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Openness, Integration, and the International Monetary Order

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Abstract

This paper develops a calibrated general-equilibrium model to study how different configurations of trade and financial policy reshape the hierarchy of global currencies — and the U.S. dollar's position at its anchor. Currency safety and anchor status arise endogenously from each economy's 'effective size' — the weight its domestic shocks carry in setting world prices. Tariffs reduce this effective size on the goods side; capital controls do the same on the financial side. A unifying result emerges: The economy that maintains the deepest integration with the global trading network retains the largest safety premium and gains anchor status. We use this framework to evaluate the effects of three policy levers for Europe that affect the effective size of the euro: internal harmonization and enlargement, trade openness, and capital-account openness. The stakes are large: In our model, shifts in currencies' safety can redirect global capital flows and alter sovereign borrowing costs by hundreds of billions of dollars annually.

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1 Introduction

The U.S. dollar's role as the world's anchor currency, settled since the end of World War II, has recently come into question (Rogoff, 2025). A resurgence of economic nationalism has exposed a possible fragility of the dollar's global role: the tariff announcements by the United States in April 2025 coincided with market dynamics that are difficult to reconcile with the conventional view of the dollar as a safe haven currency — the dollar depreciated markedly even as indicators of global stress spiked, U.S. interest rates rose, and stock prices fell sharply (Jiang et al., 2025). These developments highlight a need to better understand the economic forces underpinning the dollar's role as the linchpin of global finance, and the extent to which that role may be reshaped by trade and other policies.

This paper develops a quantitative framework for studying these forces and applies it to the policy tools available to Europe. Our central question is how different choices over European integration, trade, and capital-account openness reshape the international monetary system. Under what conditions would the euro emerge as the world's anchor currency?

We build directly on our recent work (Hassan, Mertens, and Zhang, 2023; Hassan et al., 2025), which develops a quantitative, risk-based theory of currency safety and exchange-rate stabilization. In that framework, the dollar's safe-haven status, low interest rates, and anchor role emerge endogenously.

Currency safety arises because shocks to large, systemically important economies (such as the U.S. and EU) spill over into world prices, causing their currencies to appreciate in global "bad times." This mechanism generates persistent interest-rate differentials, differences in firm valuations, and incentives for smaller countries to stabilize their exchange rates against the safest currency.

Countries' trade and financial policies affect this equilibrium by altering the degree to which a country's shocks transmit to the global economy. For example, tariffs that isolate a country from world trade weaken the link between that country's domestic shocks and global prices, eroding the safety premium of that country's currency. Capital controls do the same on the financial side, by preventing cross-border risk-sharing through asset trade. When safety premiums shift, so do the optimal exchange-rate regimes chosen by small and medium-sized economies, and with them the identity of the anchor currency.

We organize the analysis around three policy levers Europe can deploy to expand the effective size of the euro: internal harmonization and enlargement, trade openness, and capital-account openness.

First, reforms that deepen economic integration across EU member states or expand the geographic scope of the currency union and the EU mechanically raise the euro's effective size and lower the tariff threshold at which the euro displaces the dollar as the world's anchor. Under our calibration, this threshold falls from approximately 26% at current eurozone membership to roughly 6% if the eurozone were to deeply integrate with the remaining EU members and associated European countries. That is, our calibrations suggest that under current U.S. trade policies – with average tariffs close to 12% – a unified Europe could rival the dollar.

The second lever is maintaining trade openness. Our analysis suggests potentially high returns from maintaining free trade even in the face of rising economic nationalism. Expanding free trade between Europe and the world lowers the cost of capital of European firms, enables European governments to borrow more cheaply, and makes the euro a safer and more attractive anchor currency.

By contrast, we find that a transatlantic bloc between the U.S. and EU with a common external tariff erodes the openness premium of both the dollar and the euro and leaves the door open for a third currency to capture the center of the international monetary system. At the other extreme, if the United States and China both withdraw from the global trading network, Europe emerges as the largest economy that remains broadly integrated, and the euro becomes the dominant anchor currency by default.

The third lever is capital-account openness. We show formally that, in our model, severe capital controls are the key factor diminishing the renminbi's international standing. The economics mirrors the trade case: cross-border movements of stocks and bonds are what finance the cross-border movements of traded goods through which a country's shocks transmit to world prices, so restricting domestic residents from holding foreign securities — and foreigners from holding domestic ones — mechanically severs that transmission and erodes the safety premium of the issuing country's currency. China's tightly controlled capital account thus plays, on the financial side, the role tariffs play on the goods side, effectively removing the renminbi as a contender for the world's anchor currency.

If China were to liberalize its capital account, the contest for anchor status would, according to our model, become a three-way race in which the renminbi could displace either the dollar or the euro, depending on the prevailing trade configuration. By a symmetric logic, the euro's own capital-market depth—in particular, the supply of common safe assets such as joint eurozone debt—determines whether the euro can in fact serve as a target for stabilization even when it is the safest currency on offer.

Across the three levers, a clear pattern emerges: the economy that maintains the deepest ties to global trade and financial markets minimizes its currency risk, maximizes its capital stock, and attracts the world's stabilizers. We quantify the fiscal implications of these shifts and find that they are large. For instance, the loss of safe haven status can raise U.S. annual debt-servicing costs by hundreds of billions of dollars, while conferring comparable savings on the economy that inherits the safe haven and anchor roles.

Our paper builds on Hassan, Mertens, and Zhang (2023), which established the safety-premium logic of the dollar anchor under free trade, and Hassan et al. (2025), which showed how unilateral U.S. tariffs erode that premium. We extend these models by introducing a monetary shock to meaningfully differentiate between the size of the EU vs. the eurozone; by formally introducing capital controls, which brings the renminbi explicitly into the analysis; and by analyzing a set of European policy options, allowing for a multipolar contest among the dollar, the euro, and the renminbi.

More broadly, we contribute to the literature studying the U.S. dollar's role in the world economy. Our focus is on the dollar's role as a safe-haven and anchor currency, an approach that builds on a growing literature linking persistent differences in interest rates, currency returns, and capital intensity across countries to differences in the stochastic properties of their currencies (Lustig and Verdelhan, 2007; Hassan, 2013; Hassan et al., 2019; Richmond, 2019; Hassan, Mertens, and Wang, 2024). Other authors have focused instead on the size of the American sovereign debt market (Farhi and Maggiori, 2018; He and Krishnamurthy, 2019), the dollar's emergence as the dominant currency in trade finance (Chahrour and Valchev, 2022), cross-border payments infrastructure (Bahaj and Reis, 2026), the level of financial development (Maggiori, 2017), the dollar's use as invoicing currency (Gopinath and Stein, 2021), and the geopolitical alliances that backstop its reserve role (Eichengreen, Mehl, and Chiţu, 2019). Although the literature to-date lacks a unifying framework connecting these different features of dollar dominance, we might view the dollar's status as a safe-haven currency as somewhat foundational to each of these types of dominance, suggesting that a loss of safe-haven status may also damage these other pillars of the dollar's dominance.[1]

Our model has the structure of a standard international business cycle model with fluctuating exchange rates (Stockman and Tesar, 1995). We introduce market segmentation along the lines of Alvarez, Atkeson, and Kehoe (2002), Gabaix and Maggiori (2015), and Fanelli and Straub (2021), and use differences in country size as a source of heterogeneity in the stochastic properties of countries' exchange rates (Hassan, 2013; Martin, 2013).

