Tariffs and "Unconventional" Monetary Policy: The Return of the ZLB

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1 Question and Main Result

- Question. How should monetary policy respond when import tariffs rise and labor-income taxes are cut?
- Main result. Through the Tariff-LIT channel, a tariff shock can require not only conventional easing but also unconventional monetary policy: the Ramsey nominal interest rate reaches the ZLB.
- The central bank takes this fiscal-policy configuration as given.
- Introducing Fiscal Block.
- Tariff revenue changes the residual labor-income-tax adjustment required by the government budget constraint.

2 Relation to the Literature

- Closest paper: Monacelli (2025), who studies tariff shocks in an open-economy New Keynesian model.
- Monacelli's import-tariff result: strict CPI inflation targeting creates a tightening bias because the tariff mechanically raises consumer prices.
- Bianchi and Coulibaly show that monetary easing can mitigate the inefficient contraction in imports and aggregate activity caused by a tariff-induced distortion in relative import prices.
- Our mechanism is different: tariff revenues enter the government budget constraint and reduce residual distortionary labor-income taxation.
- Hence the result is stronger than conventional accommodation: the required easing can become ZLB-constrained, so unconventional monetary policy may be required.

3 Contribution

- Prior work showed, at most, that tariff shocks may call for monetary easing rather than tightening.
- This paper adds the missing fiscal block: nominal debt, tariff revenue, residual labor-income taxation, and a Bohn-type fiscal rule.
- Once that block is introduced, tariff revenue affects the labor-income-tax adjustment and changes the constrained-efficient monetary policy problem.
- The contribution is therefore stronger: tariffs can require not merely monetary easing, but unconventional monetary policy when the Ramsey nominal interest rate hits the ZLB.

4 Model Environment

- Small open economy based on Monacelli: sticky prices, import/export tariffs, and complete asset markets.
- Introducing fiscal block: nominal government debt, labor-income taxation, import-tariff revenue, and a Bohn-type primary-balance rule.
- The primary-balance rule pins down the required surplus.
- The labor-income-tax rate adjusts residually once tariff revenues are realized.
- Monetary policy: Ramsey / constrained-efficient policy under commitment, with the ZLB constraint.

5 Fiscal Block behind the Tariff-LIT Channel

- The primary balance is

$$SP_t = \frac{1}{P_t}\{\tau_t W_t N_t + \tau_{M,t} P_{F,t} C_{F,t} - P_{H,t} G_t\}.$$

- The Bohn-type rule pins down the required primary balance as a function of inherited debt.
- Solving the primary-balance definition for the labor-income tax gives

$$\tau_t = \frac{P_t SP_t + P_{H,t} G_t - \tau_{M,t} P_{F,t} C_{F,t}}{W_t N_t}.$$

