Fiscal Unions

Emmanuel Farhi, Harvard

Iván Werning, MIT

Currency Unions

- Case for flexible exchange rates...Friedman (53)

- Currency union...single monetary policy...
    - can stabilize symmetric shocks
    - <u>cannot</u> stabilize asymmetric shocks

- How to deal with asymmetric shocks?

Currency Unions

- Optimal Currency Area literature

  - factor mobility...Mundell (61)

  - openness...McKinnon (63)

  - fiscal integration....Kennen (69)

  - financial integration...Mundell (73)

Currency Unions

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This Paper

- Mechanism design meets Keynesian economics
  - fiscal union as **insurance** in a currency union
  - characterize **optimal** arrangement

- Dual role of transfers
  - risk sharing
  - macroeconomic stabilization

This Paper

- **Key result:** macro externality in insurance decisions

- Within a currency union: social $\neq$ private

- Fiscal and monetary unions go hand in hand
- Fiscal and financial integration **not** perfect substitutes

Implementation

- Complete markets
  - macro-prudential portfolio taxes

- Incomplete markets
  - fiscal transfers

Implementation

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Households

$$U^i(C_{NT}^i, C_T^i, N^i; s)$$

Households

- Country i households maximizes

$$\int U^i(C^i_{NT}(s), C^i_T(s), N^i(s); s)\pi(s)ds$$

subject to

$$\int D^i(s)Q(s)\pi(s)ds \leq 0$$

$$P^i_{NT}C^i_{NT}(s) + P_T(s)C^i_T(s) \leq W^i(s)N^i(s) + P_T(s)E^i_T(s)$$

$$+\Pi^i(s) + T^i(s) + D^i(s)$$

Households

- Country i households maximizes

$$\int U^i(C^i_{NT}(s), C^i_T(s), N^i(s); s)\pi(s)ds$$

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$$P^i_{NT}C^i_{NT}(s) + P_T(s)C^i_T(s) \leq W^i(s)N^i(s) + P_T(s)E^i_T(s)$$

$$+\Pi^i(s) + T^i(s) + \left(1 + \tau^i_D(s)\right)D^i(s)$$

Households

$$C_{NT}^i(s) = \left(\int_0^1 C_{NT}^{i,j}(s)^{1-\frac{1}{\varepsilon}} dj \right)^{\frac{1}{1-\frac{1}{\varepsilon}}}$$

- Country i households maximizes

$$\int U^i(C_{NT}^i(s), C_T^i(s), N^i(s); s)\pi(s)ds$$

subject to

$$\int D^i(s)Q(s)\pi(s)ds \leq 0$$

$$P_{NT}^i C_{NT}^i(s) + P_T(s)C_T^i(s) \leq W^i(s)N^i(s) + P_T(s)E_T^i(s)$$

$$+\Pi^i(s) + T^i(s) + \left(1 + \tau_D^i(s)\right)D^i(s)$$

Firms

- Each variety j of NT
  - produced monopolistically
  - technology

$$Y_{NT}^{i,j}(s) = A^i(s)N^{i,j}(s)$$

  - price set one period in advance

Government

- Government budget constraint

$$T^i(s) = \tau_L^i W^i(s) N^i(s) - \tau_D^i(s) D^i(s) + \hat{T}^i(s)$$

- Zero net international fiscal transfers

$$\int \hat{T}^i(s) di = 0$$

Equilibrium

- Household FOCs

- Firm FOC

- Government budget constraint

- Market clearing

$$C_{NT}^i(s) = A^i(s)N^i(s)$$

$$\int C_T^i(s)di = \int E_T^i(s)di$$

FOCs

$$\frac{U_{C_T}^i(s)(1 + \tau_D^i(s))}{Q(s)P_T(s)} = \frac{U_{C_T}^i(s')(1 + \tau_D^i(s'))}{Q(s')P_T(s')}$$

$$\frac{U_{C_T}^i(s)}{P_T(s)} = \frac{U_{C_{NT}}^i(s)}{P_{NT}^i}$$

$$-\frac{U_N^i(s)}{W^i(s)} = \frac{U_{C_{NT}}^i(s)}{P_{NT}^i}.$$

$$P_{NT}^i = (1 + \tau_L^i)\frac{\varepsilon}{\varepsilon - 1}\frac{\int \frac{Q(s)}{1+\tau_D^i(s)}\frac{W^i(s)}{A^i(s)}C_{NT}^i(s)\pi(s)ds}{\int \frac{Q(s)}{1+\tau_D^i(s)}C_{NT}^i(s)\pi(s)ds}$$