We also relate to the literatures on the economic effects of trade and capital controls. The classical optimal-tariff literature, going back to Johnson (1953) and Bagwell and Staiger (1999), studies the design of trade policy under various national-welfare and strategic objectives, with terms-of-trade

[1]In this sense, we echo results in Obstfeld and Rogoff (2000) that already point to an interdependence between free trade and the dollar's exorbitant privilege. See also Rogoff (2025) for a broader discussion of the dollar's evolving role, and Arvai and Coimbra (2024) and Chahrour and Valchev (2024) for recent analyses of whether dollar dominance may be waning.

manipulation as its central motive.[2] The capital-controls literature similarly treats restrictions on cross-border financial flows as optimal-policy instruments: as Pigouvian taxes correcting pecuniary externalities (Bianchi, 2011; Schmitt-Grohé and Uribe, 2017; Korinek, 2018), as tools for dynamic terms-of-trade manipulation (Costinot, Lorenzoni, and Werning, 2014), as macroprudential levers under nominal rigidities (Farhi and Gabaix, 2016), or as instruments for real-exchange-rate undervaluation (Jeanne, 2013). Neither studies the channel we highlight here, by which both tariffs and capital controls reshape currency safety premia and, with them, the equilibrium structure of the international monetary system. Closely related to our own work, Chahrour and Valchev (2024) study the effects of economic nationalism on the dollar's status as the dominant currency in trade finance, while Kalemli-Özcan, Soylu, and Yildirim (2026) study the effect of tariff uncertainty on the dollar through risk premia.

Finally, we add to the aforementioned literature on currency risk and safety by developing a quantitatively viable model of the world's exchange rate arrangements, taking it to the data, and studying the interaction between the choice of anchor currency and economic nationalism.[3]

The remainder of this paper is organized as follows. Section 2 outlines the general equilibrium framework and its calibration. Section 3 examines the three policy levers — internal harmonization and enlargement (Section 3.1), trade openness (Section 3.2), and capital-account openness (Section 3.3) — through which Europe can expand the effective size of the euro. Section 4 concludes.

[2] See our companion paper Hassan et al. (2025) for a detailed discussion of how our framework relates to the recent literature spurred by the U.S. tariff announcements of 2025.

[3] In this sense, we also relate to a large literature that studies the effects of exchange rate stabilizations in two-country business cycle models (e.g., Kollmann, 2002; Kollmann, 2004; Devereux and Engel, 2003; Fornaro, 2015; Bacchetta and van Wincoop, 2000; Corsetti, Dedola, and Leduc, 2010). One branch of this literature argues that stabilizations may promote bilateral trade or serve to import monetary policy credibility (Hooper and Kohlhagen, 1978; Kenen and Rodrik, 1986; Frankel and Rose, 2002). More closely related, Fanelli and Straub (2021) and Gabaix and Maggiori (2015) argue that real exchange rate interventions can alter the distribution of wealth across agents under segmented markets. For an empirical evaluation of the effects of exchange rate stabilizations, see Mertens and Shultz (2017) and Fukui, Nakamura, and Steinsson (2025). Our work complements these other approaches in that the effect of currency stabilization on risk premia may operate in parallel to all of these other mechanisms.

2 A Model of the International Monetary Order

In this section, we outline the general equilibrium framework used to analyze the relationship between trade integration, currency safety, and the structure of the international monetary system. We build directly on the framework developed by Hassan, Mertens, and Zhang (2023) and Hassan et al. (2025). We first describe the equilibrium under free trade, where economic size determines currency safety. From that, we derive the effects of exchange rate stabilization and anchor status.[4]

The world economy exists in two discrete time periods, $t = 1, 2$. A unit measure of households $i \in [0, 1]$ is partitioned into N countries of measure θ^n, where each partition represents the constituent households of a country. We calibrate the sizes of different partitions to match the shares that various countries contribute to world GDP and label them accordingly. These include the United States, the eurozone, China, and a continuum of small economies that together account for the remaining mass. Households make investment decisions in the first period, and consumption occurs in the second period.

Consumers and Financiers. Within each country, households differ in their access to financial markets. A fraction ψ of households act as *financiers*: they own and control a domestic financial intermediary that trades equities and bonds in international markets. The remaining fraction $1 - \psi$ are *consumers*: they hold no risky assets, and their only financial instrument is a country-specific nominal bond issued by the domestic intermediary. We use a hat to denote consumer-household quantities and unadorned letters for financier-household quantities. The financier/consumer split is the key modeling device through which the size of risk premia is amplified and that allows monetary shocks to affect real allocations and the global stochastic discount factor.[5]

In the second period, all households derive utility from consuming an index composed of a

[4] For a detailed derivation of the model setup and solution methods, please refer to Appendix A.

[5] This segmentation is in the spirit of Alvarez, Atkeson, and Kehoe (2002), Gabaix and Maggiori (2015), and Fanelli and Straub (2021).

country-specific nontraded good, $C_{N,2}$, and a freely traded good, $C_{T,2}$, in each state ω:

$$C_2(i,\omega) = C_{T,2}(i,\omega)^{\alpha} C_{N,2}(i,\omega)^{1-\alpha}, \tag{1}$$

where $\alpha \in (0,1)$ is the expenditure share on traded goods. Each household exhibits constant relative risk aversion:

$$U(i) = \frac{1}{1-\gamma} \mathbb{E}\left[C_2(i,\omega)^{1-\gamma}\right], \tag{2}$$

where $\gamma > 1$ is the coefficient of relative risk aversion—a restriction that is standard in the macro-finance literature, where estimates of risk aversion tend to be large and calibrations typically fall in the range of 2 to 10.

Production and Endowments. On the production side, each household operates a firm that produces the local nontraded good using capital (K) and one unit of labor, which is inelastically supplied. A given household's output is determined by:

$$Y_{N,2}(i,\omega) = \exp(\eta^n) K(i)^{\nu}, \tag{3}$$

where $0 < \nu < 1$ is the capital share, and η^n is a country-specific productivity shock, normally distributed with mean $-\frac{1}{2}\sigma_N^2$ and variance σ_N^2. Each household is also endowed with one unit of a homogeneous traded consumption good in the second period, which can be freely exchanged across borders and serves as the numéraire.

