Currency Misalignment and Optimal Capital Controls*

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Abstract

This paper shows how invoicing currency reshapes the welfare case for capital-flow management. In a two-country New Keynesian model with optimal monetary policy, capital controls are beneficial under producer-currency pricing only when inefficient markup shocks move inflation through wealth effects. Under local-currency pricing, sticky export prices break the law of one price and create a wedge between exporters' foreign currency revenues and domestic marginal costs. A planner can use capital flow taxes/subsidies to steer the exchange rate, compress export markup distortions, and stabilize export price inflation. Controls raise welfare not only for markup shocks but also for efficient productivity and demand shocks, and they remain desirable even when wealth effects on labor supply are shut down. Under local-currency pricing, the parameter region with excessive capital flows disappears, strengthening the case for intervention.

Key Words: Capital Flow Management, Inflation, Externalities, Optimal monetary policy, Invoicing Currency

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1 Introduction

This paper establishes that Local Currency Pricing (LCP) fundamentally expands the welfare rationale for capital control policies. In a standard open-economy new Keynesian model such as Engel (2011) and Corsetti et al. (2011), currency misalignments lead to inefficient allocations that monetary policy alone cannot correct. We demonstrate, however, that this very inefficiency presents a distinct economic rationale for government intervention. We show that global policymakers find it optimal to engineer specific paths of currency misalignment through capital controls to further stabilize inflation and output gaps. Put differently, rather than treating misalignment solely as a friction to be eliminated, the optimal policy deliberately utilizes this wedge to achieve a superior global economic outcome.

This insight offers a new perspective on the recent global inflation surge, which has renewed interest in capital flow management. During the 2021–2023 episode, Bengui and Coulibaly (2025) document a systematic movement of capital from low- to high-inflation countries. While this aligns with standard risk-sharing predictions, they demonstrate that these flows paradoxically worsen the global output-inflation trade-off. This tension is initially studied by previous works of ours (Cho et al. (2023a)), who show that the welfare implications of risk sharing hinge critically on the origin of inflation. When inflation arises from inefficient markup shocks, complete markets can be destabilizing: capital inflows fuel consumption and depress labor supply in the inflation-hit country, amplifying inflationary pressure. Conversely, under efficient productivity or demand shocks, complete markets support efficient allocations, rendering capital controls redundant.

Consequently, the existing case for capital controls delivers a sharp but fragile message. It is strictly tied to a specific set of assumptions: Producer Currency Pricing (PCP), incomplete stabilization of inefficient markup shocks, and strong wealth effects on labor supply. If the source of inflation is instead efficient shocks, the normative case for intervention disappears. This fragility poses a significant challenge for policymakers facing uncertainty regarding the decomposition of inflation (Bernanke and Blanchard, 2025) or the magnitude of wealth effects.

Our analysis overcomes this fragility by demonstrating that Local Currency Pricing (LCP) provides a more robust foundation for intervention. We show that under LCP, capital controls improve welfare even in response to efficient productivity or demand shocks, and regardless of the strength of wealth effects. Because LCP insulates foreign prices from exchange rate fluctuations, it transforms the exchange rate into a lever for managing exporter markups—a mechanism we term the *price-adjustment channel*. Crucially, this channel remains effective in economic environments where capital controls would be rendered redundant under the standard PCP benchmark.

Under LCP, export prices are sticky in the foreign currency, so exchange rate movements do not pass through to foreign consumers. Consider a scenario where the Home economy is struck by an inefficient markup shock that generates high relative inflation. In a standard complete market, capital would flow into Home to equalize consumption. The optimal policy reverses this logic: the planner taxes international borrowing to block these inflows and induce a net capital outflow, forcing a sharp nominal depreciation.

This engineered depreciation activates the price-adjustment channel by decoupling revenues from costs. Because export prices are fixed in foreign currency, depreciation mechanically inflates the Home-currency revenue of exporters—each unit of foreign currency earned is now worth more domestically—while marginal costs remain anchored to domestic wages. Exporters thus face profit margins above their profit-maximizing level. To restore optimal markups, price-resetting firms cut their foreign-currency prices to boost sales volume. The planner uses currency depreciation not merely for expenditure switching, but as a lever to compress export prices directly, quenching the export inflation caused by the shock.

We develop this mechanism in a two-country New Keynesian model where PCP and LCP are alternative assumptions about the currency of price stickiness. The framework nests Cho et al. (2023a) and Bengui and Coulibaly (2025) as special cases, and we use it to run two tests that isolate the new channel.

The first test varies the preference specification. With standard KPR preferences under PCP, we replicate the existing result: capital controls are desirable when inflation is driven by inefficient markup shocks and wealth effects are present. Switching to GHH preferences eliminates wealth effects on labor supply, and under PCP the role for capital controls vanishes—optimal policy leaves risk sharing undistorted. Under LCP, by contrast, capital controls remain strictly welfare-improving even with GHH preferences: the planner uses capital flows to move the exchange rate in ways that correct export markup distortions. The fact that optimal capital controls are zero under PCP–GHH but non-zero under LCP–GHH cleanly identifies the price-adjustment channel as distinct from the traditional wealth-effect channel.

The second test varies the source of inflation. Under PCP with commitment, efficient productivity and demand shocks restore the divine coincidence: monetary policy closes output gaps and stabilizes inflation, complete markets implement the efficient allocation, and capital controls are redundant. Under LCP, this redundancy breaks down. Even for efficient shocks, incomplete pass-through makes the divine coincidence to fail to hold, and optimal policy uses capital controls to manage exchange-rate–induced distortions in export markups. Once invoicing is in local currency, free capital mobility is no longer optimal outside the narrow environments highlighted by PCP models.

Beyond these intensive-margin results, we also show that the invoicing regime has stark implications for the *direction* of optimal capital flows relative to the market equilibrium. Section 6 maps capital-flow patterns across home-bias and trade-elasticity configurations. Under PCP, the optimal policy response is highly parameter-dependent: there are regions where the planner reverses market flows, regions where it amplifies them, and regions where market-driven capital flows are already too large, requiring the planner to dampen them. We demonstrate that LCP eliminates this latter region of excessive market flows entirely. Because the price-adjustment channel makes exchange-rate depreciation systematically valuable for correcting export markups, optimal policy under LCP consistently demands capital outflows from the inflationary economy. This qualitative distinction proves robust to efficient shocks: while the sign of the optimal flow depends on the nature of the disturbance, the LCP implication is invariant: Starting from free mobility, the planner consistently intervenes to reinforce or reverse market flows to achieve the Ramsey allocation, but never finds the capital flow too much in the right direction.

Related Literature Our paper relates to work on the welfare consequences of international risk sharing and capital controls, and on open-economy New Keynesian models with local-currency pricing. A first strand asks when international risk sharing can be welfare-reducing. Devereux and Smith (1994) show that complete markets can lower welfare by depressing saving and long-run growth. Baxter and Crucini (1995) find that, after productivity shocks, output is more volatile under complete than under incomplete markets. With nominal rigidities and asymmetric productivity shocks in a monetary union, Auray and Eyquem (2014) show that financial autarky can dominate complete markets, while Cho et al. (2023b) obtain a similar reversal under asymmetric price stickiness and a zero lower bound. Most closely related, Cho et al. (2023a) use a two-country New Keynesian model with PCP to compare welfare under complete markets and autarky following asymmetric markup shocks. We build on this PCP benchmark, but show that once prices are set in local currency, capital controls remain welfare-improving even in response to efficient productivity and demand shocks.

A second strand studies optimal capital-flow management in open-economy New Keynesian models with nominal rigidities. Building on the classic aggregate-demand externality logic in Farhi and Werning (2014), Acharya and Bengui (2018) show that at the zero lower bound capital outflows can be inefficiently low under full risk sharing, while Fornaro and Romei (2019) emphasize that, under free mobility, non-cooperative monetary policy can be excessively tight when shocks shift demand toward tradables—both motivating capital controls as a corrective device. Related contributions study optimal policy mixes with sudden stops and exchange-rate objectives (Benigno et al., 2022; Schmitt-Grohé and Uribe, 2016; De Paoli and Lipinska, 2013), and recent studies that study interactions between capital flow managements and inflation dynamics (Bianchi and Coulibaly, 2022; Bengui and Coulibaly, 2025; Itskhoki and Mukhin, 2023). Relative to this work, we ask how the invoicing regime and and its implications for optimal stabilization policy, similar to Egorov and Mukhin (2023) and Basu et al. (2025). However, we focus on the optimal use of capital controls, and we uncover a distinct price-adjustment channel operating through export markups and currency misalignment.

Finally, we contribute to the literature on currency invoicing and local-currency pricing. Empirical work documents pervasive deviations from the law of one price, incomplete exchange-rate pass-through, and the prevalence of dominant-currency invoicing (e.g. Goldberg and Knetter, 1997; Engel, 2011; Gopinath et al., 2010). On the theory side, open-economy New Keynesian models with LCP (e.g. Betts and Devereux, 2000; Devereux and Engel, 2003) show how pricing in the buyer's currency dampens expenditure switching and reshapes optimal monetary policy relative to PCP environments, a theme extensively analyzed in recent work (Corsetti et al., 2010; Fujiwara and Wang, 2017; Kim et al., 2025). We take this LCP structure as given, but instead of revisiting optimal monetary policy in isolation, we study how the invoicing regime interacts with capital controls. To our knowledge, we are the first to demonstrate that pricing-to-market creates a novel transmission channel that renders capital controls welfare-enhancing.

The rest of the paper is organized as follows. Section 2 develops the two-country model and derives the welfare criteria. Section 3 characterizes optimal capital policy under markup shocks, establishing a new channel of welfare gains unique to LCP. Section 4 isolates this LCP-specific price-adjustment channel by neutralizing wealth effects on labor supply. Section 5 extends the analysis to efficient TFP and demand shocks, demonstrating that LCP warrants capital controls even when shocks are efficient. Section 6 analyzes optimal capital flow patterns, demonstrating that LCP eliminates the parameter regions of "excessive" market outflows found under PCP, thereby providing a robust justification for active intervention across the parameter space. Section 7 concludes.

2 Model

We develop a workhorse two-country New Keynesian model building on Corsetti et al. (2011) with two key features. First, following Bengui and Coulibaly (2025), we introduce capital controls as an active policy instrument alongside monetary policy. Second, we compare two currency pricing regimes—Producer Currency Pricing (PCP) and Local Currency Pricing (LCP)—to examine how the degree of exchange rate pass-through (ERPT) affects optimal capital control policy.

The world consists of two equal-sized countries, Home and Foreign, with discrete time and perfect foresight over aggregate variables. We describe the Home country in detail, with Foreign variables denoted by asterisks (*) following symmetric structure.

2.1 Households

The representative Home household maximizes lifetime utility:

$$\sum_{t=0}^{\infty} \beta^t \{U(C_t) - V(N_t)\} = \sum_{t=0}^{\infty} \beta^t \left(Z_t \frac{C_t^{1-\rho}}{1-\rho} - \frac{N_t^{1+\eta}}{1+\eta} \right)$$

$$\log(Z_t) = \rho_z \log(Z_{t-1}) + \sigma_z \varepsilon_{z,t},$$

where C_t denotes consumption, N_t labor supply, $\beta \in (0,1)$ the discount factor, $\rho > 0$ the inverse intertemporal elasticity of substitution, and $\eta > 0$ the inverse Frisch elasticity of labor supply. Z_t is preference shock. This King-Plosser-Rebelo (KPR) specification features wealth effects on labor supply through the marginal rate of substitution between consumption and leisure. Section 3.1 examines Greenwood-Hercowitz-Huffman (GHH) preferences that eliminate such wealth effects.

The consumption basket aggregates domestic and imported goods with elasticity of substitution $\theta > 0$:

$$C_t = \left[\nu^{\frac{1}{\theta}} C_{H,t}^{\frac{\theta-1}{\theta}} + (1-\nu)^{\frac{1}{\theta}} C_{F,t}^{\frac{\theta-1}{\theta}} \right]^{\frac{\theta}{\theta-1}}$$

where $\nu \in [1/2, 1]$ captures home bias in consumption. Each country-specific bundle aggregates differentiated varieties with elasticity $\sigma > 1$:

$$C_{H,t} = \left[2^{\frac{1}{\sigma}} \int_0^{1/2} C_{H,t}(i)^{\frac{\sigma-1}{\sigma}} di \right]^{\frac{\sigma}{\sigma-1}}, \quad C_{F,t} = \left[2^{\frac{1}{\sigma}} \int_{1/2}^{1} C_{F,t}(i)^{\frac{\sigma-1}{\sigma}} di \right]^{\frac{\sigma}{\sigma-1}}$$

where $\sigma > 1$ governs the elasticity of substitution between varieties within each country.

Financial Markets and Capital Controls Households access two types of bonds. Domestic bonds D_t trade only within the Home country in local currency with gross return R_t.

International bonds B_t trade across borders in Home currency with gross return $R_{B,t}$. The budget constraint is:

$$D_t + B_t = R_{t-1}D_{t-1} + R_{B,t-1}B_{t-1} + W_tN_t + \Pi_t - P_{H,t}C_{H,t} - P_{F,t}C_{F,t}$$

where W_t, Π_t, $P_{H,t}$, and $P_{F,t}$ denote the nominal wage, firm profits, and price indices for domestic and imported goods.

Following Bengui and Coulibaly (2025), we model capital controls as wedges in international bond returns that allow governments to influence the direction and magnitude of capital flows. Define the gross return wedge as:

$$(1 + \tau_{t+1}^D) \equiv \frac{R_{B,t}}{R_{B,t}^*} = \frac{(1 + \tau_{t+1})}{(1 + \tau_{t+1}^*)}$$

where $\tau_{t+1}^D > 0$ taxes Home's international borrowing and $\tau_{t+1}^D < 0$ taxes Foreign's. Under free capital mobility regime, $\tau_t^D = 0$ holds for every periods.

Household Optimality and Risk Sharing Standard optimization yields the consumption Euler equation and labor supply condition:

$$\frac{Z_tC_t^{-\rho}}{P_t} = \beta R_t \frac{Z_{t+1}C_{t+1}^{-\rho}}{P_{t+1}}, \qquad \frac{W_t}{P_t} = \frac{N_t^\eta}{Z_tC_t^{-\rho}}.$$

No-arbitrage between domestic and international bonds ($R_t = R_{B,t}$) combined with the analogous Foreign condition yields modified uncovered interest parity:

$$R_t = R_t^* \frac{e_{t+1}}{e_t} \left(1 + \tau_{t+1}^D\right),$$

where e_t denotes the nominal exchange rate (units of Home currency per Foreign currency). Combining Home and Foreign Euler equations delivers the risk-sharing condition:

$$F_tQ_t = \frac{Z_t^* \left(C_t^*\right)^{-\rho}}{Z_tC_t^{-\rho}},$$

where $Q_t \equiv e_tP_t^*/P_t$ is the CPI-based real exchange rate and $F_t \equiv F_0 \prod_{s=0}^{t}(1 + \tau_s^D)$ (with $F_0 = 1$) accumulates capital control distortions. Deviations of F_t from unity represent capital-control induced shifts in the international distribution of consumption that redistribute purchasing power across countries. Henceforth, we refer to F_t as the capital control wedge.

2.2 Firms

Each firm $i \in [0, 1/2]$ in Home employs labor under linear technology $Y_{H,t}(i) = A_t N_t(i)$, where total factor productivity follows:

$$\log(A_t) = \rho_a \log(A_{t-1}) + \sigma_a \varepsilon_{a,t}$$

Prices adjust subject to Calvo (1983) frictions: fraction $(1-\alpha)$ reset optimally each period while fraction α remain fixed. Production subsidies τ_N eliminate steady-state markup distortions.

The crucial distinction between pricing regimes lies in the currency of invoicing. This determines whether exchange rate movements pass through immediately to import prices or are absorbed by sticky nominal prices, fundamentally shaping the expenditure-switching mechanism.