FOCs

$$\frac{U^i_{C_T}(s)}{P_T(s)} = \frac{U^i_{C_{NT}}(s)}{P^i_{NT}}$$

FOCs

$$\frac{U^i_{C_T}(s)}{P_T(s)} = \frac{U^i_{C_{NT}}(s)}{P^i_{NT}}$$

weak separability
+ homothetic

$$C^i_{NT}(s) = \alpha^i(p^i(s); s)C^i_T(s)$$

$$p^i(s) = \frac{P_T(s)}{P^i_{NT}}$$

Alternative: Incomplete markets
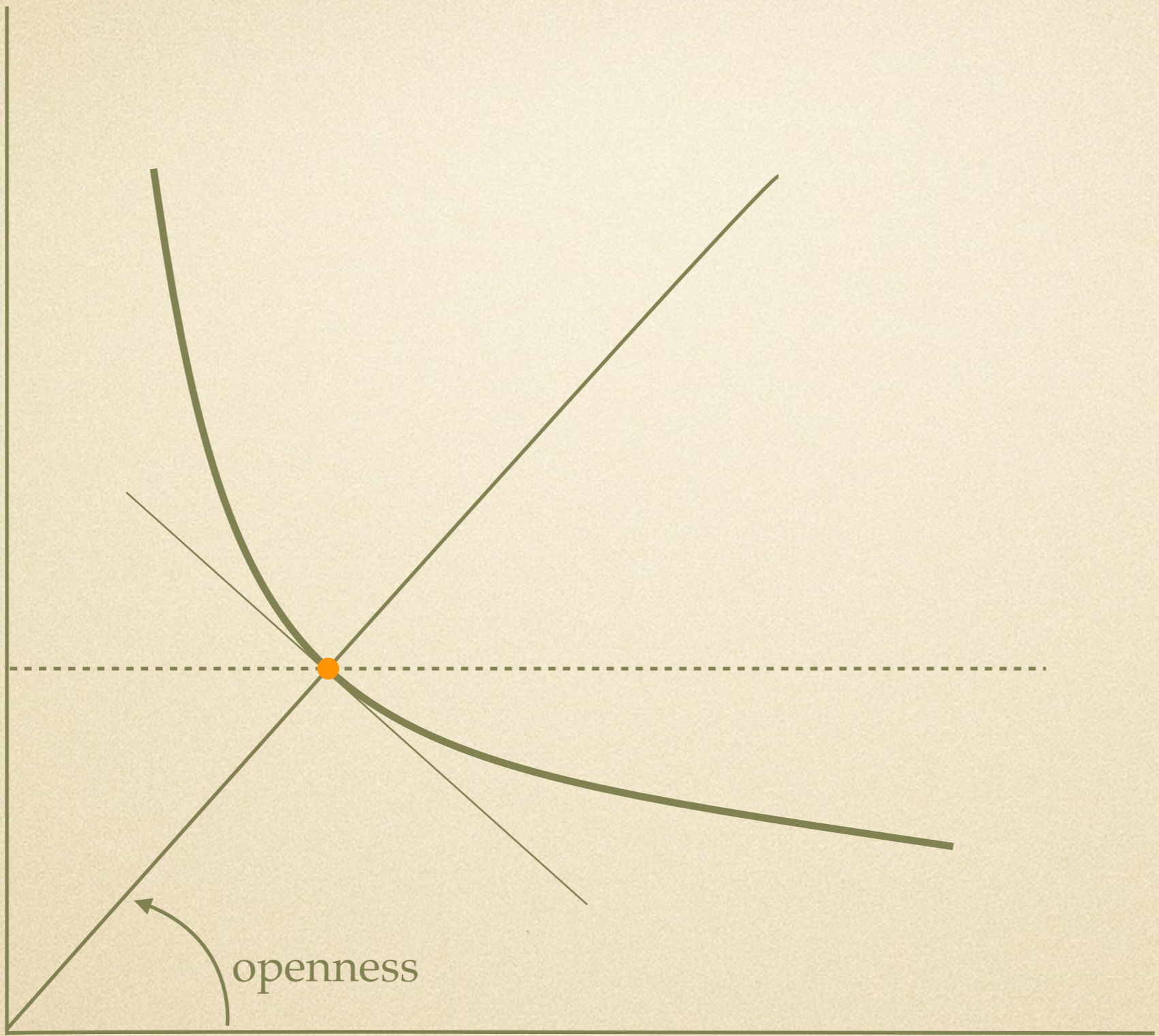
- Household budget constraint

$$P_{NT}^i C_{NT}^i(s) + P_T(s) C_T^i(s)$$
$$\leq W^i(s) N^i(s) + P_T(s) E_T^i(s) + \Pi^{i,j}(s) + T^i(s)$$

- Government budget constraint

$$T^i(s) = \tau_L^i W^i(s) N^i(s) + \hat{T}^i(s)$$
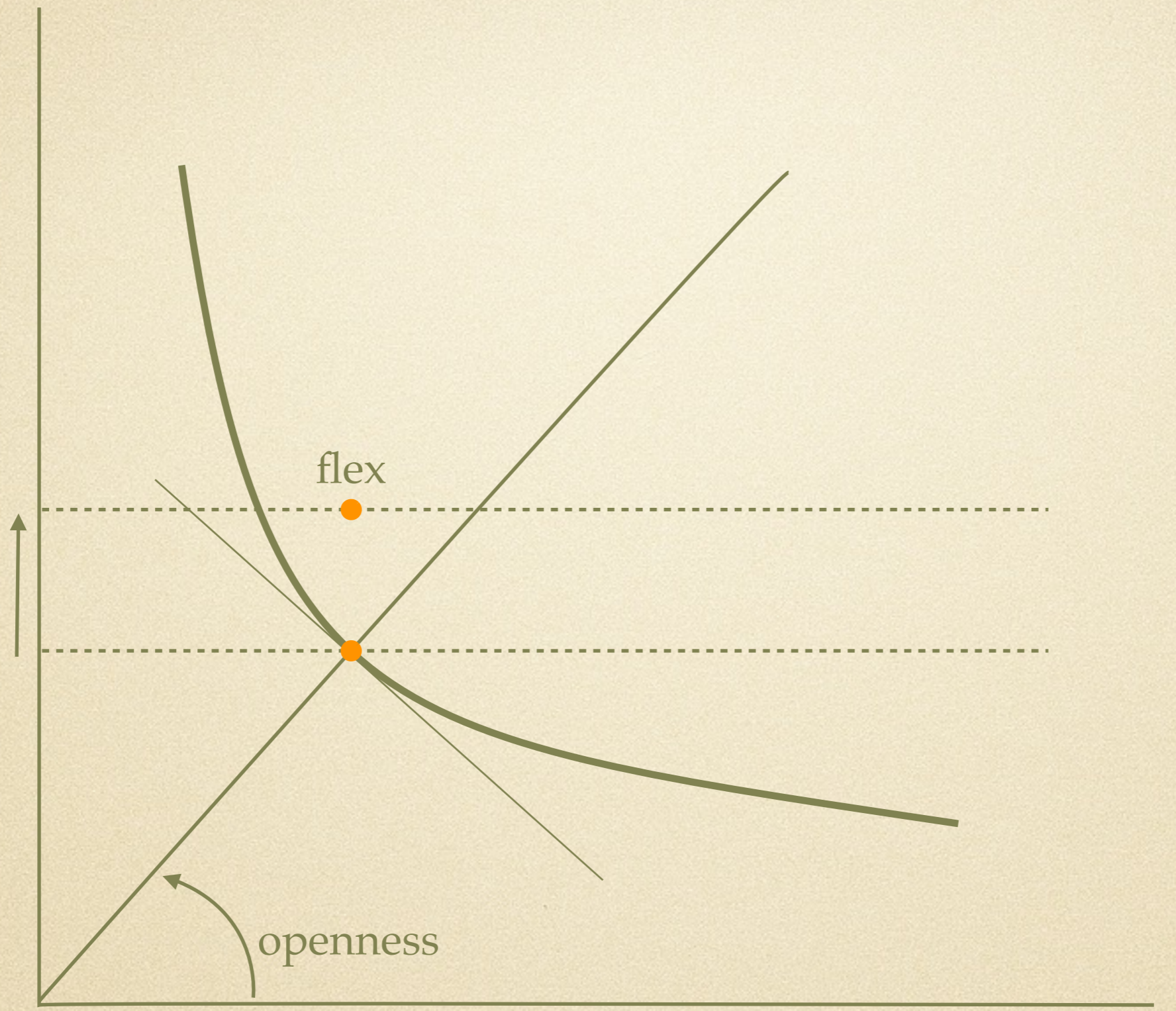
- Same implementability conditions!

