

Global Price Shocks and International Monetary Coordination

Inflation Drivers and Dynamics (ECB-Cleveland Fed)
September 2026

Veronica Guerrieri, Guido Lorenzoni, Iván Werning

Motivation: Inflation and Global Shocks

- Recent post-pandemic inflationary episode

- similar patterns across countries
- Inflation surge in goods...
- ... later transmitted to services + wages...

- Theory + Evidence → suggest...

tighter supply constraints → price inflation → wage inflation

- Blanchard & Bernanke (2023); Ball, Mishra, & Leigh (2022)
- Lorenzoni & Werning (2022); Guerrieri, Marcussen, Reichlin, & Tenreyro (2023); Gertler & Gagliardone (2023); di Giovanni, Kalemli-Özcan, Silva, and Yildirim (2023)

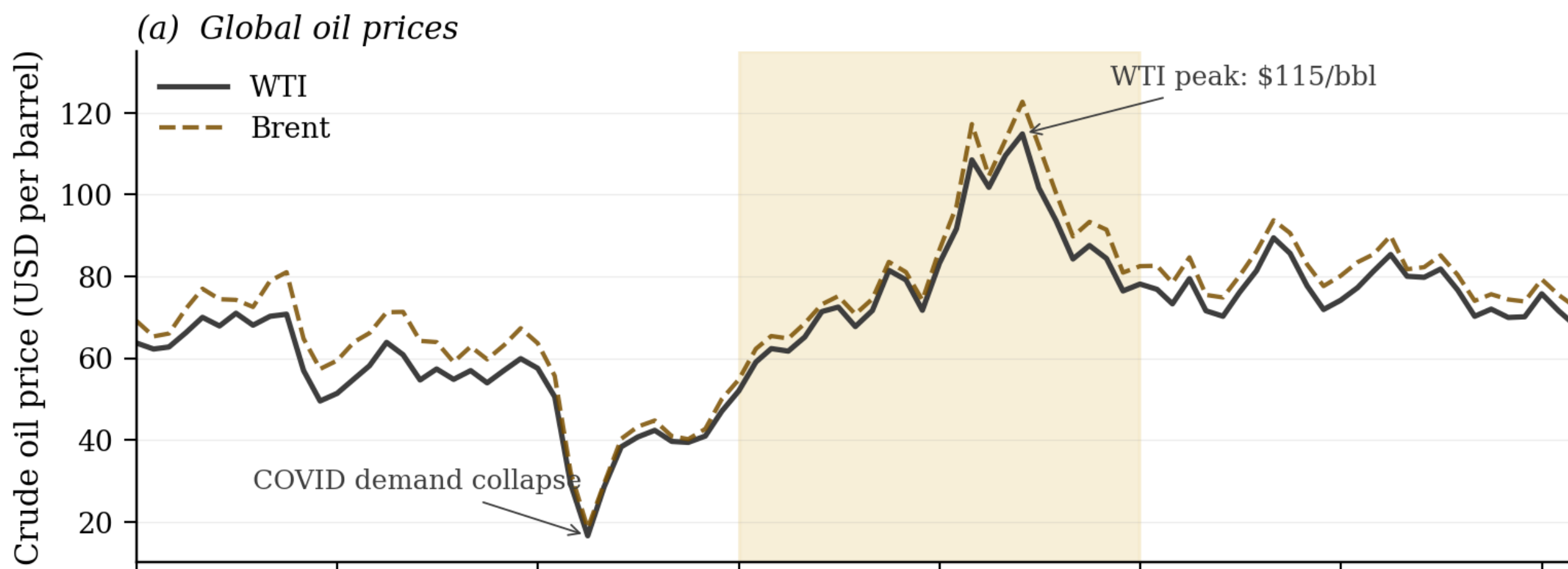
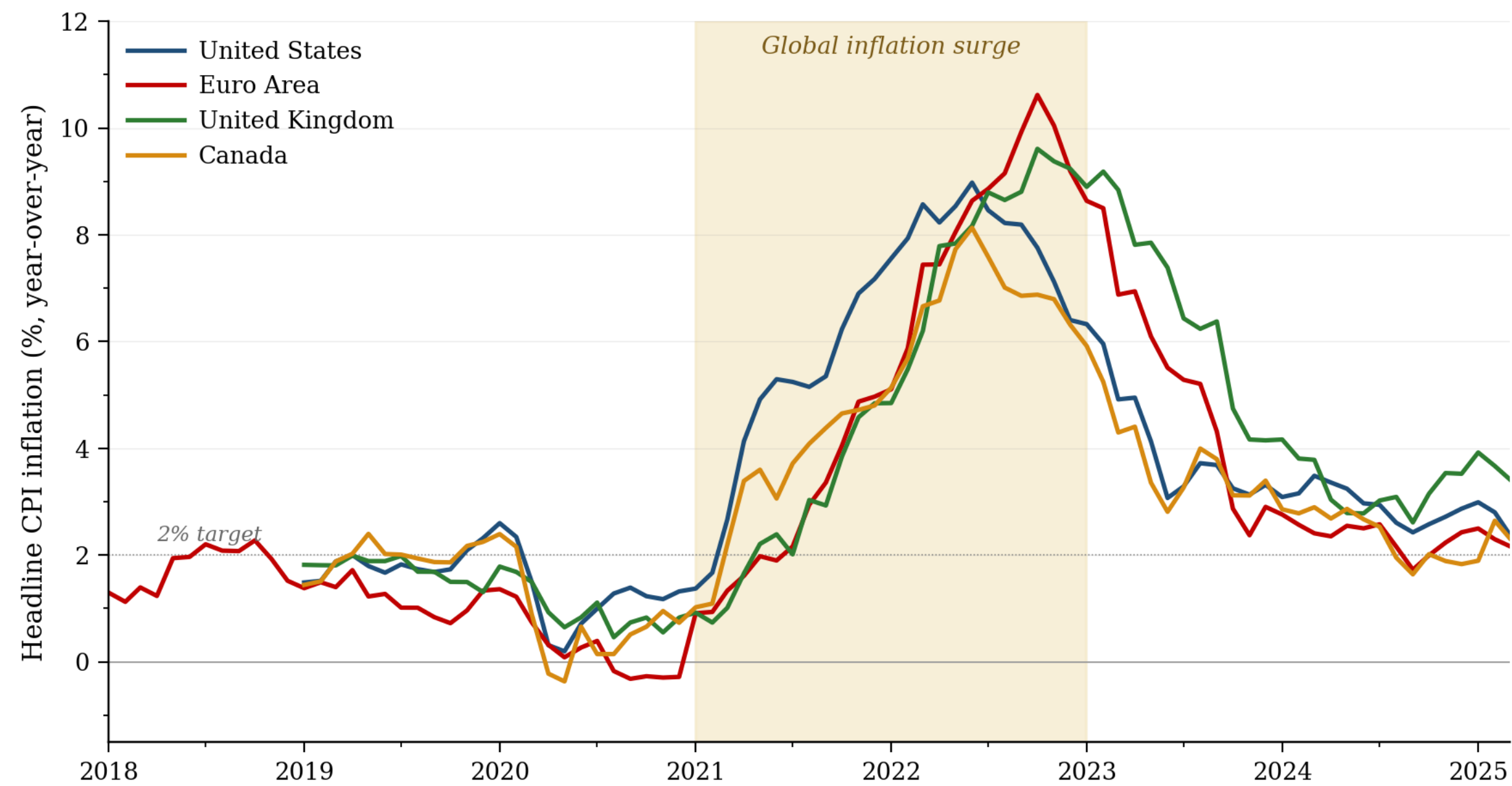
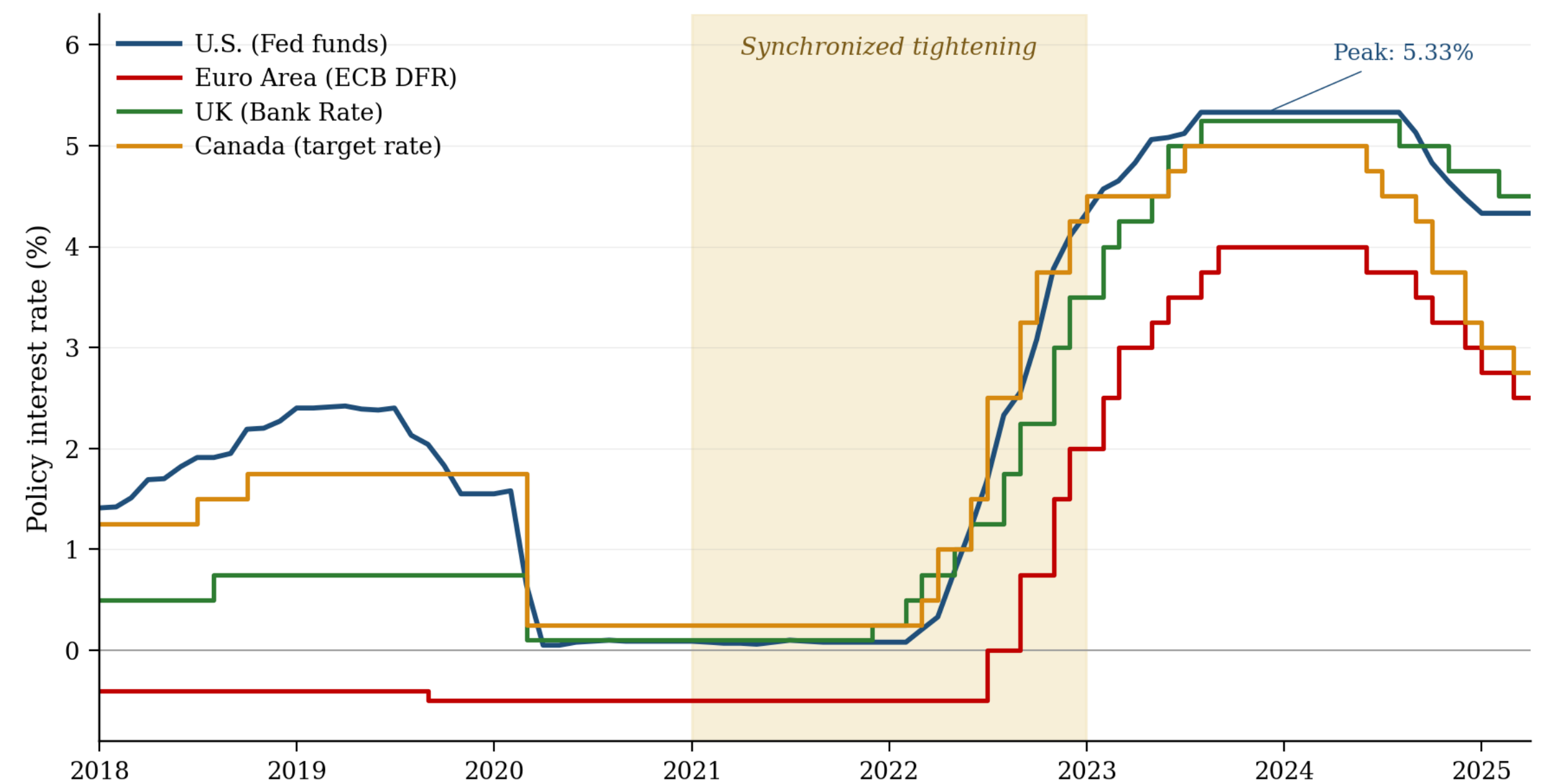


Figure 3. Major central banks tightened in lockstep, 2022-2024



Intuition: Phillips curves

- Domestic central bank view...

