Tariff Timing, Currency of Pricing, and the Sign of Optimal Monetary Policy

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Abstract

This paper studies optimal monetary policy in the country that imposes an import tariff and asks why the sign of the optimal nominal interest-rate response can differ across pricing environments. We distinguish a pre-tariff-price convention (PreTP), under which the sticky destination price excludes the tariff, from a post-tariff-price convention (PostTP), under which the sticky destination price includes it. Although the two conventions imply the same flexible-price tariff wedge, they put the tariff on different sides of the nominal rigidity and therefore generate different price-setting constraints. In a small open economy, importer LCP changes the impact policy response from a 75.95-basis-point cut under PreTP to a 57.68-basis-point increase under PostTP. In an equal-size two-country economy with national Nash–Ramsey policy under commitment, the corresponding response changes from −31.92 to +43.09 basis points under importer LCP, from +49.49 to −4.98 under full LCP, and from +57.59 to −4.29 under Home-currency dominant pricing. These sign reversals survive changes in country size and steady-state monopoly distortions. We then separate model-structure robustness from the international policy game. Cooperation eliminates the zero crossings in our clean benchmark and, in the cooperative Bergin–Corsetti [5] model, PostTP reduces but does not reverse the tariff-imposing country's tightening. Crucially, when the same substantially richer Bergin–Corsetti private economy—with international production chains, imported intermediate inputs, trade costs, firm entry, incomplete asset markets, and Rotemberg pricing—is solved under the same national Nash–Ramsey policy game as our benchmark, the sign reversal returns under both full LCP and DCP: +576.61 to −20.57 basis points and +222.67 to −9.00 basis points, respectively. Thus the sign reversal is not a peculiarity of the parsimonious benchmark; it survives substantial model enrichment when the policy game is held fixed. Tariff location and international monetary-policy interaction are distinct determinants of the optimal monetary stance.

Keywords: import tariffs; optimal monetary policy; tariff pass-through; local-currency pricing; dominant currency pricing; Nash–Ramsey policy.
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1 Introduction

What should monetary policy do in the country that imposes an import tariff: raise the policy rate or lower it? In the standard open-economy New Keynesian mechanism, an import tariff shifts expenditure away from foreign goods and toward Home goods, raising the Home output gap and creating a motive for monetary tightening. Bergin and Corsetti [5], for example, obtain tightening by the tariff-imposing country in their benchmark PCP and exporter-LCP cases. The question is whether this policy prescription is robust once international pricing behavior is taken seriously. Other recent analyses likewise show that the monetary transmission of tariffs depends on the surrounding international-price and exchange-rate environment [19, 21, 6]. The relevant issue is therefore not a mechanical reaction to the first-round CPI effect of a tariff, but how nominal rigidities shape the welfare-relevant stabilization problem in the tariff-imposing economy.

A natural place to ask whether this tightening prescription is robust is international pricing behavior. Bergin and Corsetti [5] already make pricing behavior central by comparing producer-currency, local-currency, and dominant-currency pricing. That dimension is empirically important. Gopinath, Itskhoki, and Rigobon [15] show that exchange-rate pass-through depends strongly on the currency of invoicing, and Gopinath et al. [16] document the dominant role of a small set of currencies, especially the U.S. dollar, in international price adjustment and trade transmission. Dominant-currency pricing is therefore a natural benchmark for asking how the central bank of a tariff-imposing country should respond.

The tariff evidence points, however, to a second dimension of pricing behavior that is distinct from the currency of invoicing: *where the tariff enters relative to the sticky destination price.* Amiti, Redding, and Weinstein [1] find very high pass-through of U.S. tariffs into domestic import prices. Using border and retail micro data, Cavallo, Gopinath, Neiman, and Tang [8] likewise find high tariff pass-through at the border but substantially more muted adjustment at the retail level, with part of the tariff absorbed through lower domestic margins. This evidence does not structurally identify the pricing convention used in this paper. Its most direct model counterpart is our importer-LCP PostTP specification, in which the tariff is rapidly passed through into the importer's landed cost while the purchaser-facing price adjusts more slowly, temporarily compressing the importer or retailer margin. We subsequently apply the same tariff-timing distinction to exporter-set full-LCP and DCP prices as counterfactual pricing architectures; the domestic retail-margin evidence should not be read as directly identifying those exporter-pricing cases.

This observation matters because the standard tariff-pricing convention and the empirically motivated alternative put the tariff on different sides of the nominal rigidity. In Bergin and Corsetti [5], including their dominant-currency specification, the tariff is imposed on top of a sticky tariff-exclusive exporter price. We call this the pre-tariff-price convention, or PreTP. We contrast it with a post-tariff-price convention, PostTP, under which the tariff-inclusive destination price is the sticky object. Under PostTP the tariff enters the acquisition cost or net revenue relevant for the price setter before the sticky purchaser-facing price can fully adjust. Thus Bergin and Corsetti incorporate the empirically important *currency* of international price setting, while our distinction asks whether the monetary-policy prescription is also sensitive to the *location of the tariff* relative to that sticky price.

The two timing conventions are deliberately constructed so that this difference is not a disguised wealth effect. With lump-sum rebate of tariff revenue and representative-household ownership of firms, PreTP and PostTP have the same consolidated household-side tariff wedge. What differs is the price-setting constraint. Under PreTP the tariff lies outside the sticky-price setter's reset problem; under PostTP it enters the relevant marginal cost or net-revenue margin. The corresponding first-order conditions and Phillips curves therefore differ even though the household-side incidence is the same. This is not a secondary modeling detail: because it changes the private-sector price-setting constraint faced by the Ramsey authority, the PreTP/PostTP distinction can determine the sign of the optimal interest-rate response itself. Our question is therefore whether this additional dimension of pricing behavior makes the tariff-imposing country optimally raise or lower its policy rate.

It can. We first isolate the mechanism in a small open economy. Under PCP the tariff raises the Home policy rate by 18.56 basis points. Under importer LCP, however, the same 20-percentage-point tariff innovation produces a 75.95-basis-point cut under PreTP and a 57.68-basis-point increase under PostTP. The sign reversal comes from the importer price-setting constraint: PreTP makes the tariff-exclusive import price sticky, whereas PostTP makes the cum-tariff import price sticky. The Ramsey authority therefore faces a different feasible combination of the welfare-relevant output, LOOP, relative-price, and inflation margins.

We then move to an equal-size two-country economy, $\nu = 0.5$, with markup-correcting subsidies and national Nash–Ramsey policy under commitment in the sense of Faia and Monacelli [13]. The Home importer-LCP response again reverses, from -31.92 basis points under PreTP to $+43.09$ under PostTP. Under full LCP the response changes from $+49.49$ to -4.98 basis points, and under Home-currency dominant pricing it changes from $+57.59$ to -4.29 basis points. Hence allowing for dominant-currency pricing does not by itself settle the sign of the optimal response: the answer still depends on whether the tariff is outside or inside the sticky destination-price problem. The same qualitative sign pattern survives when country size and the steady-state producer-markup distortion are varied.

The policy implication is especially transparent in a U.S.-like calibration. We set $\nu = 0.27$ to match the U.S. share of world current-dollar GDP, and with the benchmark openness parameter $\upsilon = 0.30$ this implies a Home import expenditure weight of $\upsilon(1 - \nu) = 0.219$. The latter is close to the 22.3 percent average ratio of U.S. imports of goods and services to personal consumption expenditures (PCE) over 2000–2025; importantly, that match is an implication of ν and υ, not a separate calibration target [18, 20]. Under dominant-currency pricing and PostTP, the tariff-imposing country optimally lowers its policy rate on impact, and this conclusion is essentially unchanged by whether the steady-state producer-markup distortion is removed: the impact response is -6.34 basis points with the markup-correcting producer subsidies and -6.30 basis points without them. Under dominant-currency pricing and PreTP, by contrast, the same U.S.-like calibration calls for monetary tightening, with impact responses of $+90.59$ and $+89.15$ basis points, respectively. The PreTP result is therefore qualitatively consistent with the tightening obtained by Bergin and Corsetti [5]; our results do not contradict their policy conclusion under that pricing convention. What changes the prescription is the location of the tariff relative to the sticky price. The border-versus-retail evidence summarized above provides the most direct motivation for importer-LCP PostTP, not for the exporter-pricing DCP block itself. Our DCP PostTP experiment should instead be read as combining the empirically important dominant-currency dimension with the same alternative tariff timing: the tariff-inclusive destination price is sticky and the Foreign exporter absorbs the tariff through its net-of-tariff revenue margin. In this U.S.-like DCP counterfactual, that change in tariff location is sufficient to turn the optimal impact response from tightening to easing.

The contribution is therefore to add a second, empirically motivated dimension to the pricing architecture used in the tariff–monetary-policy literature. Existing work has shown that the currency of price setting matters for tariff transmission and optimal policy. We show that the position of the tariff relative to the sticky price matters separately and can reverse the sign of the optimal nominal interest-rate response in the country imposing the tariff. The mechanism is a constrained welfare tradeoff: the welfare criterion determines which output and relative-price deviations matter, while the timing-specific price-setting constraints determine which combinations of those objects are feasible in the short run.

A central robustness question is whether the sign reversal is merely a feature of our parsimonious model or instead survives substantial model enrichment. We address this question while separately controlling for the international policy game. First, motivated by the fact that Bergin and Corsetti [5] solve their quantitative model cooperatively, we re-solve our clean benchmark under cooperative Ramsey policy. The zero crossings disappear, showing that policy coordination is itself an important margin. This observation also means that the absence of a sign reversal in the original cooperative Bergin–Corsetti environment cannot by itself be attributed to its richer trade and production structure. We therefore perform the sharper comparison: we hold the Bergin–

Corsetti private economy fixed and solve it under the same national Nash–Ramsey policy game under commitment as in our benchmark, following Faia and Monacelli [13]. The sign reversal returns under both full LCP and DCP, with the tariff-imposing country's impact response changing from $+576.61$ to -20.57 basis points and from $+222.67$ to -9.00 basis points, respectively. This is our strongest external-model robustness result: even after moving from the clean Calvo benchmark to the substantially richer Bergin–Corsetti economy, the PreTP–PostTP sign reversal survives when the policy game is held fixed. The cooperative comparison then identifies international coordination as a separate determinant of whether the timing-induced change in stance crosses zero. Trade structure clearly matters for the magnitude and transmission of tariff shocks, but our comparison points to a more fundamental determinant of the sign of optimal monetary policy: how the tariff enters the marginal-cost or net-revenue margin in the relevant sticky-price-setting problem. In this sense, our results redirect attention from the richness of the trade block itself to the location of the tariff within the nominal pricing problem.

The rest of the paper is organized as follows. Section 2 relates the analysis to the tariff–monetary-policy and international-pricing literatures. Section 3 derives the small-open-economy ILCP model and isolates why PreTP and PostTP imply opposite optimal rate responses. Section 4 introduces the two-country national Nash–Ramsey model and compares PCP, importer LCP, full LCP, and dominant-currency pricing, including the reset-price problems, Calvo laws, and Phillips curves. Section 5 presents the equal-size markup-corrected benchmark, beginning with the welfare criteria and their numerical weights before reporting the interest-rate table and IRFs. Section 6 repeats the same analysis for the $\nu = 0.27$ distorted-steady-state benchmark. Section 7 first examines robustness to country size and steady-state distortions, then introduces an external small-open-economy check based on Bianchi and Coulibaly [7], next isolates the role of international policy coordination by re-solving the clean benchmark under cooperative Ramsey policy, and finally implements the PreTP–PostTP distinction in the richer Bergin–Corsetti [5] model under both cooperative and national Nash–Ramsey policy. Section 8 concludes.

2 Related Literature

This paper belongs first to the relatively small recent literature on optimal monetary policy in the country that imposes a tariff. Bergin and Corsetti [5] study cooperative Ramsey stabilization under PCP and extend the analysis to exporter local-currency and dominant-currency pricing. For the tariff-imposing country, their benchmark PCP and exporter-LCP results imply monetary tightening. Their LCP specification is exporter LCP: exporters set destination-specific sticky prices in the buyer's currency and the tariff is imposed on top of that exporter-set price. In the terminology of the present paper, this structure is closest to full-LCP PreTP. Monacelli [19] derives optimal policy for import and export tariffs in a small open economy, while Werning, Lorenzoni, and Guerrieri [21] study tariffs on imported intermediate inputs as cost-push shocks. The later Bergin–Corsetti analysis [6] emphasizes exchange-rate management in the cooperative stabilization of unilateral tariffs, and Auray, Devereux, and Eyquem [2] study monetary-rule design when tariffs are endogenous strategic choices. These contributions show that the monetary stabilization of tariffs depends on the real and nominal structure of the open economy. Our focus within this literature is deliberately narrower: we ask whether international pricing behavior itself can determine the sign of the optimal policy response.

Bianchi and Coulibaly [7] provide an important comparison precisely because their scope is different. International pricing behavior is not the object of their analysis. Their baseline is a small-open-economy Ramsey model with Rotemberg rigidity in Home producer prices and lump-sum rebates of tariff revenue. The tariff creates a fiscal externality because private import decisions respond to the tariff-inclusive price whereas the tariff payment is a domestic transfer from the social point of view. Their optimal policy is therefore expansionary relative to the look-through allocation in the sense that the Ramsey authority raises employment and imports and tolerates more Home-producer inflation. This allocation-based characterization should not be read mechanically as a statement that the impact nominal policy rate must fall. Section 7.2 extends their environment with importer local-currency pricing and applies the same PreTP–PostTP distinction as in Section 3. The exercise is useful because it asks whether tariff timing can still determine the sign of the optimal nominal-rate response when the real welfare mechanism is the Bianchi–Coulibaly fiscal externality rather than the clean pricing benchmark used in our baseline.

A second strand shows directly that tariff transmission depends on international pricing behavior. Hwang and Turnovsky [17] compare PCP and LCP in a two-country tariff model and show that real effects can differ sharply across pricing regimes. More recently, Auray, Devereux, and Eyquem [3] compare PCP, LCP, and DCP and show that invoicing currency has first-order effects on the response to a unilateral tariff. Bergin and Corsetti [5] are especially close to our question because they analyze optimal monetary policy under alternative pricing currencies, including dominant-currency pricing. Their analysis establishes that the currency in which the sticky international price is set matters for the monetary-policy prescription. Our contribution is to ask whether the position of the tariff relative to that sticky price matters separately.

The empirical pricing literature motivates both dimensions. Gopinath, Itskhoki, and Rigobon [15] document that exchange-rate pass-through depends strongly on the currency of invoicing, and Gopinath et al. [16] show that dominant currencies, especially the U.S. dollar, govern a large share of international price adjustment and transmission. This evidence motivates our DCP experiments. Separately, Amiti, Redding, and Weinstein [1] document very high pass-through of U.S. tariffs into domestic import prices, while Cavallo, Gopinath, Neiman, and Tang [8] find high pass-through at the border but much more muted retail-price adjustment, with part of the tariff absorbed through lower margins. The latter pattern most directly motivates importer-LCP PostTP, where the tariff raises the domestic importer's landed cost before its sticky purchaser-facing price fully adjusts. Full-LCP and DCP PostTP extend the same timing experiment to exporter-set destination prices, where the absorbing margin is instead the exporter's net-of-tariff revenue. We do not interpret the border-versus-retail evidence as structurally identifying those exporter-pricing cases; rather, it motivates the broader question of whether the tariff lies inside or outside the relevant sticky destination-price problem.

This distinction is orthogonal to the invoicing-currency distinction. A model can feature DCP and still be PreTP if the tariff is simply added on top of a sticky dominant-currency exporter price, as in the Bergin–Corsetti convention. Conversely, a PostTP model can be formulated under importer LCP, full LCP, or DCP. The pricing architecture therefore has two separate dimensions: the currency and identity of the sticky price setter, and the location of the tariff relative to that sticky price. Our results show that the second dimension can overturn the policy implication associated with the first.

The broader open-economy monetary literature provides the welfare logic for this comparison. Devereux and Engel [12] show that the optimal degree of exchange-rate flexibility depends fundamentally on whether prices are set in producer or local currency. Corsetti, Dedola, and Leduc [9, 10] emphasize that incomplete pass-through introduces additional stabilization margins, including LOOP and international relative-price misalignments, that are absent from the benchmark PCP case. Corsetti, Dedola, and Leduc [11] provide a particularly sharp example in which the optimal monetary stance changes sign with the degree of exchange-rate pass-through. Fujiwara and Wang [14] solve cooperative and noncooperative Ramsey problems under LCP and use quadratic national welfare representations to make the output, inflation, and LOOP stabilization margins transparent. Their work is an important methodological precedent for the welfare decomposition used below. In the present paper, the nonlinear national Nash–Ramsey system determines the policy allocation, while the Benigno–Woodford criterion is used to interpret the welfare margins behind that allocation.

To our knowledge, existing work has not directly compared Ramsey-optimal monetary policy for the tariff-imposing country under a sticky tariff-exclusive destination price and a sticky tariff-inclusive destination price. The PreTP/PostTP comparison therefore does more than add an alternative timing convention: it asks whether the sign of the monetary-policy prescription is robust to an empirically motivated difference in where nominal adjustment occurs along the pricing chain. It is not. The timing convention changes the relevant Phillips curve and can reverse the sign of optimal monetary policy, with the direction of the reversal depending on whether pricing is importer LCP, full LCP, or DCP.