Planning Problem
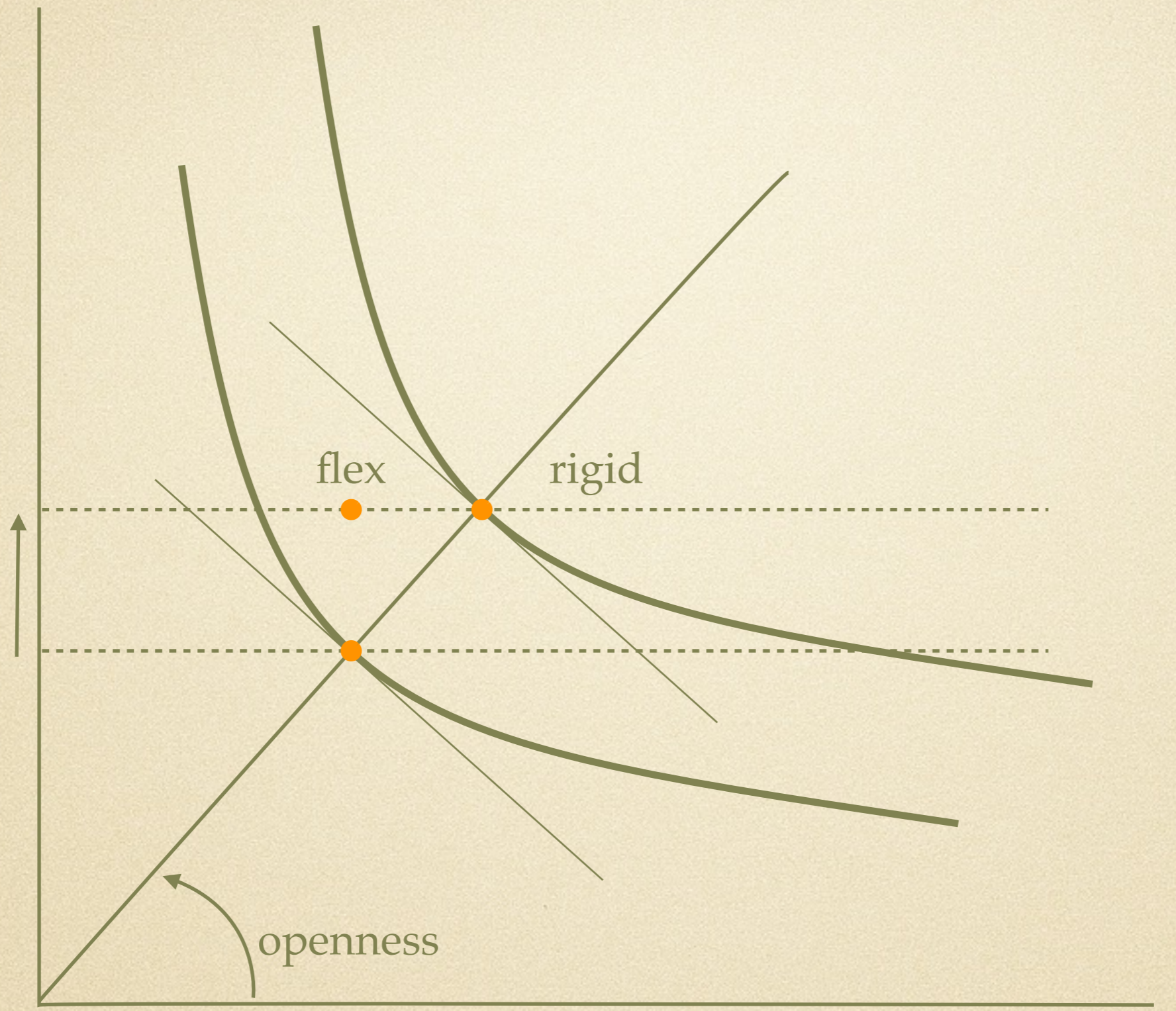
- Constrained Pareto frontier (weights λ^i)

$$\max_{P_{NT}^i, P_T(s), C_T^i(s)} \int \int V^i \left(C_T^i(s), \frac{P_T(s)}{P_{NT}^i}; s \right) \lambda^i \pi(s) \, di \, ds$$

$$\int C_T^i(s) di = \int E_T^i(s) di$$

Planning Problem

$$U^i\left(\alpha^i(p^i(s);s)C_T^i(s), C_T^i(s), \frac{\alpha^i(p^i(s);s)}{A^i(s)}C_T^i(s); s\right)$$

- Constrained Pareto frontier (weights λ^i)

$$\max_{P_{NT}^i, P_T(s), C_T^i(s)} \int\int\int V^i\left(C_T^i(s), \frac{P_T(s)}{P_{NT}^i}; s\right)\lambda^i\pi(s)\,di\,ds$$

$$\int C_T^i(s)di = \int E_T^i(s)di$$

Optimality Conditions

Proposition (Optimal Price Setting).
Zero average labor wedge across states for each country:

$$\int \alpha_p^i(s)\, C_T^i(s)\, U_{C_T}^i(s)\, \tau^i(s)\, \pi(s)\, ds = 0$$

across states for each country

labor wedge

across countries for each state

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across states for each country

across countries for each state

labor wedge

Proposition (Optimal Monetary Policy).
Zero average labor wedge across countries for each state:

$$\int \alpha_p^i(s) C_T^i(s) U_{C_T}^i(s)\, \tau^i(s) \lambda^i\, di = 0$$

Optimal Risk Sharing

Proposition (Optimal Risk Sharing).

$$\frac{V^i_{C_T}(s)}{V^{i'}_{C_T}(s)} = \frac{V^i_{C_T}(s')}{V^{i'}_{C_T}(s')}$$

- Standard risk sharing condition...