Phillips curves...

$$\pi = \pi_w^e + \text{supply chain disruptions, energy shocks, ...}$$

$$\pi_w = \pi^e + \text{labor market tightness}$$

Global factors

outside domestic

policy control



Local demand

local policy



- ... but, **global factors** depend on **global demand** conditions!

Need for Coordination?

- World-Level Phillips curves...

$$\pi = \pi_w^e + \text{world excess demand}$$

$$\pi_w = \pi^e + \text{domestic excess demand}$$

- Coordination → needed to contain world excess demand?
- **Question:** Is there an expansionary bias in global policy in response to negative world supply shocks?

Coordination and Bias

■ Traditional view → **Contractionary Bias!**

● Canzoneri-Henderson (1988)

- countries try to lower inflation by appreciating domestic currency...
- ... but leads to competing appreciations, zero-sum game! → contraction!

● Obstfeld (2022, blog): echoes argument

■ Large seminal literature

● Corsetti-Pesenti (2001), Obstfeld-Rogoff (2002), Benigno-Benigno (2006), Engel (2011)

■ Recent revival

● Contractionary bias in Fornaro and Romei (2022)

● Bianchi and Coulibaly (2024) show it can go either way, focus on R^*

● Auclert-Monnery-Rognlie-Straub (2024): Global energy shocks in HANK, positive

This Paper

- Simple model → isolate economic mechanisms...
 - price taking small open economies → no terms of trade manipulation!
 - symmetric countries, world shock → no asymmetric shocks
 - steady state efficient → emphasis on response to shocks
- Results
 - intuition: countries see **flatter** Phillips Curve
 - surprise 1: this requires a condition!
 - surprise 2: additional force at play, but...
 - with very plausible conditions: **EXPANSIONARY BIAS!**

Environment

Environment

■ World economy...

- continuum of small open economies/countries
- countries are symmetric

■ 2 final goods, 1 intermediate good...

- Tradable (T) $\rightarrow$ endowment $\bar{Y}_T$ (numeraire)
- Non-Tradable (N) $\rightarrow$ aggregate of continuum of varieties
- Intermediate good (X) $\rightarrow$ endowment $\bar{X}$

Preferences and Technology

■ Preferences...

$$\sum_{t=0}^{\infty} \beta^t U(C_{Tt}, C_{Nt}, L_t)$$

$$U(C_T, C_N, L) = C_T + u(C_N) - v(L)$$

■ Production of non-tradable varieties

$$Y_t(i) = F(L_t(i), X_t(i))$$

Non-labor global
factor (e.g., "oil")



Crucial: limited substitution L vs X

■ Aggregation...

$$Y_t = C_{Nt} = \left(\int C_{Nt}(i)^{1-1/\varepsilon} di \right)^{\varepsilon/(\varepsilon-1)}$$

$$L_t = \int L_t(i) di \quad X_t = \int X_t(i) di$$

Sticky Prices and Wages

- Prices of T and X → flexible
- Prices of N goods (simpler than Calvo)...
 - monopolistic firms
 - fraction λ → set price P_{iN} *before* shock
 - fraction $1 - \lambda$ → set price P_{iN} *after* shock
- Wages → set before shock (rigid ex post)

$$W_t = \bar{W}$$

- Rigidities Price + Wage → breaks “divine coincidence” → **policy tradeoff**

Monetary Policy

- Each country: independent currency (flexible exchange rate)
- World Currency = basket of all currencies

E = nominal exchange rate

- Tradable and Oil prices...

$$\begin{aligned} P_T &= EP_T^* \\ P_X &= EP_X^* \end{aligned} \quad \begin{array}{l} \nwarrow \\ \nwarrow \end{array} \quad \text{world prices}$$

- Relative price of oil

$$Q \equiv \frac{P_X^*}{P_T^*} = \frac{P_X}{P_T}$$

Timeline

- Steady state: zero inflation, efficient
- Shock: unexpected
 - period $t \rightarrow$ symmetric reduction $\downarrow \bar{X}$
 - ◆ Each country $\rightarrow$ monetary policy response
 - ◆ World $\rightarrow$ global oil market clears
 - period $t + 1$ onward $\rightarrow$ shock goes away $\rightarrow \bar{X}$ recover
- With linear utility in tradable: no memory, zero trade balance:

$$C_T = \bar{Y}_T - Q(X - \bar{X})$$

Equilibrium

No Coordination vs Coordination

■ No coordination: symmetric Nash equilibrium

- Domestic central bank → maximizes utility subject to domestic equilibrium conditions, **taking Q as given** (can choose $X \neq \bar{X}$)
- World oil **market sets Q** → to ensure $X = \bar{X}$

■ Coordination: symmetric optimum

- World planner → maximizes utility subject to domestic equilibrium conditions
+ takes into account Q endogenous + imposes $X = \bar{X}$

Equilibrium

- Central bank single degree of freedom $\rightarrow Y$
- Key variables...

$$P_N = \mathcal{P}(Y, Q), \quad X = \mathcal{X}(Y, Q), \quad L = \mathcal{L}(Y, Q)$$