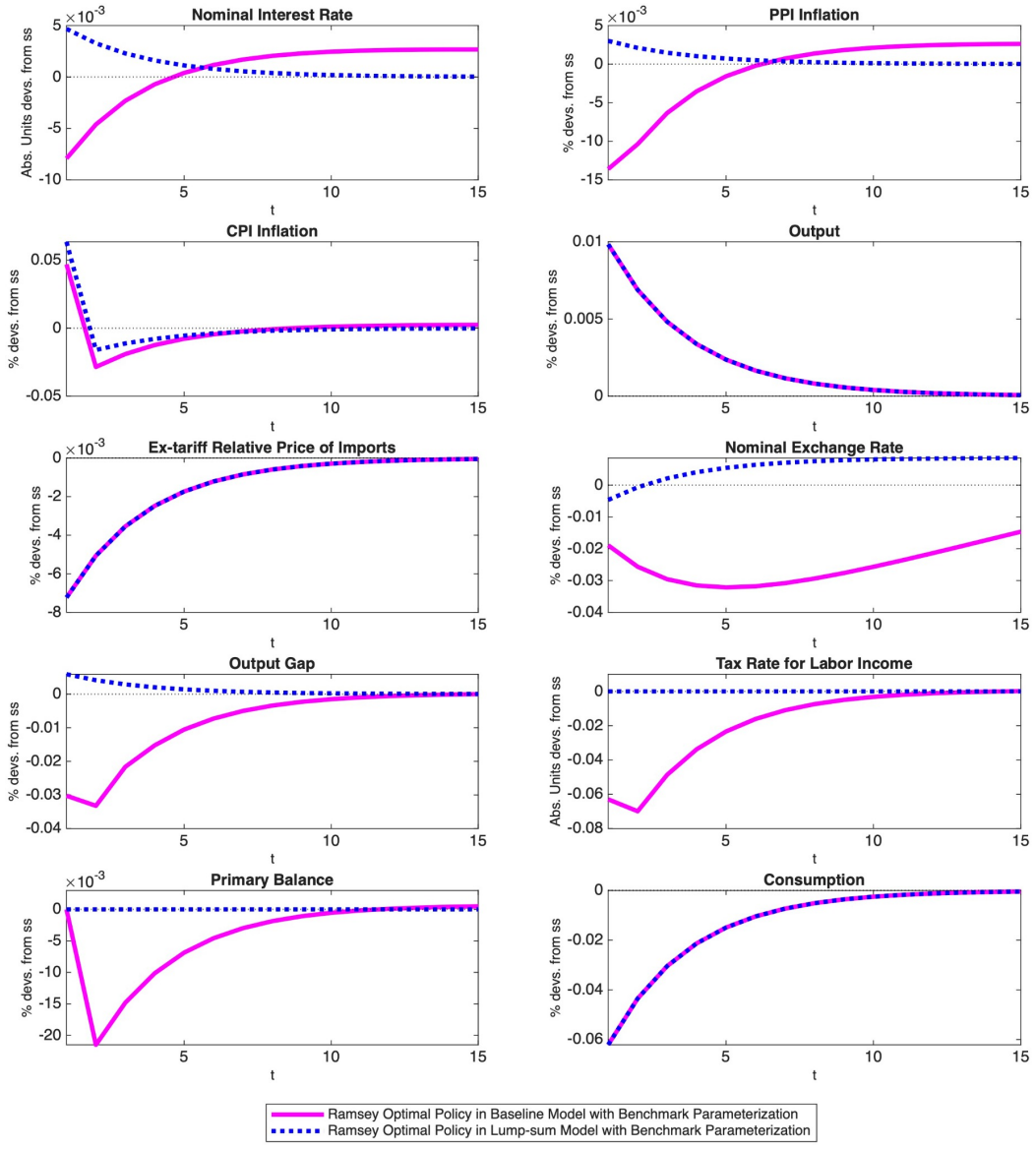
- With $G_t = 0$, higher tariff revenue lowers the residual labor-income tax rate required to implement the fiscal rule: this is the fiscal side of the Tariff-LIT channel.

6 Tariff-LIT Channel: Main Mechanism

$$\tau_{M,t} \uparrow \Rightarrow \text{tariff revenue} \uparrow \Rightarrow \text{residual labor-income tax} \downarrow$$
$$\Rightarrow \text{natural output } Y_t^n \uparrow \Rightarrow \text{output gap } x_t = y_t - y_t^n \downarrow$$
$$\Rightarrow \text{real marginal cost} \downarrow \Rightarrow \text{PPI inflation} \downarrow \Rightarrow \text{nominal rate } i_t \downarrow.$$