3 Small open economy: importer LCP and the tariff-timing mechanism

We begin with the small open economy because it isolates the tariff-timing mechanism from foreign monetary feedback and strategic interaction between national planners. The only international price-setting regime needed at this stage is importer local-currency pricing (ILCP). PCP is retained only as a control in the figure.

3.1 Environment

The Home household has period utility

$$u_t = \log C_t - \frac{N_t^{1+\varphi}}{1+\varphi}. \tag{1}$$

Let $P_{H,t}$ denote the Home producer price, $P_{F,t}$ the tariff-exclusive Home-currency import price, and

$$S_t \equiv \frac{P_{F,t}}{P_{H,t}}, \qquad \Psi_t \equiv \frac{\mathcal{E}_t P^*_{F,t}}{P_{F,t}}, \tag{2}$$

so that Ψ_t is the law-of-one-price (LOOP) ratio for Home imports. The tariff-inclusive import price is

$$\widetilde{P}_{F,t} \equiv (1+\tau_{M,t})P_{F,t}, \qquad \widetilde{\pi}_{F,t} = \pi_{F,t} + \Delta m_{H,t}, \qquad m_{H,t} \equiv \log(1+\tau_{M,t}). \tag{3}$$

The CPI–PPI ratio is

$$\mathcal{G}(S_t, \tau_{M,t}) = \Big[(1-\upsilon) + \upsilon(1+\tau_{M,t})^{1-\eta} S_t^{1-\eta}\Big]^{1/(1-\eta)}. \tag{4}$$

Complete international risk sharing under log utility is

$$\Psi_t S_t = \frac{C_t}{C_t^*}\mathcal{G}(S_t, \tau_{M,t}), \tag{5}$$

and Home goods-market clearing is

$$Y_t = (1-\upsilon)\mathcal{G}(S_t, \tau_{M,t})^{\eta} C_t + \upsilon \left(\frac{\Psi_t S_t}{1+\tau_{X,t}}\right)^{\eta} C_t^*. \tag{6}$$

The experiment sets $\tau_{X,t} = 0$ and holds C_t^* fixed. The household Euler equation is part of the implementation constraints,

$$\frac{1}{1+i_t} = \beta \frac{C_t \mathcal{G}(S_t, \tau_{M,t})}{C_{t+1}\mathcal{G}(S_{t+1}, \tau_{M,t+1})\Pi_{H,t+1}}, \tag{7}$$

but it is not used below as a stand-alone explanation for the sign of optimal monetary policy. That sign is interpreted from the planner's welfare-relevant inflation and relative-price margins together with the timing-specific price-setting constraints.

Let τ denote the constant subsidy to Home producers and τ_I the constant subsidy to Home importers. The import tariff remains denoted by $\tau_{M,t}$, so the subsidy and tariff are distinct policy instruments. In the markup-corrected benchmark the two subsidies remove the corresponding deterministic monopolistic-markup distortions:

$$(1-\tau)\frac{\varepsilon}{\varepsilon-1}=1, \qquad (1-\tau_I)\frac{\varepsilon_M}{\varepsilon_M-1}=1. \tag{8}$$

Hence the zero-tariff, zero-inflation steady state is

$$\bar{S}=\bar{\Psi}=\bar{C}=\bar{Y}=\bar{N}=1. \tag{9}$$

3.2 ILCP price setting: PreTP and PostTP

Under ILCP a Home importer sets the local-currency destination price. The two timing conventions differ only in which nominal price is Calvo sticky. Under PreTP the sticky object is the tariff-exclusive price $P_{F,t}$; under PostTP it is the tariff-inclusive price $\widetilde{P}_{F,t}$.

It is useful to separate the household's tariff wedge from the identity of the statutory remitter. Under PreTP, the Home household's expenditure on the imported variety is

$$(1+\tau_{M,t})P_{F,t}C_{F,t},$$

because the tariff is added on top of the sticky tariff-exclusive quote. Under PostTP, the corresponding expenditure is

$$\widetilde{P}_{F,t}C_{F,t}, \qquad P_{F,t}\equiv\frac{\widetilde{P}_{F,t}}{1+\tau_{M,t}},$$

so it can equivalently be written as $(1+\tau_{M,t})P_{F,t}C_{F,t}$. Thus the household demand system and the economically relevant household budget constraint are the same under the two timing conventions. What differs is the statutory location of the tariff payment. PreTP can be represented as the tariff being remitted downstream, after the importer has quoted its tariff-exclusive price, whereas under PostTP the importer remits the tariff and therefore pays the tariff-inclusive acquisition cost. Because tariff revenue is rebated lump sum and the representative household owns the importing firms, the identity of the statutory remitter has no independent wealth effect in the consolidated household budget. It matters only through nominal rigidity: under PostTP the tariff enters the marginal cost of the sticky-price setter, while under PreTP it lies outside that setter's pricing problem. The PreTP convention is the standard benchmark used in the tariff literature, including the pricing convention in Bergin and Corsetti [5]; PostTP changes the location of the tariff relative to the nominal contract rather than the household's underlying tariff wedge.

Let

$$\Lambda_{t,t+k}\equiv\beta^k\frac{C_t}{C_{t+k}}\frac{P_t}{P_{t+k}} \tag{10}$$

denote the household's nominal stochastic discount factor, where $P_t\equiv P_{H,t}\mathcal{G}(S_t,\tau_{M,t})$ is the Home consumption-price index. The resetting importer solves

$$\text{PreTP}: \quad \max_{\overline{P}_{F,t}} E_t\sum_{k=0}^{\infty}\theta_M^k\Lambda_{t,t+k}\left[\overline{P}_{F,t}-(1-\tau_I)\mathcal{E}_{t+k}P^*_{F,t+k}\right]C_{F,t+k|t}, \tag{11}$$

$$\text{PostTP}: \quad \max_{\overline{\widetilde{P}}_{F,t}} E_t\sum_{k=0}^{\infty}\theta_M^k\Lambda_{t,t+k}\left[\overline{\widetilde{P}}_{F,t}-(1-\tau_I)(1+\tau_{M,t+k})\mathcal{E}_{t+k}P^*_{F,t+k}\right]C_{F,t+k|t}, \tag{12}$$

with the usual CES demand for the resetting variety. Equations (11) and (12) therefore differ in the importer's cost, not in the household's gross purchase price. In PreTP the statutory tariff does not enter the importer's acquisition cost or reset-price problem. In PostTP the importer pays $(1+\tau_{M,t})\mathcal{E}_tP^*_{F,t}$ at the border; if it cannot reset its tariff-inclusive retail price, an increase in the tariff initially compresses its markup. This is the model counterpart of the distinction emphasized by Cavallo et al. [8]: tariff pass-through into the cost paid at the border can be high while short-run retail-price pass-through is lower because domestic margins absorb part of the shock. There is no contradiction between high border pass-through and temporary importer incidence; the latter is precisely the margin compression generated when the border cost moves more rapidly than the sticky purchaser-facing price.

Because the importer subsidy eliminates the static markup, the first-order conditions can be written

$$\text{PreTP}: \quad E_t \sum_{k=0}^{\infty} \theta_M^k \Lambda_{t,t+k} C_{F,t+k|t} \left[\overline{P}_{F,t} - \mathcal{E}_{t+k} P^*_{F,t+k}\right] = 0, \tag{13}$$

$$\text{PostTP}: \quad E_t \sum_{k=0}^{\infty} \theta_M^k \Lambda_{t,t+k} C_{F,t+k|t} \left[\overline{\widetilde{P}}_{F,t} - (1+\tau_{M,t+k})\mathcal{E}_{t+k} P^*_{F,t+k}\right] = 0. \tag{14}$$

The tariff is outside the sticky-price first-order condition under PreTP and inside it under PostTP.

The Calvo price-index laws are

$$P_{F,t}^{1-\varepsilon_M} = \theta_M P_{F,t-1}^{1-\varepsilon_M} + (1-\theta_M)\overline{P}_{F,t}^{1-\varepsilon_M}, \qquad \text{PreTP}, \tag{15}$$

$$\widetilde{P}_{F,t}^{1-\varepsilon_M} = \theta_M \widetilde{P}_{F,t-1}^{1-\varepsilon_M} + (1-\theta_M)\overline{\widetilde{P}}_{F,t}^{1-\varepsilon_M}, \qquad \text{PostTP}. \tag{16}$$

Linearizing the reset-price condition and the corresponding Calvo law gives

$$\pi_{F,t} = \beta E_t \pi_{F,t+1} + \kappa_M \psi_t, \qquad \text{PreTP}, \tag{17}$$

$$\widetilde{\pi}_{F,t} = \beta E_t \widetilde{\pi}_{F,t+1} + \kappa_M \psi_t, \qquad \text{PostTP}, \tag{18}$$

where

$$\kappa_M \equiv \frac{(1-\theta_M)(1-\beta\theta_M)}{\theta_M}. \tag{19}$$

Using Eq. (3), the PostTP equation in the same tariff-exclusive inflation coordinate becomes

$$\pi_{F,t} = \beta E_t \pi_{F,t+1} + \kappa_M \psi_t - \Delta m_{H,t} + \beta E_t \Delta m_{H,t+1}. \tag{20}$$

This is the central theoretical distinction. PreTP and PostTP face the same flexible-price tariff wedge, but they impose different nominal constraints on the Ramsey allocation.

3.3 Ramsey policy and welfare interpretation

The SOE Ramsey authority maximizes

$$E_0 \sum_{t=0}^{\infty} \beta^t \left(\log C_t - \frac{N_t^{1+\varphi}}{1+\varphi}\right) \tag{21}$$

subject to the household, resource, producer-price, importer-price, and tariff-process constraints above. The nonlinear first-order conditions determine the allocation. For interpretation, the second-order welfare criterion under ILCP can be written

$$\mathcal{L}_t^{SOE,j} = \frac{1}{2}\Big[\Lambda_y(\hat{y}_t^{w,j})^2 + \Lambda_\psi(\hat{\psi}_t^{w,j})^2 + \Lambda_{\pi,H}\pi_{H,t}^2 + \Lambda_{\pi,F}(\pi_{F,t}^j)^2\Big], \qquad j \in \{\text{PreTP}, \text{PostTP}\}, \tag{22}$$

where $\pi_{F,t}^{\text{PreTP}} \equiv \pi_{F,t}$ and $\pi_{F,t}^{\text{PostTP}} \equiv \widetilde{\pi}_{F,t}$. At the calibration used below,

$$\Lambda_y = 1.6236, \quad \Lambda_\psi = 0.5054, \quad \Lambda_{\pi,H} = 38.5689, \quad \Lambda_{\pi,F} = 27.1051. \tag{23}$$

The square weights are identical across timing conventions. What changes is the welfare center and, crucially, the inflation object constrained by the importer Phillips curve.

The calibration is

$$\beta = 0.99, \quad \upsilon = 0.30, \quad \varphi = 2.2, \quad \eta = 1.5, \quad \varepsilon = \varepsilon_M = 3.8, \quad \theta = \theta_M = 0.8, \tag{24}$$

with tariff persistence 0.7 and a 20-percentage-point Home import-tariff innovation.

Figure 1 shows the result. Under ILCP, the Home nominal rate falls by 75.95 basis points under PreTP and rises by 57.68 basis points under PostTP. The sign reversal is not a mechanical response to CPI inflation. Under PreTP, tariff-exclusive import-price inflation is only 0.14 percent per quarter on impact, while Home PPI inflation is 0.62 percent; the large negative LOOP-gap deviation from its welfare center is reduced by a depreciation that raises the border price relative to the locally sticky import price. Under PostTP, by contrast, the sticky inflation object is the cum-tariff import price, which rises by 1.48 percent per quarter on impact, and the LOOP-gap deviation changes sign. The optimal allocation therefore uses appreciation and monetary tightening to restrain the directly welfare-relevant sticky import-price inflation and the associated relative-price distortion. The importer Phillips curves in Eqs. (17)–(20), not the Euler equation by itself, explain why the feasible inflation–relative-price tradeoff changes.

PCP is plotted only as a control. It has no separate sticky importer-price block and hence no PreTP/PostTP pair; the Home rate rises by 18.56 basis points.

4 Two-country model and pricing regimes

4.1 Environment and national Ramsey planners

A mass ν of households resides in Home and a mass $1-\nu$ in Foreign. The expenditure weights are

$$\omega_F = \upsilon(1-\nu), \qquad \omega_H = 1-\omega_F, \qquad \omega_H^* = \upsilon\nu, \qquad \omega_F^* = 1-\omega_H^*. \tag{25}$$

Preferences are the two-country counterparts of Eq. (1), financial markets are complete, and tariff revenue is rebated lump sum. The Home and Foreign authorities play a national Nash–Ramsey game under commitment. For pricing regime R, the Home planner solves

$$\max_{\{Z_{H,t}^R\}_{t\geq 0}} E_0 \sum_{t=0}^{\infty} \beta^t \left[\log C_t - \frac{N_t^{1+\varphi}}{1+\varphi}\right] \quad \text{s.t.} \quad \Gamma_{H,t}^R(Z_{H,t}^R, Z_{H,t+1}^R, Z_{H,t-1}^R; Z_F^R, m_{H,t}, m_{F,t}) = 0, \tag{26}$$

taking the complete contingent Foreign allocation Z_F^R as given. The Foreign planner solves the corresponding national problem. The constraint vector Γ_H^R contains the household allocation conditions, resource constraints, all Calvo price-index and reset-price recursions relevant under R, and the nominal-interest-rate implementation condition.

Let $\lambda_{H,t}^R$ collect the multipliers on $\Gamma_{H,t}^R$. Since $\Gamma_{H,t}^R$ may contain one lead and one lag of the planner's choice vector, an interior Home first-order condition can be summarized as

$$\begin{aligned} 0 = u_x(Z_{H,t}^R) + (\lambda_{H,t}^R)' \frac{\partial \Gamma_{H,t}^R}{\partial x_t} + \beta^{-1}(\lambda_{H,t-1}^R)' \frac{\partial \Gamma_{H,t-1}^R}{\partial x_t} \\ + \beta E_t \left[(\lambda_{H,t+1}^R)' \frac{\partial \Gamma_{H,t+1}^R}{\partial x_t}\right], \qquad x_t \in Z_{H,t}^R, \end{aligned} \tag{27}$$

with the analogous Foreign conditions. In particular, the consumption, labor, and policy-rate conditions are the $x_t = C_t, N_t, i_t$ members of Eq. (27). The full expanded systems are lengthy because each pricing regime contains a different set of price states; Appendix D records the constraint sets and the corresponding Lagrangian representation. The quantitative results below solve these nonlinear national Ramsey systems. The welfare cost functions introduced later are second-order diagnostic representations and are not substituted for the nonlinear Ramsey problem.

We denote the Home and Foreign producer subsidies by τ and τ^*, respectively. Where importer markup-correction subsidies are present, they are denoted by τ_I and τ_I^*. Thus the Home and Foreign producer markup factors are

$$\mathcal{M}_P = (1-\tau)\frac{\varepsilon}{\varepsilon-1}, \qquad \mathcal{M}_P^* = (1-\tau^*)\frac{\varepsilon}{\varepsilon-1},$$

and the Home and Foreign importer markup factors are defined analogously using τ_I and τ_I^*.

4.2 PCP

Under PCP each producer sets prices in its own currency. There is no separate sticky local destination price for imports, so the law of one price holds for international goods prices and there is no PreTP/PostTP pair. A resetting Home producer solves

$$\max_{\bar{P}_{H,t}} E_t \sum_{k=0}^{\infty} \theta^k \Lambda_{t,t+k} \left[\bar{P}_{H,t} - (1-\tau)P_{H,t+k}MC_{H,t+k}\right] Y_{t+k|t}. \tag{28}$$

Its first-order condition is

$$E_t \sum_{k=0}^{\infty} \theta^k \Lambda_{t,t+k} Y_{t+k|t} \left[\bar{P}_{H,t} - \mathcal{M}_P P_{H,t+k}MC_{H,t+k}\right] = 0, \qquad \mathcal{M}_P \equiv (1-\tau)\frac{\varepsilon}{\varepsilon-1}. \tag{29}$$

The Calvo price index evolves according to

$$P_{H,t}^{1-\varepsilon} = \theta P_{H,t-1}^{1-\varepsilon} + (1-\theta)\bar{P}_{H,t}^{1-\varepsilon}, \tag{30}$$

and the linearized producer-price Phillips curve is

$$\pi_{H,t} = \beta E_t \pi_{H,t+1} + \kappa_H \widehat{mc}_{H,t}, \qquad \kappa_H = \frac{(1-\theta)(1-\beta\theta)}{\theta}. \tag{31}$$

Foreign has the mirror producer block with τ^* and $\mathcal{M}_P^*$. PCP will be used below only as a control.