- ... but with *social* instead of *private* marginal values

- Fiscal and financial integration not perfect substitutes

Optimal Risk Sharing

Proposition (Optimal Risk Sharing).

$$\frac{U_{C_T}^i(s)}{U_{C_T}^{i'}(s)} \frac{1 + \frac{\alpha^i(s)}{p^i(s)}\tau^i(s)}{1 + \frac{\alpha^{i'}(s)}{p^{i'}(s)}\tau^{i'}(s)} = \frac{U_{C_T}^i(s')}{U_{C_T}^{i'}(s')} \frac{1 + \frac{\alpha^i(s')}{p^i(s')}\tau^i(s')}{1 + \frac{\alpha^{i'}(s')}{p^{i'}(s')}\tau^{i'}(s')}$$

- Standard risk sharing condition...

- ... but with *social* instead of *private* marginal values

- Fiscal and financial integration not perfect substitutes

Two Implementations

- Complete markets + macro-prudential portfolio taxes

$$\tau_D^i(s) = \frac{\alpha^i(s)}{p^i(s)}\tau^i(s)$$

- Incomplete markets + fiscal transfers

$$\hat{T}^i(s) = P_T(s)(C_T^i(s) - E^i(s))$$

Two Implementations

- Complete markets + macro-prudential portfolio taxes

$$\tau_D^i(s) = \frac{\alpha^i(s)}{p^i(s)}\tau^i(s)$$

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Non-Members

- Outside currency union, same conditions, but...
  - zero labor wedges
  - privately and socially optimal risk sharing coincide
  - no need for macro-prudential portfolio taxes
  - fiscal unions replicate complete markets

- Fiscal unions and currency unions go hand in hand

Moral Hazard

- Up to now, no incentive issues

- Introduce to capture concerns for moral hazard

- Tradeoff insurance vs. incentives

- More insurance in currency union (social vs. private)

Dynamic Model

- Dynamic model
    - Calvo price setting
    - all goods traded
    - openness: home bias in preferences
    - fraction of HtM consumers with high MPCs (financially constrained)

Impulse Response (No HtM)

Output gap

PPI Inflation
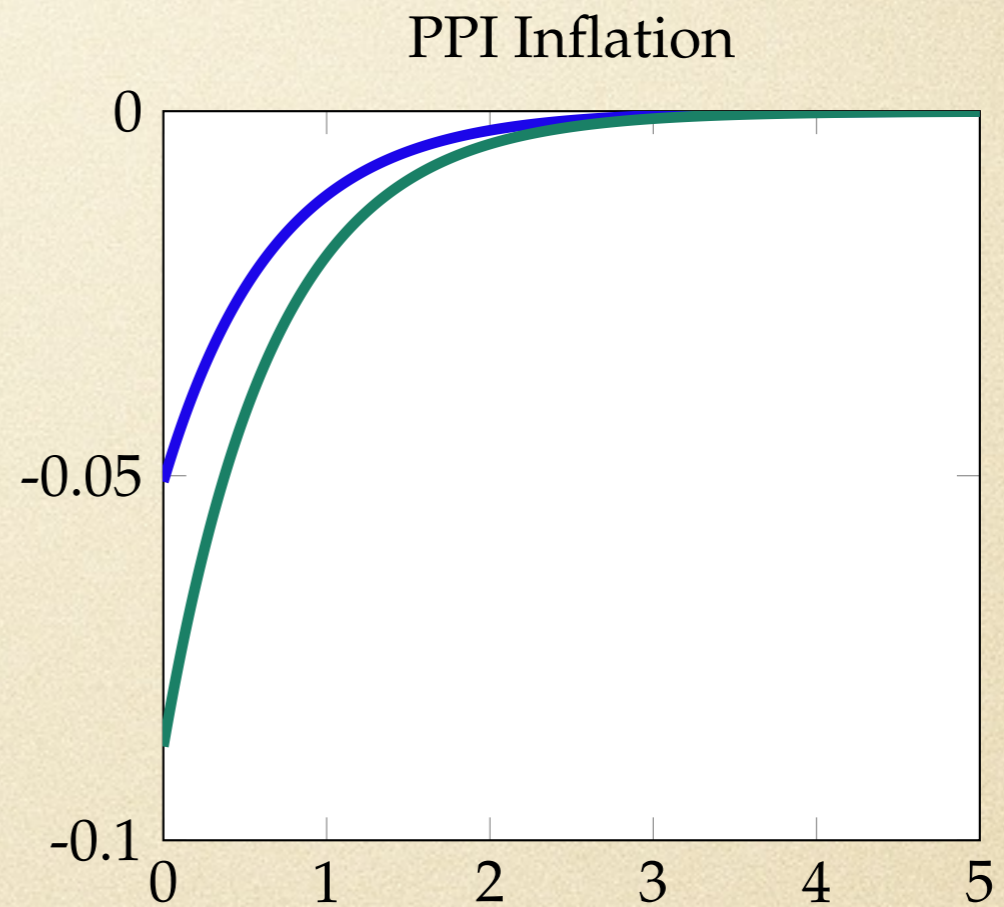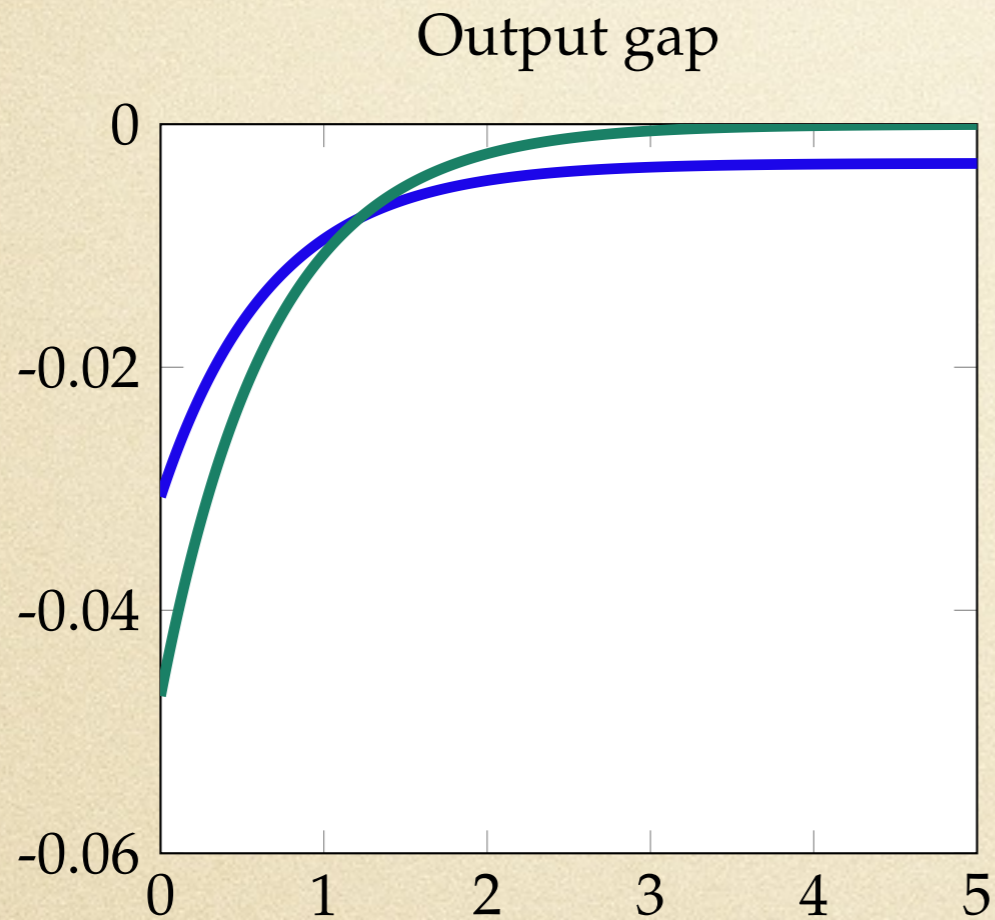
- 5% productivity shock