Monetary Shocks and the Consumer Household's Bond. The consumer household in country n holds a nominal bond issued by the domestic intermediary. The bond promises to pay, in the second period, the country's real price level $P^n(\omega)$ scaled down by a country-specific monetary shock $\mu^n(\omega)$. That is, the nominal bond's real payoff measured in traded goods is

$$B^n(\omega) = P^n(\omega) \exp\left(-\mu^n(\omega)\right). \tag{4}$$

The monetary shock μ^n is normally distributed with mean $\frac{1}{2}\sigma_\mu^2$ and variance σ_μ^2, so that $\mathbb{E}[\exp(-\mu^n)] = 1$ and the bond's expected real payoff equals the price level P^n. A positive realization of μ^n is an unanticipated inflationary shock in country n, and reduces the repayment of debt financiers transfer to households. Monetary shocks thus redistribute wealth between financier and consumer households.

For what follows, we assume that the nominal bond is purchased before any stabilization policy or trade policy, thus its payoff does not respond to these policies.[6]

Financial Markets and Capital Accumulation. The financier households' intermediary trades claims to firm output (stocks) and risk-free traded-good bonds in international markets, and additionally services the country's consumer-household nominal bond. Since financial intermediaries can trade international assets, the stochastic discount factor (SDF) is equalized across financier-households in different countries. Capital is freely shipped in the first period. The equilibrium capital stock is determined by the firms' first-order conditions, equating the expected marginal product of capital to the cost of capital determined in international financial markets.

Throughout, we use the traded consumption good in the world market (outside the countries levying tariffs or capital controls) as the numéraire, such that all prices and returns are accounted for in the same units.[7]

Finally, because all financier households within a given country are identical and consumption only occurs in the second period, we henceforth drop the household index i, the state of the economy

[6] See Appendix A.2 for a formal treatment.

[7] To simplify the derivation, we also assume financier households receive a country-specific transfer in the first period, κ^n, that equalizes the marginal utility of wealth across countries.

ω, as well as the time subscript t whenever appropriate and write the per-capita capital stock, output, and financier households' consumption of traded and nontraded goods in country n as K^n, Y_N^n, C_T^n, and C_N^n, respectively. The corresponding consumer-household consumption variables are $\widehat{C}_T^n$ and $\widehat{C}_N^n$.

The resulting economic environment closely resembles a standard international business cycle model augmented with financial market segmentation and a nominal bond. The financier/consumer split has two substantive implications: (i) the financier household's budget contains the consumer household's bond payoff with multiplier $(1-\psi)/\psi$, which amplifies the quantitative effects of real and monetary shocks on the SDF, boosting the size of risk premia in equilibrium; and (ii) monetary shocks have real effects because they alter the distribution of wealth between consumers and the financial intermediary.

Our only, somewhat subtle, departure from a canonical international business cycle model is that we confine the financier households to trading stocks and bonds in international markets, rather than a full set of state-contingent claims. Because financier households can trade one stock and one bond for each country, financial markets for these households remain "first-order complete" with respect to country-specific supply and monetary shocks in the sense of Coeurdacier and Rey (2013): the available assets span the realizations of η^n and μ^n in the log-linear solution, and the allocation of goods across financier households is efficient conditional on the distribution of wealth.[8]

Exchange Rates and Dollar Safety. We characterize the equilibrium by log-linearizing around the deterministic steady state, in which all shock variances equal zero and every firm installs one

[8] This modest restriction is the source of the two implications noted above: It preserves the wealth effects of monetary shocks and exchange rate stabilization policies that an unrestricted Arrow–Debreu market could insure against, and, as we show below, it gives rise to a model-consistent rationale for small economies to stabilize their exchange rates against the currency of the largest economy. We view the restriction as realistic — investors and intermediaries in the data trade a limited menu of stocks, bonds, and currencies, not the full set of state-contingent claims — and as the minimal deviation from completeness needed to generate the safety, anchor, and stabilization phenomena that are the focus of our analysis.

unit of capital.[9] Lower-case variables denote natural logs throughout. Since the model is static, the resulting expressions should be interpreted as characterizing long-run equilibrium allocations.

Under free trade, financier households find it optimal to use traded goods to partially insure against domestic shocks. In equilibrium, the financier household in country n consumes traded goods according to

$$c_T^{n*} = \frac{(1-\alpha)(\gamma-\psi)}{\psi(1-\alpha)+\gamma\alpha}\,(\bar{y}_N - y_N^n) + \frac{\gamma(1-\psi)}{\psi(1-\alpha)+\gamma\alpha}\,(\bar{\mu}-\mu^n),$$

where lowercase variables denote logs, asterisks denote the free-trade equilibrium with floating exchange rates, and $\bar{y}_N = \sum_j \theta^j y_N^j$ and $\bar{\mu} = \sum_j \theta^j \mu^j$ represent country-size-weighted global averages. At $\psi = 1$ both monetary terms vanish and the supply terms collapse to $\frac{(1-\alpha)(\gamma-1)}{(1-\alpha)+\gamma\alpha}(\bar{y}_N - y_N^n)$, recovering the complete-participation limit.

Reading the equation from left to right, financier households import additional traded goods whenever the local supply of non-traded goods is low (supply is lower than the world average) and when they are hit by lower than average monetary shocks that require them to make higher real payments on outstanding nominal bonds (demand is higher than the world average)[10].

The real exchange rate between any two countries n and f is driven by the same forces:

$$s^{n,f*} = p^{n*} - p^{f*} = \frac{\gamma(1-\alpha)}{\psi(1-\alpha)+\gamma\alpha}\left(y_N^f - y_N^n\right) + \frac{\gamma(1-\alpha)(1-\psi)}{\psi(1-\alpha)+\gamma\alpha}\left(\mu^f - \mu^n\right). \tag{5}$$

The key takeaway is that any shock — to supply or monetary — that leads a country to import more traded goods simultaneously causes its currency to appreciate: the domestic consumption basket appreciates whenever there is a shortfall in the local nontraded good (supply is low) or when inflation is (unexpectedly) low. Importantly, this mechanism operates identically for all countries

[9] This approach abstracts from the feedback between differential capital accumulation and risk premia. In this sense, we examine the *incentives* for cross-country differences in investment while treating the capital stock as given.

[10] Aggregate imports of traded goods are also higher in these states of the world.

regardless of size, as reflected in the absence of θ^n from equation (5).

We define the broad real exchange rate index of country n by averaging its bilateral exchange rates across all trading partners. With a continuum of foreign economies, idiosyncratic foreign shocks wash out by the law of large numbers, yielding:

$$\bar{s}^{n*} = -\frac{\gamma(1-\alpha)}{\psi(1-\alpha)+\gamma\alpha} y_N^n - \frac{\gamma(1-\psi)(1-\alpha)}{\psi(1-\alpha)+\gamma\alpha} \mu^n. \tag{6}$$

A country's currency appreciates ($\bar{s}^{n*}$ rises) when domestic supply y_N^n or inflation is low.