4.3 Importer LCP

Two-country ILCP differs from the SOE because both foreign consumption and foreign monetary policy are endogenous, and both countries have local importer price blocks. For the Home import block, however, the timing distinction is exactly the one isolated in Section 3. The resetting Home importer solves

$$\text{PreTP}: \quad \max_{\overline{P}_{F,t}} E_t \sum_{k=0}^{\infty} \theta_M^k \Lambda_{t,t+k} \left[\overline{P}_{F,t} - (1-\tau_I)\mathcal{E}_{t+k}P_{F,t+k}^*\right] C_{F,t+k|t}, \tag{32}$$

$$\text{PostTP}: \quad \max_{\widetilde{\overline{P}}_{F,t}} E_t \sum_{k=0}^{\infty} \theta_M^k \Lambda_{t,t+k} \left[\widetilde{\overline{P}}_{F,t} - (1-\tau_I)(1+\tau_{M,t+k})\mathcal{E}_{t+k}P_{F,t+k}^*\right] C_{F,t+k|t}. \tag{33}$$

The first-order conditions are

$$\text{PreTP}: \quad E_t \sum_{k=0}^{\infty} \theta_M^k \Lambda_{t,t+k} C_{F,t+k|t} \left[\overline{P}_{F,t} - \mathcal{M}_I \mathcal{E}_{t+k}P_{F,t+k}^*\right] = 0, \tag{34}$$

$$\text{PostTP}: \quad E_t \sum_{k=0}^{\infty} \theta_M^k \Lambda_{t,t+k} C_{F,t+k|t} \left[\widetilde{\overline{P}}_{F,t} - \mathcal{M}_I(1+\tau_{M,t+k})\mathcal{E}_{t+k}P_{F,t+k}^*\right] = 0, \tag{35}$$

where $\mathcal{M}_I = (1-\tau_I)\varepsilon_M/(\varepsilon_M - 1)$. The Calvo laws are the two-country counterparts of Eqs. (15)–(16). Linearization yields

$$\pi_{F,t} = \beta E_t \pi_{F,t+1} + \kappa_M \psi_t, \qquad \text{PreTP}, \tag{36}$$

$$\widetilde{\pi}_{F,t} = \beta E_t \widetilde{\pi}_{F,t+1} + \kappa_M \psi_t, \qquad \text{PostTP.} \tag{37}$$

Equivalently,

$$\pi_{F,t} = \beta E_t \pi_{F,t+1} + \kappa_M \psi_t - \Delta m_{H,t} + \beta E_t \Delta m_{H,t+1}, \qquad \text{PostTP.} \tag{38}$$

The Foreign importer block is the mirror image, with importer subsidy τ_I^* and the corresponding Foreign importer markup factor.

4.4 Full LCP

Under full LCP exporters set destination-specific prices in the buyer's currency. For Foreign goods sold in Home, a resetting Foreign exporter solves

$$\text{PreTP}: \quad \max_{\bar{P}_{F,t}} \frac{\nu}{1-\nu} E_t \sum_{k=0}^{\infty} \theta^k \Lambda^*_{t,t+k} \left[\frac{\bar{P}_{F,t}}{\mathcal{E}_{t+k}} - (1-\tau^*) P^*_{F,t+k} MC^*_{F,t+k} \right] C_{F,t+k|t}, \tag{39}$$

$$\text{PostTP}: \quad \max_{\bar{\bar{P}}_{F,t}} \frac{\nu}{1-\nu} E_t \sum_{k=0}^{\infty} \theta^k \Lambda^*_{t,t+k} \left[\frac{\bar{\bar{P}}_{F,t}}{(1+\tau_{M,t+k})\mathcal{E}_{t+k}} - (1-\tau^*) P^*_{F,t+k} MC^*_{F,t+k} \right] C_{F,t+k|t}. \tag{40}$$

The constant market-size factor drops from the first-order condition:

$$\text{PreTP}: \quad E_t \sum_{k=0}^{\infty} \theta^k \Lambda^*_{t,t+k} C_{F,t+k|t} \left[\frac{\bar{P}_{F,t}}{\mathcal{E}_{t+k}} - \mathcal{M}^*_P P^*_{F,t+k} MC^*_{F,t+k} \right] = 0, \tag{41}$$

$$\text{PostTP}: \quad E_t \sum_{k=0}^{\infty} \theta^k \Lambda^*_{t,t+k} C_{F,t+k|t} \left[\frac{\bar{\bar{P}}_{F,t}}{(1+\tau_{M,t+k})\mathcal{E}_{t+k}} - \mathcal{M}^*_P P^*_{F,t+k} MC^*_{F,t+k} \right] = 0. \tag{42}$$

The Calvo laws are

$$P^{1-\varepsilon}_{F,t} = \theta P^{1-\varepsilon}_{F,t-1} + (1-\theta) \bar{P}^{1-\varepsilon}_{F,t}, \qquad \text{PreTP,} \tag{43}$$

$$\widetilde{P}^{1-\varepsilon}_{F,t} = \theta \widetilde{P}^{1-\varepsilon}_{F,t-1} + (1-\theta) \bar{\bar{P}}^{1-\varepsilon}_{F,t}, \qquad \text{PostTP.} \tag{44}$$

The Home-import Phillips curves are

$$\pi_{F,t} = \beta E_t \pi_{F,t+1} + \kappa_H \left[\psi_t + \log\left(\frac{MC^*_{F,t}}{\overline{MC}^*_F} \right) \right], \qquad \text{PreTP,} \tag{45}$$

$$\widetilde{\pi}_{F,t} = \beta E_t \widetilde{\pi}_{F,t+1} + \kappa_H \left[\psi_t + \log\left(\frac{MC^*_{F,t}}{\overline{MC}^*_F} \right) \right], \qquad \text{PostTP.} \tag{46}$$

Thus the tariffed price is set by the Foreign exporter rather than by a Home importer. Under PostTP a non-resetting exporter absorbs the tariff through lower net-of-tariff revenue.

4.5 Dominant-currency pricing

With Home-currency dominant pricing, both international export prices are sticky in Home currency. The Foreign-to-Home block directly hit by the Home tariff is therefore identical to the full-LCP block in Eqs. (39)–(46). DCP differs in the opposite Home-to-Foreign block, which is also set in Home currency rather than in Foreign currency. Using the paper's LOOP notation, the corresponding Home-currency export-price inflation objects are

$$\pi_{H,t} - \Delta\psi^*_t \quad \text{(PreTP)}, \qquad \pi_{H,t} - \Delta\psi^*_t + \Delta m_{F,t} \quad \text{(PostTP)}. \tag{47}$$

For the unilateral Home tariff considered below, $m_{F,t} = 0$, so the Home welfare objective is the same under the two timing conventions; the different Home policy response is therefore generated by the different private price-setting constraints rather than by a change in national welfare weights.

4.6 The common PreTP–PostTP structure

Table 1 summarizes what is common across ILCP, full LCP, and DCP.

Table 1: Common timing structure across sticky destination-price regimes

	PreTP	PostTP
Sticky Home import price	$P_{F,t}$, tariff exclusive	$\widetilde{P}_{F,t} = (1+\tau_{M,t})P_{F,t}$, tariff inclusive
Tariff in reset-price FOC	No	Yes
Price initially faced by Home purchaser	Preset price plus tariff; purchaser-facing price jumps	Cum-tariff price is preset; non-reset price setter absorbs tariff in its margin
Inflation in NKPC	$\pi_{F,t}$	$\widetilde{\pi}_{F,t}$
PostTP written in π_F coordinates	–	$-\Delta m_{H,t} + \beta E_t \Delta m_{H,t+1}$ enters directly

The regime-independent difference is therefore which side of the Calvo-fixed nominal price contains the tariff. What differs across pricing regimes is the real term in the Phillips curve and the identity of the agent that absorbs the margin compression. Under ILCP the relevant real term is the importer LOOP margin and the Home importer absorbs the tariff under PostTP. Under full LCP and DCP the relevant term includes Foreign producer marginal cost and the Foreign exporter absorbs the tariff. PCP has no separate sticky destination-price block and hence no timing pair. Appendix E collects the parallel reset-price derivations and Foreign-country mirror blocks.

5 Equal-size clean two-country benchmark

5.1 Calibration

The baseline two-country experiment sets

$$\nu = 0.50, \quad \upsilon = 0.30, \quad \beta = 0.99, \quad \varphi = 2.2, \quad \eta = 1.5, \quad \varepsilon = \varepsilon_M = 3.8, \quad \theta = \theta_M = 0.8, \tag{48}$$

with tariff persistence 0.7 and a 20-percentage-point unilateral Home import-tariff innovation. Equal country size implies

$$\omega_H = \omega_F^* = 0.85, \qquad \omega_F = \omega_H^* = 0.15.$$

The clean benchmark sets

$$\tau = \tau^* = \frac{1}{\varepsilon}, \qquad \tau_I = \tau_I^* = \frac{1}{\varepsilon_M},$$

so the producer and importer subsidies remove the deterministic steady-state markup distortions and

$$C = C^* = Y = Y^* = N = N^* = MC = MC^* = 1.$$

This is the cleanest two-country benchmark because foreign feedback is endogenous while the steady-state monopoly distortion is absent.

5.2 Welfare cost functions and numerical weights

The nonlinear Nash–Ramsey systems generate the IRFs. To interpret the allocation, we use second-order national welfare representations. In the full-LCP expressions, $\pi_{HH,t}$ denotes inflation in the Home-produced price charged in the Home market; it is the domestic Home-producer inflation block, distinguished from the destination-specific Home export-price inflation $\pi^{*,j}_{H,t}$. The completed Home criteria can be summarized as follows:

$$\mathcal{L}^{PCP}_{H,t} = \frac{1}{2}\left[2.3818(\hat{y}^w_t)^2 - 0.0704(\hat{s}^w_t)^2 + 54.3921\pi^2_{H,t}\right], \tag{49}$$

$$\mathcal{L}^{ILCP,j}_{H,t} = \frac{1}{2}\Big[2.9831(\hat{y}^w_t)^2 + 0.2328(\hat{\psi}^w_t)^2 - 0.0962(\hat{s}^w_t)^2 + 0.2974(\hat{\psi}^{*,w}_t)^2 + 68.1246\pi^2_{H,t} + 15.4031(\pi^j_{F,t})^2 + 10.4508(\pi^{*,j}_{H,t})^2\Big], \tag{50}$$

$$\mathcal{L}^{FLCP,j}_{H,t} = \frac{1}{2}\Big[2.9718(\hat{y}^w_t)^2 - 0.3307(\hat{\psi}^{*,w}_t)^2 - 0.0660(\hat{s}^w_t)^2 + 0.0292(\hat{\psi}^w_t)^2 + 73.0769\pi^2_{HH,t} - 5.2120(\pi^{*,j}_{H,t})^2\Big], \tag{51}$$

$$\mathcal{L}^{DCP}_{H,t} = \frac{1}{2}\Big[2.9718(\hat{y}^w_t)^2 - 0.3307(\hat{\psi}^{*,w}_t)^2 - 0.0660(\hat{s}^w_t)^2 + 0.0292(\hat{\psi}^w_t)^2 + 67.8649(\pi_{H,t} - \pi^w_{H,t})^2 - 5.6123(\Delta\psi^*_t)^2\Big]. \tag{52}$$

Here $\pi^j_{F,t}$ and $\pi^{*,j}_{H,t}$ denote the timing-specific sticky destination-price inflation rates; PostTP uses the corresponding cum-tariff inflation. Signed relative-price terms are strategic components of national welfare rather than positive-definite stabilization penalties. Exact welfare-center definitions are reported in Appendix F.

For comparison, Table 2 collects the main coefficients.

Table 2: Equal-size clean benchmark: Home welfare coefficients

Pricing	Output	Own LOOP	ToT	Foreign LOOP	Main PPI	Other inflation
PCP	2.3818	–	-0.0704	–	54.3921	–
ILCP	2.9831	0.2328	-0.0962	0.2974	68.1246	15.4031, 10.4508
FLCP	2.9718	0.0292	-0.0660	-0.3307	73.0769	-5.2120
DCP	2.9718	0.0292	-0.0660	-0.3307	67.8649	-5.6123

Notes: "Main PPI" is the coefficient on the principal Home producer-price-inflation square (the completed PPI square under DCP). "Other inflation" reports the additional destination-price or strategic inflation coefficient(s). Negative coefficients are signed national-welfare terms, not stabilization penalties.

The important quantitative point is that the planner's basic priorities do not change by an order of magnitude across pricing regimes. The positive coefficient on the principal Home producer-price-inflation square lies between 54.4 and 73.1, whereas the principal output coefficient lies between 2.38 and 2.98. PreTP and PostTP also use the same square weights within a given pricing regime. Hence the sign reversals below should not be attributed to radically different welfare preferences. They arise because tariff timing changes which sticky inflation rate and relative-price path are feasible under the price-setting constraints.

5.3 Home nominal-interest-rate responses

Before turning to the IRFs, Table 3 displays the Home impact rate response.

5.4 Importer LCP

Figures 2 and 3 show the ILCP comparison. The Home rate falls by 31.92 basis points under PreTP and rises by 43.09 basis points under PostTP.

The interpretation should start from the inflation terms that the Home planner actually values. In Eq. (50), Home PPI inflation carries weight 68.12, the Home sticky import-price inflation carries weight 15.40, and the other destination-price inflation term carries weight 10.45. On impact, PreTP produces Home PPI inflation of about +0.31 percent per quarter and tariff-exclusive import-price

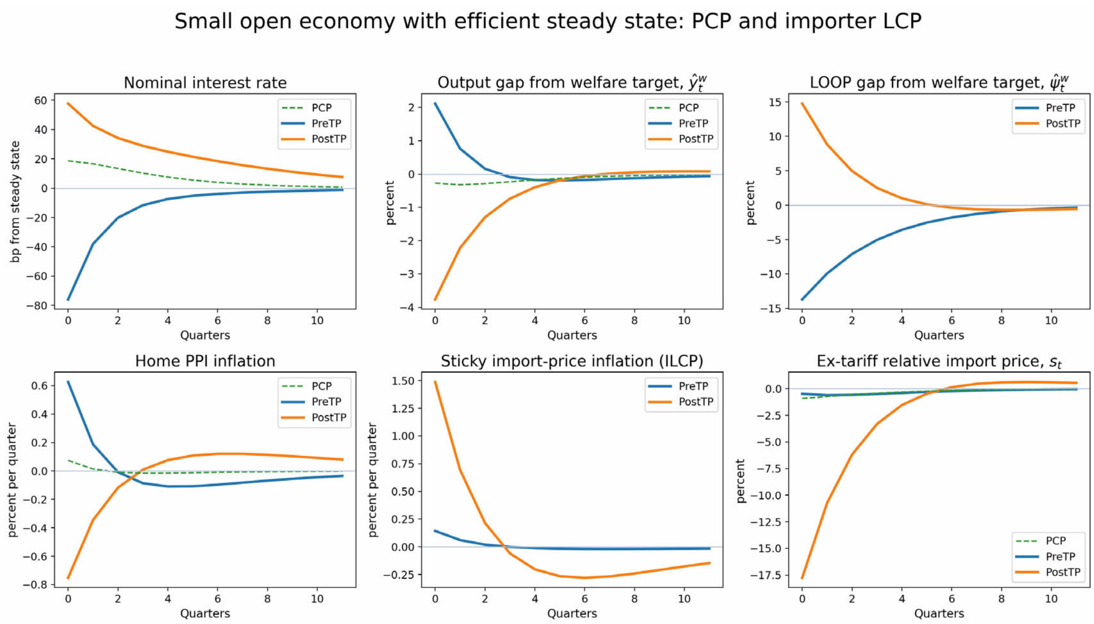

Figure 1: Small open economy with markup-correcting subsidies: importer LCP under PreTP and PostTP, with PCP as a control. The nominal interest rate is shown in basis points from steady state; other panels are in percent, with inflation rates in percent per quarter.

Table 3: Equal-size clean benchmark: Home impact nominal-interest-rate responses

Pricing	PreTP	PostTP
PCP control	5.48	
Importer LCP	-31.92	43.09
Full LCP	49.49	-4.98
DCP	57.59	-4.29

Notes: Basis-point deviations from the deterministic steady-state quarterly nominal rate. PCP has no PreTP/PostTP pair. Its entry is the unconstrained linear Nash–Ramsey solution.[1]

inflation of about −0.23 percent. PostTP instead produces Home PPI inflation of about −0.31 percent and cum-tariff import-price inflation of about +1.60 percent. Thus PostTP creates a much larger deviation in the sticky import-price inflation rate that enters national welfare directly. Tightening and appreciation restrain this cum-tariff importer inflation. Under PreTP the tariff is outside the sticky import price; easing and depreciation raise the importer's acquisition cost relative to its preset local price and counter the tariff-exclusive import-price deflation. The opposite policy signs are therefore tied to the different inflation objects in Eqs. (36) and (37), not to a mechanical response to CPI inflation.

The Foreign rate falls by 93.33 basis points under PreTP but rises by 11.31 basis points under PostTP. These spillovers matter quantitatively, but the Home sign reversal remains the same one isolated in the SOE.

5.5 Full LCP

Figures 4 and 5 show that the Home rate rises by 49.49 basis points under PreTP but falls by 4.98 basis points under PostTP. The Foreign rate rises by 36.69 and 9.90 basis points, respectively.