Under PCP, firm i that can adjust at time t sets a single reset price $P^o_{H,t}$ in Home currency for both markets:[1]

$$\max_{P^o_{H,t}} \sum_{k=0}^{\infty} (\alpha\beta)^k \Lambda_{t+k} \left[P^o_{H,t} \left\{ C_{H,t+k}(i) + C^*_{H,t+k}(i) \right\} - \mu_{t+k}(1-\tau_N) W_{t+k} N_{t+k}(i) \right], \quad (1)$$

where $\Lambda_{t+k} \equiv \beta^k \frac{Z_{t+k} U_C(C_{t+k})}{Z_t U_C(C_t)} \frac{P_t}{P_{t+k}}$ is the stochastic discount factor, and μ_{t+k} is markup shock. The markup shock μ_t follows:

$$\log(\mu_t) = \rho_\mu \log(\mu_{t-1}) + \sigma_\mu \varepsilon_{\mu,t}.$$

Because the export price is set in Home currency, the law of one price holds: Foreign consumers face the price $P^*_{H,t} = P_{H,t}/e_t$. When Home currency depreciates (higher e_t), the Foreign-currency price $P^*_{H,t}$ falls proportionally and immediately. This delivers complete exchange rate pass-through.

Under LCP, firm i that can adjust sets separate reset prices in each market's currency—$P^o_{H,t}$ for domestic sales (in Home currency) and $P^{*,o}_{H,t}$ for exports (in Foreign currency):

$$\max_{P^o_{H,t}, P^{*,o}_{H,t}} \sum_{k=0}^{\infty} (\alpha\beta)^k \Lambda_{t+k} \left[P^o_{H,t} C_{H,t+k}(i) + e_{t+k} P^{*,o}_{H,t} C^*_{H,t+k}(i) - \mu_{t+k}(1-\tau_N) W_{t+k} N_{t+k}(i) \right]. \quad (2)$$

The key difference is that $P^{*,o}_{H,t}$ is set in Foreign currency and remains sticky in those terms. This creates an important asymmetry. When the Home currency depreciates, firms unable to adjust their prices maintain the same Foreign currency price. This price rigidity in the destination currency generates incomplete exchange rate pass-through: same good

[1] In symmetric equilibrium, all adjusting firms face identical problems, so we drop the firm index i.

commands different prices across countries when expressed in a common currency, violating the law of one price. To measure the degree of deviation from the law of one price, we define currency misalignment:

$$m_t = \left(\frac{e_t P^*_{H,t}}{P_{H,t}} \frac{e_t P^*_{F,t}}{P_{F,t}} \right)^{\frac{1}{2}}.$$

Under PCP, $m_t = 1$ always. Under LCP, m_t fluctuates, creating welfare-relevant distortions. Specifically, when $m_t > 1$, Home residents pay lower prices than Foreign residents in common currency terms.

Terms of trade measures the relative price of imported to domestic goods: $T_t = P_{F,t}/P_{H,t}$ for Home and $T^*_t = P^*_{H,t}/P^*_{F,t}$ for Foreign. These relative prices govern expenditure switching between domestic and foreign goods.

2.3 Market Clearing

Home goods production must equal total demand from both countries:

$$Y_{H,t} = \nu \left(\frac{P_{H,t}}{P_t} \right)^{-\theta} C_t + (1-\nu) \left(\frac{P^*_{H,t}}{P^*_t} \right)^{-\theta} C^*_t,$$

where $Y_{H,t} = \left[2^{\frac{1}{\sigma}} \int_0^{1/2} Y_{H,t}(i)^{\frac{\sigma-1}{\sigma}} di \right]^{\frac{\sigma}{\sigma-1}}$ is aggregate home output.

2.4 Linearized Equilibrium and Welfare

We log-linearize around the efficient steady state, denoting $\hat{X}_t \equiv \log(X_t/X)$ for deviations from steady state and $\tilde{X}_t \equiv \log(X_t/X^{fb}_t)$ for gaps from the flexible-price allocation.[2] Following Engel (2011) and Cook and Devereux (2013), we decompose variables into world averages $\hat{X}^W_t = (\hat{X}_t + \hat{X}^*_t)/2$ and relative differences $\hat{X}^R_t = (\hat{X}_t - \hat{X}^*_t)/2$. This separation cleanly isolates how pricing regimes affect international transmission—ERPT influences only cross-country distribution, leaving global aggregates invariant. Complete derivations appear in the online appendix.

2.4.1 World Dynamics

World aggregates evolve identically across regimes. The world IS curve:

$$\tilde{Y}^W_t - \tilde{Y}^W_{t+1} = -\frac{1}{\rho} \left(\frac{\hat{R}_t + \hat{R}^*_t}{2} - \hat{\pi}^W_{t+1} - \hat{R}^{W,nat}_{ppi,t} \right), \tag{3}$$

[2] Steady-state subsidies eliminate monopolistic distortions, ensuring $X = X^{fb}$.

where $\hat{R}^{W,nat}_{ppi,t} \equiv (\hat{R}^{fb}_{ppi,t} + \hat{R}^{fb,*}_{ppi,t})/2$ denotes the world natural rate—the PPI-based real interest rate that would prevail absent nominal rigidities. World New Keynesian Phillips Curve follows:

$$\hat{\pi}^{W}_{t} = \kappa[(\rho + \eta)\tilde{Y}^{W}_{t} + \hat{\mu}^{W}_{t}] + \beta\hat{\pi}^{W}_{t+1}, \tag{4}$$

where $\kappa \equiv (1 - \alpha\beta)(1 - \alpha)/\alpha$ is the Phillips curve slope. Crucially, neither the demand imbalance $\hat{F}_t$ nor currency misalignment $\hat{m}_t$ appears in (3)-(4). This implies that neither the trajectory of currency misalignment nor the active management of capital flows has any impact on world aggregate dynamics. But as will be seen in the relative dynamics, capital controls and incomplete pass-through influences relative variables, and both distortions play important roles.

2.4.2 Relative Demand Dynamics

Cross-country differences diverge sharply across regimes. Under PCP:

$$\left(\tilde{Y}^{R}_{t} - \tilde{Y}^{R}_{t+1}\right) + \frac{D - (2\nu - 1)}{2\rho}\left(\hat{F}_t - \hat{F}_{t+1}\right) = -\frac{D}{\rho}\left(\frac{\hat{R}_t - \hat{R}^{*}_{t}}{2} - \hat{\pi}^{R}_{ppi,t+1} - \hat{R}^{R,nat}_{ppi,t}\right), \tag{5}$$

where $D \equiv (2\nu - 1)^2 + 4\rho\theta\nu(1 - \nu)$ measures international linkages and $\hat{R}^{R,nat}_{ppi,t} \equiv (\hat{R}^{fb}_{ppi,t} - \hat{R}^{fb,*}_{ppi,t})/2$ is the relative natural rate. Under PCP, the term in $\hat{F}_t$ captures how capital controls distort the intertemporal profile of relative absorption. A rise in the expected future demand imbalance, $\hat{F}_{t+1} - \hat{F}_t > 0$, corresponds to an anticipated fall in Home net exports (or, equivalently, stronger future demand for Foreign goods by Home residents). This expected shift toward Foreign absorption forces the relative output gap to decline over time: $\tilde{Y}^{R}_{t+1} - \tilde{Y}^{R}_{t} < 0$. In other words, Home output grows more slowly (or contracts more) relative to Foreign output when future demand is tilted toward Foreign goods.

Under LCP, the following equation describes the relative output gap dynamics:

$$\begin{aligned}\left(\tilde{Y}^{R}_{t} - \tilde{Y}^{R}_{t+1}\right) &+ \frac{D - (2\nu - 1)}{2\rho}\left(\hat{m}_t + \hat{F}_t - \hat{m}_{t+1} - \hat{F}_{t+1}\right) \\ &= -\frac{D}{\rho}\left(\frac{\hat{R}_t - \hat{R}^{*}_{t}}{2} - \hat{\pi}^{R}_{ppi,t+1} - \hat{R}^{R,nat}_{ppi,t}\right),\end{aligned} \tag{6}$$

Under LCP, (6) shows that the same demand-imbalance term now enters as $\hat{m}_t + \hat{F}_t$, so relative demand dynamics are also shaped by currency misalignment $\hat{m}_t$. Misalignment summarizes the effect of incomplete pass-through on relative consumer prices. When $\hat{m}_{t+1} - \hat{m}_t > 0$, markets expect further Home depreciation under sticky local-currency prices. Imports at Home then do not become as expensive as they would under the law of one price, and Home exports do not gain as much competitiveness abroad. Foreign goods are effectively underpriced in world markets relative to the law-of-one-price benchmark. Forward-looking households internalize this future relative-price wedge and tilt demand toward Foreign production, which tightens the path of relative output: the expected relative output gap falls over time, $\tilde{Y}_{t+1}^R - \tilde{Y}_t^R < 0$. Finally, the risk-sharing condition written in the linearized form is given by:

$$\rho(\hat{C}_t - \hat{C}_t^*) + \hat{Z}_t^* - \hat{Z}_t = \hat{m}_t + \hat{F}_t + (2\nu - 1)\hat{T}_t \tag{7}$$

2.4.3 Relative Supply Dynamics

Under PCP, relative producer price inflation depends on relative output gaps, demand imbalances, and markup shocks:

$$\hat{\pi}_{ppi,t}^R = \kappa\left[\left(\frac{\rho}{D} + \eta\right)\tilde{Y}_t^R + \frac{D - (2\nu - 1)}{2D}\hat{F}_t + \hat{\mu}_t^R\right] + \beta\hat{\pi}_{ppi,t+1}^R. \tag{8}$$

The demand imbalance $\hat{F}_t$ enters through a wealth effect: higher $\hat{F}_t$ increases Home's relative consumption, reducing labor supply as households feel richer. Reduced labor supply raises real wages ($W_t/P_t = N_t^{\eta}/(Z_t C_t^{-\rho})$), increasing firms' marginal costs and inflationary pressure.

Under LCP, we must distinguish between domestic and export price inflation. Relative PPI inflation (prices of goods sold domestically) follows:

$$\hat{\pi}_t^{R,\text{ppi}} = \kappa\left[(\rho + \eta)\tilde{Y}_t^R - \frac{\rho\theta}{2}\tilde{T}_t + \frac{1}{2}(\hat{m}_t + \hat{F}_t) + \frac{1}{2}\tilde{T}_t + \hat{\mu}_t^R\right] + \beta\hat{\pi}_{t+1}^{R,\text{ppi}}, \tag{9}$$

while relative export inflation (prices of goods sold abroad) follows:

$$\hat{\pi}_t^{R,\text{export}} = \kappa\left[(\rho + \eta)\tilde{Y}_t^R - \frac{\rho\theta}{2}\tilde{T}_t + \frac{1}{2}(\hat{m}_t + \hat{F}_t) + \frac{1}{2}\tilde{T}_t - \hat{m}_t + \hat{\mu}_t^R\right] + \beta\hat{\pi}_{t+1}^{R,\text{export}} \tag{10}$$

Both equations share a common real marginal cost component: $(\rho + \eta)\tilde{Y}_t^R - \frac{\rho\theta}{2}\tilde{T}_t + \frac{1}{2}(\hat{m}_t + \hat{F}_t)$. The term $\frac{1}{2}(\hat{m}_t + \hat{F}_t)$ captures consumption distortions that affect labor supply through the wealth effect, identical to the mechanism under PCP. The crucial distinction appears in the export inflation equation through the additional term $(-\hat{m}_t)$. When Home currency depreciates ($\hat{m}_t > 0$), export revenue measured in Home currency rises ($e_t \cdot P_{H,t}^*$ increases because $P_{H,t}^*$ is sticky in Foreign currency) while marginal costs remain anchored to domestic wages. This pushes exporters' markups above their profit-maximizing level, inducing reset-price exporters to cut Foreign currency prices and creating downward pressure on export inflation. This mechanism operates through firms' pricing decisions, not labor supply, making it independent of household preferences—a channel we isolate in Section 3.1 using GHH preferences where wealth effects are absent.

2.5 Welfare

We adopt a cooperative framework where a benevolent global planner maximizes joint welfare:

$$W = \sum_{t=0}^{\infty} \beta^t \left[\frac{1}{2} \left(Z_t \frac{C_t^{1-\rho}}{1-\rho} - \frac{N_t^{1+\eta}}{1+\eta} \right) + \frac{1}{2} \left(Z_t^* \frac{(C_t^*)^{1-\rho}}{1-\rho} - \frac{(N_t^*)^{1+\eta}}{1+\eta} \right) \right].$$

Second-order approximation around the efficient allocation yields quadratic loss functions (derived in the online appendix):

$$\textbf{PCP:} \quad 2\{\mathcal{L}_t^{W,PCP} - (\mathcal{L}_t^W)^{fb}\} = (\rho+\eta)(\tilde{Y}_t^W)^2 + \left(\frac{\rho}{D} + \eta\right)(\tilde{Y}_t^R)^2 + \frac{\theta\nu(1-\nu)}{D}\hat{F}_t^2 + \frac{\sigma}{\kappa}[(\hat{\pi}_t^W)^2 + (\hat{\pi}_{ppi,t}^R)^2], \tag{11}$$

$$\textbf{LCP:} \quad 2\{\mathcal{L}_t^{W,LCP} - (\mathcal{L}_t^W)^{fb}\} = (\rho+\eta)(\tilde{Y}_t^W)^2 + \left(\frac{\rho}{D} + \eta\right)(\tilde{Y}_t^R)^2 + \frac{\theta\nu(1-\nu)}{D}(\hat{m}_t + \hat{F}_t)^2 + \frac{\sigma}{\kappa}[(\hat{\pi}_t^W)^2 + \nu(\hat{\pi}_{ppi,t}^R)^2 + (1-\nu)(\hat{\pi}_{export,t}^R)^2]. \tag{12}$$

The PCP loss penalizes world and relative output gaps, inflation volatility, and demand imbalances $\hat{F}_t^2$. LCP adds a currency misalignment term $(\hat{m}_t + \hat{F}_t)^2$ capturing inefficient deviations from the law of one price, and relative export inflation $\hat{\pi}_{export,t}^R$ from independent price dispersion in export markets.

2.6 Monetary Policy

We assume that monetary policy in both the Home and Foreign economies is set cooperatively by a global planner operating under full commitment. By anchoring our analysis in optimal cooperative policy, we ensure that the welfare gains identified in this paper are not driven by a failure of monetary authorities to internalize cross-border spillovers or stabilize the economy efficiently. Instead, we isolate the specific value-added of capital controls in addressing distortions, such as currency misalignments and sticky export prices, that remain even when interest rates are set optimally.

2.7 Calibration

Table 1 summarizes our baseline calibration. We set $\beta = 0.99$ (4% annual real interest rate), $\eta = 1$, and $\alpha = 0.75$ (average price duration of one year). The within-country elasticity $\sigma = 7.66$ implies a 15% steady-state markup. Following Cho et al. (2023a), we set $\rho = 1$ and $\theta = 2$, implying international goods are Edgeworth substitutes. Shock persistence is $\rho_i = 0.8$ for $i \in \{A, Z, \mu\}$. Home bias $\nu = 0.5$ represents full trade openness for illustrative purposes.

Parameter	Value	Description
ρ	1	Inverse intertemporal elasticity of substitution
β	0.99	Discount factor
η	1	Inverse Frisch elasticity of labor supply
ν	0.5	Home bias (trade openness)
σ	7.66	Elasticity of substitution between varieties
θ	2	Elasticity of substitution across countries
α	0.75	Calvo parameter
ρ_i	0.8	Shock persistence ($i = A, Z, \mu$)

Table 1: Baseline Calibration

In Section 4.1, we explore the implications of home bias, which does not qualitatively alter our results.