- World Market clearing... (inverting)

$$\mathcal{X}(Y, Q) = \bar{X} \iff Q = \mathcal{Q}(Y, \bar{X})$$

- Utility...

$$\mathcal{U}(Y, Q) \equiv U\left(\underbrace{\bar{Y}_T - Q(\mathcal{X}(Y, Q) - \bar{X})}_{C_T}, \underbrace{Y}_{C_N}, \underbrace{\mathcal{L}(Y, Q)}_L\right)$$

■ No coordination

1. All country...

$$\mathcal{Y}(Q) = \arg \max_Y \mathcal{U}(Y, Q)$$

2. World equilibrium...

$$Q = Q(\mathcal{Y}(Q), \bar{X})$$

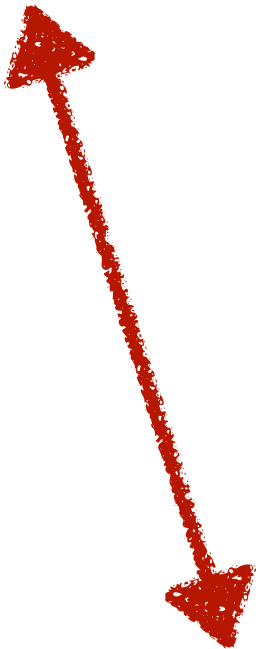
■ Coordination

$$\max_Y \mathcal{U}(Y, Q(Y, \bar{X}))$$

- never bad
- ... actually strictly good

First-order conditions

■ No Coordination

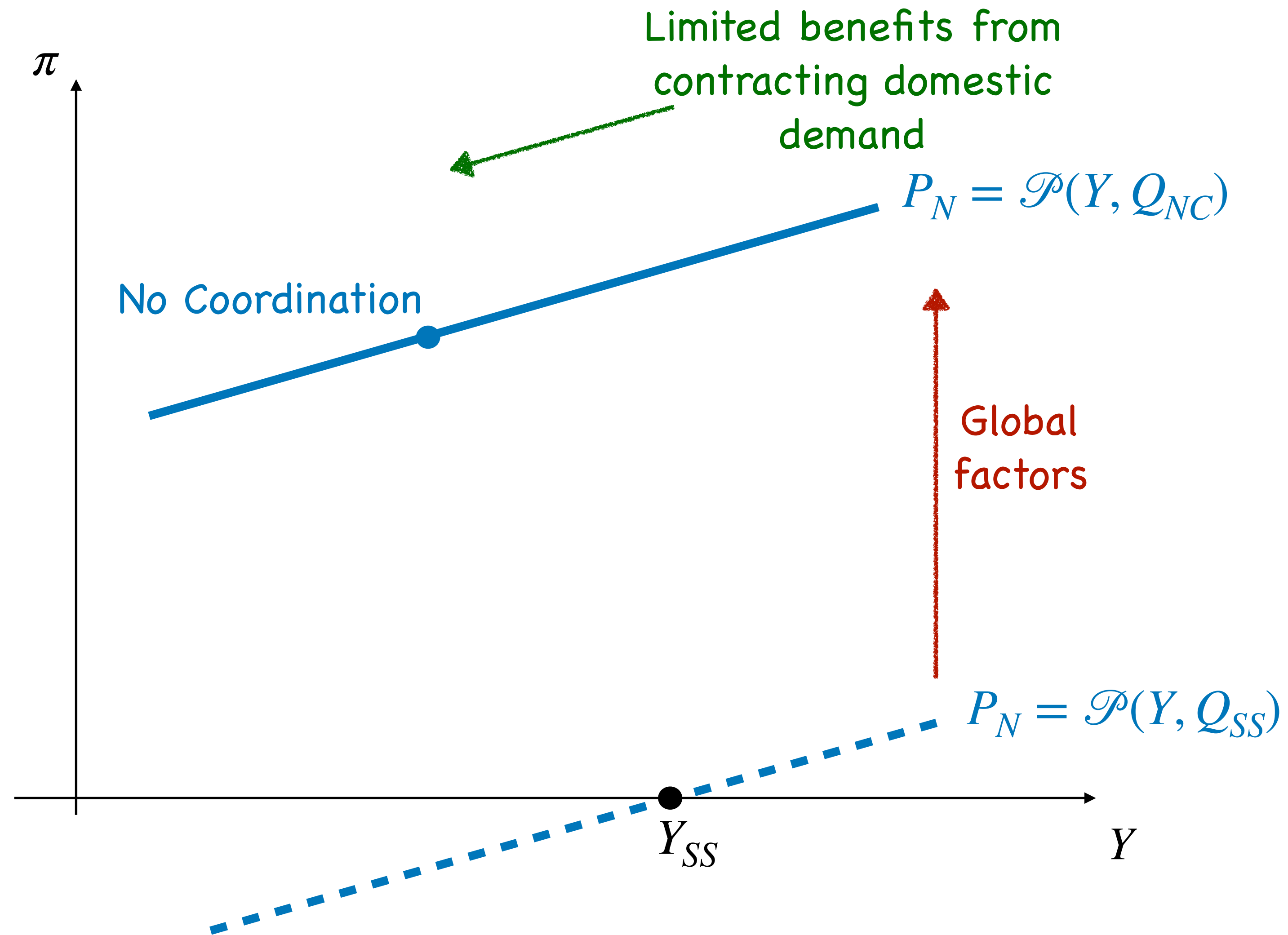
$$\underbrace{\left(u' - \frac{\Delta}{F_L} v'\right)}_{\text{Labor wedge}} - \underbrace{v' \frac{\Delta' (P_N) Y}{F_L}}_{\text{Inflation distortion}} \cdot \mathcal{P}_Y + \underbrace{\left(v' \frac{F_X}{F_L} - Q\right)}_{\text{Oil wedge}} \cdot \mathcal{X}_Y = 0$$