The Home welfare criterion now puts a coefficient of 73.08 on domestic PPI inflation and contains a smaller signed strategic term for Home export-price inflation. On impact, domestic PPI inflation is about −0.056 percent under PreTP but only −0.007 percent under PostTP. The tariffed Foreign-to-Home sticky price behaves much more differently: tariff-exclusive destination-price inflation is about −0.65 percent under PreTP, whereas the PostTP cum-tariff destination price inflates by about 1.74 percent. That latter inflation is generated by Foreign price setters and is not itself a positive Home inflation-dispersion square in Eq. (51); it matters through the equilibrium relative-price constraints.

Two points follow. First, the Home rate is not reacting mechanically to the sign of impact PPI inflation. The planner minimizes the discounted path of the weighted inflation and real distortions subject to the full price-setting system. Second, PostTP makes the high-weight Home PPI deviation much smaller and moves the tariff burden into the Foreign exporter's margin. The large PreTP adjustment is therefore no longer required, and the remaining national welfare tradeoff implies mild easing.

5.6 Dominant-currency pricing

Figures 6 and 7 show the same direction of reversal as full LCP: the Home rate rises by 57.59 basis points under PreTP but falls by 4.29 basis points under PostTP. The Foreign rate rises by 39.41 and 9.50 basis points.

DCP provides the cleanest welfare comparison because, for the unilateral Home tariff, the Home criterion in Eq. (52) is identical under PreTP and PostTP. The completed Home PPI square carries weight 67.86 in both cases. Yet Home PPI inflation is about −0.10 percent on impact under PreTP and only −0.015 percent under PostTP. PostTP therefore leaves the high-weight Home inflation margin much closer to its welfare target. Since the weights have not changed, the disappearance of strong tightening must come from the private price law: under PreTP the tariff is added to the preset purchaser-facing destination price; under PostTP the preset cum-tariff price forces the Foreign exporter to absorb the tariff through its net-of-tariff margin. This is precisely the distinction derived in Section 4.5.

6 Two-country benchmark with $\nu = 0.27$ and a distorted steady state

We next restore both features abstracted from in Section 5: Home is smaller, $\nu = 0.27$, and the producer subsidies are removed, $\tau = \tau^* = 0$. The country-size calibration is chosen to represent the United States. In the April 2026 IMF World Economic Outlook data, the U.S. share of world

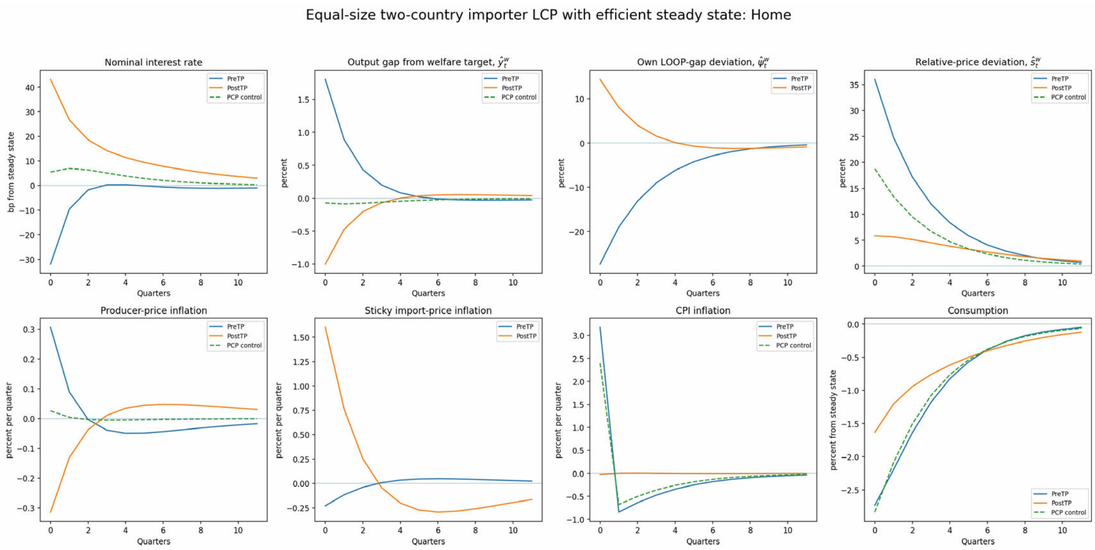

Figure 2: Equal-size clean two-country importer LCP: Home country, PreTP versus PostTP, with PCP as a control.

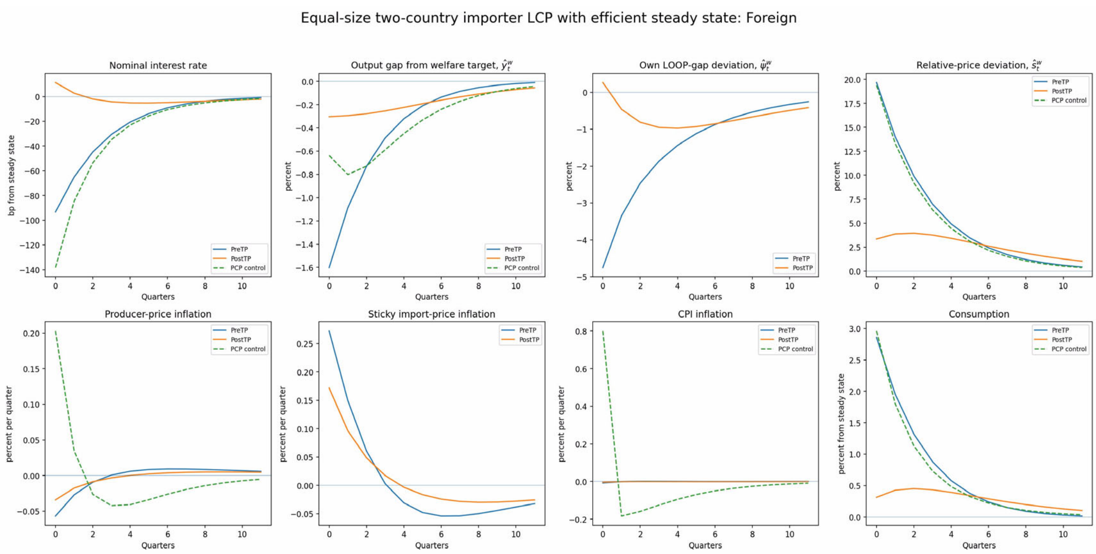

Figure 3: Equal-size clean two-country importer LCP: Foreign country, PreTP versus PostTP, with PCP as a control.

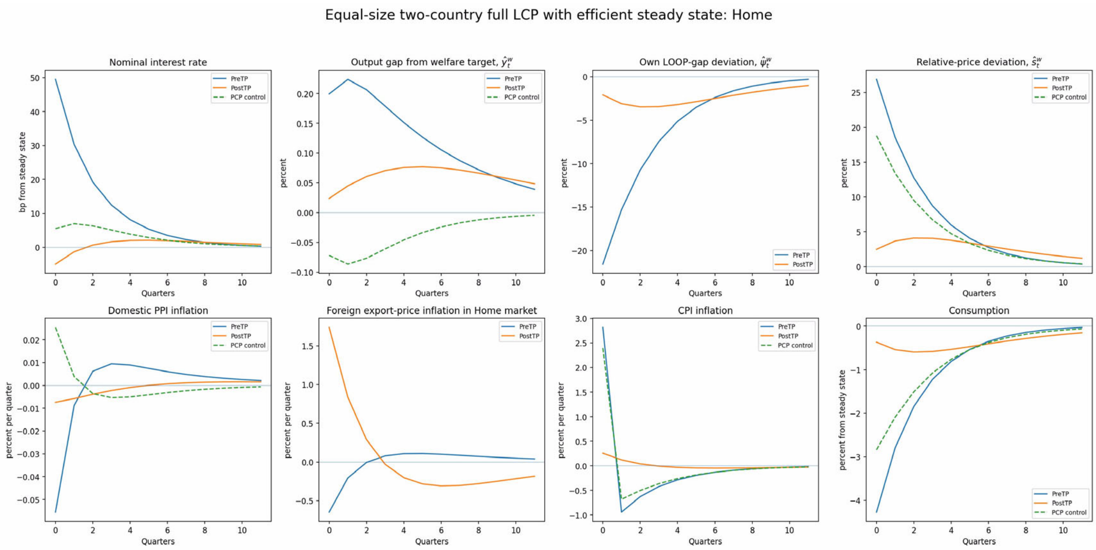

Figure 4: Equal-size clean two-country full LCP: Home country, PreTP versus PostTP, with PCP as a control.

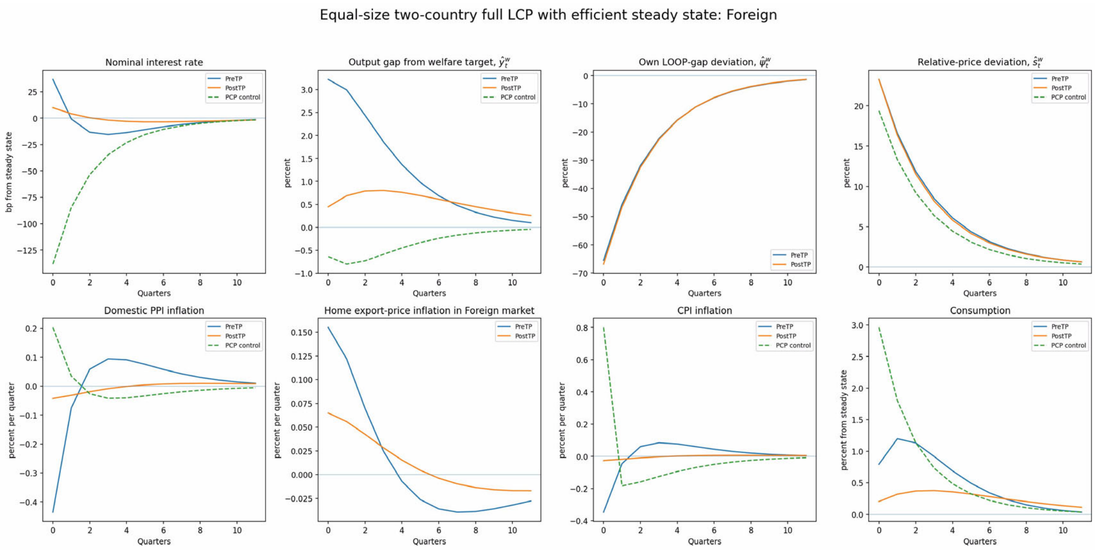

Figure 5: Equal-size clean two-country full LCP: Foreign country, PreTP versus PostTP, with PCP as a control.

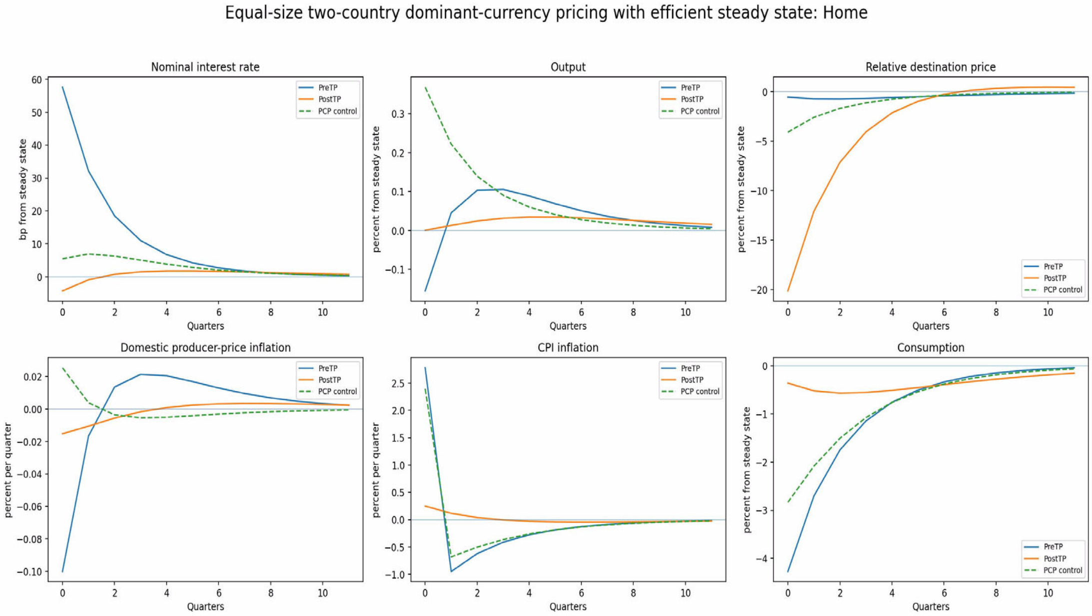

Figure 6: Equal-size clean two-country dominant-currency pricing: Home country, PreTP versus PostTP, with PCP as a control.

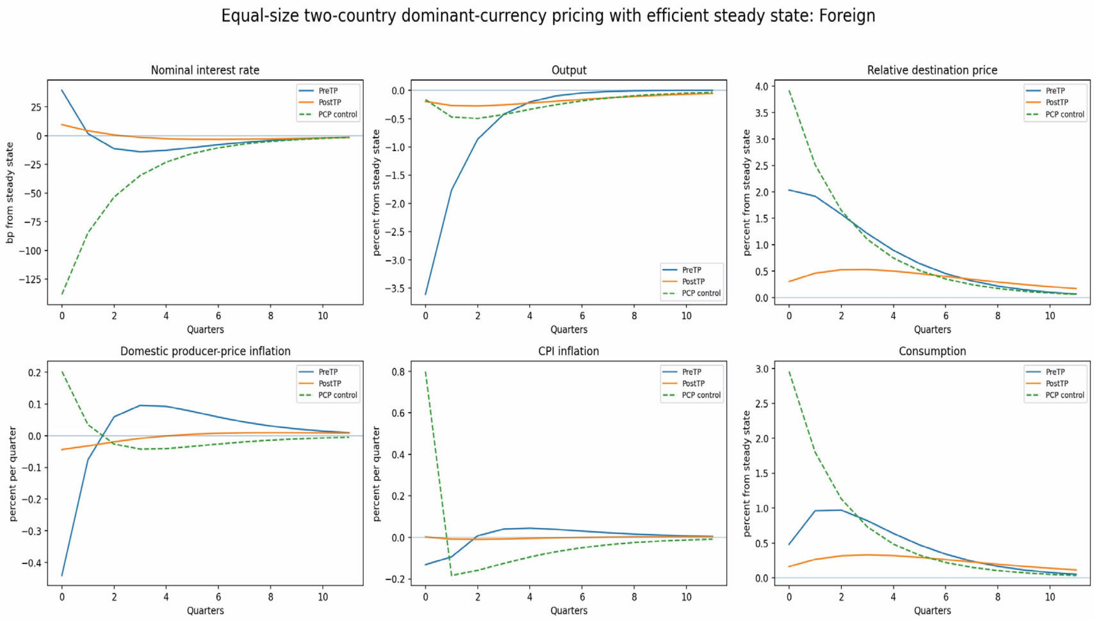

Figure 7: Equal-size clean two-country dominant-currency pricing: Foreign country, PreTP versus PostTP, with PCP as a control.

current-dollar GDP in 2025 is approximately 26.8 percent, which we round to $\nu = 0.27$ [18]. The openness parameter is not chosen to match the U.S. import ratio: we retain $\upsilon = 0.30$ from the benchmark calibration inherited from Monacelli [19]. These two parameters are therefore fixed for separate reasons. Jointly, however, they imply the Home import expenditure weight

$$\omega_F = \upsilon(1-\nu) = 0.30(1-0.27) = 0.219. \tag{53}$$

The 21.9 percent import weight is thus an implication of the country-size and openness parameters rather than an additional calibration target. Because the model contains consumption but abstracts from investment and intermediate inputs, a simple model-consistent U.S. counterpart is the ratio of imports of goods and services to personal consumption expenditures. In annual BEA data, this ratio averages 22.3 percent over 2000–2025, only 0.4 percentage point above the model-implied 21.9 percent [20]. Hence the $\nu = 0.27$ configuration is U.S.-like not only in relative country size but also, as an implication rather than a target, in its import expenditure share.

The importer markup-correction subsidies τ_I and τ_I^* are retained, as in the existing importer-pricing specification. The effective deterministic steady-state producer markup is therefore

$$\frac{\varepsilon}{\varepsilon-1} = 1.3571.$$

The pricing equations and national Ramsey problems are unchanged; only the country-size weights and producer steady-state distortion differ.