For impulse response analysis, we calibrate shock sizes to generate economically meaningful dynamics: the markup shock is 28.278% to produce 5% annual PPI inflation under PCP, and the TFP shock is 4.2948% to generate a -2% quarterly relative output gap under LCP. The demand shock is 25.765% to generate a 1% annual PPI inflation under LCP when home bias $\nu = 0.75$.[3]

3 Beyond Wealth Effects: Capital Controls and Currency Misalignment

This section demonstrates that LCP fundamentally expands the welfare rationale for capital controls. While previous literature has anchored the benefits of capital controls in wealth effects on labor supply, we show that LCP introduces a distinct *price adjustment channel,* enabled by incomplete ERPT that operates independently of household preferences.

Our argument proceeds in three steps. First, we establish the PCP baseline (Section 3.1), confirming that under producer currency pricing, capital controls are useful only if they can manipulate labor supply via wealth effects. Second, we present our main result under LCP (Section 3.2): capital controls become a tool to manage export markups by strategically engineering currency misalignment. Third, we provide the identification test (Section 3.3): under GHH preferences, where wealth effects are absent, capital controls remain

[3] We set $\nu = 0.75$ for demand shock, since divine coincidence holds at $\nu = 0.5$, causing all gaps to close under LCP even for demand shocks.

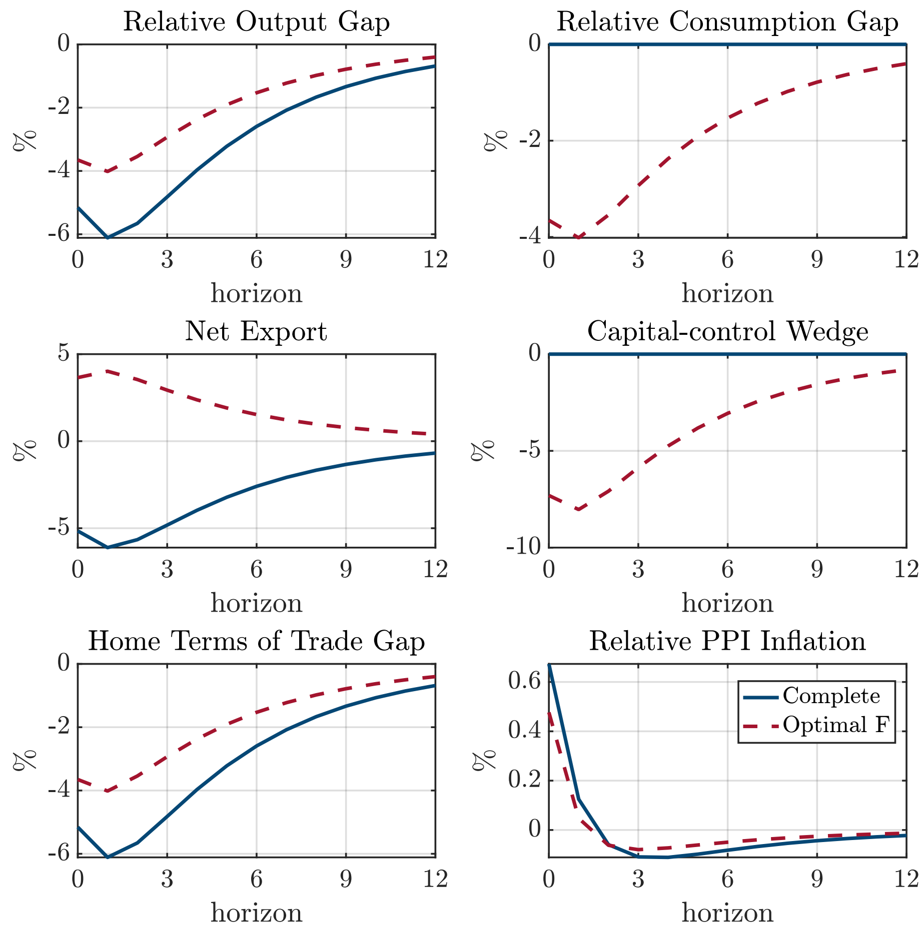


Figure 1: IRF to an inflationary cost-push shock in Home (PCP)

welfare-improving under LCP despite being redundant under PCP.

3.1 Capital Controls under PCP: The Wealth Effect Channel

We begin by isolating the mechanism under Producer Currency Pricing (PCP). Figure 1 illustrates the economy's response to a Home markup shock. Under complete markets (blue line), risk sharing dictates capital inflows to the shocked economy, equalizing consumption across borders (Panel 2).

The optimal policy (red dashed line) reverses this passive adjustment. As Panel 4 illustrates, the planner taxes capital inflows to induce a negative demand imbalance ($\hat{F}_t < 0$), driving a corresponding increase in net exports (Panel 3). This intervention disrupts the risk-sharing condition, keeping Home consumption significantly below Foreign levels (Panel 2). Crucially, the resulting welfare gains are realized solely through the wealth effect on labor supply: by suppressing relative consumption, the policy induces households to increase labor supply. Increased labor supply exerts downward pressure on real wages and marginal costs, effectively dampening relative PPI inflation (Panel 6) and stabilizing the relative output gap (Panel 1).

As previously discussed in Section 2.4.1, capital controls do not affect world aggregate variables. Therefore, the impulse responses displayed in Figure 1 focus strictly on relative dynamics, as world inflation and the world output gap remain entirely insulated from the capital wedge and the resulting movements in currency misalignment. The planner's intervention is purely a tool for managing the wedge between the two economies.

Proposition 1 formalizes the gains of capital control via labor supply channel, establishing a tight link between the optimal capital wedge and the output gap:

Proposition 1: *Under PCP with KPR preferences, the optimal capital control is:*

$$\begin{aligned}\hat{F}_t &= \frac{D-(2\nu-1)}{2\theta\nu(1-\nu)}\tilde{Y}_t^R.\\ &= 2\tilde{Y}_t^R \ \text{ if } \ \nu = \frac{1}{2}\end{aligned}$$

Proof: See Appendix B.2. □

Since the inflationary markup shock generates a negative output gap ($\tilde{Y}_t^R < 0$), Proposition 1 dictates $\hat{F}_t < 0$. This confirms the pattern in Figure 1: the planner taxes borrowing to engineer a relative decline in consumption, using the resulting wealth effect to cool down inflation.

This reliance on the wealth effect suggests a sharp falsification test: if we eliminate the wealth effect on the labor supply, the rationale for capital controls under PCP should vanish. We test this using GHH preferences, where the utility takes the form $U(C_t, N_t) = \frac{(C_t - \psi N_t^{1+\eta}/(1+\eta))^{1-\rho}}{1-\rho}$. A key property of this utility function is that the marginal rate of substitution depends solely on hours worked, effectively decoupling labor supply decisions from consumption fluctuations.

Proposition 2: *Under PCP with GHH preferences, the wealth effect channel is inoperative, and the optimal capital control is zero:* $\hat{F}_t = 0$ *for all* t.
Proof: See Appendix B.2. □

Comparing Propositions 1 and 2 delivers a clear takeaway: Under PCP, capital controls are useful if and only if they can successfully manipulate labor supply via wealth effects. If this channel is weak or absent, capital controls are redundant. As we show next, LCP fundamentally alters this logic by introducing a price-adjustment channel that survives even when wealth effects are silenced.

3.2 Capital Controls under LCP: A Dual-Channel Framework

LCP introduces incomplete ERPT, creating a disconnect between exchange rates and prices that generates currency misalignment ($\hat{m}_t$). This misalignment opens a second, qualitatively different transmission mechanism. We first decompose these two channels and then characterize the optimal policy.

Under LCP, capital controls influence the economy through the relative New Keynesian Phillips Curves (NKPC) for PPI and export inflation:

$$\hat{\pi}_t^{R,\text{ppi}} = \beta\hat{\pi}_{t+1}^{R,\text{ppi}} + \kappa\Bigg[\underbrace{(\rho+\eta)\tilde{Y}_t^R - \frac{\rho\theta}{2}\tilde{T}_t + \underbrace{\frac{1}{2}(\hat{m}_t + \hat{F}_t)}_{\text{Channel 1: Wealth Effect}}}_{\text{Real Marginal Cost }(\widehat{mc}_t)} + \frac{1}{2}\tilde{T}_t + \hat{\mu}_t^R\Bigg] \tag{13}$$

$$\hat{\pi}_t^{R,\text{export}} = \beta\hat{\pi}_{t+1}^{R,\text{export}} + \kappa\Bigg[\underbrace{(\rho+\eta)\tilde{Y}_t^R - \frac{\rho\theta}{2}\tilde{T}_t + \underbrace{\frac{1}{2}(\hat{m}_t + \hat{F}_t)}_{\text{Channel 1: Wealth Effect}}}_{\text{Real Marginal Cost }(\widehat{mc}_t)} \underbrace{+\frac{1}{2}\tilde{T}_t \underbrace{-\hat{m}_t}_{\substack{\text{Channel 2:}\\\text{Price Wedge}}}}_{\text{Price Adjustment}} + \hat{\mu}_t^R\Bigg] \tag{14}$$

Currency misalignment $\hat{m}_t$ appears in two different ways in the export inflation, corresponding to two distinct transmission channels.

Channel 1: The Wealth Effect. The term $\frac{1}{2}(\hat{m}_t + \hat{F}_t)$ captures the sensitivity of real marginal costs to consumption-induced shifts in labor supply. This channel originates from the household's intratemporal optimization. When the Home currency depreciates ($\hat{m}_t > 0$), LCP prevents import prices from rising, limiting the Home goods from the expenditure switching typically associated with depreciation. Consequently, relative consumption rises vis-à-vis the complete pass-through counterfactual, holding all others constant. This effective over-consumption induces a negative wealth effect that contracts labor supply. To clear the labor market, real wages must rise, driving up marginal costs for both Home's domestic and exporting firms. Similarly, a capital inflow subsidy ($\hat{F}_t > 0$) directly boosts relative consumption, triggering the same negative wealth effect. Critically, because domestic and export firms hire from the same labor market, this channel exerts symmetric pressure on both PPI and export inflation.

Channel 2: The Price Adjustment (Markup Channel). The term $(-\hat{m}_t)$, which appears *exclusively* in the export inflation equation, captures a direct pricing wedge unique to LCP. This mechanism operates through firm markups rather than labor costs. Under LCP, a depreciation ($\hat{m}_t > 0$) increases the Home-currency revenue of exporters ($e_t P_{H,t}^*$) while their wage costs remain sticky. This mechanically widens exporters' markups above the profit-maximizing level. To restore optimal markups, resetting firms respond by lowering their foreign-currency prices ($P^*_{H,t}$), generating downward pressure on export inflation. Unlike Channel 1, this transmission relies entirely on firm profit maximization, making it robust to alternative household preferences (such as GHH).

This price-adjustment channel is conceptually analogous to the endogenous markup mechanism highlighted by Corsetti et al. (2023). In their framework, wedges arising from incomplete financial markets enter pricing conditions as markup shocks. Here, the logic is similar but driven by nominal rigidities: the LCP-induced gap between revenue and marginal cost functions as an endogenous markup disturbance. Consequently, the nominal exchange rate, and the resulting currency misalignment, serves as a stabilization tool that improves the inflation–output tradeoff, even in the absence of exogenous cost-push shocks.

3.3 Optimal Policy Dynamics

How does the Ramsey planner utilize these two channels? Figure 2 displays the impulse responses to a Home markup shock. A comparison between the complete markets baseline (blue solid line) and the optimal policy (red dashed line) reveals a striking reversal of conventional policy logic.

To combat the markup shock, the planner taxes capital inflows ($\hat{F}_t < 0$, Panel 4), actively inducing a negative demand imbalance. This policy intervention leads to a sharp depreciation of the Home currency. Crucially, because LCP renders import prices sticky, this nominal depreciation translates directly into the currency misalignment ($\hat{m}_t > 0$) observed in Panel 5. The contrast is most visible in Panel 5. Under complete markets with no home bias, risk-sharing conditions naturally eliminate currency misalignment ($\hat{m}_t = 0$), as can be seen from flat blue line in the panel. Standard intuition suggests that policy should aim to preserve this alignment. However, the optimal policy diverges from this objective: it *deliberately engineers* a sharp, persistent misalignment ($\hat{m}_t > 0$).

Why create a distortion that the market would otherwise eliminate? The answer lies in the price adjustment channel (Channel 2). By driving $\hat{m}_t$ upward, the planner widens the gap between foreign revenue and domestic cost: revenues rise with the exchange rate while costs remain anchored to domestic wages. This excessive gap incentivizes exporters to cut their foreign-currency prices to restore optimal markups.

However, under KPR preferences where the wealth effect is active, the optimal capital control policy is not determined by the price adjustment channel alone. A central fea-

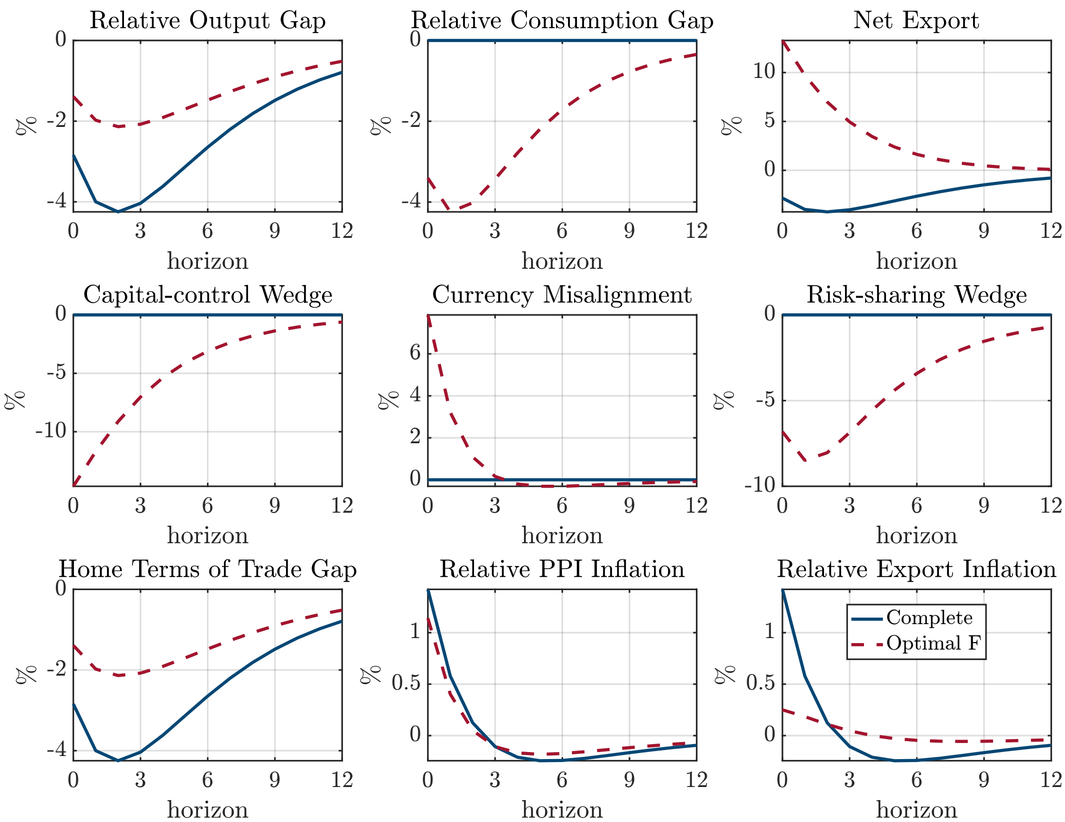


Figure 2: IRF to an inflationary cost-push shock in Home (LCP, KPR)

ture of the policy is the manipulation of the *net risk-sharing wedge*, defined as the sum of currency misalignment and the capital control tax $(\hat{m}_t + \hat{F}_t)$. This term captures the total distortion introduced into the linearized risk-sharing condition:

$$\rho\left(\hat{C}_t - \hat{C}_t^*\right) + \hat{Z}_t^* - \hat{Z}_t = \underbrace{\hat{m}_t + \hat{F}_t}_{\text{Net Risk-Sharing Wedge}} + (2\nu - 1)\hat{T}_t$$

As can be seen from Panel 6, the net risk-sharing wedge is negative. By driving this wedge into negative territory, the policy effectively suppresses Home consumption relative to Foreign. Under KPR preferences, this engineered consumption gap triggers a positive wealth effect on labor supply. The resulting outward shift in the labor supply curve lowers real wages, thereby reducing marginal costs for both domestic and exporting firms.