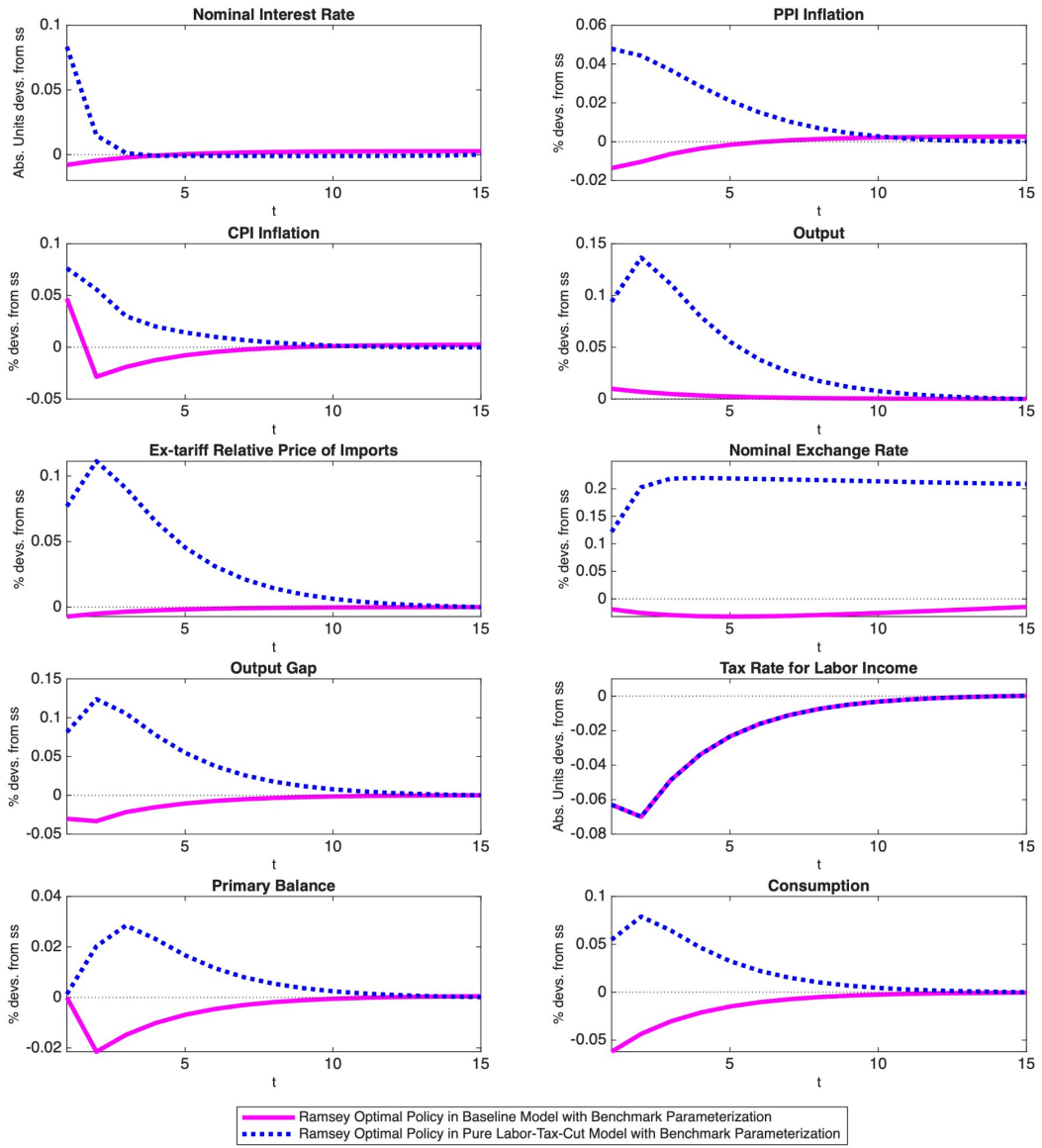
- The mechanism operates through the interaction between tariff revenue and residual distortionary labor-income taxation.
- It changes both the sign and the magnitude of the constrained-efficient monetary-policy response.

7 Small Open Economy: Benchmark Tariff Shock



- CPI rises on impact; PPI inflation falls.
- Tariff revenue lowers residual labor-income tax.
- Tariff–LIT raises natural output and lowers marginal cost.
- Ramsey eases; stronger lower-bound forces can make the ZLB bind.