Crucially, shocks to large economies affect the global scarcity of traded goods more than shocks to small economies. The equalized marginal utility with respect to traded goods, which coincides with the unique global stochastic discount factor that prices all assets, λ_T^*, is given by:

$$\lambda_T^* = -\frac{(\gamma-\psi)(1-\alpha)}{\psi} \sum_j \theta^j y_N^j - \frac{\gamma(1-\psi)}{\psi} \sum_j \theta^j \mu^j. \tag{7}$$

Because the weights θ^n correspond to economic size, the SDF is driven primarily by shocks in large countries. Consequently, the currency of the largest economy (e.g., the U.S. dollar) covaries most positively with λ_T^*, making it the world's "safest" currency.

The covariance between the global stochastic discount factor and the real exchange rate, i.e., the relative safety of a currency, is monotonically increasing in θ^n. We can write this covariance explicitly as

$$\text{cov}\left[\lambda_T^*, p^{n*} - p^{f*}\right] = \frac{\gamma(\gamma-\psi)(1-\alpha)^2}{\psi[\psi(1-\alpha)+\gamma\alpha]} \left(\theta^n - \theta^f\right) \sigma_N^2 + \frac{\gamma^2(1-\psi)^2(1-\alpha)}{\psi[\psi(1-\alpha)+\gamma\alpha]} \left(\theta^n - \theta^f\right) \sigma_\mu^2.$$

The model thus delivers a strict ordering of currency safety that mirrors the ranking of economies by size. Under free trade, the dollar sits at the top of this hierarchy because the United States accounts for the largest share of world output. Since the large economy's currency appreciates when marginal utility is high (λ_T^* is high), the covariance term in equation (8) is positive when $\theta^n > \theta^f$, implying a lower interest rate for the larger economy. That is, a currency that appreciates at times of global stress provides a hedge against worldwide consumption risk.

This safety premium results in lower risk-free interest rates for the large economy, as governed by the following Euler equation[11]

$$r^{f*} + \Delta \mathbb{E}\, s^{f,n*} - r^{n*} = \text{cov}\left[\lambda_T^*, p^{n*} - p^{f*}\right], \tag{8}$$

where $\Delta \mathbb{E}\, s^{f,n*} \equiv \log\left(\mathbb{E}[P^{f*}]/\mathbb{E}[P^{n*}]\right)$ is the log ratio of expected price levels between countries f and n.[12] These safety premia lower both nominal and real interest rates (Hassan, 2013).

Firm Value and Capital Accumulation. Finally, since domestic firms produce nontraded goods that are consumed domestically, the value of their output comoves with the real exchange rate. The implication is that the forces generating dollar safety simultaneously make U.S. equities attractive to global investors: the value of dividends on American firms is high precisely in states of the world where the U.S. suffers a low productivity shock or when U.S. inflation is low.[13] This covariance lowers the discount rate applied to U.S. cash flows, raising firm valuations and reducing the cost of capital. The resulting incentive to invest more in the United States creates a capital-intensity premium: American firms accumulate more capital per worker than otherwise comparable firms in smaller economies. A safe currency, thus attracts disproportionate international investment.[14]

[11]See Appendix A.7 for the full derivation.

[12]Nominal and real interest rates both inherit the safety properties due to strong co-movement, particularly at longer horizons (Mertens and Zhang, 2025).

[13]Equation (18) in Appendix Section A.8 shows a positive local productivity shock y_N^n lowers the value of dividends. This is because price of nontraded goods falls more than proportionally to the quantity increase, so the value of nontradable dividends declines when local productivity is high.

[14]A strand of the literature establishes that reductions in a country's interest rate or risk lead to increased investment and capital growth at the firm-level (Rajan and Zingales (1998), Kroszner, Laeven, and Klingebiel (2007), Hassan, Mertens, and Zhang (2016), Wang (2021), di Giovanni et al. (2022), and Kalemli-Özcan, Laeven, and Moreno (2022), among others).

Optimal Stabilization and the Anchor Currency. In our prior work (Hassan, Mertens, and Zhang, 2023), we have also shown that small economies can import this safety premium by stabilizing their exchange rates against the currency of the largest economy in the world. Formally, the central bank of a stabilizing country m controls the real exchange rate by placing a state-contingent wedge $1 + z(\omega)$ between the domestic and world-market price of traded goods, adjusting the number of traded goods imported in each state.[15] A stabilization of the real exchange rate $s^{\mathcal{T},m}$ relative to a target country $\mathcal{T}$ is then a schedule of contingent wedges $z(\omega)$ such that:

$$\mathrm{var}\left[s^{\mathcal{T},m}\right] = (1 - \Omega^{\mathcal{T},m})^2\, \mathrm{var}\left[s^{\mathcal{T},m*}\right], \tag{9}$$

where $\Omega^{\mathcal{T},m} = 1$ represents a hard peg and $\Omega^{\mathcal{T},m} = 0$ means the currency floats freely.

To implement this policy, the stabilizing government has two instruments available: (i) a lump-sum transfer $\bar{Z}^m$ paid to each household in the first period, and (ii) a state-contingent tax $Z_P^m(\omega)$ on the domestic consumption of traded goods in the second period. The tax drives a wedge between the domestic and world-market price of traded goods, altering the covariance of country m's real exchange rate with the global stochastic discount factor. The per-capita resource cost of implementing the stabilization is

$$\Delta\mathrm{Res} = \bar{Z}^m - \mathbb{E}\left[\frac{\Lambda_T(\omega)}{\Lambda_{T,1}}\left(Z_P^m(\omega) - 1\right)\left(\psi C_T^m(\omega) + (1-\psi)\hat{C}_T^m(\omega)\right)\right], \tag{10}$$

which equals the expected change in the world-market cost of the stabilizing country's traded-good purchases, net of the lump-sum rebate. Any revenues (positive or negative) are rebated lump-sum to the country's financier households.[16]

[15] In practice, central banks do not levy state-contingent taxes; they achieve the same effect by buying and selling foreign currency in the open market. When the anchor currency appreciates, the stabilizing central bank tightens domestic monetary policy, which (because traded-goods prices adjust slowly in the short run) raises the local price of imports and induces households to buy fewer of them. The resulting adjustment in trade flows is the same one our wedge captures; see Hassan, Mertens, and Zhang (2023) for details.

[16] See Appendix A.3 for a full characterization of the linear tax that implements the policy and the resulting resource cost.

In Hassan, Mertens, and Zhang (2023), we showed that by aligning the stochastic properties of its exchange rate with those of a large, safe currency, the stabilizing country can inherit its risk profile. Because the stabilized exchange rate inherits the comovement of the target currency with λ_T^*, the stabilizing country effectively imports the safety properties of the anchor. For the stabilizing country, interest rates fall, domestic firm valuations rise, and the capital stock expands. Choosing the world's largest economy as the target maximizes these gains, allowing even a small country to capture a portion of the economic benefits that would otherwise accrue exclusively to the anchor.