This cost reduction introduces a critical asymmetry in stabilization. Relative PPI inflation is stabilized through this wealth effect (Channel 1). Relative export inflation, however, benefits from a dual mechanism: the wealth effect reinforces the direct price-adjustment channel (Channel 2) activated by the currency depreciation. Because the wealth effect acts alone for PPI but synergistically for exports, the policy stabilizes relative export inflation far more aggressively than relative PPI inflation, preserving a persistent spread between the two rates. This can be clearly seen from much greater stabilization of relative export inflation, as can be seen from comparing Panel 8 and Panel 9.

Consequently, the optimal policy emerges as a strategic trade-off. The planner must balance the allocative cost of the consumption wedge against the gains from this differential inflation stabilization. Proposition 3 formalizes this principle, showing that the optimal capital control rule is dynamic: it tracks the divergence—or spread—between relative export inflation and relative PPI inflation.

Proposition 3: *Under LCP with KPR preferences and no home bias ($\nu = 0.5$), the optimal capital control satisfies:*

$$\Delta \hat{F}_t = -\Delta \hat{m}_t + \sigma \hat{\pi}^R_{export,t} - \sigma \hat{\pi}^R_{ppi,t}$$

Proof: See Appendix B.2. □

Under complete markets, this wedge would be zero. However, the optimal policy strategically manipulates this wedge to exploit the wealth effect, and as Proposition 3 demonstrates, the degree of intervention is governed precisely by the realized spread between the two inflation rates.

3.4 Welfare Analysis

Table 2 presents the welfare decomposition under optimal capital controls for both pricing regimes. The results highlight a stark asymmetry in policy effectiveness: while capital controls yield modest benefits under PCP, they generate substantial welfare improvements under LCP.

Under PCP, the optimal policy reduces welfare losses by 19.9%. As shown in the decomposition, this gain is driven primarily by relative output stabilization, followed by the benefits from relative PPI inflation stabilization. However, these gains have tradeoff due to the policy instrument itself: the capital control wedge $\hat{F}_t$ introduces a direct distortion that offsets nearly half of the stabilization benefits.

Under LCP, the gains from optimal capital controls increase significantly, achieving a 31.46% reduction in total losses. The source of these gains shifts from output stabilization to nominal inflation stabilization. Specifically, the planner achieves a sharp reduction in relative export inflation variance, followed by improvements in relative PPI inflation. This hierarchy is expected: while PPI inflation is influenced only through the wealth effect, export inflation is stabilized through both the wealth effect and the price adjustment channel.

	PCP			LCP		
	Complete Market	Optimal CC	Gain (level)	Complete Market	Optimal CC	Gain (level)
$100 \times [\mathcal{L} - (\mathcal{L})^{fb}]$						
$\tilde{Y}^W$	0.9653	0.9653	0	0.9653	0.9653	0
$\tilde{Y}^R$	1.1990	0.4863	0.7127	0.7437	0.2071	0.5366
$(\hat{m} + \hat{F})$	0	0.3242	-0.3242	0	0.3767	-0.3767
$\hat{\pi}^W$	0.1565	0.1565	0	0.1565	0.1565	0
$\hat{\pi}^R_{ppi}$	0.2332	0.1136	0.1196	0.5997	0.3661	0.2336
$\hat{\pi}^R_{export}$	—	—	—	0.5997	0.0291	1.5706
Total Loss	**2.5539**	**2.0459**	**0.5081**	**3.0649**	**2.1007**	**0.9642**
% Loss Reduction (Total): 19.9%				% Loss Reduction (Total): 31.46%		

Notes: Same markup-shock process and calibration across regimes. Entries are second-order welfare losses (relative to the flexible-price allocation). "Gain (level)" is the component-level difference (Complete Market minus Optimal CC). PCP has no export-price dispersion term; so $(\hat{m} + \hat{F})$ = $\hat{F}$ under PCP.

Table 2: Welfare Decomposition and Gains (KPR): PCP vs LCP

Achieving this stability requires aggressive intervention. While the policy induces a large welfare cost via the net risk-sharing distortion $(\hat{m}_t + \hat{F}_t)$, the resulting reduction in inflation volatility overwhelmingly dominates this allocative cost. The heightened efficacy under LCP stems from the planner's ability to use the capital wedge $(\hat{F}_t)$ to engineer a currency misalignment $(\hat{m}_t)$. This activates the price adjustment channel, generating a "markup windfall" that suppresses export price volatility.

Until this point, our results reflect the joint operation of both channels. To identify the unique role of the price adjustment channel, we must eliminate the wealth effect on the labor supply. We achieve this in the next section by analyzing the optimal policy under LCP with GHH preferences.

4 Isolating the Price Adjustment Channel

The definitive test of our hypothesis is whether capital controls remain welfare-improving when wealth effects are entirely absent. As established in Section 3, GHH preferences neutralize the wealth effect on labor supply (Channel 1), effectively isolating the price adjustment mechanism (Channel 2). If capital controls remain optimal under LCP with GHH preferences—despite being redundant under PCP with GHH (Proposition 2)—this would provide decisive evidence that LCP creates a transmission channel operating independently of household preferences.

Figure 3 illustrates the impulse responses to a markup shock with the identical shock

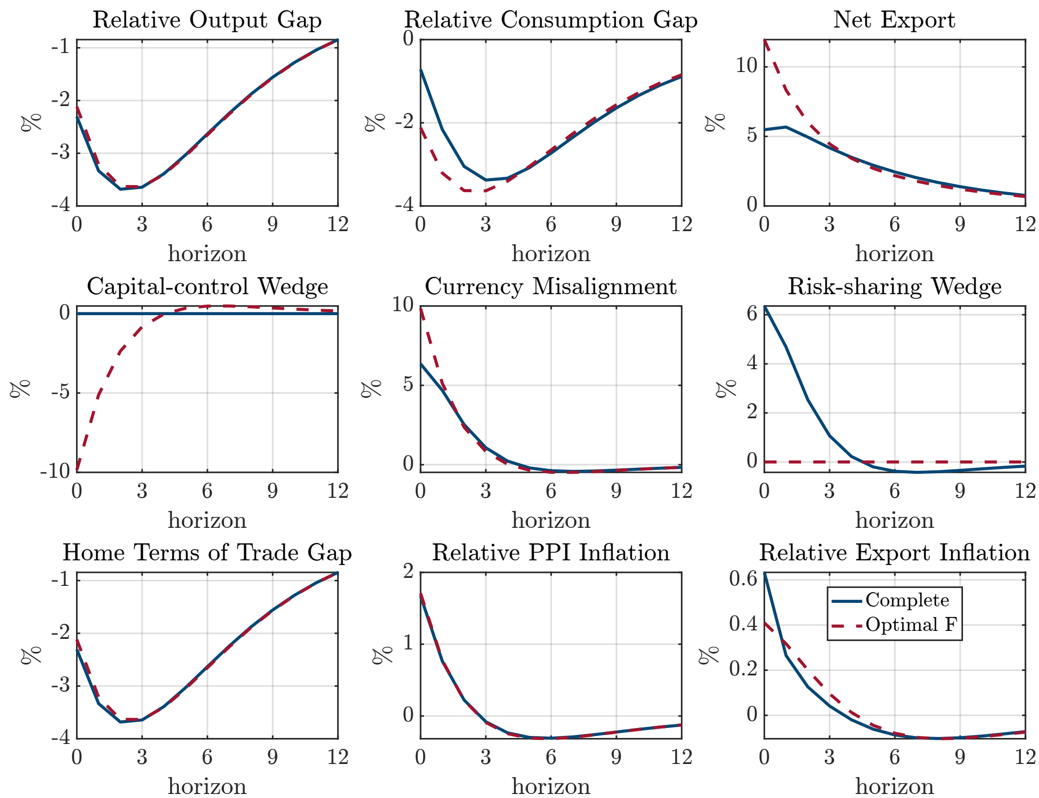


Figure 3: IRF to an inflationary cost-push shock in Home (LCP, GHH)

size under LCP with GHH preferences. The results confirm that capital controls remain beneficial even in the absence of wealth effects. The optimal policy continues to tax capital inflows ($\hat{F}_t < 0$ in Panel 4), engineering a currency depreciation (a rise in $\hat{m}_t$ in Panel 5) that improves both relative output (Panel 1) and net exports (Panel 3).

These dynamics isolate the operation of Channel 2. While the policy generates depreciation ($\hat{m}_t > 0$), this adjustment now transmits solely through export inflation (Panel 9) rather than PPI inflation (Panel 8). In fact, PPI inflation rises slightly under the optimal policy because higher relative output increases marginal costs without an offsetting labor supply response. In stark contrast, export inflation declines sharply. This divergence demonstrates that the LCP price adjustment channel operates autonomously: the depreciation-induced markup distortion is corrected via lower export inflation. The capital control policy effectively leverages capital outflows to generate the specific depreciation required to activate this channel.

We formalize this result in the following proposition:

Proposition 4: *Under LCP with GHH preferences and no home bias, the optimal capital con-*

trol satisfies:

$$\Delta \hat{F}_t = -\Delta \hat{m}_t - \frac{\eta\sigma(2\nu-1)}{2(1-\nu)}\hat{\pi}^R_{cpi,t} - (2\nu-1)\Delta\hat{T}_t - \frac{\eta(2\nu-1)}{1-\nu}\Delta\tilde{Y}^R_t.$$

When $\nu = 0.5$ (no home bias), this simplifies to $\Delta\hat{F}_t = -\Delta\hat{m}_t$.
Proof: See Appendix B.2. □

This result validates the decomposition of motives identified in the previous section. Under KPR preferences (Proposition 3), the optimal rule combined two distinct objectives: insulating risk-sharing from currency movements and actively manipulating wealth effects to stabilize inflation. Under GHH preferences, the second motive vanishes entirely. The simplified rule $\Delta\hat{F}_t = -\Delta\hat{m}_t$ represents the pure operation of the insulation motive. The planner uses capital controls to perfectly sterilize the allocative wedge created by the exchange rate ($\hat{m}_t + \hat{F}_t = 0$), effectively decoupling the currency misalignment from domestic consumption. This allows the exchange rate to depreciate aggressively to correct export pricing distortions (Channel 2) without transmitting volatility to the household risk-sharing condition.

The survival of optimal capital controls in this setting establishes a fundamental distinction between market structures. Under PCP with GHH preferences, the optimal policy is dormant ($\hat{F}_t = 0$) because neither the wealth effect nor the price adjustment channel is active (Proposition 2). In contrast, under LCP, the policy remains active ($\hat{F}_t < 0$) even when wealth effects are entirely absent. This confirms that incomplete pass-through creates a novel transmission mechanism: the planner intervenes not to manipulate household labor supply, but to correct export inflation. Thus, the price adjustment channel alone is sufficient to justify capital controls, expanding the welfare rationale beyond traditional labor market stabilization.

4.1 Extension to Consumption Home Bias

Our baseline analysis focused on the case of no home bias ($\nu = 0.5$) for analytical clarity. We now verify that our central findings extend to economies with consumption home bias ($\nu = 0.75$), where households place greater weight on domestically produced goods.

Figure A.1 presents the impulse responses under LCP with KPR preferences and home bias. A key distinction from the baseline arises in the initial exchange rate dynamics: under free capital mobility, the markup shock drives domestic real interest rates higher, generating immediate pressure for the home currency to appreciate vis-à-vis the foreign currency (a negative currency misalignment).

Despite this initial appreciation pressure, the optimal policy response remains qualitatively consistent with our baseline: the planner introduces a tax on capital inflows. In this context, the capital control does not merely engineer a misalignment from scratch but actively counters market forces. As shown in the figure, the policy is sufficiently aggressive to reverse the natural appreciation, effectively turning it into a depreciation.

This policy intervention operates through two distinct channels. First, the wealth effect is responsible for the domestic stabilization: it improves the relative output gap (Panel 1) while simultaneously exerting downward pressure on wages. This wage suppression explains why PPI inflation declines even as the output gap recovers—a dynamic independent of the exchange rate channel. Second, by turning appreciation into depreciation, the planner effectively quenches relative export inflation (Panel 9).

Critically, the independence of this LCP price adjustment channel persists under home bias. Figure A.2 illustrates the responses of macro variables for identical shock under GHH preferences. Even in the absence of wealth effects, the optimal policy continues to tax capital inflows. While currency depreciates even under a complete market, optimal policy involves inducing additional depreciation by encouraging capital outflows, as illustrated by the currency misalignment dynamics in Panel 5. This intensified depreciation helps stabilize relative export inflation through LCP adjustment channel. This confirms that the rationale for capital controls relies on the specific friction of Local Currency Pricing rather than wealth effects on labor supply, reinforcing our finding that LCP fundamentally expands the welfare scope for capital flow management.

5 Capital Control under Efficient Shocks

In the previous section, we established that LCP creates an independent price adjustment channel for capital controls in the presence of inefficient inflationary markup shocks. We now examine whether these findings extend to efficient shocks, specifically Total Factor Productivity (TFP) and demand (preference) shocks.

This extension offers a rigorous test of the theory. In the standard New Keynesian framework with Producer Currency Pricing (PCP), the divine coincidence holds when the central bank can commit to optimal policy. In that environment, efficient shocks allow the economy to achieve first-best efficiency through monetary policy alone, rendering capital controls strictly redundant ($\hat{F}_t = 0$). This benchmark is even more restrictive than the environments studied by Bengui and Coulibaly (2025) or Cho et al. (2023a), as there is no justification for capital control intervention. However, we demonstrate that under LCP, this redundancy result breaks down. Even for efficient shocks, the presence of sticky local-

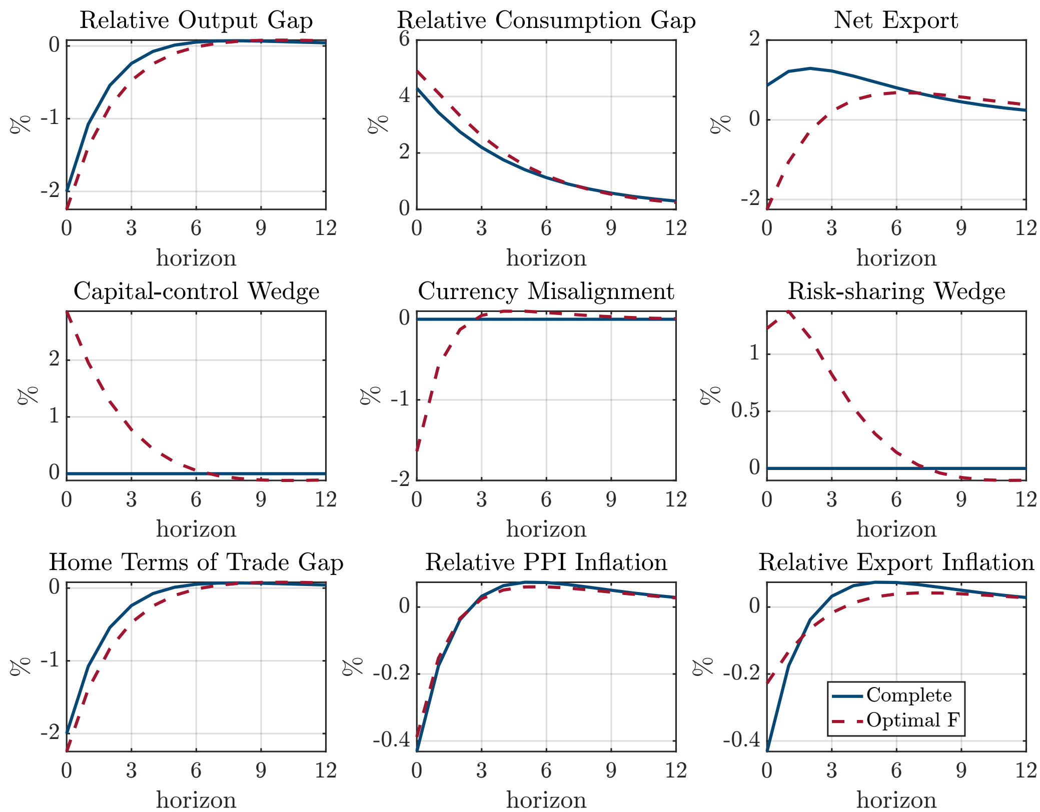


Figure 4: IRF to a positive TFP shock in Home (LCP)

currency prices prevents the decentralized international allocation from replicating the efficient frontier. Consequently, capital controls remain welfare-improving even when optimal monetary policy is in place. This provides a robust justification for capital flow management that exists independently of the nature of the shock.