■ Coordination

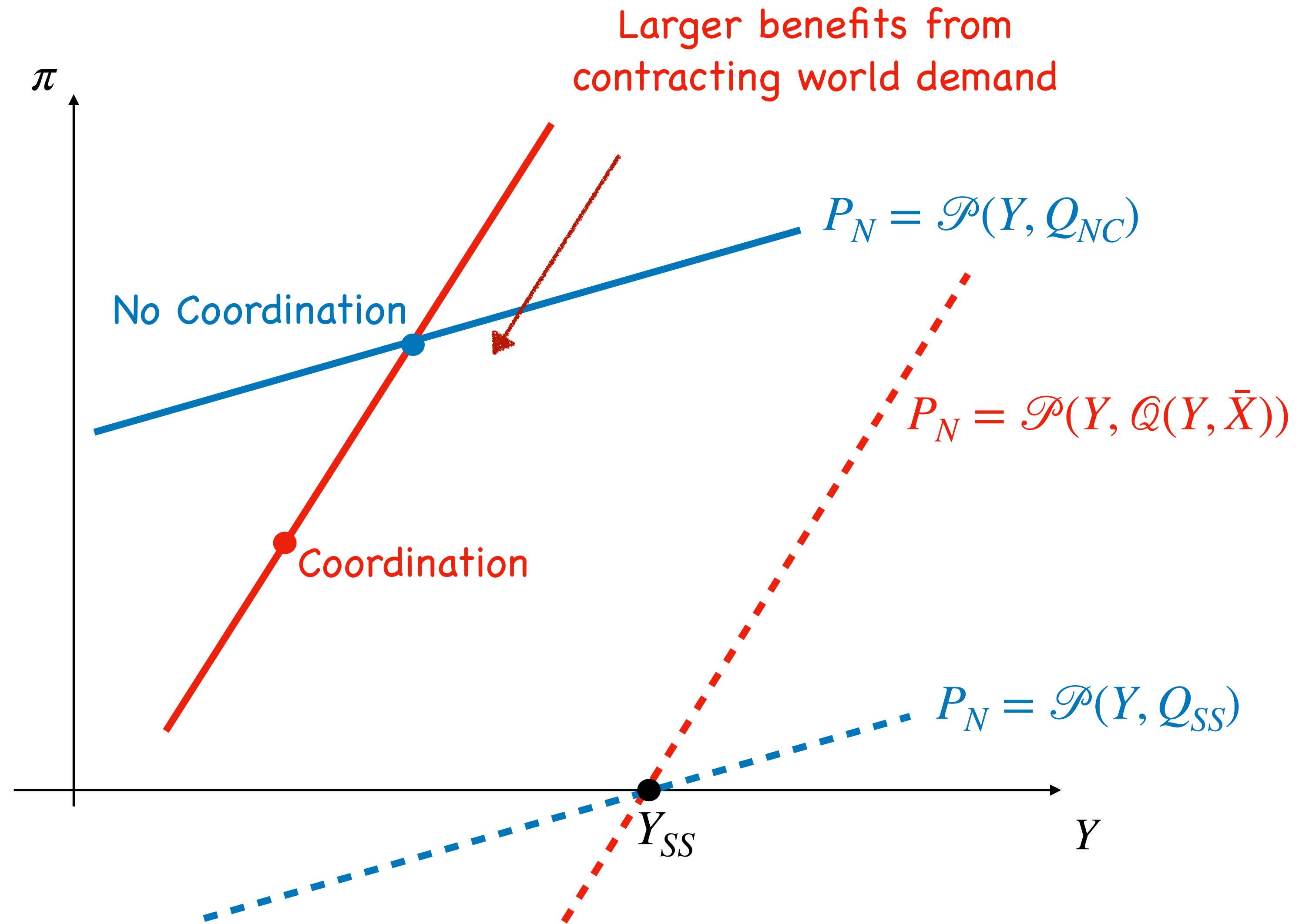
$$\underbrace{\left(u' - \frac{\Delta}{F_L} v'\right)}_{\text{Labor wedge}} - \underbrace{v' \frac{\Delta' (P_N) Y}{F_L}}_{\text{Inflation distortion}} \cdot \left(\mathcal{P}_Y + \mathcal{P}_Q Q_Y\right) = 0$$

Phillips Curve
Slope Comparison

Phillips Curves



Phillips Curves



World Phillips Curve Steeper?