6.1 Welfare cost functions and numerical weights

The Home welfare criteria have the same structure as in the clean benchmark but different numerical coefficients:

$$\mathcal{L}_{H,t}^{PCP} = \frac{1}{2}\left[2.0936(\hat{y}_t^w)^2 - 0.0920(\hat{s}_t^w)^2 + 47.8109\pi_{H,t}^2\right], \tag{54}$$

$$\begin{aligned}\mathcal{L}_{H,t}^{ILCP,j} = \frac{1}{2}\Big[&2.8600(\hat{y}_t^w)^2 + 0.3212(\hat{\psi}_t^w)^2 - 0.1237(\hat{s}_t^w)^2 + 0.3521(\hat{\psi}_t^{*,w})^2\\ &+ 65.3128\pi_{H,t}^2 + 21.2829(\pi_{F,t}^j)^2 + 13.5187(\pi_{H,t}^{*,j})^2\Big],\end{aligned} \tag{55}$$

$$\begin{aligned}\mathcal{L}_{H,t}^{FLCP,j} = \frac{1}{2}\Big[&2.9009(\hat{y}_t^w)^2 - 0.6011(\hat{\psi}_t^{*,w})^2 - 0.0804(\hat{s}_t^w)^2 + 0.0448(\hat{\psi}_t^w)^2\\ &+ 73.0769\pi_{HH,t}^2 - 6.8297(\pi_{H,t}^{*,j})^2\Big],\end{aligned} \tag{56}$$

$$\begin{aligned}\mathcal{L}_{H,t}^{DCP} = \frac{1}{2}\Big[&2.9009(\hat{y}_t^w)^2 - 0.6011(\hat{\psi}_t^{*,w})^2 - 0.0804(\hat{s}_t^w)^2 + 0.0448(\hat{\psi}_t^w)^2\\ &+ 66.2472(\pi_{H,t} - \pi_{H,t}^w)^2 - 7.5338(\Delta\psi_t^*)^2\Big].\end{aligned} \tag{57}$$

The corresponding coefficient comparison is

Table 4: $\nu = 0.27$ distorted benchmark: Home welfare coefficients

Pricing	Output	Own LOOP	ToT	Foreign LOOP	Main PPI	Other inflation
PCP	2.0936	–	-0.0920	–	47.8109	–
ILCP	2.8600	0.3212	-0.1237	0.3521	65.3128	21.2829, 13.5187
FLCP	2.9009	0.0448	-0.0804	-0.6011	73.0769	-6.8297
DCP	2.9009	0.0448	-0.0804	-0.6011	66.2472	-7.5338

The same message as in Table 2 survives the change in country size and steady-state distortion. The main positive Home PPI coefficient remains in the range 47.8–73.1 and the output coefficient remains around 2–3. PreTP and PostTP again share the same square weights within each regime. The rate reversals therefore do not come from large changes in the planner's welfare weights.

6.2 Home nominal-interest-rate responses

Table 5: $\nu = 0.27$ distorted benchmark: Home impact nominal-interest-rate responses

Pricing	PreTP	PostTP
PCP control	11.52	
Importer LCP	-60.64	71.44
Full LCP	72.12	-7.32
DCP	89.15	-6.30

Notes: Basis-point deviations from the deterministic steady-state nominal rate. PCP has no PreTP/PostTP pair.

6.3 Importer LCP

Figures 8 and 9 show that the Home response again changes from easing to tightening: -60.64 basis points under PreTP and $+71.44$ under PostTP. The inflation block gives the most direct interpretation. The Home planner places weight 65.31 on Home PPI inflation, 21.28 on the Home sticky import-price inflation, and 13.52 on the other destination-price inflation term. PreTP generates Home PPI inflation of about $+0.41$ percent per quarter and tariff-exclusive import-price inflation of about -0.08 percent. PostTP generates Home PPI inflation of about -0.46 percent but cum-tariff import-price inflation of about $+1.54$ percent. Thus the timing change again produces a large positive movement in the sticky import-price inflation rate that enters Home welfare directly. Tightening under PostTP restrains that margin; easing under PreTP works in the opposite direction on the tariff-exclusive importer price. The result is the same mechanism as in the clean benchmark, amplified by the distorted steady state and country-size asymmetry.

The Foreign nominal rate changes from -50.40 basis points under PreTP to $+5.21$ under PostTP.

6.4 Full LCP

Figures 10 and 11 show the opposite reversal: the Home rate rises by 72.12 basis points under PreTP and falls by 7.32 basis points under PostTP. The high-weight Home PPI inflation term again changes much more in PreTP than in PostTP: domestic PPI inflation is about -0.094 percent per quarter on impact under PreTP and only -0.015 percent under PostTP. The tariffed Foreign-to-Home price inflation moves from about -0.46 percent under PreTP to $+1.75$ percent under PostTP, but this price is set by Foreign exporters and is not a positive Home inflation-dispersion square in Eq. (56). PostTP shifts the short-run incidence into the Foreign exporter's margin and leaves the Home planner's high-weight PPI distortion much closer to target. Consequently, the strong PreTP tightening motive disappears and the remaining national welfare tradeoff implies mild easing.

The Foreign rate rises under both timings, by 25.46 and 5.14 basis points.

6.5 Dominant-currency pricing

Figures 12 and 13 show the strongest PreTP tightening: $+89.15$ basis points, followed by -6.30 basis points under PostTP. As in the clean benchmark, the unilateral Home tariff leaves the Home DCP welfare criterion unchanged across timing conventions. The completed PPI square carries weight 66.25 in both cases. Home PPI inflation is about -0.169 percent per quarter under PreTP and only -0.024 percent under PostTP. Since the welfare weights are identical, the sign reversal is attributable to the different feasible inflation paths generated by the private price law. PostTP makes the cum-tariff Home import price sticky and forces the Foreign exporter to absorb the tariff through lower net-of-tariff revenue; the Home PPI deviation and the associated national-welfare distortion shrink sharply, and the strong PreTP tightening disappears.

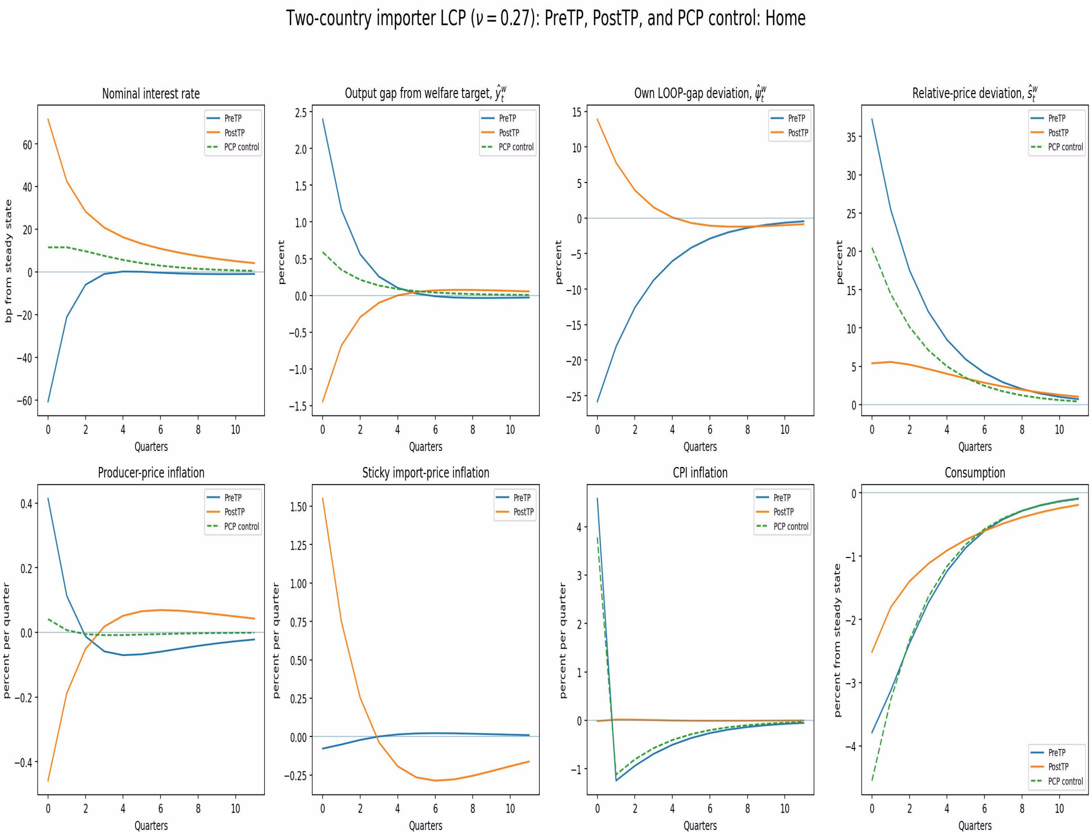

Figure 8: $\nu = 0.27$ distorted benchmark, importer LCP: Home country, PreTP versus PostTP, with PCP as a control.

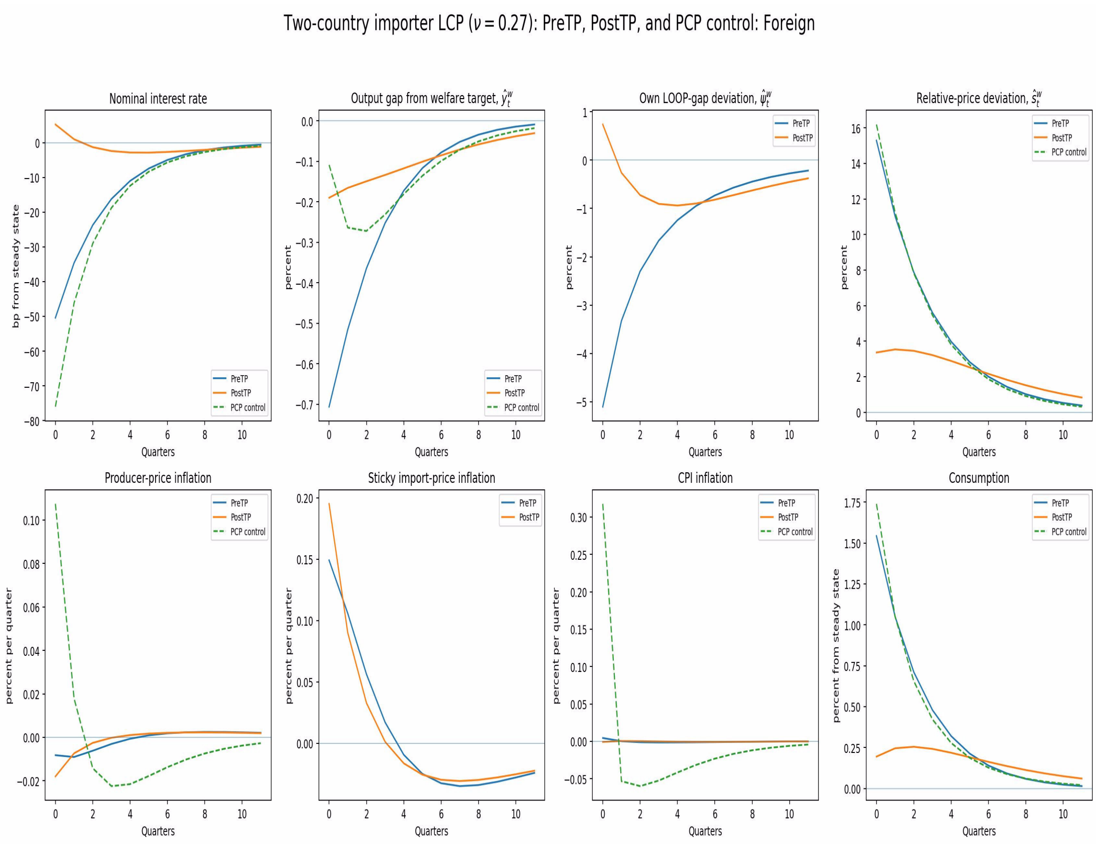

Figure 9: $\nu = 0.27$ distorted benchmark, importer LCP: Foreign country, PreTP versus PostTP, with PCP as a control.

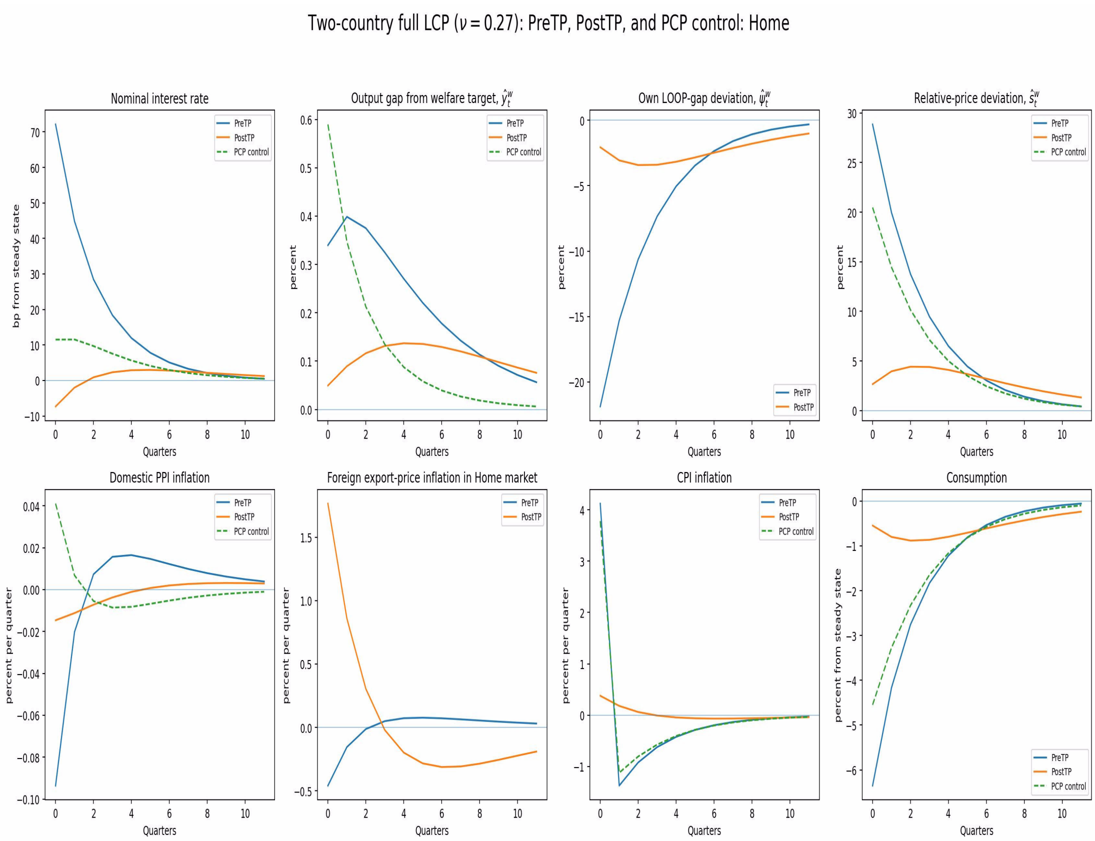

Figure 10: $\nu = 0.27$ distorted benchmark, full LCP: Home country, PreTP versus PostTP, with PCP as a control.

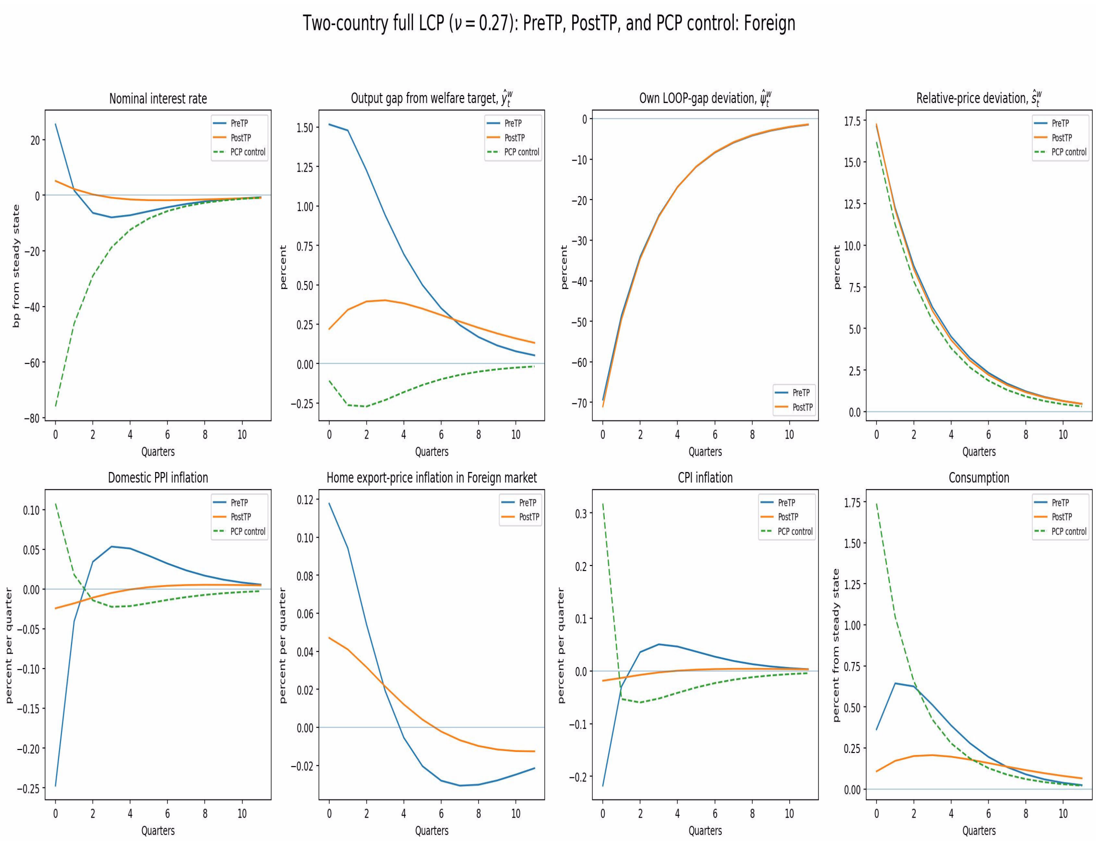

Figure 11: $\nu = 0.27$ distorted benchmark, full LCP: Foreign country, PreTP versus PostTP, with PCP as a control.