5.1 TFP Shocks

Figure 4 illustrates the impulse responses to a positive Home TFP shock under LCP with no home bias. Fundamentally, a positive productivity shock lowers marginal costs, requiring a reduction in prices to reach the efficient level of output. However, due to price stickiness, prices do not adjust downward quickly enough, resulting in inefficiently high markups and deflationary pressure.

A striking feature of the optimal policy is the complete reversal of the capital control instrument compared to the markup shock scenario. While the planner taxed inflows to curb inflationary pressures from markup shocks, the optimal policy here mandates a capital inflow subsidy ($\hat{F}_t > 0$) to combat the deflationary pressure of the productivity shock. This dynamic is confirmed by the trade balance, where the economy generates a deficit relative to the complete markets benchmark.

The specific transmission mechanisms mirror the dual-channel framework identified in Section 3, though they now operate to generate inflationary pressure to counteract the stickiness-induced distortions. The first mechanism, the wealth effect channel, is triggered by the capital inflow subsidy ($\hat{F}_t > 0$), which boosts Home's relative consumption. Under KPR preferences, this induced wealth effect encourages households to reduce labor supply, thereby reducing the relative output gap (Panel 1). The resulting rise in real wages and marginal costs directly moderates the deflationary pressure created by the productivity shock (Panel 8 and 9). Simultaneously, the policy activates the misalignment channel by engineering an appreciation of the Home currency ($\hat{m}_t < 0$). In an LCP environment, this appreciation compresses the local-currency value of export revenues relative to domestic production costs. To restore profit margins, newly price setting exporters raise their prices, further alleviating the export price deflation (Panel 9). Consequently, both channels work in concert to generate the necessary upward price adjustments that monetary policy cannot achieve in isolation.

To isolate the specific contribution of the LCP price adjustment mechanism, we turn to the case of GHH preferences. Figure 5 serves as a critical robustness check: Do capital controls remain beneficial under TFP shocks when the wealth effect on labor supply is eliminated?

The results confirm our central hypothesis. Even with the elimination of Channel 1, optimal capital controls remain positive ($\hat{F}_t > 0$). The mechanism in this scenario relies exclusively on Channel 2. The induced capital inflows drive a Home currency appreciation (declining $\hat{m}_t$ in Panel 5). This decline in the currency misalignment triggers the markup adjustment channel: it lowers the home-currency revenue of exporters, forcing an upward adjustment in export prices to counteract the deflationary shock.

Interestingly, under this policy, relative PPI inflation (Panel 8) actually performs worse compared to the complete risk-sharing case, because the planner can no longer use the wealth effect to raise domestic marginal costs. However, the policy remains welfare improving overall because Channel 2 provides sufficient stabilization benefits for export price inflation (Panel 9). This highlights the unique role of capital controls under LCP: they act as a targeted instrument to alleviate export inflation arising from incomplete ERPT.

5.2 Demand Shocks

We now turn to demand shocks. Unlike the TFP shock, when there is no home bias as in our baseline case, the divine coincidence holds for demand shocks even under LCP, rendering

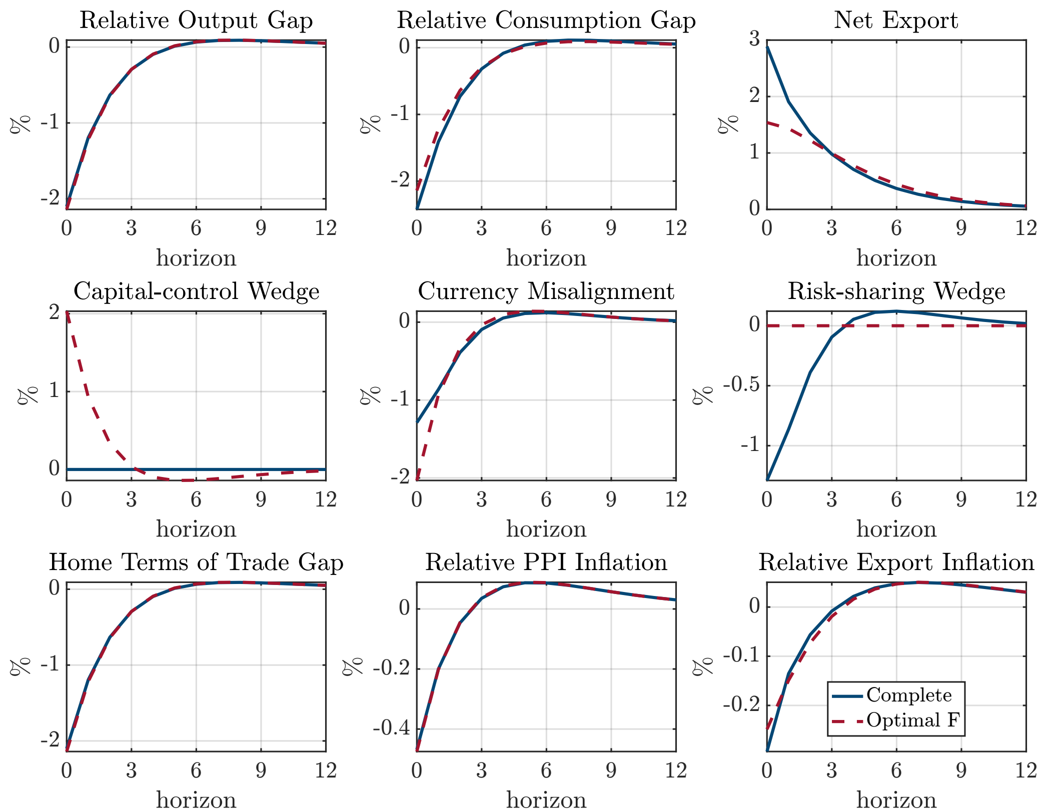


Figure 5: IRF to a positive TFP shock in Home (LCP, GHH Preference)

capital controls ineffective. Therefore, we focus our analysis on the case with a moderate degree of home bias ($\nu = 0.75$).

Figure 6 illustrates the impulse responses to a positive demand shock in Home under LCP with KPR preferences. The shock acts as a direct stimulus to the domestic economy, opening a positive output gap (Panel 1). The resulting excess demand drives up marginal costs, generating inflationary pressures: both domestic PPI inflation (Panel 8) and export price inflation (Panel 9) rise on impact.

Under complete markets (blue solid line), this surge in demand drives real interest rates higher, leading to a sharp appreciation of the Home currency (a negative currency misalignment in Panel 5). While this appreciation helps dampen domestic inflation, it simultaneously distorts export markups by compressing the local-currency revenue of exporters.

The optimal policy (red dashed line) intervenes by taxing capital inflows ($\hat{F}_t < 0$, Panel 4), effectively inducing a more negative net risk-sharing wedge (Panel 6). This intervention operates through two channels to cool the inflationary pressure. First, by suppressing relative consumption (Panel 2), the policy triggers a negative wealth effect. Under KPR

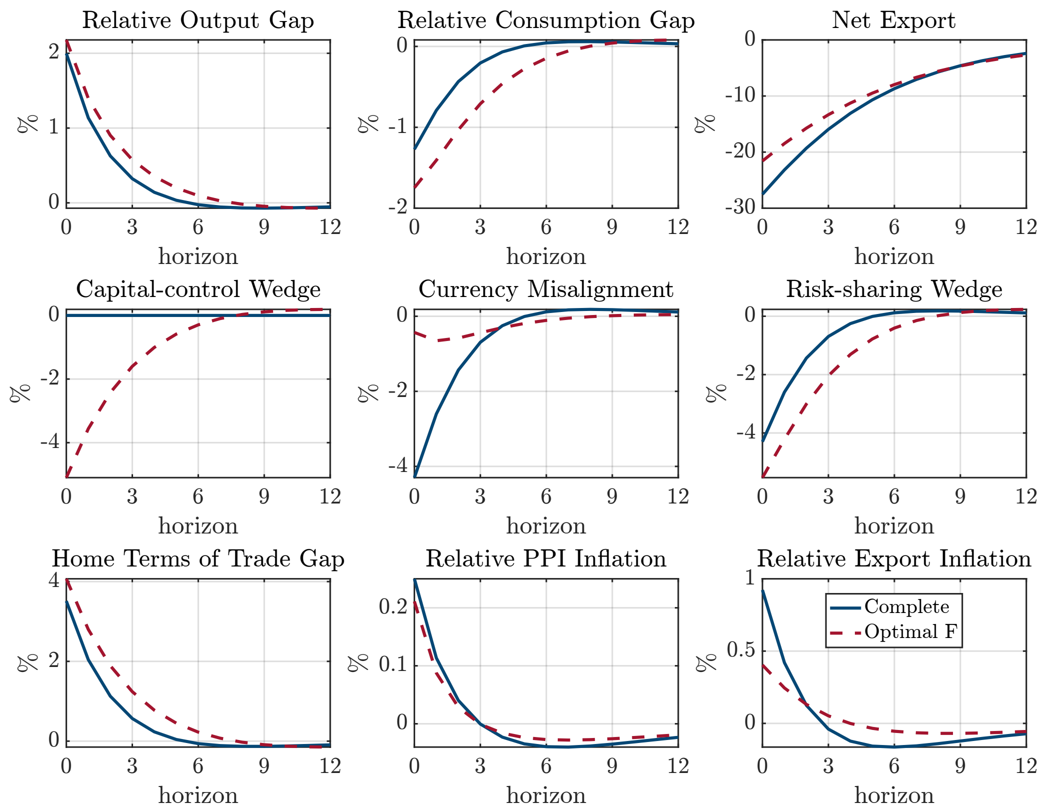


Figure 6: IRF to a Demand shock in Home (LCP)

preferences, this stimulates labor supply and lowers real wages, which directly helps stabilize relative PPI inflation (Panel 8) and relative export inflation (Panel 9). Second, the policy actively manages the exchange rate. By taxing inflows, the planner mitigates the sharp market-driven appreciation, effectively generating a relative depreciation compared to the complete markets benchmark. By moderating the appreciation, the policy prevents the sharp compression of export markups, thereby reducing the incentive for firms to increase the prices sharply upward and curbing export inflation (Panel 9).

To isolate the LCP price adjustment mechanism from the wealth effect, we examine the same positive demand shock under GHH preferences in Figure 7. Unlike the KPR case, where the economy overheats, the GHH economy exhibits a negative relative output gap (Panel 1) and deflationary pressure (Panels 8 and 9). This paradoxical result arises because the sticky-price economy "under-reacts" to the shock. While the demand shock sharply raises the efficient level of output (Y_t^{fb}), the sticky price equilibrium fails to keep pace.

Consequently, market forces generate a positive currency misalignment (Panel 5), corresponding to a sharp depreciation of the exchange rate. The optimal policy responds by subsidizing capital inflows ($\hat{F}_t > 0$, Panel 4). The planner intervenes to dampen the

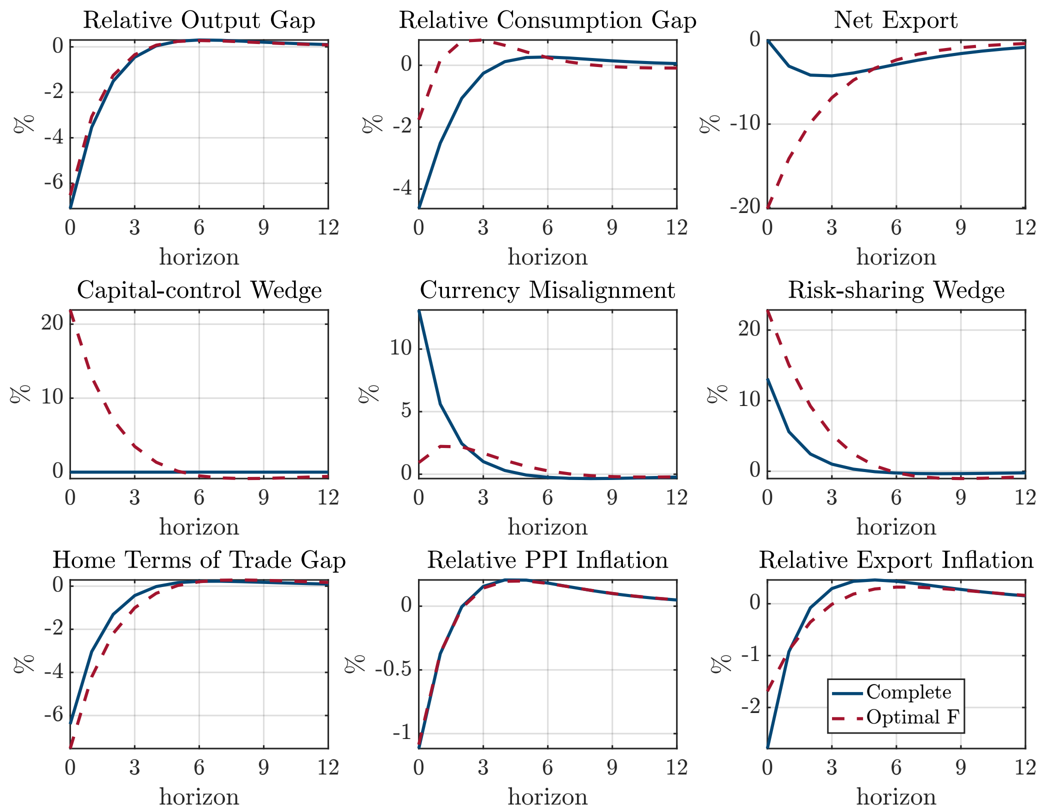


Figure 7: IRF to a Demand shock in Home (LCP, GHH Preference)

market-driven depreciation. In an LCP setting, this dampening of depreciation compresses the home-currency revenue of exporters (since their prices are sticky in foreign currency). To restore their compressed markups, price-resetting exporters raise their foreign-currency prices. This mechanism effectively counteracts the export deflation (Panel 9).

Thus, despite the sign reversal of the instrument, the underlying normative logic remains consistent. Whether the economy overheats (KPR) or under-reacts (GHH), the planner utilizes capital controls to manipulate the exchange rate to correct distortions in export pricing. Under GHH, this requires subsidizing inflows to lean against the excessive depreciation and generate the necessary inflationary pressure in the export sector.

6 Capital Flow Patterns: PCP versus LCP

Having established that LCP strengthens the welfare rationale for capital controls via a price-adjustment channel, we now address a complementary question: how does the invoicing regime shape the direction of optimal capital flows? Bengui and Coulibaly (2025) previously mapped these regimes for the PCP case. By performing the analogous mapping under LCP, we uncover a striking asymmetry: while present under PCP, the parameter region in which market-driven capital outflows are excessive vanishes entirely under LCP.

6.1 Characterizing Optimal Flow Regimes

We begin by benchmarking the capital flow regimes under PCP. Figure 8 shows the parameter space defined by home bias (ν) and trade elasticity (θ) following a markup shock. The analysis reveals three distinct regions based on the comparison between laissez-faire ($\hat{NX}_t^{\text{free}}$) and optimal policy allocations ($\hat{F}_t^{\text{managed}}$).