■ **RESULT:** World Phillips Curve Steeper

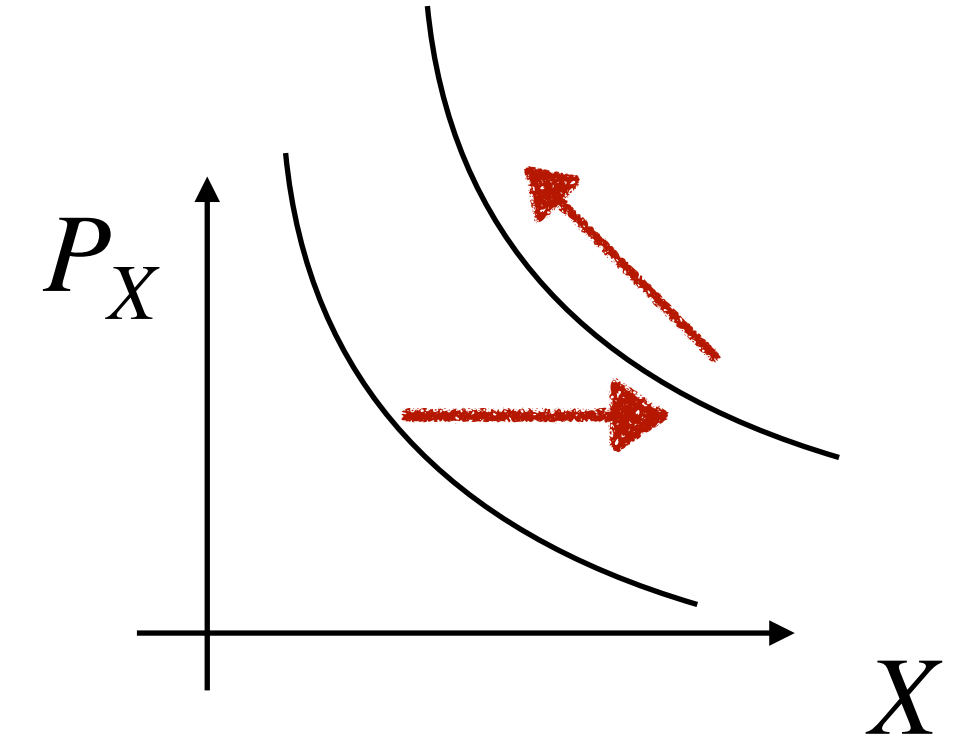
- Oil prices are increasing in global activity $\mathcal{Q}_Y > 0$
- Local oil demand is increasing in local activity $\mathcal{X}_Y > 0$

Both true if and only if

$$\eta s_L < \frac{1 - (1 - \lambda)s_X}{\sigma}$$

Reduction in oil demand due
to oil price increase
(depreciation)

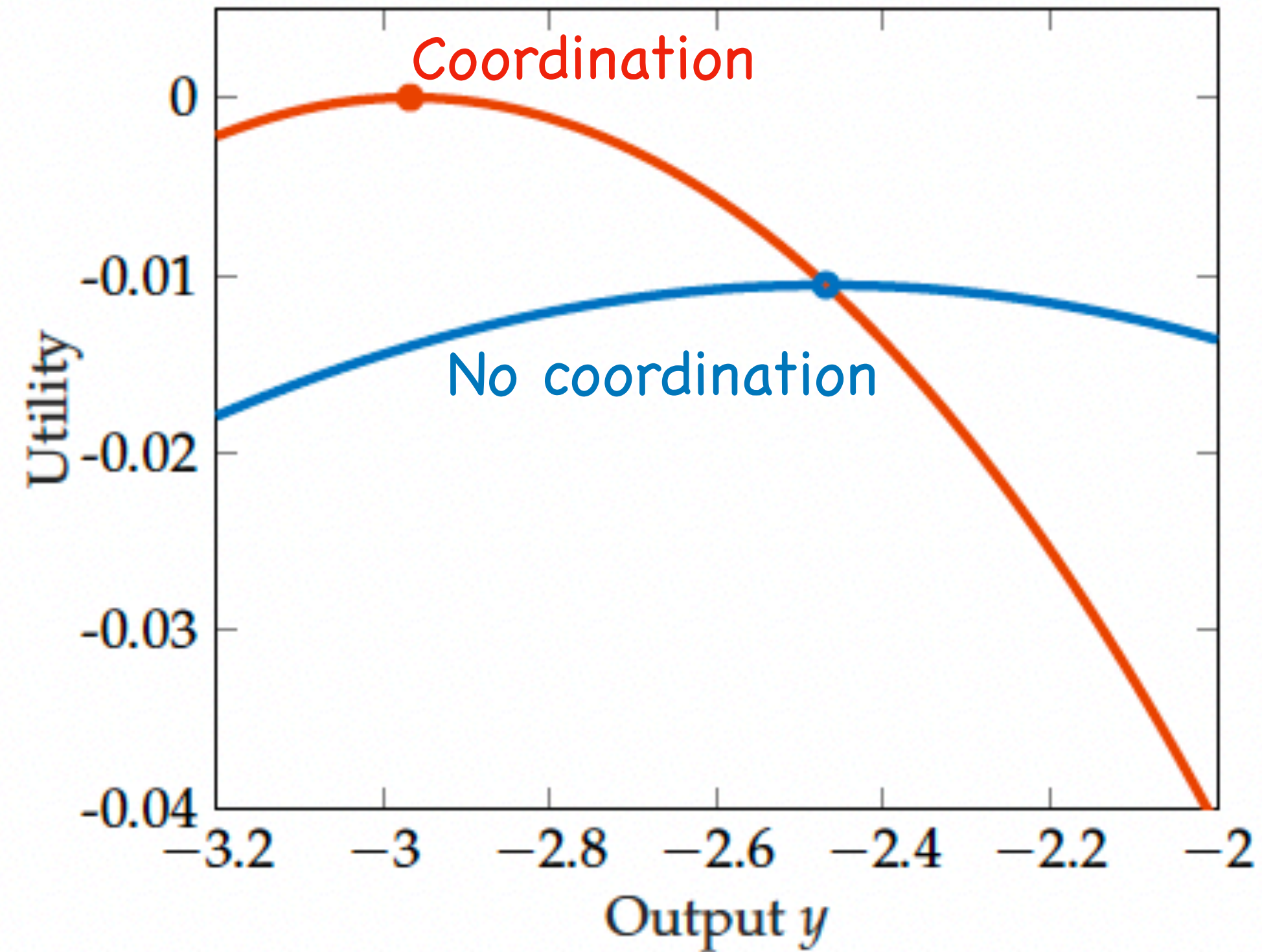
Outward shift in oil
demand due to
expansion in activity



Main Result: Expansionary Bias

Social welfare, local and global

- Simple numerical example



First-order conditions

■ Country planner

$$\underbrace{\left(u' - \frac{\Delta}{F_L} v'\right)}_{\text{Labor wedge}} - \underbrace{v' \frac{\Delta' (P_N) Y}{F_L}}_{\text{Inflation distortion}} \cdot \mathcal{P}_Y - \underbrace{\left(v' \frac{F_X}{F_L} - Q\right)}_{\text{Oil wedge}} \cdot \mathcal{X}_Y = 0$$

Next....