Optimal Transfers (No HtM)
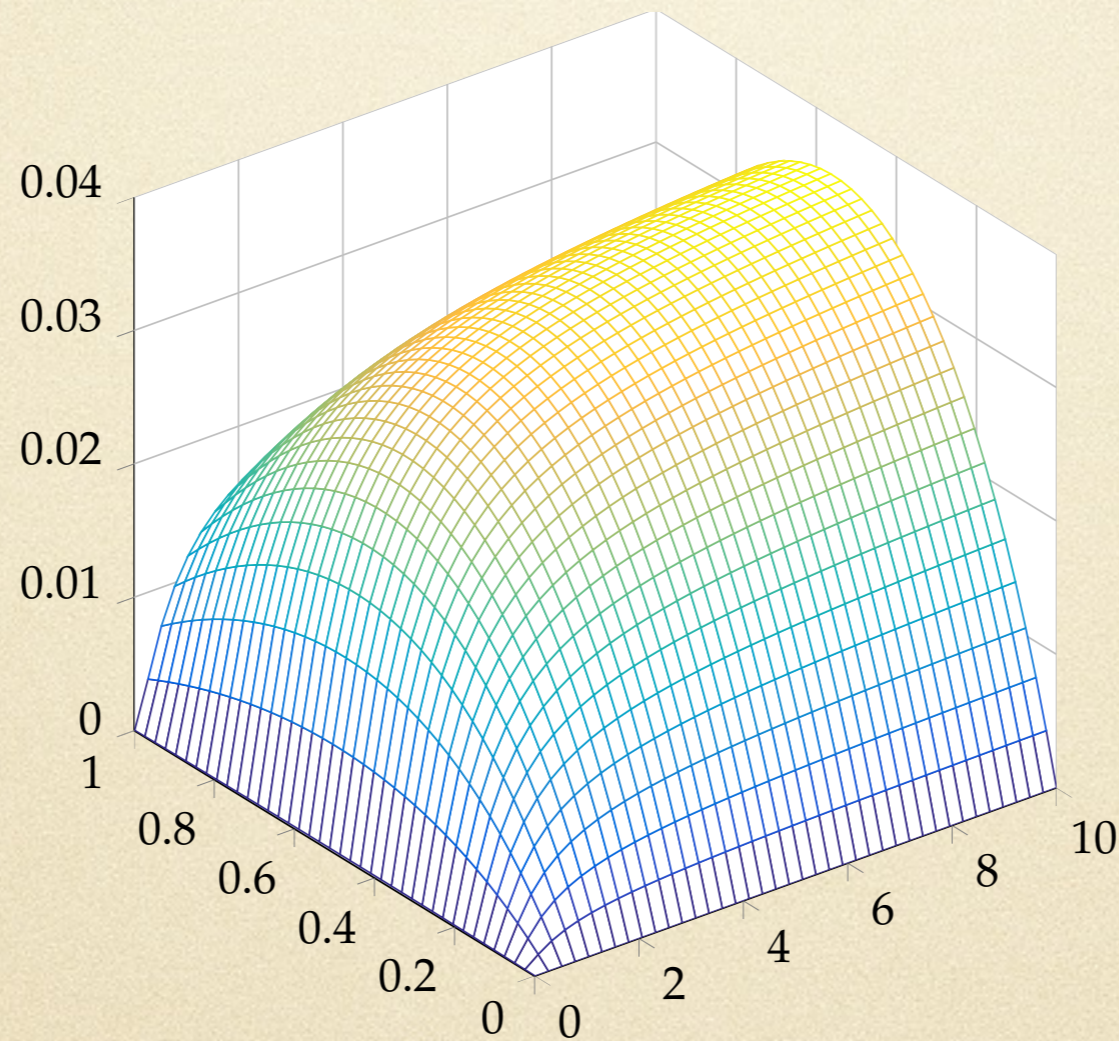
- NPV transfers/GDP: half-life of shock and openness
- 5% productivity shock