Remarkably, for a very small economy ($\theta^m \to 0$), the stabilization policy generates positive revenue in expectation: the central bank accumulates reserves by purchasing traded goods at low prices during states when the anchor country depreciates, and selling them at elevated prices when the anchor appreciates. The stabilizing country thus earns a return for providing consumption insurance to the anchor country. However, for a larger stabilizing country, its interventions begin to move world prices. The resulting adverse terms-of-trade effect raises the cost of the stabilization policy, which increases monotonically in θ^m. Beyond a critical size, the cost exceeds the benefits and stabilization becomes welfare-reducing. Consequently, small economies optimally accept higher consumption variance in exchange for lower interest rates and higher firm values, whereas large countries prefer to float.

Calibration and Model Fit. We calibrate the model to the 1984–2019 period, when world capital markets and trade were relatively free. We take country sizes θ^n from each country's average share of world GDP over this period (Penn World Tables), and set the capital share to $\nu = 0.33$ and the coefficient of relative risk aversion to $\gamma = 4.5$ at standard values in the literature. The four remaining parameters — the share of financier households ψ, the expenditure share on traded goods α, and the volatilities of supply and monetary shocks σ_N and σ_μ — are jointly calibrated to match five targets in the 1984–2019 data: (i) the average risk-free interest rate differential between the U.S. dollar and the currencies of small developed countries with floating exchange rates (Australia and New Zealand),

Table 1: Target Moments

	Data	Model
Interest Rate Difference (USA - ANZ) (in pp.)	-2.84	-2.77
	[-3.35, -2.33]	
Currency Excess Return (USA - ANZ) (in pp.)	-3.18	-2.77
	[-4.47, -1.89]	
Strength of Stabilization ($\Omega^{\mathcal{T},m}$)		
Small economies (< 1% of World GDP)	0.78	1.00
	(0.54, 1.00)	
Intermediate sized economies (1–10% of World GDP)	0.41	0.42
	(0.33, 0.42)	
Large economies (> 10% of World GDP)	0.00	0.01
	(0.00, 0.00)	

Notes: The table shows the target moments we use to calibrate the model. The interest rate differential is the 12-month forward premium between the U.S. dollar and the Australian dollar and the New Zealand dollar. The currency excess return subtracts off changes in the exchange rate. These moments are computed using monthly data. The sample period is 1984 to 2019. We report the median stabilization strength in the data for three groups of countries (smaller than 1% of world GDP, between 1% and 10%, and larger than 10% of world GDP. GDP data are obtained from Penn World Table 10.1, averaging across 1984-2019, with the US accounting for roughly 27% of world GDP). Bootstrapped 95% confidence intervals are shown in square brackets. Interquantile ranges are shown in parentheses.
Source: Ilzetzki, Reinhart, and Rogoff (2019), Hassan and Mano (2019) and authors' calculations.

(ii) the average excess return on the U.S. dollar relative to those currencies, and (iii-v) the degree of exchange rate stabilization observed for small (<1% of world GDP), intermediate-sized (1-10% of world GDP, and large economies (>10% of world GDP) reported by Ilzetzki, Reinhart, and Rogoff (2019) on average during the sample period.

This procedure yields $\psi = 0.03$, $\alpha = 0.45$, $\sigma_N = 0.03$, and $\sigma_\mu = 0.01$. We use this calibration for all of our quantitative exercises below. As shown in Hassan et al. (2025), the joint calibration is also consistent with the market reaction after the tariff announcements (see also Jiang et al. (2025) and Garimella, Kwan, and Mertens (2025)).

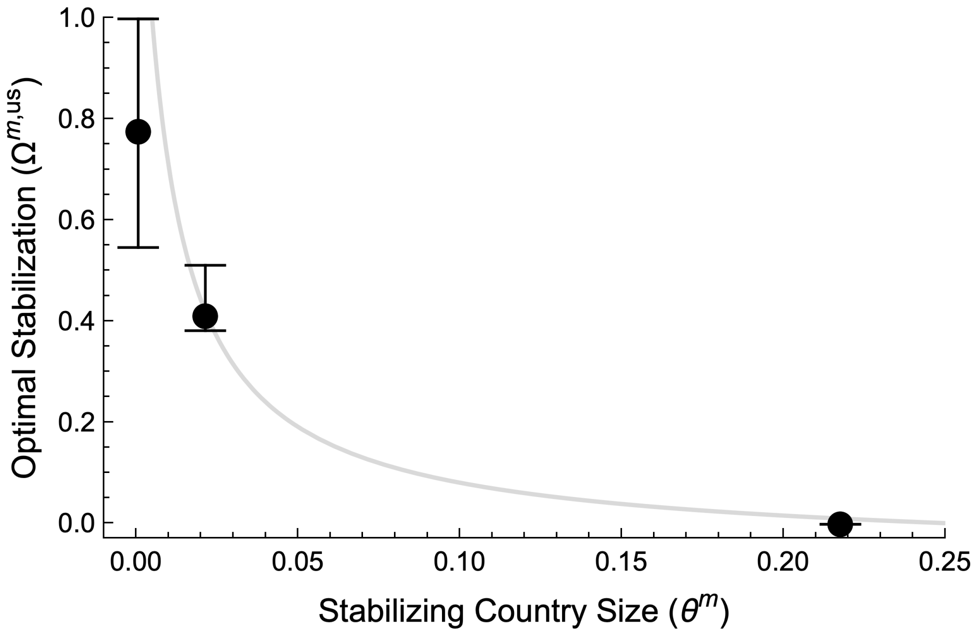
Figure 1 shows that the model fits the structure of the post-Bretton-Woods international monetary system with surprising accuracy. It plots the model-predicted optimal stabilization strength as a function of country size and compares it to the stabilization choices recorded in Ilzetzki, Reinhart, and Rogoff (2019). Three features of the data line up tightly with the model. First, on the extensive margin, the model predicts that essentially every country smaller than the eurozone, Japan, or China should stabilize its real exchange rate; this prediction holds for all but a handful of the 141 economies in the sample. Second, on the intensive margin, the model predicts near-hard pegs for small economies (those below roughly one percent of world GDP), looser stabilizations with roughly forty percent variance reduction for intermediate economies (between one and ten percent of world GDP), and floating regimes for the largest economies. The figure shows that the median country in each size group lines up closely with this profile. Third, although each central bank chooses its anchor independently, every stabilizer in the model picks the U.S. dollar, matching the data, where about four out of five stabilizers target the dollar.