The Foreign rate rises by 28.57 basis points under PreTP and 4.98 basis points under PostTP.

7 Robustness

7.1 Country Size and Distortions

The first robustness exercise combines the two dimensions separately varied above: country size and the presence of the steady-state producer-markup distortion. Table 6 is designed to report only the Home impact nominal-interest-rate response, because the robustness claim in this exercise concerns the sign pattern rather than a new transmission mechanism.

Table 6: Home impact nominal-interest-rate responses across country size and steady-state distortion

ν	Steady state	ILCP		Full LCP		DCP		PCP
		Pre	Post	Pre	Post	Pre	Post	
0.50	markup corrected	-31.92	43.09	49.49	-4.98	57.59	-4.29	5.48
0.50	distorted	-29.74	42.56	49.37	-4.98	57.07	-4.27	6.25
0.27	markup corrected	-62.36	71.57	72.20	-7.31	90.59	-6.34	10.46
0.27	distorted	-60.64	71.44	72.12	-7.32	89.15	-6.30	11.52

Notes: Entries are basis-point deviations of the Home nominal interest rate from steady state. “Markup corrected” denotes the producer-subsidy calibration, while “distorted” denotes the no-producer-subsidy calibration ($\tau = \tau^* = 0$). PCP has no PreTP/PostTP distinction, so a single PCP response is reported for each calibration.

All four configurations display the same qualitative pattern. Under ILCP the Home authority eases under PreTP and tightens under PostTP, whereas under full LCP and DCP it tightens under PreTP and eases under PostTP. The producer subsidy has only a small effect on the impact responses at either country size. At $\nu = 0.50$, removing the subsidy changes the ILCP responses from -31.92 and $+43.09$ basis points to -29.74 and $+42.56$; the full-LCP responses from $+49.49$ and -4.98 to $+49.37$ and -4.98; and the DCP responses from $+57.59$ and -4.29 to $+57.07$ and -4.27. At $\nu = 0.27$, the markup-corrected and distorted responses are likewise close: -62.36 versus -60.64 and $+71.57$ versus $+71.44$ under ILCP, $+72.20$ versus $+72.12$ and -7.31 versus -7.32 under full LCP, and $+90.59$ versus $+89.15$ and -6.34 versus -6.30 under DCP. Hence the PreTP–PostTP sign reversals are robust to both country size and the presence of the steady-state producer-markup distortion.[2]

7.2 Bianchi and Coulibaly (2025) Model

Bianchi and Coulibaly [7] provide a useful external small-open-economy robustness check because the force behind their optimal policy is deliberately different from the mechanism emphasized in Section 3. Their quantitative model is solved as a nonlinear Ramsey problem with Rotemberg rigidity in Home producer prices. Tariff revenue is rebated to households, so private agents perceive imports at the tariff-inclusive price while the tariff payment is a domestic transfer from the social point of view. The resulting fiscal externality gives the Ramsey authority a motive to support employment and imports relative to the look-through allocation. We add an importer local-currency-pricing block with Rotemberg adjustment costs, set the importer elasticity and adjustment-cost parameter equal to their Home-producer counterparts, and use a markup-correcting importer subsidy so that the added sector does not introduce a new steady-state monopoly distortion. Because the Bianchi–Coulibaly framework is a small open economy, ILCP is the only destination-pricing regime among our LCP cases that has a direct counterpart here; full LCP and DCP require an explicit two-country structure.

[2] As an additional robustness check, Appendix Table 9 varies the trade-openness parameter υ in the equal-size, markup-corrected benchmark. The same PreTP–PostTP sign pattern is preserved for $\upsilon = 0.15$, 0.30, and 0.45.

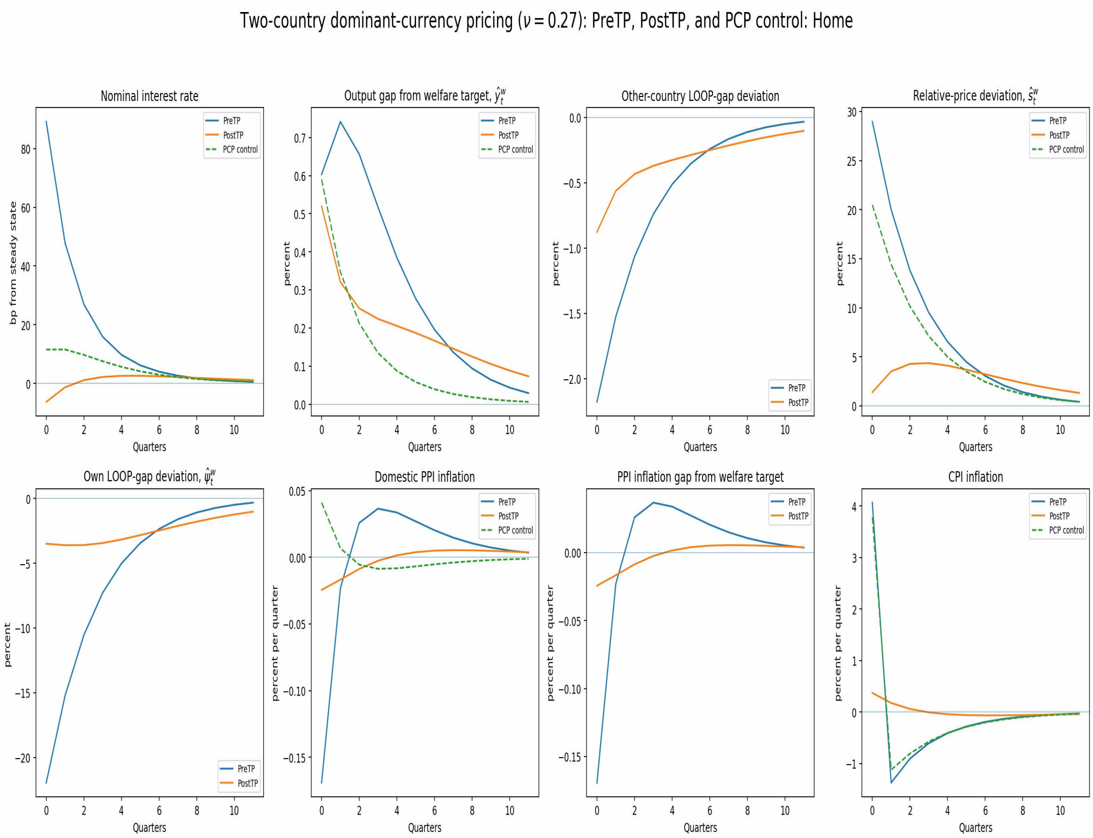

Figure 12: $\nu = 0.27$ distorted benchmark, dominant-currency pricing: Home country, PreTP versus PostTP, with PCP as a control.

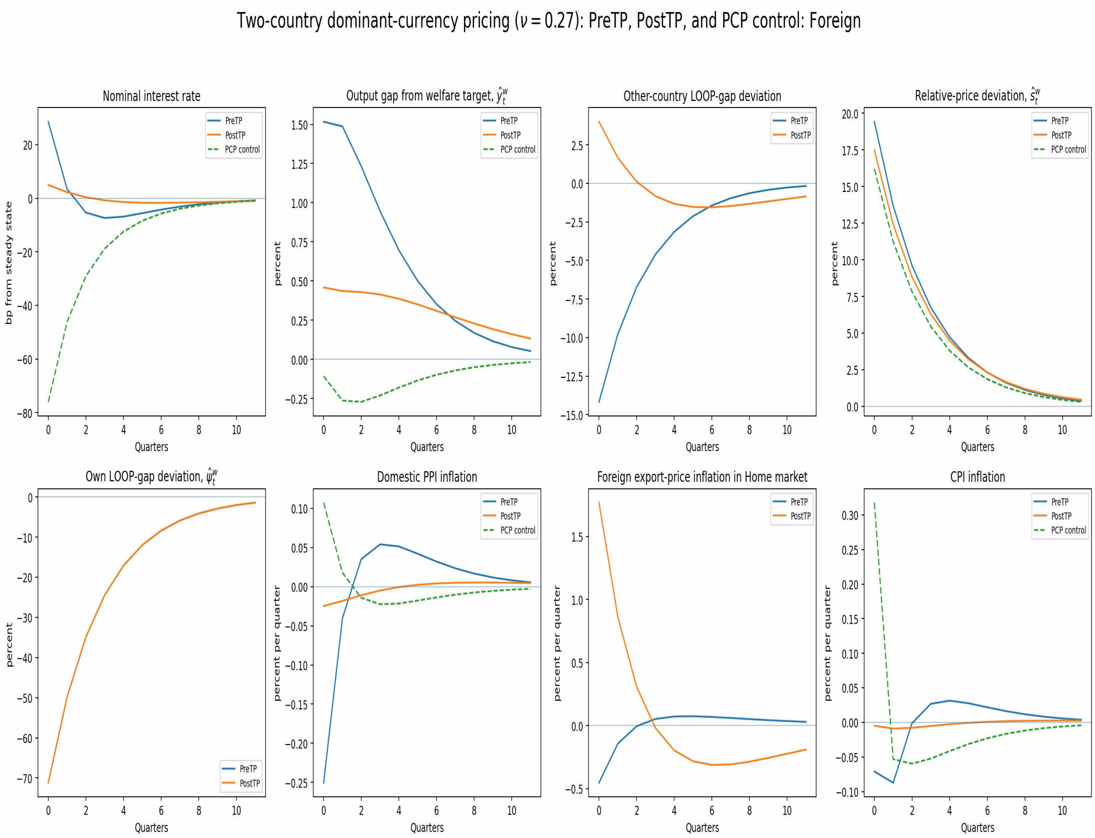

Figure 13: $\nu = 0.27$ distorted benchmark, dominant-currency pricing: Foreign country, PreTP versus PostTP, with PCP as a control.

For the main cross-model comparison, we use Bianchi and Coulibaly's own endogenous-terms-of-trade extension to relax the one-for-one exchange-rate/PPI mapping. In their baseline the border terms of trade are fixed and the normalization implies $P_{H,t} = \mathcal{E}_t$. Once the border terms of trade are endogenous, the law of one price instead allows $\mathcal{E}_t/P_{H,t}$ to move with the international relative price. We then add the same Rotemberg ILCP block while retaining the tariff-revenue fiscal externality that is central to the Bianchi–Coulibaly mechanism. In this broader extension, the qualitative ILCP result is the same as in Section 3: the optimal impact nominal rate falls under PreTP and rises under PostTP. This is a robustness comparison, not a pure identification exercise for the restriction $P_{H,t} = \mathcal{E}_t$: endogenizing the terms of trade also makes export demand finite-elasticity and introduces the associated terms-of-trade margin. The result therefore shows that the PreTP–PostTP zero crossing also arises in a Rotemberg SOE in which the tariff-revenue fiscal externality is a central force behind the Ramsey allocation, while the exact direction of the crossing remains model dependent.

The welfare interpretation is correspondingly close to the one used in Section 3. Up to the additional wealth/net-foreign-asset component generated by incomplete international asset markets, the second-order criterion can be organized in terms of a welfare-relevant output gap $\hat{y}_t^w$, a welfare-relevant import LOOP gap $\hat{\psi}_t^w$, Home PPI inflation $\pi_{H,t}$, and the inflation rate of the sticky local import price. PreTP and PostTP have the same quadratic stabilization margins; what changes is the sticky inflation object and the constraint linking that object to the LOOP gap. With an independent exchange-rate margin, PreTP allows depreciation to move the border price relative to the tariff-exclusive sticky local import price, while PostTP places the tariff inside the importer's sticky purchaser-price margin. The resulting Ramsey tradeoff therefore has the same qualitative orientation as in Section 3: easing under PreTP and tightening under PostTP.

The exact Bianchi–Coulibaly baseline normalization is informative precisely because it removes that independent margin. With exogenous border terms of trade and their law-of-one-price normalization, $P_{H,t} = \mathcal{E}_t$, so exchange-rate adjustment is simultaneously Home-producer-price adjustment. Appendix B shows that the timing-induced sign reversal survives under this restriction, but its direction is reversed: under a permanent 15-percentage-point tariff increase, the ILCP impact response is $+9.45$ basis points under PreTP and -6.95 basis points under PostTP. In the broader endogenous-terms-of-trade extension, the one-for-one mapping is relaxed and the qualitative ILCP ordering returns to that of Section 3. Because that extension also introduces a finite-elasticity export-demand and terms-of-trade margin, we do not attribute the change in direction to the relaxation of $P_{H,t} = \mathcal{E}_t$ alone. The robust conclusion is the existence of the timing-induced zero crossing, not a universal claim that a particular timing convention must always imply easing or tightening. Which side of zero each convention occupies depends on the full nominal and international-relative-price implementation structure.

7.3 Policy-Game Robustness: Cooperative Ramsey

Before turning to the Bergin–Corsetti economy, we isolate the policy-game margin within our own model. This exercise is motivated directly by Bergin and Corsetti [5], who solve their quantitative model under cooperative Ramsey policy. Comparing their cooperative allocation directly with our national Nash–Ramsey benchmark would therefore change both the economic environment and the policy game at the same time. We first ask whether the PreTP–PostTP sign reversals in our clean benchmark survive when the two monetary authorities cooperate.

We re-solve the equal-size, markup-corrected benchmark under a single population-weighted world planner. The private-equilibrium equations, the 20-percentage-point unilateral Home tariff innovation, the pricing convention, and the two national ZLB constraints are unchanged; only the policy objective is replaced by population-weighted world welfare. The full planner problem and numerical checks are reported in Appendix C. Table 7 compares the resulting impact responses with the national Nash–Ramsey benchmark.

Cooperation removes all three timing-induced zero crossings. Under ILCP, the Nash response changes from -31.92 basis points under PreTP to $+43.09$ under PostTP, whereas the cooperative

Table 7: Policy-game robustness: impact nominal-interest-rate responses in the equal-size clean benchmark

Pricing regime	Timing	Nash Home (bp)	Cooperative Home (bp)	Cooperative Foreign (bp)
ILCP	PreTP	-31.92	-3.57	-87.38
ILCP	PostTP	43.09	-10.48	16.60
Full LCP	PreTP	49.49	-2.25	-93.51
Full LCP	PostTP	-4.98	-12.26	7.41
DCP	PreTP	57.59	-6.70	-101.01[a]
DCP	PostTP	-4.29	-8.91	6.34

Notes: Entries are basis-point deviations from steady state after a 20-percentage-point unilateral Home tariff innovation. The Nash Home column is the national Nash–Ramsey benchmark reported in the main text. The cooperative columns maximize population-weighted world welfare and jointly choose both nominal rates while retaining the same private-equilibrium constraints and pricing convention. [a]The Foreign nominal rate reaches its zero lower bound on impact; with $\beta = 0.99$, the deviation from the steady-state nominal rate to zero is -101.01 basis points.

Home rate is negative under both conventions, moving from -3.57 to -10.48 basis points. Under full LCP, the Nash reversal from $+49.49$ to -4.98 becomes cooperative easing of -2.25 and -12.26 basis points. Under DCP, the Nash reversal from $+57.59$ to -4.29 becomes cooperative easing of -6.70 and -8.91 basis points. Thus the sign reversal is not invariant to the international policy game.

The reason is that cooperation removes the national strategic component of the stabilization problem. Under Nash–Ramsey policy, each authority evaluates the effects of its own monetary plan on resident welfare while taking the other country's contingent allocation as given. Cross-border movements in relative prices and foreign demand therefore remain strategic national-welfare margins. Under cooperation, those spillovers are internalized jointly: a relative-price or expenditure-switching movement that raises one country's welfare partly at the expense of the other no longer provides an independent reason for one central bank to manipulate the international allocation. What remains in the clean LCP/DCP economies is primarily the joint stabilization of the tariff-induced contraction in activity together with price-dispersion and sticky-relative-price distortions. Those residual motives call for Home accommodation under both timing conventions.

PostTP does not become irrelevant under cooperation. In fact, the cooperative Home rate generally moves further toward accommodation: from -3.57 to -10.48 basis points under ILCP, from -2.25 to -12.26 under full LCP, and from -6.70 to -8.91 under DCP. The timing logic is the same as in the Nash experiments. When the tariff-inclusive purchaser-facing price is sticky, the tariff is initially absorbed to a greater extent in the price setter's acquisition-cost or net-revenue margin rather than appearing immediately in the purchaser price. The short-run inflation cost of supporting demand is therefore smaller, so the cooperative planner can accommodate the contraction more aggressively. Cooperation eliminates the strategic force that makes the Nash response cross zero, but it does not eliminate the underlying PreTP–PostTP pricing mechanism.

This result is essential for interpreting the external-model exercise that follows. Because cooperation alone removes the zero crossings in our clean economy, the absence of a reversal in Bergin and Corsetti's cooperative simulations cannot tell us whether their richer private economy destroys the sign mechanism. To answer that question, the policy game must be held fixed. Section 7.4 therefore asks whether the sign reversal survives when the private economy is replaced by Bergin and Corsetti's substantially richer structure but the national Nash–Ramsey policy game is restored.