■ World planner

$$\underbrace{\left(u' - \frac{\Delta}{F_L} v'\right)}_{\text{Labor wedge}} - \underbrace{v' \frac{\Delta' (P_N) Y}{F_L}}_{\text{Inflation distortion}} \cdot \left(\mathcal{P}_Y + \mathcal{P}_Q Q_Y\right) = 0$$

Oil Wedge

■ Why Oil wedge?

- firms substitute labor-oil given W/P_X
- wage rigidity: nominal wage $\neq$ social value of labor

■ In numerical example

$$v' \frac{F_X}{F_L} - Q < 0$$

- Labor is relatively too expensive in equilibrium: firms use too much oil per worker
- Oil wedge could overturn expansionary bias! Can it?

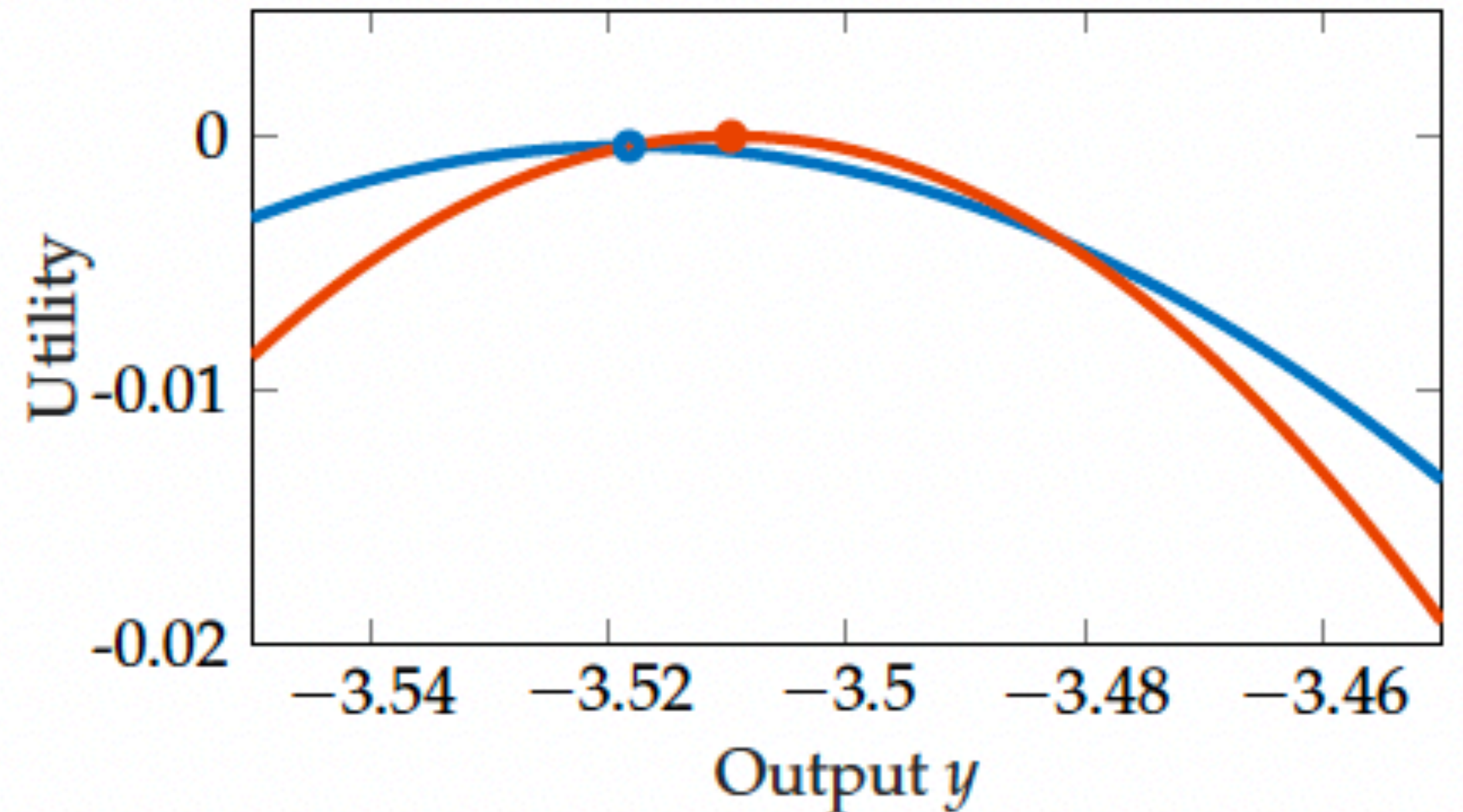
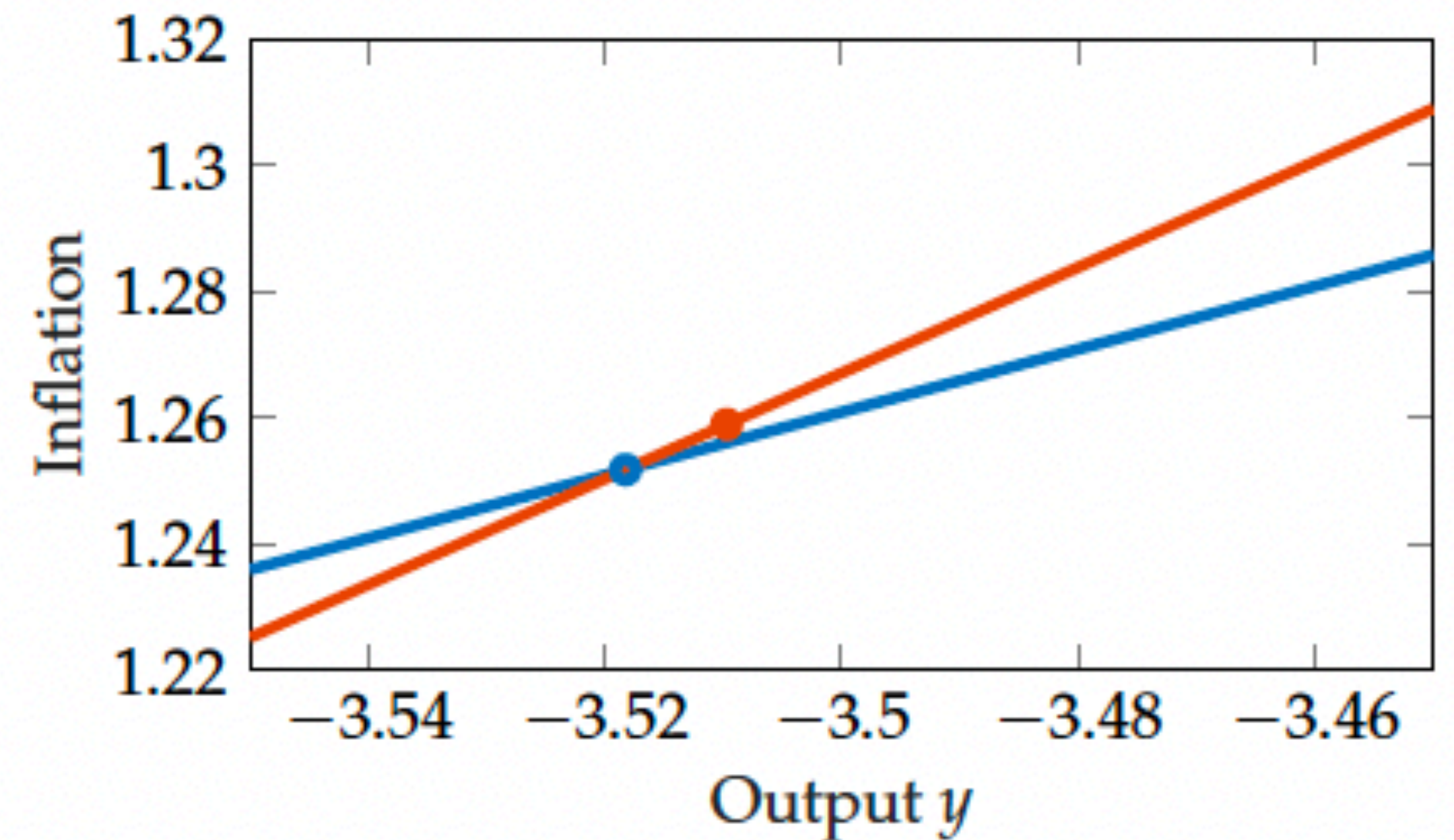
Expansionary Bias?