Even though our calibration explicitly targets three moments related to exchange-rate stabilization, the model's ability to fit the wider cross-sectional variation in exchange rate regimes is by no means guaranteed. The four estimated parameters apply to all countries. The only cross-country heterogeneity relates to the empirical distribution of GDP shares; there are no further country-specific parameters to target the cross-sectional variation in exchange-rate regimes. The dollar-centered structure of the international monetary system thus emerges endogenously from each country's individually optimal choice, rather than from coordination or institutional design.

3 Three Policies to Shape the International Monetary Order

Having established that the world's largest economy endogenously becomes the issuer of the safest currency and the anchor of the international monetary system, we now turn to the forces that may reshape this structure going forward. To organize the discussion, we explore the implications of different policy choices facing Europe. The eurozone is the world's second-largest currency area so that a direct comparison with the dollar brings the underlying economic mechanisms sharply into view.

Figure 1: Optimal Stabilization by Size of Stabilizing Country: Model vs Data



Notes: This figure is reproduced from Hassan et al. (2025), adjusted to monetary shocks (as opposed to demand shocks). The grey line in this figure plots the model-predicted optimal stabilization policy for countries of different sizes using our calibration. All optimal stabilizations are against the U.S. dollar. The dots in the figure present the median stabilization strength in the data for three groups of countries (smaller than 1% of world GDP, between 1% and 10%, and larger than 10% of world GDP. GDP data are obtained from Penn World Table 10.1, averaging across 1984-2019, with the US accounting for roughly 27% of world GDP.), as well as their inter-quartile range, using data from Ilzetzki, Reinhart, and Rogoff (2019), 1984-2019.

Because anchor status follows safety, and safety follows effective size, the question reduces to which policy levers can expand the weight of the European Union and the euro in the world-market price of traded goods. We study three such levers. The first is internal: policies that raise the effective economic mass of the eurozone itself, through economic growth, deeper harmonization among current members, or EU enlargement. The second is trade policy, which alters the effective size of every currency area by reshaping the cross-border transmission of shocks. The third is capital-account openness, which determines which currencies are admissible as anchors in the first place.

For the quantitative exercises that follow we set the GDP shares of each country equal to their 2023 values, with the U.S., the EU (eurozone members), and China contributing 26%, 15%, and 17% to world GDP, respectively.

3.1 Internal: Harmonization and Enlargement

The most direct way of expanding a country's weight in the global SDF is, of course, to grow the underlying economy faster than other large countries. Beyond that, the European Union is in a unique position because two further levers have been part of the policy discussion: deeper integration of current member states — raising the cross-country correlation of real shocks — and enlargement of the EU and the eurozone to additional European countries. Both raise the effective economic mass of the euro in the global SDF, and with it the safety of the euro.

Since we already treat the eurozone as one country — all countries within the eurozone share the same supply and monetary shocks — we model deeper integration of the European economies outside the eurozone by a higher cross-country correlation of the supply shock η^n. Adoption of the Euro by additional countries is captured by the consumer-households of those countries holding nominal bonds denominated in euros, so that effectively, countries that adopt the euro all share the same monetary shock μ^{eu}. (Recall that, by assumption, unless otherwise noted, all other real and monetary shocks are i.i.d. across countries.[17])

To compare currency safety across different policy configurations, we summarize each candidate anchor by its *effective country size*: the GDP share an economy would need under the baseline model — with uncorrelated shocks and no policy interventions — to generate the same level of currency safety (covariance between its currency and the global stochastic discount factor) as the configuration of interest.[18] This translates the safety consequences of any intervention, whether deeper EU integration, tariffs, or capital controls, into a single summary statistic that is directly comparable to a country's actual GDP share.[19]

Figure 2 presents the euro's effective country size for three hypothetical levels of integration.

The eurozone alone accounts for approximately 15.0% of world GDP—the baseline size used in our calibration, which leaves the euro with a significantly smaller weight than the U.S. dollar at approximately 26% of world GDP.[20] A full integration of the existing EU economies with that of the eurozone (with a correlation of one between the eurozone's productivity shock and that of the remaining EU economies) raises the EU's effective weight to 17.2%.

Integrating the EU economy with that of the United Kingdom, EFTA (Iceland, Liechtenstein, Norway, and Switzerland), and all countries that have formally applied for EU membership (includ-

[17]One can equivalently set them to a common nonzero value, which cancels out of the relative-currency-safety comparison.

[18]Using equation (2), we can then measure the safety of the euro as

$$\text{cov}\left[\lambda_T, p^{Euro} - p^f\right] = \frac{\gamma(\gamma-\psi)(1-\alpha)^2}{\psi[\psi(1-\alpha)+\gamma\alpha]}\sigma_N^2\left[\theta^{Euro} + \sum_{j\in\mathcal{B}}\theta^j\rho_{j,Euro} - \theta^f\right] + \frac{\gamma^2(1-\psi)^2(1-\alpha)}{\psi[\psi(1-\alpha)+\gamma\alpha]}\sigma_\mu^2\left[\theta^{Euro} + \sum_{j\in\mathcal{M}}\theta^j - \theta^f\right].$$

where $\mathcal{B}$ is the set of countries integrating their real economies with the eurozone, $\rho_{j,EU}$ is the degree of correlation of the supply shocks with that of the eurozone, and $\mathcal{M}$ is the set of countries outside the current eurozone that adopt the euro.

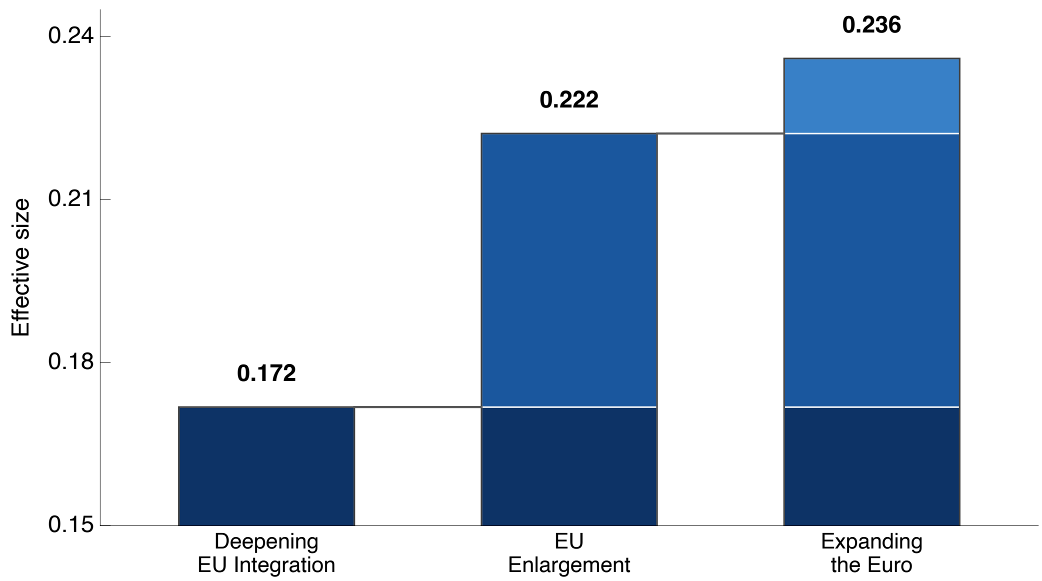
[19]Formally, the euro's effective country size is defined as

$$\tilde{\theta}^{Euro} = \frac{\text{cov}[\lambda_T, p^{Euro}]}{\frac{\gamma(\gamma-\psi)(1-\alpha)^2}{\psi[\psi(1-\alpha)+\gamma\alpha]}\sigma_N^2 + \frac{\gamma^2(1-\psi)^2(1-\alpha)}{\psi[\psi(1-\alpha)+\gamma\alpha]}\sigma_\mu^2},$$

obtained by inverting equation (2) for θ^n at the observed covariance, with the foreign comparison country's size set to zero.