The red region depicts scenarios where free capital mobility results in a capital inflow toward the depressed economy ($\hat{NX}_t^{\text{free}} < 0$). Here, the optimal policy prescribes a capital outflow ($\hat{F}_t^{\text{managed}} < 0$) to mitigate inflationary pressures. The blue region captures combinations where free mobility generates an outflow ($\hat{NX}_t^{\text{free}} > 0$) from the depressed economy, yet the optimal policy calls for an even larger outflow ($\hat{F}_t^{\text{managed}} < 0$). Finally, the green region represents cases where the market generates excessive outflows ($\hat{NX}_t^{\text{free}} > 0$); consequently, the optimal policy restricts the magnitude of this outflow ($\hat{F}_t^{\text{managed}} > 0$) relative to the free market allocation.

A sharp dichotomy emerges when transitioning to Local Currency Pricing. As shown in the right panel of Figure 8, the green region—where market-driven outflows are excessive—disappears. Whereas significant portions of the parameter space under PCP require policy to moderate capital flight, LCP creates a uniform policy prescription: regardless of the direction of capital flow under free mobility regime, optimal policy under LCP consistently demands capital outflows (or reduced inflows) relative to the laissez-faire equilibrium.

Formally, while the marginal welfare effect of capital controls under PCP, $\frac{d\mathcal{L}_t^{PCP}}{d\hat{F}_t}|_{\hat{F}_t=0}$, may alternate signs depending on parameter values, the derivative under LCP, $\frac{d\mathcal{L}_t^{LCP}}{d\hat{F}_t}|_{\hat{F}_t=0}$, remains strictly negative across the entire calibrated space of home bias and trade elasticity.

6.2 Welfare Decomposition: The Vanishing Green Region

This divergence is best understood through a perturbation exercise. Starting from the allocation under optimal monetary policy and free capital mobility, we consider a small perturbation $d\hat{F}_t < 0$ (an induced outflow) at time t. Using the envelope theorem, the partial derivative of the quadratic welfare function with respect to the demand imbalance is:

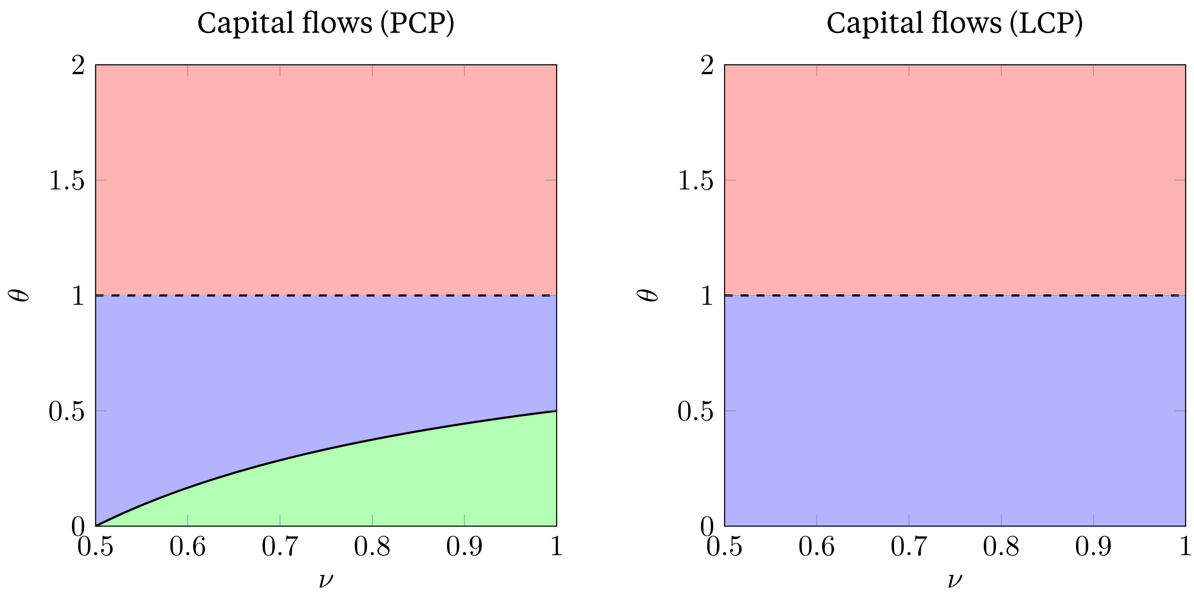


Figure 8: KPR, Markup Shock, Baseline Calibration

$$d\mathcal{L}_t^{PCP} = \frac{2\nu(1-\nu)\theta}{D}\left(\underbrace{1}_{\text{Wealth Effect}} - \underbrace{\frac{(2\nu-1)}{2\nu\theta}}_{\text{Purchasing Power Effect}}\right)\kappa\lambda_t^{ppi,R}d\hat{F}_t \tag{15}$$

where $\lambda_t^{ppi,R}$ is the Lagrange multiplier associated with the relative PPI NKPC (corresponding to $\frac{1}{\kappa}\tilde{y}_t^R < 0$). Under PCP with home bias, optimal capital controls must balance two competing effects:

1. **Wealth Effect:** Capital outflows reduce consumption in the shocked country, increasing labor supply and dampening inflationary pressures. This channel favors outflows.

2. **Purchasing Power Effect:** Outflows reduce the relative demand for Home goods (due to home bias), depreciating Home's terms of trade and increasing marginal costs in CPI terms. This channel opposes outflows.

The threshold determining the net effect is $\theta = \frac{2\nu-1}{2\nu}$. When θ falls below this threshold (the green region), the purchasing power effect dominates, rendering additional outflows welfare-reducing.

As we analyzed previously, under LCP, the system gains an additional channel that always favors outflows: the LCP price adjustment effects. Currency depreciation from outflows creates downward pressure on export prices through the $(-\hat{m}_t)$ term, providing anti inflationary benefits unavailable under PCP. Applying the same perturbation approach to the quadratic welfare function of LCP, the change in welfare from the marginal capital outflow can be represented as follows.

$$d\mathcal{L}_t^{LCP} = \left(-\frac{\theta\nu(1-\nu)}{D}\hat{m}_t + \kappa\frac{D-(2\nu-1)}{2D}\left(\lambda_t^{ppi,R} + \lambda_t^{export,R}\right) - \lambda_t^m - \kappa\lambda_t^{\Delta\hat{T}}\right) d\hat{F}_t \tag{16}$$

$\lambda_t^{ppi,R}$, and $\lambda_t^{export,R}$ are the Lagrange multipliers associated with relative PPI NKPC and relative export PPI NKPC, respectively. Likewise, λ_t^m, and $\lambda_t^{\Delta\hat{T}}$ are the Lagrange multipliers for currency misalignment dynamics equation, $\hat{m}_t = \frac{2\rho}{(2\nu-1)}\tilde{y}_t^R - \frac{D}{(2\nu-1)}\tilde{T}_t - \hat{F}_t$, and relative price dynamics equation, $\Delta\hat{T}_t = -\kappa\left(2\eta\tilde{y}_t^R + \tilde{T}_t + \hat{F}_t + 2\mu_t^R\right) + \beta\Delta\hat{T}_{t+1}$, respectively. Although the welfare change expression under LCP involves additional terms that make assessing the net effect of marginal capital outflow more complex, we concentrate on the three key components driving welfare—$\lambda_t^{ppi,R}$, $\lambda_t^{export,R}$, and λ_t^m—since the remaining terms are quantitatively insignificant.

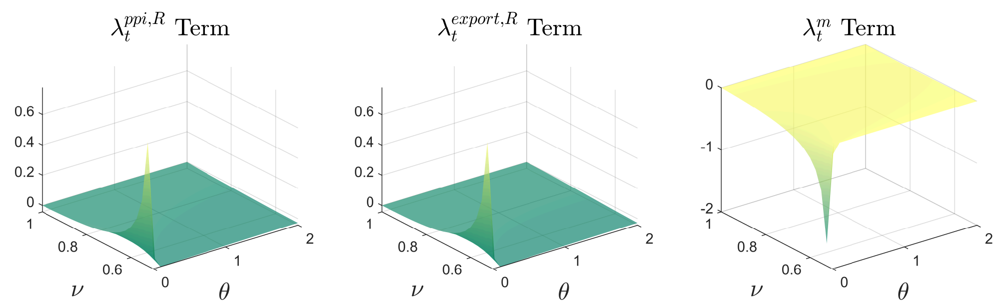


Figure 9: Welfare Effect of Marginal Capital Outflow (LCP)

Figure 9 displays how each term varies for the different combinations of home bias (ν) and trade elasticity (θ), keeping other parameters fixed at the benchmark level[4]. First and second panel denotes the value of $\kappa\frac{D-(2\nu-1)}{2D}\lambda_t^{ppi,R}$ and $\kappa\frac{D-(2\nu-1)}{2D}\lambda_t^{export,R}$ respectively. The last panel illustrates the value of $-\lambda_t^m$ for different parameterization. Lagrange multipliers are evaluated at the optimal policy allocation under free capital mobility. Technically, a positive value in each panel represents a channel through which a marginal capital outflow reduces welfare, while a negative value represents a channel through which a marginal capital outflow improves welfare.

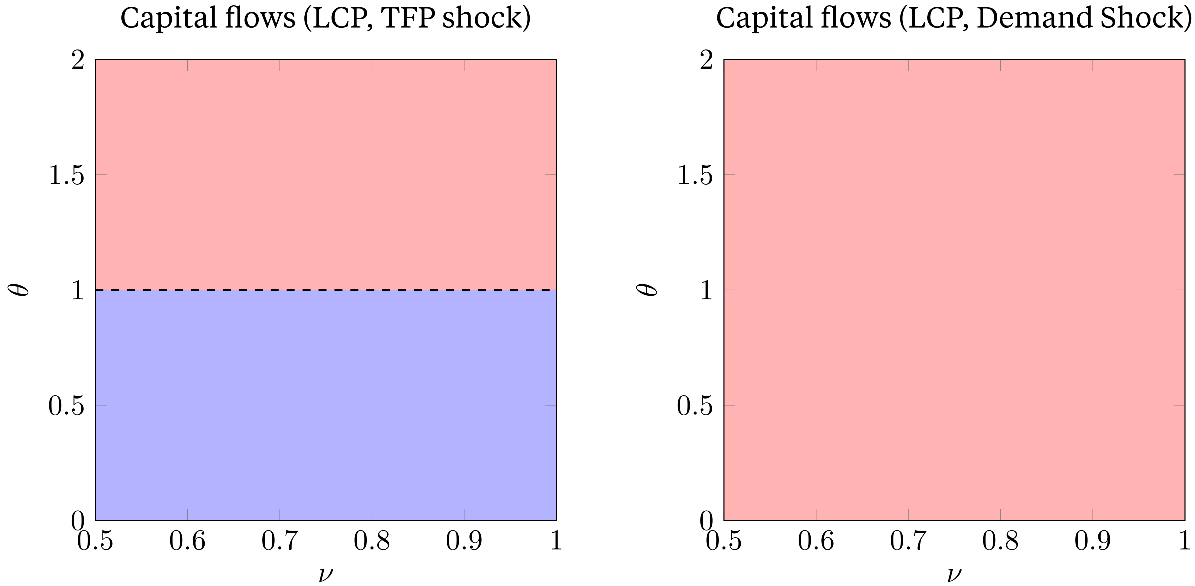
Analogous to the PCP, a marginal capital outflow affects welfare through inflation-relevant channels, represented by the composite term $\lambda_t^{ppi,R} + \lambda_t^{export,R}$ in equation (16). The key distinction is that, under LCP, the outflow mitigates fluctuations in both PPI and

[4]While the figure shows the result under benchmark parametrization, results are robust for the change in price stickiness (α), intratermporal substitutability of goods (σ) and labor supply elasticity (η).

export inflation, thereby introducing an additional welfare component $\lambda_t^{export,R}$. Since the coefficients on these terms $\left(= \kappa \frac{D-(2\nu-1)}{2D}\right)$ are exactly equivalent to the coefficient under PCP in equation (15), there exists a possibility that marginal capital outflow decreases household welfare by overwhelming purchasing power effect that dominates favorable wealth effect. The possibility manifests as positive spikes in panels 1 and 2 of figure (9), occurring for the parameter combinations represented by the green region in figure (8). However, the term $-\lambda_t^m$ rules out this possibility as observed by a large negative spike at the same parameter combination in panel 3. This component reflects a pre-described LCP-specific welfare gain, as a capital outflow ($d\hat{F}_t < 0$) leads to home currency depreciation, allowing relative inflation to be further stabilized through adjustments in firms' markups. This additional channel reinforces the wealth effect rather than competing with it. Even in parameter regions where the purchasing power effect under PCP might overwhelm the wealth effect and make outflows excessive, the LCP price adjustment channel provides independent justification for continued depreciation through capital flow management. The result is that LCP expands the parameter space where outflows are beneficial, eliminating scenarios where they become excessive.

The elimination of excessive outflow regions under LCP has important policy implications. LCP provides a more robust justification for capital outflows from countries experiencing inflationary pressures. Policymakers operating under LCP regimes need not worry about scenarios where intervention might exacerbate already excessive market-driven outflows—the price adjustment channel ensures that additional depreciation remains welfare-improving across the entire feasible parameter space.

Figure 10 presents the analogous analysis for TFP shock and demand shocks. Recall that positive TFP shocks create deflationary pressures, making capital inflows (rather than outflows) optimal to stimulate consumption and moderate deflation. For a positive demand shock, capital inflow occurs regardless of the trade elasticity parameter θ, and a rise in inflation makes capital outflow optimal. Despite the varying direction of capital flow under free mobility and a managed capital control regime, the pattern remains consistent: under LCP, green regions where free market capital inflows become excessive do not appear. Indeed, the LCP price adjustment channel provides additional stabilization benefits that eliminate scenarios of excessive capital flows regardless of their direction. This reinforces our central finding that LCP fundamentally broadens the welfare case for capital controls, making intervention robustly beneficial across diverse economic conditions and shock types.



Notes. Figure classifies the parameter region depending on the direction of capital flow under free mobility and managed capital flow regimes. For TFP shock, red region corresponds to $\hat{NX}_t^{\text{free}} > 0$ and $\hat{F}_t^{\text{managed}} > 0$. Blue region denotes the case under which $\hat{NX}_t^{\text{free}} < 0$ and $\hat{F}_t^{\text{managed}} > 0$. For demand shock, red region represent the case where $\hat{NX}_t^{\text{free}} < 0$ and $\hat{F}_t^{\text{managed}} < 0$.

Figure 10: KPR, Baseline Calibration

7 Conclusion

This paper establishes that the welfare case for capital controls is significantly more robust when firms invoice in local currency (LCP) than under the traditional Producer Currency Pricing (PCP) paradigm. While previous literature suggests that capital controls are useful primarily to manipulate labor supply through wealth effects, a rationale that disappears under GHH preferences or efficient shocks. We demonstrate that LCP introduces a distinct "price-adjustment channel." By influencing the exchange rate, capital controls can correct the currency misalignments and export markup distortions inherent to sticky local-currency prices. This mechanism operates independently of household preferences, allowing the planner to improve welfare by managing the wedge between domestic costs and foreign-currency prices.

Consequently, our findings challenge the view that capital flow management is only a second-best tool for specific inefficiencies. We show that under LCP, the divine coincidence breaks down even with efficient productivity or demand shocks, and optimal policy systematically uses capital controls to lean against exchange-rate-induced markup fluctuations. Whether effectively reversing market-driven flows or reinforcing them, the optimal policy leverages the exchange rate to stabilize export inflation. Ultimately, in a world characterized by incomplete pass-through and deviations from the law of one price, we provide a broader theoretical justification for the active management of cross-border financial flows.