8 This Is Not a Pure Labor-Income-Tax Cut



- Tariff shut down; only the LIT cut path remains.
- Output, consumption, and inflation rise.
- Ramsey nominal rate rises rather than falls.
- Benchmark easing comes from tariff plus fiscal block.

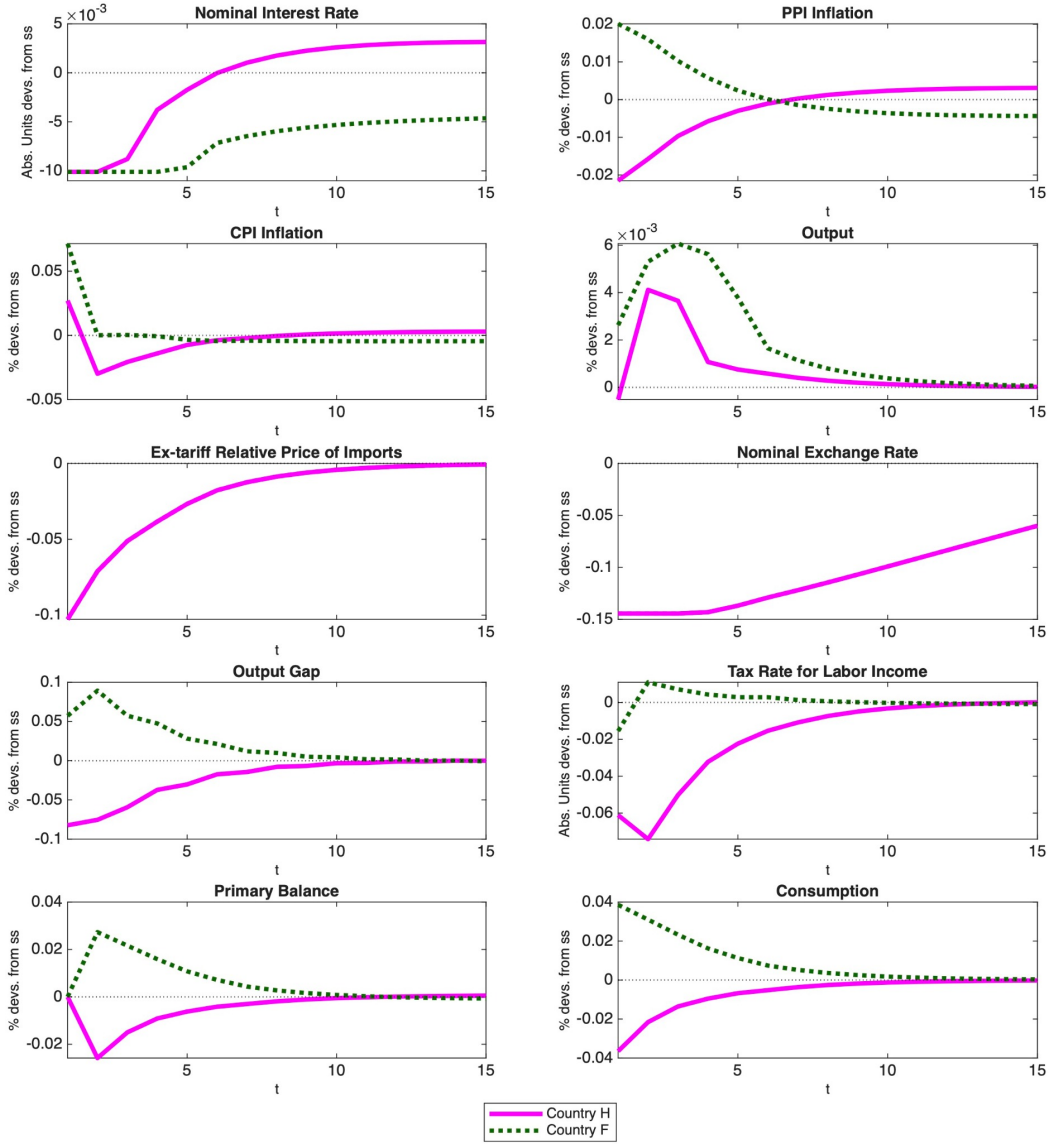
9 When the SOE Reaches the ZLB

- High persistence: a more durable tariff shock prolongs the residual labor-income-tax cut.
- The persistent tax cut keeps natural output high for longer, making the negative output gap more persistent.
- Low price stickiness: PPI inflation adjusts more strongly to the lower marginal cost and higher natural output.
- In both cases, the required Ramsey accommodation is large enough for the nominal interest rate to hit the ZLB.