[20]In practice, economic integration across EU member states remains weaker than across U.S. states, reflecting persistent national border effects in trade, migration, and capital markets (Head and Mayer, 2021).

Figure 2: Effective Sizes of the eurozone under Deepening Integration



Notes: The figure presents the eurozone's effective size in addition to status quo (15%) under three scenarios: full real integration of the EU with the eurozone, labeled Deepening EU Integration; full real integration of EU plus UK, the EFTA countries (Iceland, Liechtenstein, Norway, Switzerland) and countries that have applied to be part of EU (Albania, Bosnia and Herzegovina, Georgia, Kosovo, Moldova, Montenegro, North Macedonia, Serbia, Türkiye, and Ukraine), labeled EU Enlargement; and expanding the Euro to all the countries in the enlarged EU, labeled Expanding the Euro.

ing Turkey) raises this weight to 22.2%. Finally, expanding use of the euro to all of these countries increases the EU's effective weight in the world-market price of traded goods to 23.6%.[21]

Comparing these numbers suggests that about 80% of the achievable gain comes from real-side integration of European economies rather than from formal euro adoption. In practice, however, the two margins may be related. A long literature beginning with Frankel and Rose (1998) argues that currency unions endogenously raise the synchronization of trade and business cycles among their members. Consistent with this view, Cavallo, Neiman, and Rigobon (2014) document that the introduction of the euro itself substantially compressed cross-country dispersion in retail prices within the eurozone.

In our model, any reform that deepens economic integration across European economies raises the euro's effective size, makes its currency safer, and strengthens its appeal as the world's anchor. Unlike the trade and capital-account channels we turn to next, this lever lies entirely within European institutional control. And as the following sections show, against the backdrop of current U.S. tariffs and a still-closed Chinese capital account, our model predicts that these integration steps could be sufficient on their own to install the euro at the center of the international monetary system.

3.2 External I: Trade Openness

So far, our analysis has assumed that international trade flows freely across borders. We now extend the model to allow for trade barriers – where countries impose tariffs on imported traded goods, in order to study trade openness as the second lever shaping the international monetary order.

As we show formally below, tariffs tend to shrink the effective size of the countries that impose

[21] One caveat worth noting is that among non-euro EU members, some maintain credible pegs to the euro while others float. In the model's terms, a small country that credibly pegs to the euro does not add to the eurozone's effective size — it *reduces* it. As shown in Hassan, Mertens, and Zhang (2023), when a small economy stabilizes its exchange rate to a larger anchor, it absorbs part of the anchor's shocks, lowering the covariance between the anchor's currency and the world-market price of traded goods. For example Denmark's long-standing peg to the euro via ERM II theoretically shrinks the eurozone's effective size below the headline $\theta^{EU} = 0.15$. Formal adoption by Denmark would then raise θ^{EU} by more than Denmark's GDP share, since it would both add Denmark's economic mass and undo the insurance the peg currently provides. A floating non-euro member such as Sweden, by contrast, provides no such insurance, so its adoption would raise θ^{EU} simply by its own GDP share.

them: by maintaining open trade while the United States restricts it, Europe can expand its effective size relative to the dollar.

We now introduce tariffs into the model as follows: Once a traded good enters a country, it becomes indistinguishable from the domestically endowed traded goods, so that all (price-taking) households within the country pay the same price for the traded goods they purchase (as they would if traded goods were assembled from differentiated intermediates). Because we are not concerned with identifying an optimal tariff, we assume any tariff revenue is rebated lump-sum to the country's financier households.

When a country n levies a tariff τ^n on imported traded goods and trading partners retaliate by imposing an equal tariff rate on n's exports, the wedge between the price of traded goods in the country n and the world market then takes the form

$$\lambda_T^n = \lambda_T + \tau^n c_{T,agg}^n, \tag{11}$$

where λ_T^n is the logarithm of marginal utility of traded consumption in country n, which now deviates from its counterpart in the rest of the world (λ_T). $c_{T,agg}^n = \psi c_T^n + (1-\psi)\hat{c}_T^n$ is the aggregate consumption in country n. In particular, country n's marginal utility of traded consumption exceeds marginal utility in other countries whenever it imports traded goods ($c_{T,agg}^n > 0$). The tariff is thus placing a wedge on the marginal utility of country n's traded consumption relative to the rest of the world, which is increasing in the share of consumption that is imported or exported, and thus also increasing in the size of the shock prompting the trade flow. A trade war therefore partially isolates the country from the world economy, inhibiting risk-sharing and the ability of domestic households to respond to shocks by importing or exporting traded goods (see Appendix A.4 for the derivation).

To simplify the algebra, we always assume that the imposition of a tariff is met by full (symmetric) retaliation. However, none of the directional results in the discussion below rely on symmetric retaliation but it scales the magnitude of the effect. For example, the effect on interest rates and risk premia of a 30% unilateral tariff without retaliation is very similar to that of a 15% tariff met with retaliation (Hassan et al., 2025).

Effective Country Size under Tariffs. The key consequence of imposing tariffs is that the effect of the imposing country's shocks on world-market price of traded goods is no longer weighted by its actual country sizes but by its "effective" country size. For example, under complete markets ($\psi = 1$), when country n levies a tariff τ^n on imported traded goods, one can show

$$\lambda_T = -(\gamma - 1)(1 - \alpha) \sum_j \tilde{\theta}^j y_N^j - \gamma \sum_j \tilde{\theta}^j \mu^j, \tag{12}$$

where

$$\tilde{\theta}^n = \frac{(1-\alpha) + \gamma\alpha}{(1-\alpha) + \gamma\alpha + (1-\theta^n)\tau^n} \theta^n < \theta^n, \tag{13}$$

$$\tilde{\theta}^f = \frac{(1-\alpha) + \gamma\alpha + \tau^n}{(1-\alpha) + \gamma\alpha + (1-\theta^n)\tau^n} \theta^f > \theta^f \qquad f \neq n \tag{14}$$

are effective country sizes, adjusted for the effect of the trade war, with $\sum_j \tilde{\theta}^j = 1$. Examining these two expressions shows that the "effective country size" of country n, $\tilde{\theta}^n$, is strictly decreasing in the size of the tariff, whereas the other countries' effective sizes are increasing. In the extreme, if country n imposes prohibitive tariffs ($\tau^n \to \infty$), its shocks (y_N^n and μ^n) have no effect on world-market prices, so that its effective size shrinks to zero, $\tilde{\theta}^n \to 0$, while the effective sizes of the remaining countries expand to compensate.