- Possible
 - World Phillips curve steeper...
 - ... yet: Contractionary Bias?
- **Yes:** if oil wedge large enough!

■ Ruled out if...

$$\eta < \varepsilon(1 - \lambda)$$

Low Substitution Again!



Main Result

- Combining both conditions

Main Result.

Expansionary bias if and only if...

$$[\varepsilon(1 - \lambda) - \eta][\sigma(1 - (1 - \lambda)s_X) - \eta s_L] > 0$$

- Product of previous two conditions...
- ... also can have both inverted!

Conclusions

Conclusions

■ Main contributions:

- coordination without terms of trade!
- global shocks not asymmetric shocks!
- mechanism via inflation vs. output

■ Intuition vs Result

- Phillips curve slope comparison... but not enough, due to oil wedge
- requires plausible conditions

■ Questions

- Large countries?
- Financial channels? Monetary vs Fiscal Policy Biases?
- Asymmetric effects? (Large oil importers like Europe may internalize more ...)
- Is it stronger the social benefit of producing more traded goods (Fornaro-Romei) or the social cost of absorbing more trade inputs (this paper)?

Extension: H vs F Trade

Home vs Foreign Good Trade

- Alternative model: Gali-Monacelli version
- Home good, foreign good

$$C = \left(\frac{C_H}{\omega} \right)^{\omega} \left(\frac{C_F}{1 - \omega} \right)^{1 - \omega}$$

- Foreign good is composite of home goods produced by all countries
- Home good produced with technology

$$Y_H(i) = F(L(i), X(i))$$

- Each home good is made of continuum of varieties

Contractionary bias?

- Now the world economy faces a form of contractionary bias
- This bias is there in steady state!
- Countries would like to lower their level of activity to improve their *terms of trade*
- **Question:** does the presence of a global supply shock push the bias in the direction of expansionary bias?
- To address this question compare:
 - Uncoordinated economy, in which each country uses fiscal tools to distort terms of trade, so monetary policy achieves zero inflation
 - Coordinated economy, in which global planner uses fiscal tools to get optimal steady state allocation, monetary policy to respond to shocks