- Thus the small-open-economy model isolates the tariff-LIT channel; the two-country model strengthens it.

10 Why the Two-Country Model Matters

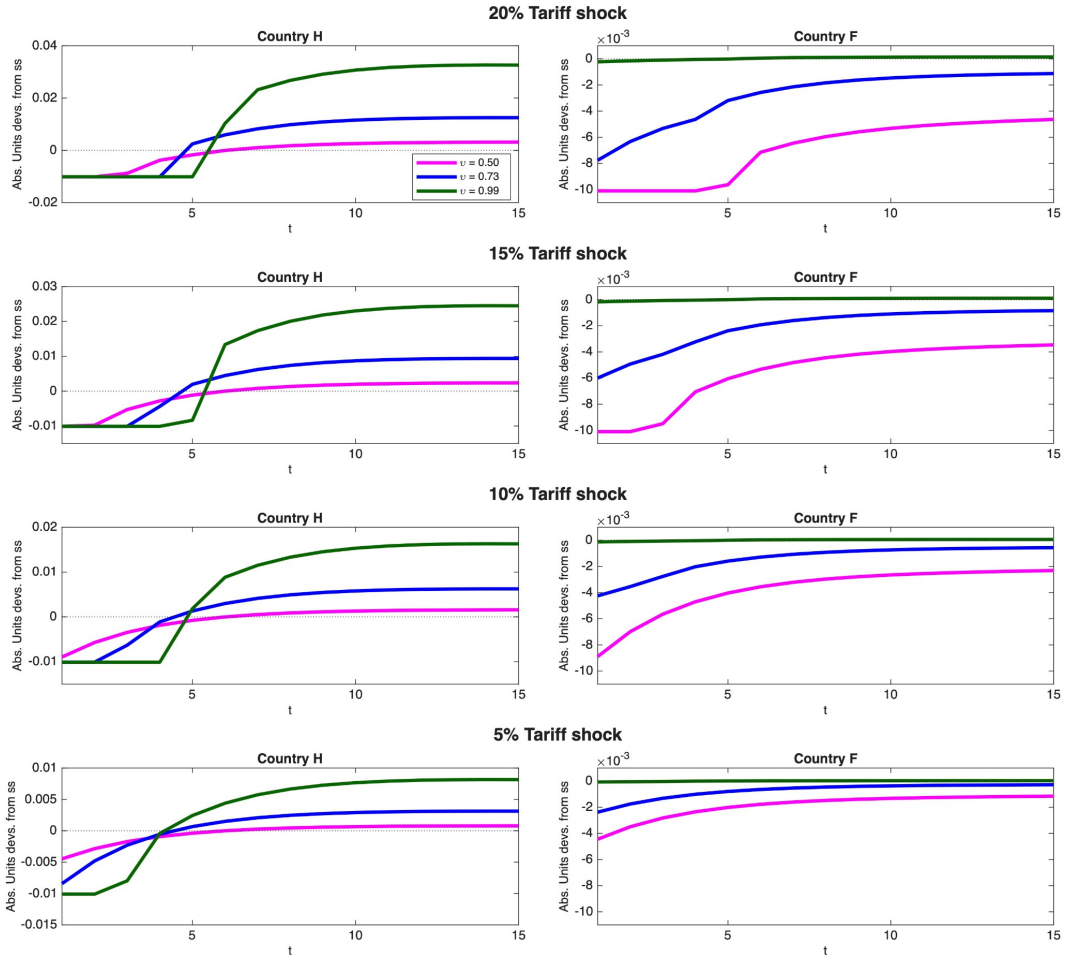
- In a small open economy, Foreign demand and Foreign monetary policy are taken as given.
- In the two-country model, a Home tariff changes the nominal exchange rate, Foreign demand, and Foreign monetary policy.
- Home deflationary pressure generated by the tariff-LIT channel is transmitted abroad.
- The Foreign Ramsey response feeds back into Home marginal cost and Home PPI inflation.
- This general-equilibrium feedback can make the ZLB bind under the benchmark persistence and price stickiness.