Stabilization (No HtM)
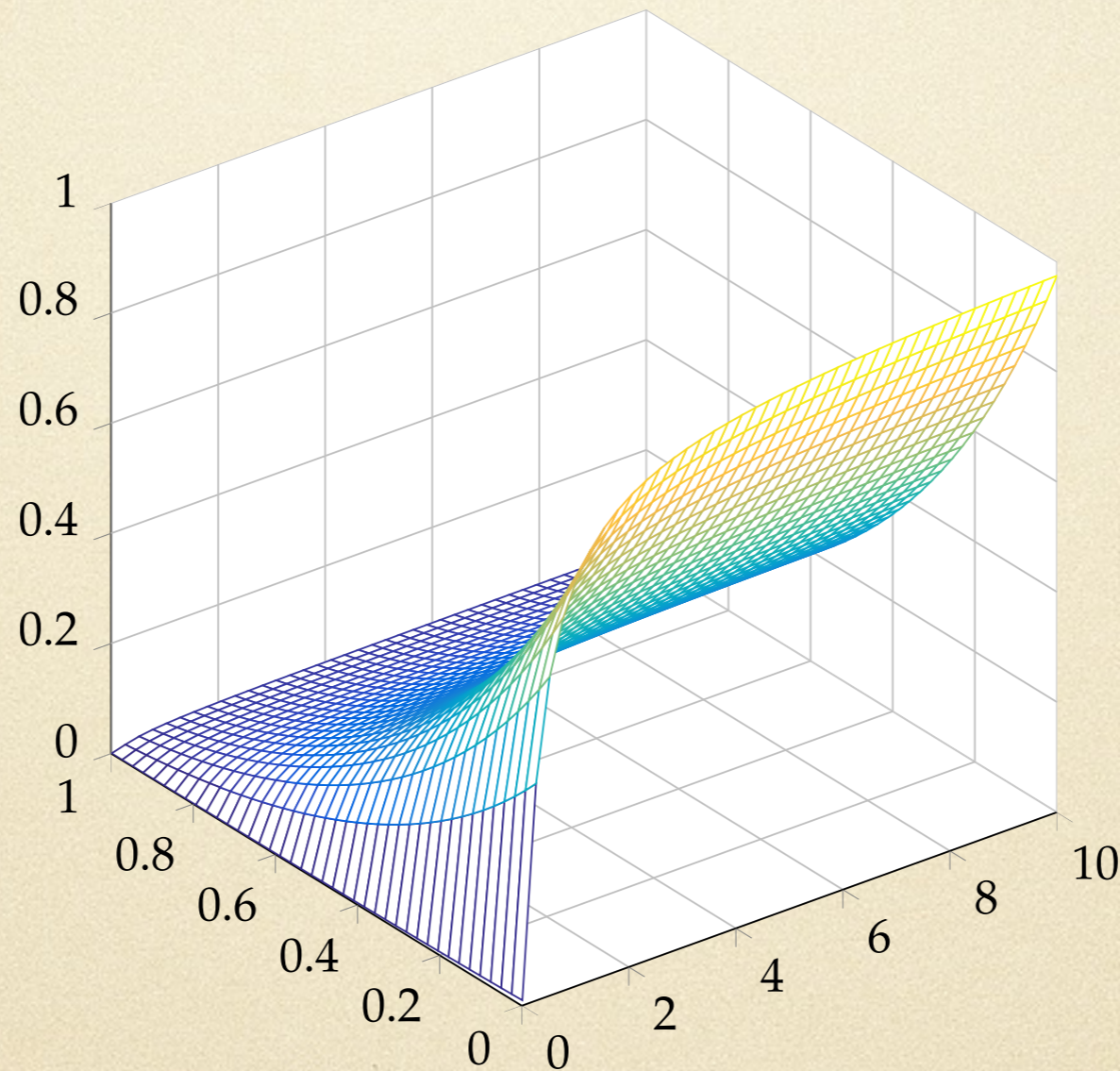
- Stabilization: half-life of shock and openness

Impulse Response (HtM)

- 5% productivity shock

Stabilization (HtM)