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A Additional Figures

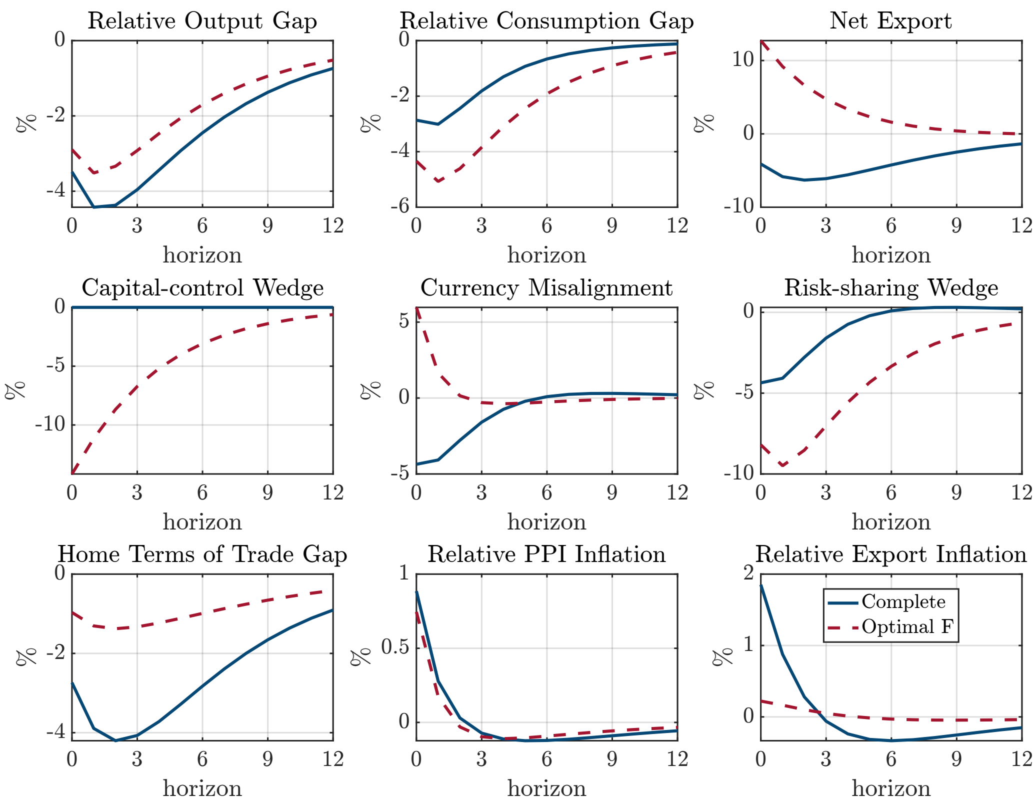

Figure A.1: IRF to an inflationary cost-push shock in Home (LCP, KPR Preference)

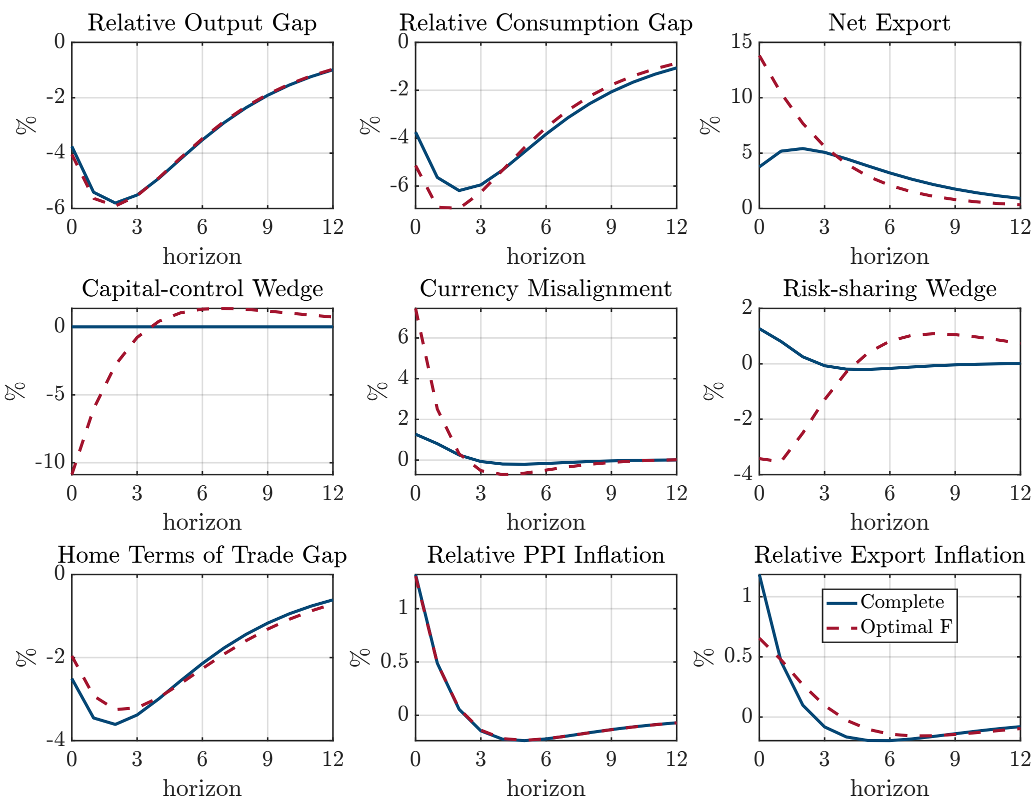

Figure A.2: IRF to an inflationary cost-push shock in Home (LCP, GHH Preference)

B Derivation of Analytical Results

This section presents solutions to the linear-quadratic optimal policy problem and provides formal proofs of the analytical results discussed in the main text. Subsection B.1 outlines four distinct policy problems, distinguished by their pricing regimes (PCP & LCP) and household preference (KPR & GHH). Subsequently, Subsection B.2 derives the proofs for the propositions presented in the main body of the paper, building upon the linear-quadratic framework established in Subsection B.1.

B.1 Linear-Quadratic Optimal Policy Problems

B.1.1 PCP-KPR Preference

A global policy maker solves the following Lagrangian problem

$$
\begin{aligned}
\mathcal{L}^{PCP} = & -\frac{1}{2}\sum_{t=0}^{\infty}\beta^t \left\{ (\rho+\eta)\left(\tilde{Y}_t^W\right)^2 + \left(\frac{\rho}{D}+\eta\right)\left(\tilde{Y}_t^R\right)^2 + \frac{\theta\nu(1-\nu)}{D}\hat{F}_t^2 + \frac{\sigma}{\kappa}\left[(\hat{\pi}_t^W)^2 + (\hat{\pi}_{ppi,t}^R)^2\right] \right. \\
& + \lambda_{1,t}\left(-\hat{\pi}_t^W + \kappa\left[(\rho+\eta)\tilde{Y}_t^W + \hat{\mu}_t^W\right] + \beta\hat{\pi}_{t+1}^W\right) \\
& \left. + \lambda_{2,t}\left(-\hat{\pi}_{ppi,t}^R + \kappa\left[\left(\frac{\rho}{D}+\eta\right)\tilde{Y}_t^R + \frac{D-(2\nu-1)}{2D}\hat{F}_t + \hat{\mu}_t^R\right] + \beta\hat{\pi}_{ppi,t+1}^R\right)\right\},
\end{aligned}
$$

We solve the above problem by choosing the eight endogenous variables $\{\tilde{Y}_t^W, \hat{\pi}_t^W, \tilde{Y}_t^R, \hat{\pi}_{ppi,t}^R, \hat{F}_t\}$:

$$
\begin{aligned}
(\tilde{Y}_t^W) &: -(\rho+\eta)\tilde{Y}_t^W + \kappa(\rho+\eta)\lambda_{1,t} = 0 \\
(\tilde{Y}_t^R) &: -(\tfrac{\rho}{D}+\eta)\tilde{Y}_t^R + \kappa(\tfrac{\rho}{D}+\eta)\lambda_{2,t} = 0 \\
(\hat{\pi}_t^W) &: -\tfrac{\sigma}{\kappa}\hat{\pi}_t^W - \lambda_{1,t} + \lambda_{1,t-1} = 0 \\
(\hat{\pi}_{ppi,t}^R) &: -\tfrac{\sigma}{\kappa}\hat{\pi}_{ppi,t}^R - \lambda_{2,t} + \lambda_{2,t-1} = 0 \\
(\hat{F}_t) &: -\tfrac{\theta\nu(1-\nu)}{D}\hat{F}_t + \kappa\tfrac{D-(2\nu-1)}{2D}\lambda_{2,t} = 0
\end{aligned}
$$

Then, optimal targeting rules for inflation and output gap are written as follows.

$$
\begin{aligned}
\hat{\pi}_t^W &= -\frac{1}{\sigma}\left(\tilde{Y}_t^W - \tilde{Y}_{t-1}^W\right) \\
\hat{\pi}_t^R &= -\frac{1}{\sigma}\left(\tilde{Y}_t^R - \tilde{Y}_{t-1}^R\right)
\end{aligned}
$$

Finally, optimal targeting rules for capital flow can be written as follows.

$$
\hat{F}_t = \frac{D-(2\nu-1)}{2\theta\nu(1-\nu)}\tilde{Y}_t^R
$$

$$= \left(1 - \frac{2\nu - 1}{2\theta\nu}\right) 2\tilde{Y}_t^R \ \text{(under } \rho = 1\text{)}$$

$$= 2\tilde{Y}_t^R \ \text{(under } \rho = 1 \text{ and } \nu = \frac{1}{2}\text{)}$$

B.1.2 LCP-KPR Preference

A global policy maker solves the following Lagrangian problem

$$
\begin{aligned}
\mathcal{L}^{LCP} = & -\frac{1}{2}\sum_{t=0}^{\infty}\beta^t \left\{(\rho+\eta)\left(\tilde{Y}_t^W\right)^2 + \left(\frac{\rho}{D}+\eta\right)\left(\tilde{Y}_t^R\right)^2 + \frac{\theta\nu(1-\nu)}{D}(\hat{m}_t+\hat{F}_t)^2\right. \\
& + \frac{\sigma}{\kappa}\left[\left(\hat{\pi}_t^W\right)^2 + \nu\left(\hat{\pi}_{ppi,t}^R\right)^2 + (1-\nu)\left(\hat{\pi}_{export,t}^R\right)^2\right] \\
& + \lambda_{1,t}\left(-\hat{\pi}_t^W + \kappa\left[(\rho+\eta)\tilde{Y}_t^W + \hat{\mu}_t^W\right] + \beta\hat{\pi}_{t+1}^W\right) \\
& + \lambda_{2,t}\left(-\hat{\pi}_{ppi,t}^R + \kappa\left[\left(\frac{\rho}{D}+\eta\right)\tilde{Y}_t^R + \frac{D-(2\nu-1)}{2D}(\hat{m}_t+\hat{F}_t) + \hat{\mu}_t^R\right] + \beta\hat{\pi}_{ppi,t+1}^R\right) \\
& + \lambda_{3,t}\left(-\hat{\pi}_{export,t}^R + \kappa\left[\left(\frac{\rho}{D}+\eta\right)\tilde{Y}_t^R + \frac{D-(2\nu-1)}{2D}(\hat{m}_t+\hat{F}_t) - \hat{m}_t + \hat{\mu}_t^R\right] + \beta\hat{\pi}_{export,t+1}^R\right) \\
& + \lambda_{4,t}\left(-\hat{m}_t + \frac{2\rho}{2\nu-1}\tilde{Y}_t^R - \frac{D}{(2\nu-1)}\tilde{T}_t - \hat{F}_t\right) \\
& \left. + \lambda_{5,t}\left(-\left(\hat{T}_t - \hat{T}_{t-1}\right) - \kappa\left(2\eta\tilde{Y}_t^R + \tilde{T}_t + \hat{F}_t + 2\mu_t^R\right) + \beta\left(\hat{T}_{t+1} - \hat{T}_t\right)\right)\right\}
\end{aligned}
$$

We solve the above problem by choosing the four endogenous variables $\{\tilde{Y}_t^W, \tilde{Y}_t^R, \hat{\pi}_t^W, \hat{\pi}_{ppi,t}^R, \hat{\pi}_{export,t}^R, \hat{m}_t, \hat{F}_t, \hat{T}_t\}$. The first-order conditions are as follows:

$$
\begin{aligned}
(\tilde{Y}_t^W) &: -(\rho+\eta)\tilde{Y}_t^W + \kappa(\rho+\eta)\lambda_{1,t} = 0 \\
(\tilde{Y}_t^R) &: -\left(\tfrac{\rho}{D}+\eta\right)\tilde{Y}_t^R + \kappa\left(\tfrac{\rho}{D}+\eta\right)\lambda_{2,t} + \kappa\left(\tfrac{\rho}{D}+\eta\right)\lambda_{3,t} + \tfrac{2\rho}{2\nu-1}\lambda_{4,t} - 2\kappa\eta\lambda_{5,t} = 0 \\
(\hat{\pi}_t^W) &: -\tfrac{\sigma}{\kappa}\hat{\pi}_t^W - \lambda_{1,t} + \lambda_{1,t-1} = 0 \\
(\hat{\pi}_{ppi,t}^R) &: -\tfrac{\sigma}{\kappa}\nu\hat{\pi}_{ppi,t}^R - \lambda_{2,t} + \lambda_{2,t-1} = 0 \\
(\hat{\pi}_{export,t}^R) &: -\tfrac{\sigma}{\kappa}(1-\nu)\hat{\pi}_{export,t}^R - \lambda_{3,t} + \lambda_{3,t-1} = 0 \\
(\hat{m}_t) &: -\tfrac{\theta\nu(1-\nu)}{D}\left(\hat{m}_t+\hat{F}_t\right) + \kappa\tfrac{D-(2\nu-1)}{2D}\lambda_{2,t} + \kappa\left(\tfrac{D-(2\nu-1)}{2D} - 1\right)\lambda_{3,t} - \lambda_{4,t} = 0 \\
(\hat{F}_t) &: -\tfrac{\theta\nu(1-\nu)}{D}\left(\hat{m}_t+\hat{F}_t\right) + \kappa\tfrac{D-(2\nu-1)}{2D}\lambda_{2,t} + \kappa\tfrac{D-(2\nu-1)}{2D}\lambda_{3,t} - \lambda_{4,t} - \kappa\lambda_{5,t} = 0 \\
(\hat{T}_t) &: -\tfrac{D}{2\nu-1}\lambda_{4,t} - (1+\kappa+\beta)\lambda_{5,t} + \beta\lambda_{5,t+1} + \lambda_{5,t-1} = 0
\end{aligned}
$$

Then, the optimal targeting rule for inflation and output gap under $\nu = 0.5$ are as follows:

$$
\begin{aligned}
\hat{\pi}_t^W &= -\frac{1}{\sigma}\left(\tilde{Y}_t^W - \tilde{Y}_{t-1}^W\right) \\
\Delta\tilde{Y}_t^R &= -\frac{\sigma}{2}\left(\hat{\pi}_{ppi,t}^R - \hat{\pi}_{export,t}^R\right) + \frac{\rho\sigma}{\kappa(\eta D+\rho)}\left(\Delta\hat{\pi}_{export,t}^R - \beta\Delta\hat{\pi}_{export,t+1}^R\right)
\end{aligned}
$$

B.1.3 PCP-GHH Preference

A global policy maker minimizes the following loss function

$$\mathcal{L}^{PCP} = -\frac{1}{2}\sum_{t=0}^{\infty}\beta^t \left\{ \eta\left(\tilde{Y}_t^W\right)^2 + \eta\left(\tilde{Y}_t^R\right)^2 \right.$$
$$\left. +\theta\nu(1-\nu)\tilde{T}_t^2 + \frac{\eta}{4\rho(1+\eta)}[(2\nu-1)\tilde{T}_t + \hat{F}_t]^2 + \frac{\sigma}{\kappa}\left[(\hat{\pi}_t^W)^2 + (\hat{\pi}_{ppi,t}^R)^2\right] \right\},$$

subject to the following equations with the associated Lagrangian multipliers:

$$(\lambda_{1t}) \, : \hat{\pi}_{ppi,t}^R = \kappa\left[\eta\tilde{Y}_t^R + (1-\nu)\hat{T}_t + \hat{\mu}_t^R\right] + \beta\hat{\pi}_{ppi,t+1}^R$$

$$(\lambda_{2t}) \, : \hat{\pi}_t^W = \kappa\left[\eta\tilde{Y}_t^W + \hat{\mu}_t^W\right] + \beta\hat{\pi}_{t+1}^W$$

$$(\lambda_{3t}) \, : \hat{Y}_t^R = \tfrac{D}{4\rho(1+\eta)(1-\nu)}\hat{T}_t + \tfrac{(2\nu-1)\eta}{4\rho(1+\eta)(1-\nu)}\hat{F}_t - \tfrac{2\nu-1}{2(1-\nu)}\hat{A}_t^R$$

where $D \equiv \eta(2\nu-1)^2 + 4(1+\eta)\rho\theta\nu(1-\nu)$.