7.4 Bergin and Corsetti (2023) Model

The preceding cooperative experiment motivates a controlled external-model robustness test. Bergin and Corsetti [5] solve their quantitative model under cooperative Ramsey policy, while our benchmark uses national Nash–Ramsey policy under commitment. Since Section 7.3 shows that cooperation alone can eliminate the zero crossings, comparing our Nash benchmark directly with their cooperative allocation would confound policy-game effects with model-structure effects. We therefore use their official replication files and proceed in two stages. First, we preserve their calibration, private-equilibrium structure, tariff process, and cooperative Ramsey objective and introduce only the PreTP–PostTP distinction. Second, holding that same Bergin–Corsetti private economy fixed, we replace cooperation with the national Nash–Ramsey equilibrium concept under commitment of Faia and Monacelli [13], which is also the equilibrium concept used in our two-country benchmark. The second stage is the key external robustness test: it asks whether the sign reversal survives a large change in the private economy once the policy game is held constant.

Bergin and Corsetti's full model incorporates international production chains with imported intermediate inputs, iceberg trade costs, firm entry dynamics, incomplete asset markets, and Rotemberg price adjustment. The mapping to our terminology is direct. Their local-currency-pricing specification has exporters in both countries set sticky export prices in the currency of the buyer. Because the tariff is then imposed on the importer on top of the exporter-set sticky price, their LCP case corresponds to our full-LCP PreTP convention. For DCP, we use the unilateral-tariff experiment corresponding, after relabeling Home and Foreign, to column (2) of their Fig. 7: Home is the dominant-currency issuer and also the tariff-imposing country; Home exporters use PCP, while Foreign exporters set their Home-market export price in Home currency. The original Bergin–Corsetti tariff again lies outside the sticky exporter-set price and is therefore PreTP in our terminology.

To construct the PostTP counterfactual, we change only the location of the tariff relative to the sticky Foreign-to-Home export price. The tariff-inclusive purchaser-facing export price becomes the sticky Rotemberg object, while the Foreign exporter receives that price net of the Home tariff. Thus the tariff enters the exporter's net-revenue margin before the sticky destination price can adjust. All other private-equilibrium equations, parameters, and shocks are held fixed.

Table 8 first reports the cooperative results. The original PreTP simulations reproduce Bergin and Corsetti's monetary-policy pattern: the tariff-imposing country tightens by 57.57 basis points under full LCP and by 51.60 basis points under DCP. Moving the tariff inside the sticky destination price reduces the cooperative tightening to 28.97 and 16.77 basis points, respectively. As in our cooperative clean benchmark, PostTP moves policy in the accommodative direction but does not generate a zero crossing. The level differs—the Bergin–Corsetti cooperative planner still tightens—because its richer private economy contains additional production, trade, entry, and asset-market margins absent from our clean model. The comparison does not identify any one of these features in isolation.

The final row of Table 8 delivers the central external-model robustness result. We solve the same Bergin–Corsetti private economy under the Faia–Monacelli national Nash–Ramsey equilibrium concept used in our benchmark. Each national authority maximizes resident welfare over its own contingent allocation while taking the other national allocation as given, and the two Ramsey plans jointly satisfy the common international equilibrium mappings. Under full LCP, the tariff-imposing country's impact response changes from a 576.61-basis-point increase under PreTP to a 20.57-basis-point cut under PostTP. Under DCP, it changes from a 222.67-basis-point increase to a 9.00-basis-point cut. Thus the PreTP–PostTP sign reversal survives under both pricing regimes even after replacing our parsimonious benchmark with the substantially richer Bergin–Corsetti economy. In particular, an environment featuring international production chains, imported intermediate inputs, iceberg trade costs, firm entry dynamics, incomplete asset markets, and Rotemberg price adjustment still produces the same qualitative zero crossing when the policy game is held fixed.[3] The Nash magnitudes, especially under full-LCP PreTP, are much larger than under cooperation, so we interpret this exercise primarily as a qualitative external robustness check of the sign mechanism rather than as a calibrated prediction of the size of strategic monetary responses.

[3]We validate the external-model implementation in two steps. Using the same nonlinear private-equilibrium block and steady-state normalization as in the Nash exercise, an independently generated cooperative Ramsey system reproduces the PreTP impact responses of 57.5700 basis points under full LCP and 51.6030 basis points under DCP. In the four Nash–Ramsey simulations, Dynare's generalized-eigenvalue count gives 77 unstable roots for 77 forward-looking variables in every case.

Table 8: Bergin–Corsetti (2023) model: tariff-imposing-country impact policy-rate responses

	Full LCP		DCP	
Policy game	PreTP	PostTP	PreTP	PostTP
Cooperative Ramsey	57.57	28.97	51.60	16.77
National Nash–Ramsey	576.61	-20.57	222.67	-9.00

Notes: Entries are basis-point deviations of the tariff-imposing country's nominal interest rate from steady state after Bergin and Corsetti's six-percentage-point tariff innovation. In the DCP columns the tariff-imposing country is also the dominant-currency issuer. The full-LCP PreTP case corresponds to Bergin and Corsetti's symmetric LCP specification, while the DCP PreTP case corresponds to their unilateral-tariff DCP experiment after relabeling Home and Foreign. PostTP changes only the location of the tariff relative to the sticky export price. The cooperative row retains Bergin and Corsetti's world Ramsey objective. The national Nash–Ramsey row holds the same private economy fixed and uses the policy-game concept of the main two-country benchmark.

The underlying price responses clarify why tariff timing remains important before the policy game is changed. In the cooperative simulations, under PreTP the Home purchaser-facing import price jumps by about 4.9 percent on impact and Home CPI inflation rises by about one percentage point per quarter. Under PostTP the tariff-inclusive import price itself is sticky: its impact response is only about 0.3 percent, while the corresponding net border price falls by about 5.7 percent. The tariff is therefore absorbed mainly in the exporter's net-revenue margin rather than in an immediate purchaser-price jump. This alteration of the private price-setting constraint is common to the cooperative and Nash exercises; the policy game determines how the two national monetary authorities exploit the resulting relative-price and demand margins.

The comparison also sharpens the coordination result in Table 7. In our clean model, replacing national Nash–Ramsey policy with a population-weighted cooperative planner eliminates all three timing-induced zero crossings. The Bergin–Corsetti model displays the same policy-game dependence from the other side of the comparison: its cooperative solution keeps the tariff-imposing country's rate above steady state under both timings, whereas the same private economy under national Nash–Ramsey policy generates sign reversals under both full LCP and DCP. The key implication is therefore stronger than the statement that PostTP merely changes the quantitative stance in a richer model. The sign reversal itself is robust to substantial model enrichment conditional on the policy game. Conversely, the cooperative results show that matching the private economy without matching the policy game can conceal that robustness. The absence of a zero crossing in the original cooperative Bergin–Corsetti environment should therefore be read as evidence of policy-game dependence, not as evidence that its richer trade and production structure eliminates the tariff-timing mechanism. More broadly, the exercise shows that adding a rich trade block does not displace the basic New Keynesian pricing logic. International production chains, imported intermediates, trade costs, and entry reshape propagation and magnitudes, but the sign of the optimal rate response remains tightly linked to which margin the tariff enters in the sticky-price setter's first-order condition. What matters most for the sign is therefore not the richness of the trade structure per se, but the location of the tariff in the nominal pricing problem.

8 Conclusion

This paper studies how the location of a tariff relative to a sticky international price changes Ramsey-optimal monetary policy. The analysis begins in an SOE, where ILCP isolates the basic timing mechanism: PreTP makes the tariff-exclusive local import price sticky, whereas PostTP makes the cum-tariff import price sticky. The resulting Phillips curves differ even though the flexible-price tariff wedge is the same, and the Home policy rate changes from a 75.95-basis-point cut under PreTP to a 57.68-basis-point increase under PostTP.

The two-country model shows that the same timing distinction operates under importer LCP, full LCP, and dominant-currency pricing, while the identity and currency of the price setter determine which real marginal-cost and strategic price terms accompany it. In the equal-size markup-corrected benchmark, the Home response changes from −31.92 to +43.09 basis points under ILCP, from +49.49 to −4.98 under full LCP, and from +57.59 to −4.29 under DCP. In the $\nu = 0.27$ distorted benchmark, the corresponding changes are −60.64 to +71.44, +72.12 to −7.32, and +89.15 to −6.30 basis points.

The welfare decompositions show why these reversals should not be read as mechanical reactions to CPI inflation and should not be attributed to sharply different planner preferences across pricing regimes. Across the benchmark environments, the main positive Home producer-price-inflation coefficient is of similar magnitude across regimes, while PreTP and PostTP share the same welfare weights within each regime. What changes is the inflation object and relative-price path made feasible by the private price-setting constraint. Under ILCP PostTP, the Home importer absorbs the tariff inside its acquisition-cost margin; under full LCP and DCP PostTP, the Foreign exporter absorbs it through lower net-of-tariff revenue. DCP is especially informative because the Home welfare objective is unchanged across timing conventions in the unilateral-tariff experiment, yet the optimal Home rate still reverses sign.

The Bianchi–Coulibaly exercise provides a separate SOE robustness check with a different real welfare mechanism and a different nominal-adjustment technology. In their broader endogenous-terms-of-trade extension, where the one-for-one mapping between the exchange rate and Home PPI is relaxed, the fiscal-externality environment produces the same qualitative ILCP ordering as Section 3: PreTP easing and PostTP tightening. Under the exact Bianchi–Coulibaly baseline normalization $P_{H,t} = \mathcal{E}_t$, reported in Appendix B, the direction is reversed but the zero crossing remains. Because the endogenous-terms-of-trade extension also changes the real international-price environment, the comparison does not isolate the $P_{H,t} = \mathcal{E}_t$ restriction by itself. It instead separates the robust result—tariff timing can determine the sign of optimal monetary policy—from the model-specific result of which timing convention lies on which side of zero.

The four-way comparison in Table 6 confirms that the Nash–Ramsey sign pattern is robust to both country size and the steady-state producer-markup distortion. For both $\nu = 0.50$ and $\nu = 0.27$, introducing or removing the producer subsidies changes the magnitudes only modestly and never changes the PreTP–PostTP direction of the optimal Home interest-rate response. Section 7.3 shows, however, that international policy coordination is a distinct margin. Replacing the national Nash game with population-weighted cooperative Ramsey policy eliminates all three timing-induced zero crossings in the equal-size clean benchmark and produces Home accommodation under both PreTP and PostTP in ILCP, full LCP, and DCP. Cooperation internalizes the cross-border relative-price and expenditure-switching effects that remain strategic under national Nash policy; once that strategic component is removed, the residual stabilization motive in the clean LCP/DCP economies is accommodative. PostTP nevertheless remains quantitatively relevant and generally pushes the cooperative stance further toward accommodation because the sticky tariff-inclusive purchaser price mutes the immediate inflation cost of supporting demand. Thus cooperation can suppress the zero crossing without eliminating the underlying tariff-timing mechanism.

The strongest robustness result comes from Section 7.4, which separates this coordination margin from broader model structure using the substantially richer economy of Bergin and Corsetti [5]. Under their cooperative Ramsey problem, moving only the tariff location to PostTP reduces the tariff-imposing country's impact tightening from 57.57 to 28.97 basis points under full LCP and from 51.60 to 16.77 basis points under DCP, but does not cross zero. Holding that same Bergin–Corsetti private economy fixed and restoring the Faia–Monacelli national Nash–Ramsey policy game used in our benchmark restores the sign reversal: the impact response changes from +576.61 to −20.57 basis points under full LCP and from +222.67 to −9.00 basis points under DCP. Hence the sign reversal itself—not merely a large change in the degree of tightening—survives the move from our parsimonious Calvo benchmark to an environment with international production chains, imported intermediate inputs, trade costs, firm entry dynamics, incomplete asset markets, and Rotemberg pricing. The external-model evidence therefore provides direct evidence against the interpretation that the zero crossing is simply an artifact of the clean benchmark's sparse structure. Trade structure matters for magnitudes and propagation, but the sign of the optimal monetary response is governed more fundamentally by how the tariff enters the relevant sticky-price-setting margin. Our results therefore redirect attention from the richness of the trade block itself to the location of the tariff in the nominal pricing problem. What is not invariant is the policy game: cooperation can eliminate the crossing even when tariff timing remains quantitatively important. Tariff location and international monetary-policy interaction are therefore separate determinants of the sign of the optimal response.

A Robustness to trade openness

As an additional check on the tariff-timing mechanism, we vary the foreign-goods weight υ while holding fixed the equal-size calibration, $\nu = 0.5$, and the markup-correcting subsidies. Table 9 reports the Home impact nominal-interest-rate response. Lower trade openness attenuates the quantitative response to the tariff shock, while higher trade openness amplifies it. The qualitative timing result is unchanged throughout: ILCP implies easing under PreTP and tightening under PostTP, whereas full LCP and DCP imply tightening under PreTP and easing under PostTP.

Table 9: Home impact nominal-interest-rate responses across trade openness

υ	ILCP		Full LCP		DCP	
	Pre	Post	Pre	Post	Pre	Post
0.15	-13.18	17.81	24.53	-2.61	26.19	-2.42
0.30	-31.92	43.09	49.49	-4.98	57.59	-4.29
0.45	-60.24	76.12	74.69	-7.21	95.46	-5.72

Notes: Entries are basis-point deviations of the Home nominal interest rate from steady state. All rows set $\nu = 0.5$ and retain the producer and importer markup-correcting subsidies. The $\upsilon = 0.30$ row is the benchmark reported in the main text. ILCP, full-LCP, and DCP entries use the OccBin piecewise solution.

B Bianchi–Coulibaly ILCP extension under $P_{H,t} = \mathcal{E}_t$

This appendix records the exact-normalization case discussed in Section 7.2. Bianchi and Coulibaly [7] assume pre-tariff law of one price, constant foreign-currency prices, and exogenous border terms of trade $p = P_{F,t}/P_{H,t}$, normalized to one in the baseline. With the foreign-currency price of the Home good normalized to one, these assumptions imply

$$P_{H,t} = \mathcal{E}_t. \tag{58}$$

Their uncovered-interest-parity condition is

$$R_t = R^* \frac{\mathcal{E}_{t+1}}{\mathcal{E}_t}, \tag{59}$$

so Eq. (58) implies

$$\frac{R_t}{R^*} = \frac{P_{H,t+1}}{P_{H,t}} = 1 + \pi_{H,t+1}. \tag{60}$$

Hence the current policy rate is directly tied to next-period Home PPI inflation in this particular SOE closure. This restriction is stronger than the implementation structure in Section 3, where the nominal exchange rate can move relative to the Home producer price.

We extend the Bianchi–Coulibaly private economy by adding a continuum of Home importers that set local-currency prices subject to Rotemberg adjustment costs. Let $m_t \equiv \log(1 + \tau_t)$ and define the tariff-exclusive import LOOP ratio

$$\Psi_t \equiv \frac{\mathcal{E}_t P^*_{F,t}}{P_{F,t}}, \qquad \psi_t \equiv \log \Psi_t. \tag{61}$$

Under PreTP the sticky object is the tariff-exclusive local import price $P_{F,t}$; under PostTP it is the tariff-inclusive purchaser price $\widetilde{P}_{F,t} = (1+\tau_t)P_{F,t}$. The first-order importer Phillips curves can therefore be written in the same sticky-object coordinates as in Section 3,

$$\pi_{F,t} = \beta E_t \pi_{F,t+1} + \kappa_M \psi_t, \qquad \text{PreTP}, \tag{62}$$

$$\widetilde{\pi}_{F,t} = \beta E_t \widetilde{\pi}_{F,t+1} + \kappa_M \psi_t, \qquad \text{PostTP}, \tag{63}$$

where $\kappa_M = \varepsilon_M/\phi_M$ under the Rotemberg normalization used here. The tariff is outside the importer's sticky-price margin under PreTP and inside it under PostTP.

For welfare interpretation of this exact-normalization case, let s_H and s_F denote the zero-tariff steady-state expenditure shares on Home and foreign goods, with $s_H + s_F = 1$. Expanding household welfare and the consolidated resource constraint to second order around the markup-corrected zero-tariff steady state gives the following reduced-form quadratic organization of the timing-relevant margins:

$$\mathcal{L}_t^{BC,j} = \frac{1}{2}\left[\Lambda_y^{BC}(\hat{y}_t^{w,j})^2 + \Lambda_\psi^{BC}(\hat{\psi}_t^{w,j})^2 + \phi_H \pi_{H,t}^2 + s_F \phi_M (\pi_{F,t}^j)^2\right] + \mathcal{L}_{b,t}, \qquad j \in \{\text{PreTP}, \text{PostTP}\}, \tag{64}$$

up to policy-independent terms and terms of order higher than two. Here $\pi_{F,t}^{\text{PreTP}} = \pi_{F,t}$ and $\pi_{F,t}^{\text{PostTP}} = \widetilde{\pi}_{F,t}$. The term $\mathcal{L}_{b,t}$ collects the time-invariant marginal-utility/net-foreign-asset component associated with incomplete international asset markets. Equation (64) is used only to organize the welfare margins of the exogenous-terms-of-trade, $P_{H,t} = \mathcal{E}_t$ case; it is not asserted to be the complete reduced form of the endogenous-terms-of-trade extension, which introduces an additional international-relative-price margin. The timing comparison within the exact-normalization case relies only on the fact that the positive quadratic weights on Home PPI inflation and sticky import-price inflation are common across PreTP and PostTP; tariff timing changes the implementability constraints and the inflation object, not the planner's underlying preference for one timing convention.