- Stabilization: half-life of shock and openness

Optimal Transfers

- NPV transfers/GDP: half-life of shock and openness
- 5% productivity shock

Transfers vs. Other Instruments

TRANSITORY
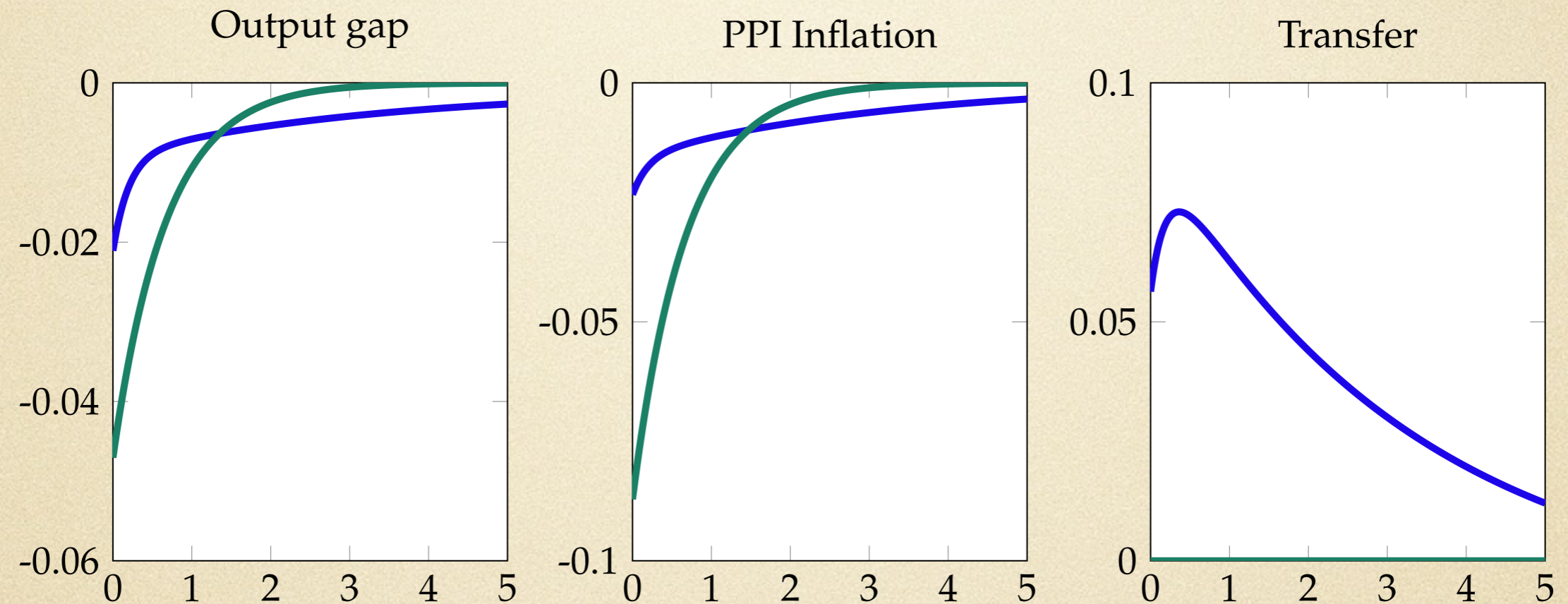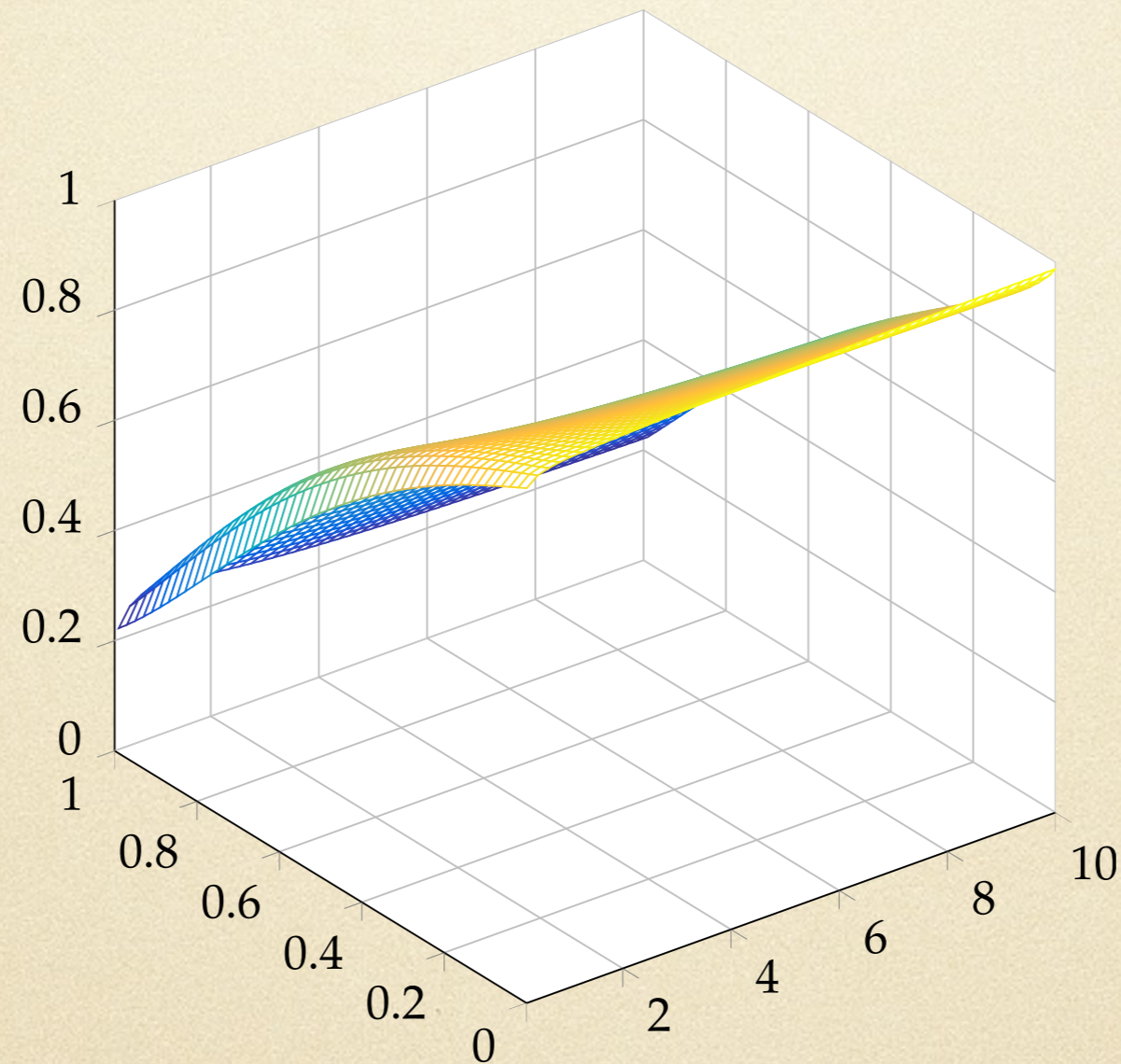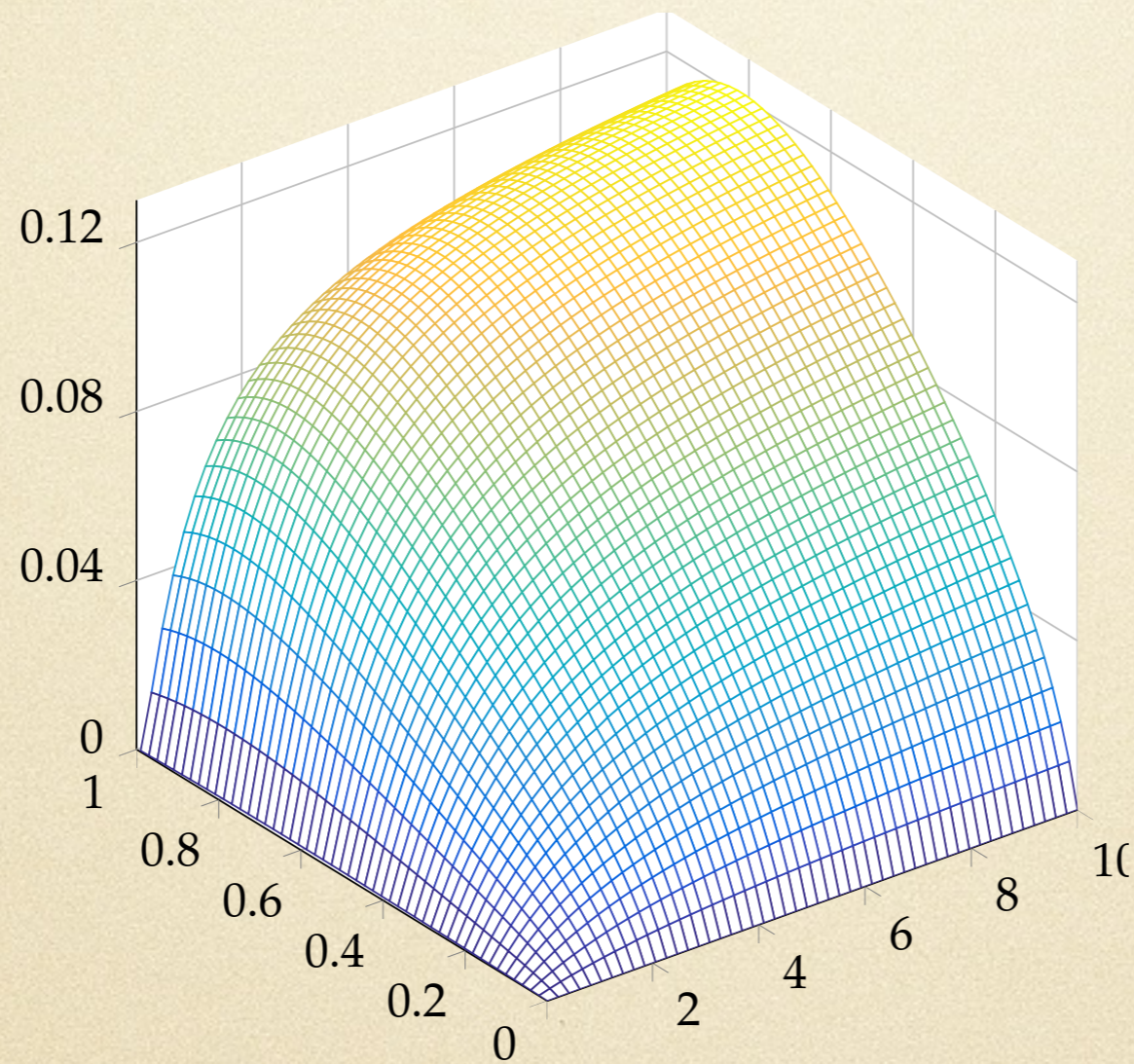
NOMINAL RIGIDITIES	OPEN-NESS	No HtM agents							HtM agents						
		No policy	Transfers	Capital controls	Gov. spending	Redistri-bution	Deficits	Joint fiscal policy	No policy	Transfers	Capital controls	Gov. spending	Redistri-bution	Deficits	Joint fiscal policy
More flexible	Open	0%	21%	83%	47%	0%	0%	47%	0%	76%	82%	47%	73%	73%	78%
	Closed	0%	57%	96%	47%	0%	0%	47%	0%	91%	96%	47%	88%	88%	89%
Sticky	Open	0%	29%	84%	49%	0%	0%	49%	0%	78%	83%	49%	75%	75%	80%
	Closed	0%	58%	97%	49%	0%	0%	49%	0%	92%	97%	49%	89%	89%	90%
Rigid	Open	0%	10%	56%	26%	0%	0%	26%	0%	53%	54%	26%	43%	43%	53%
	Closed	0%	14%	79%	26%	0%	0%	26%	0%	81%	79%	26%	67%	67%	72%