We solve the above problem by choosing the six endogenous variables $\{\hat{Y}_t^W, \hat{\pi}_t^W, \hat{Y}_t^R, \hat{\pi}_{ppi,t}^R, \hat{T}_t, \hat{F}_t\}$. The first-order conditions are as follows:

$$(\hat{Y}_t^W) \, : \kappa\lambda_{2t} = -\tilde{Y}_t^W$$

$$(\hat{\pi}_t^W) \, : \lambda_{2t} - \lambda_{2t-1} = \tfrac{\sigma}{\kappa}\hat{\pi}_t^W$$

$$(\hat{Y}_t^R) \, : -\kappa\eta\lambda_{1t} + \lambda_{3t} = \eta\tilde{Y}_t^R$$

$$(\hat{\pi}_{ppi,t}^R) \, : \lambda_{1t} - \lambda_{1t-1} = \tfrac{\sigma}{\kappa}\hat{\pi}_t^R$$

$$(\hat{T}_t) \, : -\kappa(1-\nu)\lambda_{1t} - \tfrac{D}{4\rho(1+\eta)(1-\nu)}\lambda_{3t} = \theta\nu(1-\nu)\hat{T}_t + \tfrac{\eta(2\nu-1)}{4\rho(1+\eta)}[(2\nu-1)\hat{T}_t + \hat{F}_t]$$

$$(\hat{F}_t) \, : -\tfrac{(2\nu-1)\eta}{4\rho(1+\eta)(1-\nu)}\lambda_{3t} = \tfrac{\eta}{4\rho(1+\eta)}[(2\nu-1)\hat{T}_t + \hat{F}_t]$$

B.1.4 LCP-GHH Preference

A global policy maker minimizes the following loss function

$$\mathcal{L}^{LCP} = -\frac{1}{2}\sum_{t=0}^{\infty}\beta^t\left\{\eta\left(\tilde{Y}_t^W\right)^2 + \eta\left(\tilde{Y}_t^R\right)^2\right.$$
$$+\theta\nu(1-\nu)\tilde{T}_t^2 + \frac{\eta}{4\rho(1+\eta)}[(2\nu-1)\tilde{T}_t + \hat{m}_t + \hat{F}_t]^2$$
$$\left.+\frac{\sigma}{2\kappa}\left[\nu(\hat{\pi}_{H,t})^2 + (1-\nu)(\hat{\pi}^*_{H,t})^2 + \nu(\hat{\pi}^*_{F,t})^2 + (1-\nu)(\hat{\pi}_{F,t})^2\right]\right\},$$

subject to the following equations with the associated Lagrangian multipliers:

(λ_{1t}) : $\hat{\pi}_{H,t} = \beta\,\hat{\pi}_{H,t+1} + \kappa\Big\{\eta\,\tilde{Y}_{H,t} + (1-\nu)\,\tilde{T}_t + \hat{\mu}_{H,t}\Big\}$

(λ_{2t}) : $\hat{\pi}^*_{H,t} = \beta\,\hat{\pi}^*_{H,t+1} + \kappa\Big\{\eta\,\tilde{Y}_{H,t} + (1-\nu)\,\tilde{T}_t - \hat{m}_t + \hat{\mu}_{H,t}\Big\}$

(λ_{3t}) : $\hat{\pi}^*_{F,t} = \beta\,\hat{\pi}^*_{F,t+1} + \kappa\Big\{\eta\,\tilde{Y}_{F,t} - (1-\nu)\,\tilde{T}_t + \hat{\mu}_{F,t}\Big\}$

(λ_{4t}) : $\hat{\pi}_{F,t} = \beta\,\hat{\pi}_{F,t+1} + \kappa\Big\{\eta\,\tilde{Y}_{F,t} - (1-\nu)\,\tilde{T}_t + \hat{m}_t + \hat{\mu}_{F,t}\Big\}$

(λ_{7t}) : $\hat{Y}_t^R = \frac{D}{4\rho(1+\eta)(1-\nu)}\hat{T}_t + \frac{(2\nu-1)\eta}{4\rho(1+\eta)(1-\nu)}(\hat{m}_t + \hat{F}_t) - \frac{2\nu-1}{2(1-\nu)}\hat{A}_t^R$

(λ_{8t}) : $\hat{T}_t - \hat{T}_{t-1} = \hat{\pi}_{F,t} - \hat{\pi}_{H,t}$

where $D \equiv \eta(2\nu-1)^2 + 4(1+\eta)\rho\theta\nu(1-\nu)$.

We solve the above problem by choosing the eight endogenous variables $\{\hat{Y}_{H,t}, \hat{Y}_{F,t}, \hat{\pi}_{H,t}, \hat{\pi}^*_{H,t}, \hat{\pi}^*_{F,t}, \hat{\pi}_{F,t}, \hat{T}_t, \hat{m}_t\}$, and three policy instruments $\{\hat{R}_t, \hat{R}^*_t, \hat{F}_t\}$. The first-order conditions are as follows:

$(\hat{Y}_{H,t})$: $\kappa\eta(\lambda_{1t} + \lambda_{2t}) - \frac{1}{2}\lambda_{5t} = -\frac{1}{2}\eta\tilde{Y}_{H,t}$

$(\hat{Y}_{F,t})$: $\kappa\eta(\lambda_{3t} + \lambda_{4t}) + \frac{1}{2}\lambda_{5t} = -\frac{1}{2}\eta\tilde{Y}_{F,t}$

$(\hat{\pi}_{H,t})$: $\lambda_{1t} - \lambda_{1t-1} + \lambda_{6t} = \frac{\nu\sigma}{2\kappa}\hat{\pi}_{H,t}$

$(\hat{\pi}^*_{H,t})$: $\lambda_{2t} - \lambda_{2t-1} = \frac{(1-\nu)\sigma}{2\kappa}\hat{\pi}^*_{H,t}$

$(\hat{\pi}^*_{F,t})$: $\lambda_{3t} - \lambda_{3t-1} = \frac{\nu\sigma}{2\kappa}\hat{\pi}^*_{F,t}$

$(\hat{\pi}_{F,t})$: $\lambda_{4t} - \lambda_{4t-1} - \lambda_{6t} = \frac{(1-\nu)\sigma}{2\kappa}\hat{\pi}_{F,t}$

$(\hat{T}_t)$: $-\kappa(1-\nu)(\lambda_{1t}+\lambda_{2t}-\lambda_{3t}-\lambda_{4t}) - \frac{D}{4\rho(1+\eta)(1-\nu)}\lambda_{5t} + \lambda_{6t} - \frac{1}{\beta}\lambda_{6t-1} = \theta\nu(1-\nu)\tilde{T}_t + \frac{\eta(2\nu-1)}{4\rho(1+\eta)}[(2\nu-1)\tilde{T}_t + \hat{m}_t + \hat{F}_t]$

$(\hat{m}_t)$: $\kappa(\lambda_{2t} - \lambda_{4t}) - \frac{(2\nu-1)\eta}{4\rho(1+\eta)(1-\nu)}\lambda_{5t} = \frac{\eta}{4\rho(1+\eta)}[(2\nu-1)\tilde{T}_t + \hat{m}_t + \hat{F}_t]$

$(\hat{F}_t)$: $-\frac{(2\nu-1)\eta}{4\rho(1+\eta)(1-\nu)}\lambda_{5t} = \frac{\eta}{4\rho(1+\eta)}[(2\nu-1)\tilde{T}_t + \hat{m}_t + \hat{F}_t]$

B.2 Analytical Proof of Propositions

B.2.1 Proposition 1

Recall the first order conditions with respect to $\tilde{Y}_t^R$, $\hat{F}_t$ described in section B.1.1:

$$\tilde{Y}_t^R = \kappa\lambda_{2,t}$$
$$\frac{\theta\nu(1-\nu)}{D}\hat{F}_t = \kappa\frac{D-(2\nu-1)}{2D}\lambda_{2,t}$$

By jointly solving the system of equations above and rearranging the terms, we can derive the relationship between $\hat{F}$ and $\tilde{Y}^R$ as follows:

$$\hat{F}_t = \frac{D-(2\nu-1)}{2\theta\nu(1-\nu)}\tilde{Y}_t^R.$$

B.2.2 Proposition 2

We show how to derive the optimal capital control rule under GHH preference and the PCP regime, and prove that the optimal capital control under no home bias is to maintain zero demand imbalance.

Recall the first order conditions with respect to $\{\hat{Y}_t^R, \hat{T}_t, \hat{F}_t\}$ described in section B.1.3:

$$-\kappa\eta\lambda_{1t} + \lambda_{3t} = \eta\tilde{Y}_t^R \tag{17}$$
$$-\kappa(1-\nu)\lambda_{1t} - \frac{D}{4\rho(1+\eta)(1-\nu)}\lambda_{3t} = \theta\nu(1-\nu)\tilde{T}_t + \frac{\eta(2\nu-1)}{4\rho(1+\eta)}[(2\nu-1)\tilde{T}_t + \hat{F}_t] \tag{18}$$
$$-\frac{(2\nu-1)\eta}{4\rho(1+\eta)(1-\nu)}\lambda_{3t} = \frac{\eta}{4\rho(1+\eta)}[(2\nu-1)\tilde{T}_t + \hat{F}_t] \tag{19}$$

To obtain the optimal capital control rule, we start by substituting equation (19) into (18) as below:

$$-\kappa(1-\nu)\lambda_{1t} + \frac{D}{2\nu-1}\frac{1}{4\rho(1+\eta)}[(2\nu-1)\tilde{T}_t + \hat{F}_t] = \theta\nu(1-\nu)\tilde{T}_t + \frac{\eta(2\nu-1)}{4\rho(1+\eta)}[(2\nu-1)\tilde{T}_t + \hat{F}_t]$$
$$\Rightarrow \qquad \theta\nu\hat{F}_t = \kappa(2\nu-1)\lambda_{1t} \tag{20}$$

Then, substitute equation (17) into (19) as follows:

$$-\frac{\eta^2(2\nu-1)}{4(1+\eta)\rho(1-\nu)}\tilde{Y}_t^R - \frac{\kappa\eta^2(2\nu-1)}{4(1+\eta)\rho(1-\nu)}\lambda_{1t} = \frac{\eta}{4\rho(1+\eta)}[(2\nu-1)\tilde{T}_t + \hat{F}_t]$$
$$\Rightarrow \qquad -\eta(2\nu-1)\tilde{Y}_t^R - \kappa\eta(2\nu-1)\lambda_{1t} = (1-\nu)[(2\nu-1)\tilde{T}_t + \hat{F}_t]. \tag{21}$$

Lastly, jointly solving equations (20) and (21), we can derive the relationship between $\hat{F}$, $\tilde{Y}^R$, and $\hat{T}_t$ as follows:

$$\hat{F}_t = -(2\nu - 1)\left[\frac{\eta}{1+(\eta\theta-1)\nu}\tilde{Y}_t^R + \frac{1-\nu}{1+(\eta\theta-1)\nu}\tilde{T}_t\right].$$

Therefore, $\hat{F}_t = 0$ when there exists no home bias ($\nu = 0.5$).

B.2.3 Proposition 3

We assume $\nu = 0.5$. Subtracting the first order condition of $\hat{F}_t$ from that of $\hat{m}_t$ leads to $\lambda_{3,t} = -\lambda_{5,t}$. Then, the first order condition with respect to $\hat{F}_t$ can be written in difference form as follows.

$$-\frac{1}{4\rho}\left(\Delta\hat{m}_t + \Delta\hat{F}_t\right) + \kappa\frac{1}{2}\Delta\lambda_{2,t} - \kappa\frac{1}{2}\Delta\lambda_{3,t} = 0$$

Using the optimality conditions with respect to $\hat{\pi}^R_{ppi,t}$ and $\hat{\pi}^R_{export,t}$, above optimality condition can be rewritten as

$$-\frac{1}{4\rho}\left(\Delta\hat{m}_t + \Delta\hat{F}_t\right) + \kappa\frac{1}{2}\left(-\frac{1}{2}\frac{\sigma}{\kappa}\hat{\pi}^R_{ppi,t}\right) - \kappa\frac{1}{2}\left(-\frac{1}{2}\frac{\sigma}{\kappa}\hat{\pi}^R_{export,t}\right) = 0$$

Rearranging terms concludes the proof.

$$\Delta\hat{m}_t + \Delta\hat{F}_t = -\sigma\hat{\pi}^R_{ppi,t} + \sigma\hat{\pi}^R_{export,t}$$

B.2.4 Proposition 4

We show how to derive the optimal capital control rule under GHH preference and the LCP regime, and prove that the optimal capital control under no home bias is to control capital one-to-one to the inverse of the currency misalignment.

Recall the first order conditions with respect to $\{\hat{Y}_{H,t}, \hat{Y}_{F,t}, \hat{\pi}_{H,t}, \hat{\pi}^*_{H,t}, \hat{\pi}^*_{F,t}, \hat{\pi}_{F,t}, \hat{m}_t, \hat{F}_t\}$ described in section B.1.4:

$$\kappa\eta(\lambda_{1t} + \lambda_{2t}) - \frac{1}{2}\lambda_{5t} = -\frac{1}{2}\eta\tilde{Y}_{H,t} \tag{22}$$

$$\kappa\eta(\lambda_{3t} + \lambda_{4t}) + \frac{1}{2}\lambda_{5t} = -\frac{1}{2}\eta\tilde{Y}_{F,t} \tag{23}$$

$$\lambda_{1t} - \lambda_{1t-1} + \lambda_{6t} = \frac{\nu\sigma}{2\kappa}\hat{\pi}_{H,t} \tag{24}$$

$$\lambda_{2t} - \lambda_{2t-1} = \frac{(1-\nu)\sigma}{2\kappa}\hat{\pi}^*_{H,t} \tag{25}$$

$$\lambda_{3t} - \lambda_{3t-1} = \frac{\nu\sigma}{2\kappa}\hat{\pi}^*_{F,t} \tag{26}$$

$$\lambda_{4t} - \lambda_{4t-1} - \lambda_{6t} = \frac{(1-\nu)\sigma}{2\kappa}\hat{\pi}_{F,t} \tag{27}$$

$$\kappa(\lambda_{2t} - \lambda_{4t}) - \frac{(2\nu-1)\eta}{4\rho(1+\eta)(1-\nu)}\lambda_{5t} = \frac{\eta}{4\rho(1+\eta)}[(2\nu-1)\tilde{T}_t + \hat{m}_t + \hat{F}_t] \tag{28}$$

$$-\frac{(2\nu-1)\eta}{4\rho(1+\eta)(1-\nu)}\lambda_{5t} = \frac{\eta}{4\rho(1+\eta)}[(2\nu-1)\tilde{T}_t + \hat{m}_t + \hat{F}_t] \tag{29}$$

Jointly solving the system of equations, we can derive the following rule:

$$\Delta\hat{F}_t = -\Delta\hat{m}_t - \frac{\eta(2\nu-1)}{1-\nu}\Delta\tilde{Y}_t^R - (2\nu-1)\Delta\tilde{T}_t - \frac{\eta\sigma(2\nu-1)}{2(1-\nu)}\hat{\pi}_{CPI,t}^R$$