11 Two-Country Benchmark: Same-Size Countries



- H imposes a 20 percent unilateral import tariff.
- Home Tariff–LIT lowers residual LIT and PPI inflation.
- Home reaches the ZLB under benchmark persistence and stickiness.
- Same-size spillovers bring F to the ZLB as well.

12 Unilateral Tariffs: Tariff Size and Country Size



13 ZLB Incidence under Unilateral Home Import Tariffs

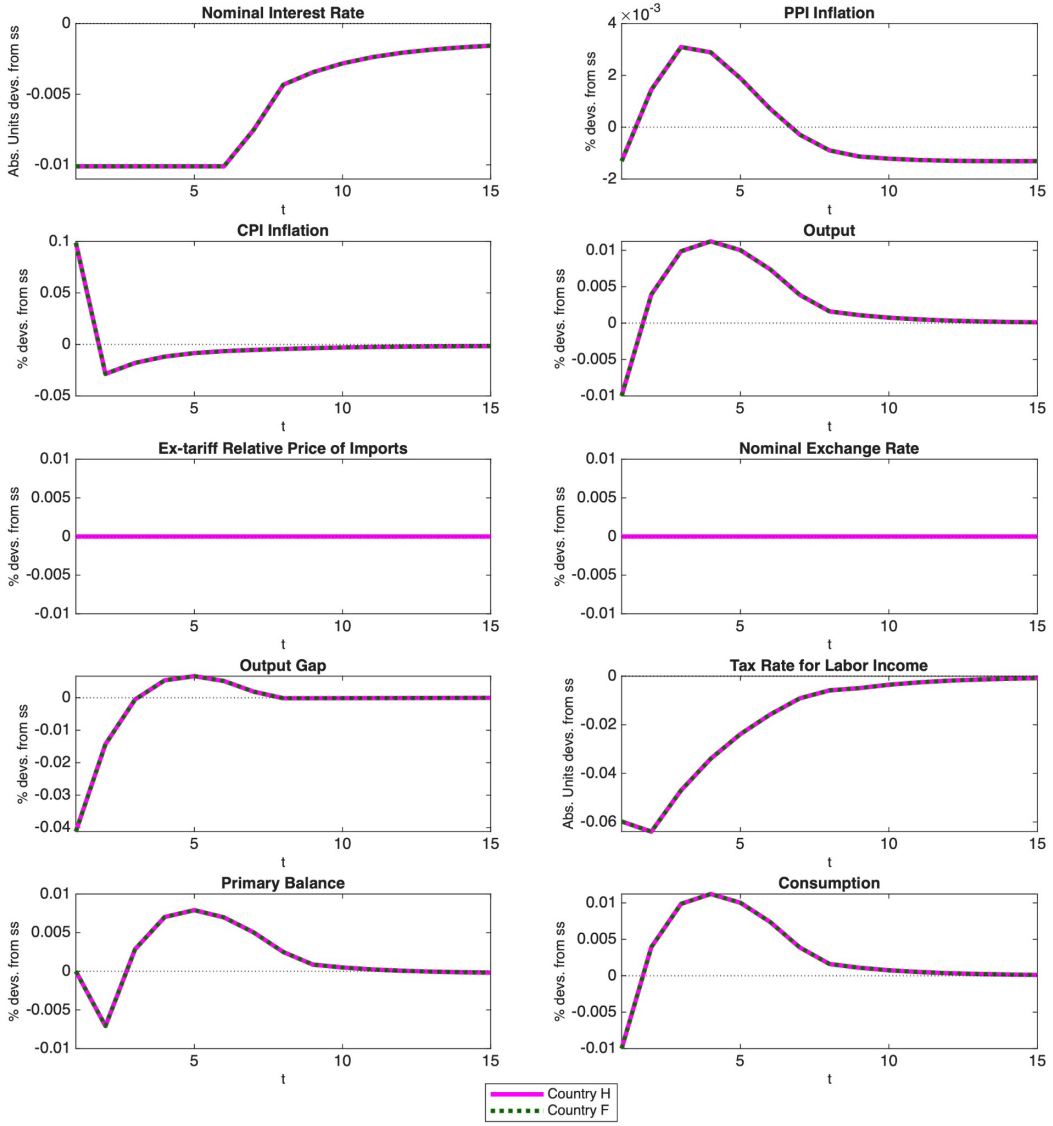
Tariff shock	$\upsilon = 0.50$ Same-size countries	$\upsilon = 0.73$ U.S.-size H	$\upsilon = 0.99$ Small H
20%	H, F	H	H
15%	H, F	H	H
10%	–	H	H
5%	–	–	H