PERMANENT

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Sticky	Open	0%	41%	65%	36%	0%	0%	36%	0%	66%	64%	36%	55%	55%	61%
	Closed	0%	81%	82%	36%	0%	0%	36%	0%	87%	82%	36%	71%	71%	72%
Rigid	Open	0%	66%	0%	26%	0%	0%	26%	0%	66%	0%	26%	0%	0%	26%
	Closed	0%	94%	0%	26%	0%	0%	26%	0%	94%	0%	26%	0%	0%	26%

Transfers vs. Other Instruments

TRANSITORY

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	Closed	0%	81%	82%	36%	0%	0%	36%	0%	87%	82%	36%	71%	71%	72%
Rigid	Open	0%	66%	0%	26%	0%	0%	26%	0%	66%	0%	26%	0%	0%	26%
	Closed	0%	94%	0%	26%	0%	0%	26%	0%	94%	0%	26%	0%	0%	26%

Transfers vs. Other Instruments

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	Closed	0%	94%	0%	26%	0%	0%	26%	0%	94%	0%	26%	0%	0%	26%

Transfers vs. Other Instruments

- Transfers: better for more persistent shocks, more closed economies, more sticky prices, fraction of HtM improves for more transitory shocks and more flexible prices

- Capital controls: better for more transitory shock, more closed economies, more flexible prices

- Government spending: less sensitive to persistence, openness, stickiness, HtM

- Redistribution and deficits: only with fraction of HtM, better for more transitory shocks, more closed economies, more flexible prices

- Baseline calibration: transfers dominate all other instruments

Conclusion

- Special argument for fiscal unions in currency unions

- Key determinants of optimal insurance arrangement
  - asymmetry
  - persistence
  - openness
  - financial constraints (HtM)

- Baseline calibration: transfers dominate domestic fiscal policy and capital controls