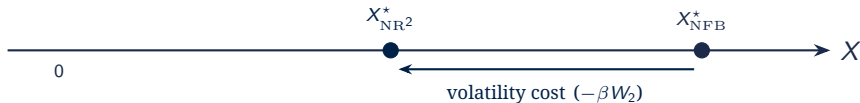
Numerical Illustration: Borrowing Limit and the Allocation



Welfare and the Optimal Borrowing Limit

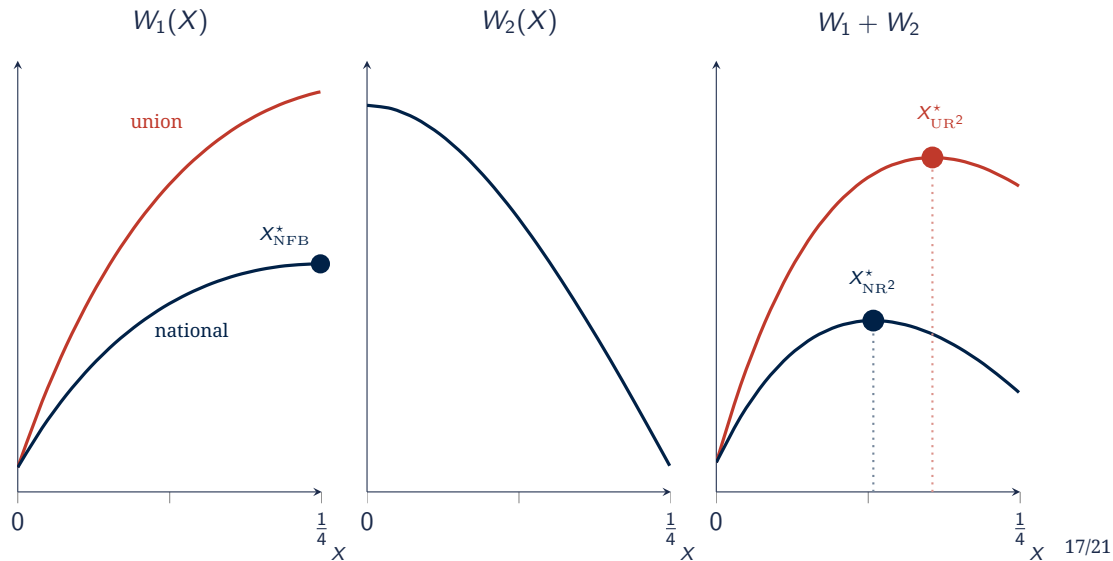


The Optimal Borrowing Limit - National

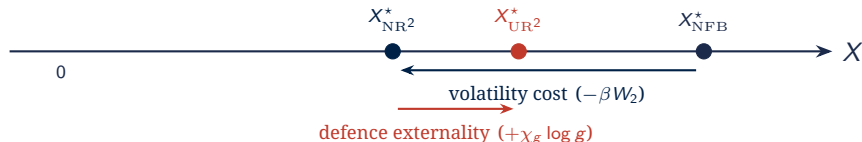


Period-2 volatility pulls the optimum below the first best: $X_{NR^2}^* < X_{NFB}^*$.

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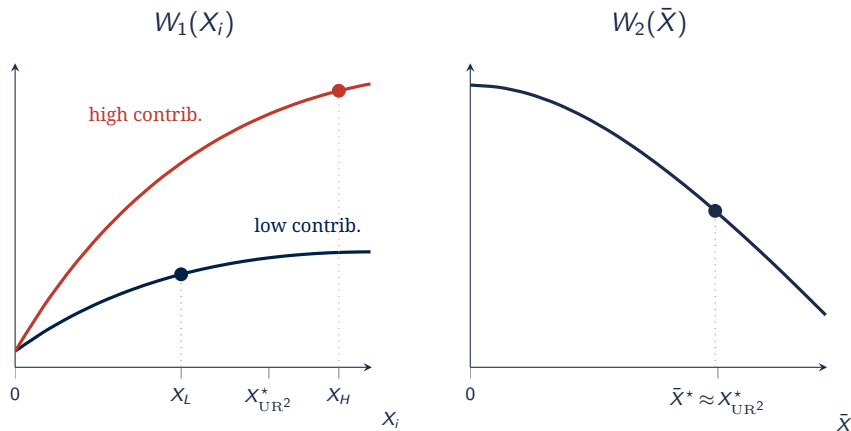


The Optimal Borrowing Limit - Union



The defence externality pushes the union optimum back up: $X_{NR^2}^* < X_{UR^2}^* < X_{NFB}^*$.

Heterogeneous Contribution to Public Good



- Steeper W_1 for high contributors $\Rightarrow$ frontline borrows more, $X_H > X_{UR^2}^*$.
- Interior cut, $X_L < X_{UR^2}^*$: average $\bar{X}^* \approx X_{UR^2}^*$, volatility unchanged.

Concluding Remarks

Countries in a union impose a variety of **spillovers** on one another.

Policies to limit overborrowing may **backfire** and suppress public good provision.

A richer set of policy instruments delivers welfare gains in a **heterogeneous** union of countries.

Many possible **extensions**: legacy debt, heterogeneous public goods, pacifist and militaristic countries ...



Thank you!