- Since country H has population share $1 - \upsilon$, a larger υ means a smaller tariff-imposing country.
- Smaller H: stronger domestic Tariff-LIT effect and lower Home ZLB threshold.
- Larger H: stronger international repercussion effects and a higher chance of a global ZLB episode.

14 Reciprocal Tariffs: What Changes?

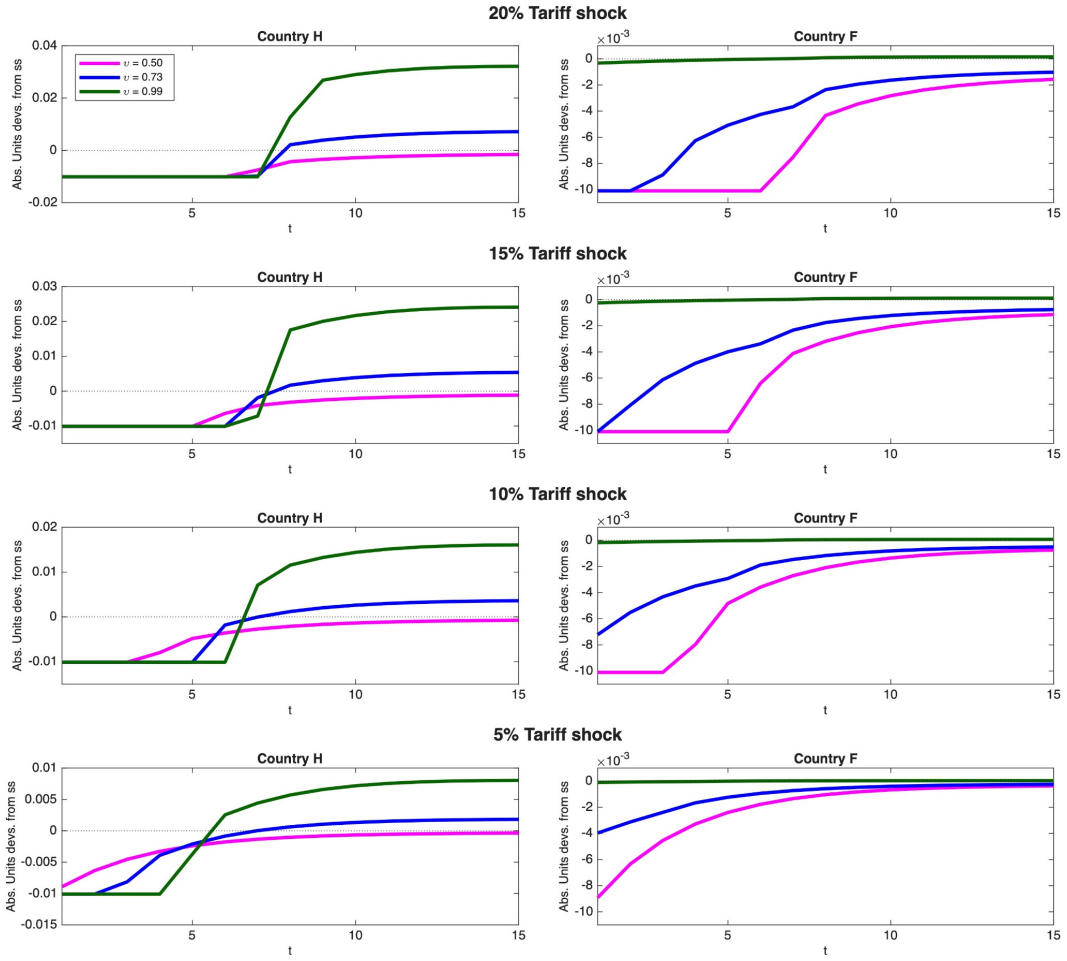
- Reciprocal tariffs make the Tariff-LIT channel operate directly in both countries.
- They therefore strengthen international repercussion effects relative to unilateral tariffs.
- Three implications:
  1. they expand the set of global-ZLB cases;
  2. they can generate a global ZLB episode under smaller tariff shocks;
  3. once the ZLB binds, they tend to lengthen the duration of the ZLB episode.
- With strong country-size asymmetry, the smaller country still experiences the larger domestic lower-bound force.

15 Reciprocal Tariffs: Same-Size Countries



- Same-size reciprocal-tariff benchmark.
- The two economies move symmetrically.
- Both nominal rates are constrained at the ZLB.
- Output and consumption contract first; the output gap later closes.

16 Reciprocal Tariffs: Tariff Size and Country Size



17 ZLB Incidence under Reciprocal Tariffs

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20%	H, F	H, F	H
15%	H, F	H	H
10%	H, F	H	H
5%	–	H	H