Under Eq. (58), the LOOP accumulation equations become especially restrictive. With $p = 1$,

$$\Delta\psi_t = \pi_{H,t} - \pi_{F,t}, \qquad \text{PreTP}, \tag{65}$$

$$\Delta\psi_t = \pi_{H,t} - \widetilde{\pi}_{F,t} + \Delta m_t, \qquad \text{PostTP}. \tag{66}$$

The Bianchi–Coulibaly fiscal externality makes private imports inefficiently low because households do not internalize that a larger import base raises tariff revenue rebated to the private sector. In the present coordinates, raising ψ_t lowers the private tariff-inclusive relative import price $m_t - \psi_t$ and therefore moves import demand in the direction preferred by the planner. Under PreTP, Eq. (65) requires this relative-price correction to be implemented through Home PPI inflation relative to sticky import-price inflation. Because Eq. (60) ties the current nominal rate to future Home PPI inflation, the resulting nonlinear Ramsey allocation produces an impact rate increase. Under PostTP, by contrast, the tariff innovation Δm_t itself enters Eq. (66); the required relative-price movement no longer has to be generated by the same positive Home-PPI differential, and the optimal transition features a lower future Home inflation path and an impact rate cut.

Table 10 reports the nonlinear Ramsey results. The permanent-shock row uses the Bianchi–Coulibaly quantitative experiment, a 15-percentage-point permanent increase in the import tariff. The additional rows show that the opposite orientation of the PreTP–PostTP reversal under Eq. (58) is not specific to permanence.

The opposite orientation relative to Section 3 is therefore consistent with the tighter nominal implementation structure imposed by Eq. (58). Bianchi and Coulibaly's own endogenous-terms-of-trade extension provides a broader robustness case in which that one-for-one mapping is relaxed. This extension is not a one-equation experiment: finite-elasticity export demand also introduces a terms-of-trade margin and changes the efficient tariff benchmark. Let p_t denote the border terms of trade. After normalizing the foreign composite price, law of one price implies $P_{H,t} = \mathcal{E}_t/p_t$, so

$$\frac{R_t}{R^*} = \frac{p_{t+1}}{p_t}(1 + \pi_{H,t+1}), \tag{67}$$

Table 10: Bianchi–Coulibaly ILCP extension under $P_{H,t} = \mathcal{E}_t$: impact nominal-rate responses

Tariff process	PCP	ILCP PreTP	ILCP PostTP
		basis points	
Permanent +15 pp	5.02	9.45	-6.95
+15 pp, $\rho = 0.976$	1.60	4.45	-4.14
+20 pp, $\rho = 0.70$	0.23	0.49	-0.21

Notes: PCP is a control and has no separate sticky importer-price block. The ILCP columns add a Rotemberg-sticky Home importer sector with $\varepsilon_M = \varepsilon$ and $\phi_M = \phi_H$, together with a markup-correcting importer subsidy. The Ramsey allocation is computed from the nonlinear equilibrium restrictions; Eq. (64) is used only for interpretation.

and the PreTP LOOP law becomes

$$\Delta\psi_t = \Delta \log p_t + \pi_{H,t} - \pi_{F,t}, \tag{68}$$

with the corresponding $+\Delta m_t$ term under PostTP when the sticky object is tariff inclusive. The international relative price can now absorb part of the LOOP correction without requiring the same movement in Home PPI, and the policy rate is no longer pinned down by future Home PPI inflation alone. In this broader extension the qualitative ILCP ordering returns to the Section 3 result: PreTP calls for easing and PostTP for tightening. Because the endogenous-terms-of-trade specification changes both the nominal mapping and the real international-price environment, this comparison does not identify the effect of Eq. (58) in isolation. It does establish the narrower robustness result needed here: the timing-induced zero crossing survives, while the direction of the crossing is model specific.

C Implementation details for cooperative Ramsey robustness

Section 7.3 reports the policy-game robustness results. This appendix records the cooperative planner problem and numerical checks. The main two-country benchmark uses national Nash–Ramsey policy under commitment. For the cooperative exercise we instead use a single population-weighted world planner that maximizes

$$W_0^C = \mathrm{E}_0 \sum_{t=0}^{\infty} \beta^t \left\{ \nu \left[\log C_t - \frac{N_t^{1+\varphi}}{1+\varphi} \right] + (1-\nu) \left[\log C_t^* - \frac{(N_t^*)^{1+\varphi}}{1+\varphi} \right] \right\}, \tag{69}$$

subject to the complete world private-equilibrium system for each pricing regime. Both national nominal rates are chosen jointly, with a separate ZLB constraint in each country. The calibration, the 20-percentage-point unilateral Home tariff innovation, and every PreTP/PostTP price-setting convention are unchanged. Thus the only policy experiment is to replace the two national objectives by Eq. (69); the private-sector pricing architecture is held fixed. We use this cooperative allocation as a diagnostic full-coordination benchmark rather than as an alternative institutional baseline for the paper.

The cooperative first-order conditions were generated directly from the nonlinear world Lagrangian and the unchanged private-equilibrium constraints. For ILCP PreTP, an independent implementation using the analytically expanded cooperative Ramsey first-order conditions gives the same impact responses, -3.5725 basis points at Home and -87.3801 basis points abroad, to numerical precision. Extending the solution horizon from 50 to 80 quarters likewise leaves the full-LCP PostTP impact responses unchanged to numerical precision. These checks are useful because the cooperative exercise changes the planner problem without changing the pricing equations that define PreTP and PostTP.

D National Ramsey problems

For each pricing regime $R \in \{PCP, ILCP, FLCP, DCP\}$, define the Home implementation vector

$$\Gamma_{H,t}^R = \left(\Gamma_{C,t}^R, \Gamma_{N,t}^R, \Gamma_{G,t}^R, \Gamma_{P,t}^R, \Gamma_{K,t}^R, \Gamma_{Z,t}^R, \Gamma_{\Delta,t}^R, \Gamma_{E,t}^R, \dots\right)'.$$

The exact entries differ with the number and currency denomination of sticky-price blocks. The Home Lagrangian is

$$\mathcal{L}_H^R = E_0 \sum_{t=0}^{\infty} \beta^t \left[\log C_t - \frac{N_t^{1+\varphi}}{1+\varphi} + (\lambda_{H,t}^R)'\Gamma_{H,t}^R\right]. \tag{70}$$

The Foreign Lagrangian is defined analogously. Because $\Gamma_{H,t}^R$ may contain one lead and one lag of the choice vector, differentiating the discounted Lagrangian requires contributions from the constraints dated $t-1$, t, and $t+1$. A generic interior first-order condition for x_t is

$$\begin{aligned} 0 = {} & \frac{\partial u_t}{\partial x_t} + (\lambda_{H,t}^R)'\frac{\partial \Gamma_{H,t}^R}{\partial x_t} + \beta^{-1}(\lambda_{H,t-1}^R)'\frac{\partial \Gamma_{H,t-1}^R}{\partial x_t} \\ & + \beta E_t\left[(\lambda_{H,t+1}^R)'\frac{\partial \Gamma_{H,t+1}^R}{\partial x_t}\right]. \end{aligned} \tag{71}$$

For compactness, let $\Gamma_{H,x,t}^{R,0}$ denote the derivative of the date-t constraint vector with respect to its date-t argument x_t, $\Gamma_{H,x,t-1}^{R,+}$ the derivative of the date-$(t-1)$ constraints with respect to their lead argument x_t, and $\Gamma_{H,x,t+1}^{R,-}$ the derivative of the date-$(t+1)$ constraints with respect to their lag argument x_t. For consumption and labor this becomes

$$\frac{1}{C_t} + (\lambda_{H,t}^R)'\Gamma_{H,C,t}^{R,0} + \beta^{-1}(\lambda_{H,t-1}^R)'\Gamma_{H,C,t-1}^{R,+} + \beta E_t[(\lambda_{H,t+1}^R)'\Gamma_{H,C,t+1}^{R,-}] = 0, \tag{72}$$

$$-N_t^{\varphi} + (\lambda_{H,t}^R)'\Gamma_{H,N,t}^{R,0} + \beta^{-1}(\lambda_{H,t-1}^R)'\Gamma_{H,N,t-1}^{R,+} + \beta E_t[(\lambda_{H,t+1}^R)'\Gamma_{H,N,t+1}^{R,-}] = 0. \tag{73}$$

The policy-rate condition is

$$(\lambda_{H,t}^R)'\Gamma_{H,i,t}^{R,0} + \beta^{-1}(\lambda_{H,t-1}^R)'\Gamma_{H,i,t-1}^{R,+} + \beta E_t[(\lambda_{H,t+1}^R)'\Gamma_{H,i,t+1}^{R,-}] = 0 \tag{74}$$

when the lower bound is slack. When an occasionally binding lower bound is imposed, Eq. (74) is replaced by the corresponding KKT condition. The numerical MOD files implement the fully expanded versions of these equations together with the pricing-regime-specific Calvo states.

E Price-setting details

This appendix records the common algebra behind the main-text reset-price equations. If a price P_t^s is Calvo sticky with reset price $\bar{P}_t^s$, elasticity ϵ_s, and non-reset probability θ_s, then

$$(P_t^s)^{1-\epsilon_s} = \theta_s (P_{t-1}^s)^{1-\epsilon_s} + (1-\theta_s)(\bar{P}_t^s)^{1-\epsilon_s}. \tag{75}$$

For a price setter with nominal marginal cost $MC_{t+k}^{n,s}$, the reset-price condition has the generic form

$$E_t \sum_{k=0}^{\infty} \theta_s^k \Lambda_{t,t+k}^s Q_{t+k|t}\left[\bar{P}_t^s - \mathcal{M}_s MC_{t+k}^{n,s}\right] = 0. \tag{76}$$

PreTP uses the tariff-exclusive destination price for P_t^s. PostTP uses the cum-tariff price, so $MC_{t+k}^{n,s}$ contains the statutory tariff for an importer or the reset seller's net revenue contains

$1/(1+\tau_{M,t+k})$ for an exporter. Linearization of Eq. (76) and Eq. (75) gives the NKPCs stated in Sections 3 and 4.

For full LCP the Home-to-Foreign block is the mirror destination-price problem in Foreign currency. Under DCP the same price is instead sticky in Home currency, generating the inflation objects in Eq. (47). These opposite export blocks are the only pricing difference between full LCP and DCP for the unilateral Home tariff; their Foreign-to-Home tariffed blocks are identical.

F Welfare-center definitions

The hatted real variables used in Sections 5 and 6 are deviations from completed Benigno–Woodford national-welfare centers, not deviations from arbitrary zero targets. Let $m_{H,t} = \log(1+\tau_{M,t})$ and $m_{F,t} = \log(1+\tau^*_{M,t})$. Before sequential completion, each primitive target can be written

$$u_t^{w,R} = b_{uH}^R m_{H,t} + b_{uF}^R m_{F,t}, \qquad u \in \{y, y^*, \psi, \psi^*\}, \tag{77}$$

with coefficients computed from the Hessian and Jacobian of national welfare and the equilibrium restrictions at the relevant deterministic steady state. Sequential completion then produces the reported objects

$$\hat{y}_t^{w,R}, \qquad \hat{\psi}_t^{w,R}, \qquad \hat{s}_t^{w,R}, \qquad \hat{\psi}_t^{*,w,R}.$$

The exact coefficient vectors are generated in the accompanying welfare routines and are regime-, country-size-, and steady-state-specific. The numerical square coefficients reported in Tables 2 and 4 are evaluated from those same routines and therefore correspond exactly to the IRF calibrations.

Under DCP the two Home-producer inflation terms can be completed around the following target. Here Θ_n denotes the steady-state coefficient on the Home-to-Foreign destination-price block that is obtained from the same national-welfare Hessian/Jacobian completion used to generate the reported DCP welfare coefficients; it is fixed within a given calibration and is not an additional shock or policy variable.

$$\pi_{H,t}^{w,DCP} = -\frac{(\eta-1)\omega_F\Theta_n}{1-(\eta-1)\omega_F\Theta_n}\left(\Delta\psi_t^* - \Delta m_{F,t}\right), \tag{78}$$

where the $-\Delta m_{F,t}$ term is absent under PreTP notation. In the unilateral Home-tariff experiment $m_{F,t} = 0$, so the Home DCP inflation target and the Home welfare weights are identical under PreTP and PostTP. This is why the DCP sign reversal isolates the timing-specific private price law particularly cleanly.

References

[1] Amiti, Mary, Stephen J. Redding, and David E. Weinstein (2019), "The Impact of the 2018 Tariffs on Prices and Welfare," *Journal of Economic Perspectives*, 33(4), 187–210.

[2] Auray, Stéphane, Michael B. Devereux, and Aurélien Eyquem (2025), "Trade Wars and the Optimal Design of Monetary Rules," *Journal of Monetary Economics*, 151, 103726.

[3] Auray, Stéphane, Michael B. Devereux, and Aurélien Eyquem (2026), "The Pass-through of Tariffs and Exchange Rates," *NBER Working Paper* No. 35398.

[4] Benigno, Pierpaolo, and Michael Woodford (2004), "Inflation Stabilization and Welfare: The Case of a Distorted Steady State," manuscript, New York University and Princeton University.

[5] Bergin, Paul R., and Giancarlo Corsetti (2023), "The Macroeconomic Stabilization of Tariff Shocks: What Is the Optimal Monetary Response?" *Journal of International Economics*, 143, 103758.

[6] Bergin, Paul R., and Giancarlo Corsetti (2025), "Exchange Rates and Monetary Stabilization of Tariff Shocks," *NBER Working Paper* No. 33845, revised February 2026.

[7] Bianchi, Javier, and Louphou Coulibaly (2025), "The Optimal Monetary Policy Response to Tariffs," *NBER Working Paper* No. 33560.

[8] Cavallo, Alberto, Gita Gopinath, Brent Neiman, and Jenny Tang (2021), "Tariff Pass-Through at the Border and at the Store: Evidence from US Trade Policy," *American Economic Review: Insights*, 3(1), 19–34.

[9] Corsetti, Giancarlo, Luca Dedola, and Sylvain Leduc (2010a), "Optimal Monetary Policy and the Sources of Local-Currency Price Stability," in Jordi Galí and Mark Gertler (eds.), *International Dimensions of Monetary Policy*, University of Chicago Press, 319–370.

[10] Corsetti, Giancarlo, Luca Dedola, and Sylvain Leduc (2010b), "Optimal Monetary Policy in Open Economies," *Handbook of Monetary Economics*, Vol. 3, 861–933.

[11] Corsetti, Giancarlo, Luca Dedola, and Sylvain Leduc (2023), "Exchange Rate Misalignment and External Imbalances: What Is the Optimal Monetary Policy Response?" *Journal of International Economics*, 144, 103771.

[12] Devereux, Michael B., and Charles Engel (2003), "Monetary Policy in the Open Economy Revisited: Price Setting and Exchange-Rate Flexibility," *Review of Economic Studies*, 70, 765–783.

[13] Faia, Ester, and Tommaso Monacelli (2004), "Ramsey Monetary Policy and International Relative Prices," *International Finance Discussion Papers* No. 798, Board of Governors of the Federal Reserve System.

[14] Fujiwara, Ippei, and Jiao Wang (2017), "Optimal Monetary Policy in Open Economies Revisited," *Journal of International Economics*, 108, 300–314.

[15] Gopinath, Gita, Oleg Itskhoki, and Roberto Rigobon (2010), "Currency Choice and Exchange Rate Pass-Through," *American Economic Review*, 100(1), 304–336.

[16] Gopinath, Gita, Emine Boz, Camila Casas, Federico J. Díez, Pierre-Olivier Gourinchas, and Mikkel Plagborg-Møller (2020), "Dominant Currency Paradigm," *American Economic Review*, 110(3), 677–719.

[17] Hwang, Yu-Ning, and Stephen J. Turnovsky (2013), "Exchange Rate Pass-through and the Effects of Tariffs on Economic Performance and Welfare," *Journal of International Money and Finance*, 33, 81–102.

[18] International Monetary Fund (2026), "World Economic Outlook Database," April 2026, GDP at current prices in U.S. dollars, World and United States.

[19] Monacelli, Tommaso (2025), "Tariffs and Monetary Policy," *CEPR Discussion Paper* No. 20142.

[20] U.S. Bureau of Economic Analysis (2026), "National Income and Product Accounts: Imports of Goods and Services and Personal Consumption Expenditures," annual series, retrieved through FRED, Federal Reserve Bank of St. Louis, July 28.

[21] Werning, Iván, Guido Lorenzoni, and Veronica Guerrieri (2025), "Tariffs as Cost-Push Shocks: Implications for Optimal Monetary Policy," *NBER Working Paper* No. 33772.