- Same-size countries: a 10 percent reciprocal tariff already generates a global ZLB episode.
- U.S.-size H: a 20 percent reciprocal tariff turns the unilateral domestic ZLB episode into a global one.
- U.S.-size H: a 5 percent reciprocal tariff generates a Home ZLB episode, but not a Foreign one.

18 Interpretation for Recent U.S. Tariffs

- ZLB incidence depends on effective tariff size, persistence, reciprocity / retaliation, country size, openness, and the initial monetary-policy environment.
- The 20 percent benchmark is useful for comparison with Monacelli, but it is an upper-tail case relative to recent effective U.S. tariff estimates.
- Limited retaliation and smaller effective tariffs imply shorter lower-bound episodes, or no observed ZLB episode.
- Thus the absence of an actual U.S. ZLB episode is not evidence against the Tariff-LIT channel.

19 Conclusion

- The Tariff-LIT channel raises natural output, lowers the output gap, and puts downward pressure on PPI inflation.
- The constrained-efficient response to an import tariff can therefore be monetary easing rather than tightening (with weak price stickiness or highly persistent shocks, the Ramsey rate hits the ZLB).
- In two-country general equilibrium, spillovers and spillbacks can push the required accommodation to the ZLB.
- Country size and reciprocity determine whether the lower-bound problem is domestic or global.