Consequences for Safety and Capital Accumulation. A large economy engaging in a trade war has direct implications for the international monetary order. For example, if the United States imposes tariffs, met by retaliation abroad, the spillovers from its domestic shocks to the world-market price of traded goods are reduced. Under free trade, a negative monetary shock in the U.S. would trigger significant imports, driving up the shadow price of traded goods in the world and appreciating the dollar. With the tariff wedge, this spillover is muted: the U.S. effectively becomes "smaller" in its impact on global asset prices, while the EU and other countries effectively become relatively "larger".[22]

In the extreme of full autarky, the complete removal of spillovers of U.S. shocks into world markets eliminates the force that induced a positive covariance between the U.S. dollar and λ_T: a U.S. dollar issued in autarky garners no safety premium. The dollar would then behave like the currency of a negligibly small open economy, paying a higher interest rate, while U.S. firms would command lower valuations and the economy would exhibit a reduced capital-to-output ratio. Meanwhile, economies that continue to participate in international trade see their effective sizes expand and their safety premia rise accordingly.[23]

The top panel of Figure 3 illustrates the direct consequence of this isolation. The vertical axis plots our measure of currency safety: the correlation between a currency's real exchange rate and the world-market price of traded goods.

As the tariff rate τ^{US} increases, the U.S. dollar's correlation with λ_T falls monotonically (solid line). The dollar becomes less safe: it no longer appreciates reliably, or appreciates less, during global downturns because the U.S. economy is less connected to those downturns. Conversely, the eurozone (dashed line) sees its correlation with global risk rise because it remains open. At a critical threshold, the lines cross: the euro displaces the dollar as the world's safest currency. In our calibration, this threshold is crossed when the tariff between the U.S. and the rest of the world exceeds 26%.[24]

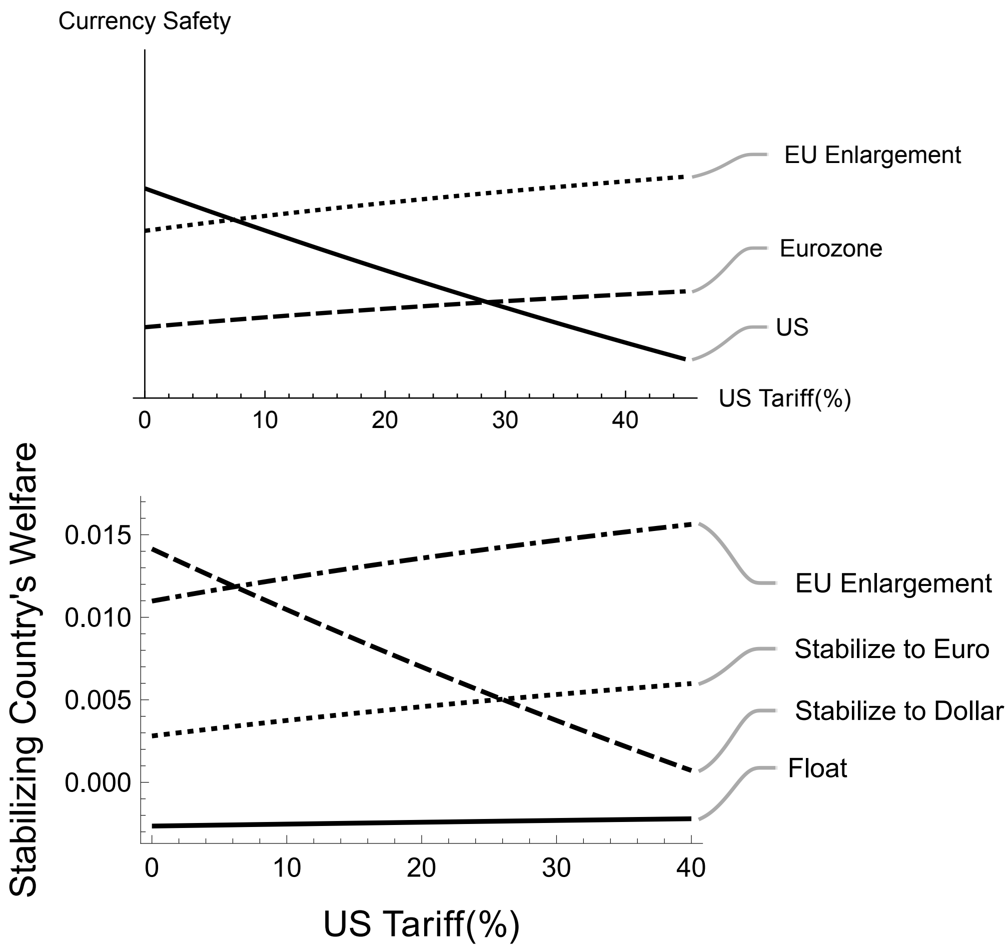
When foreign countries do not retaliate or retaliate only partially, the results are similar, except

[22]In fact, under complete markets ($\psi = 1$), one can show analytically that the effective country size of the U.S. is decreasing in τ^{US}. See Hassan et al. (2025) and Appendix A.4 for details.

[23]More generally, the result that tariffs reduce the safety premium on the U.S. dollar should not depend on country size being the source of currency safety. Because tariffs disrupt the risk-sharing mechanism through which countries interact via traded goods, any policy that restricts trade will weaken the safety properties of the imposing country's currency, regardless of whether those properties arise from size, trade centrality (Richmond, 2019), or other sources of exchange rate risk heterogeneity (Colacito et al., 2018).

[24]Appendix D shows how this threshold varies with the model's parameters. In particular, it is increasing in the share of traded goods in consumption (α) and the coefficient of relative risk aversion (γ), and decreasing in the share of financier households (ψ).

Figure 3: Correlation of Real Exchange Rates with λ_T and Optimal Stabilization



Notes: The top figure presents the covariance of the U.S. exchange rate, the euro exchange rate under status quo, and the euro exchange rate under EU enlargement, with the global stochastic discount factor under different levels of U.S. tariffs. The bottom figure shows the relationship between welfare in a small country and the level of U.S. tariffs. The four lines represent welfare in the small country under four different exchange rate regimes: stabilize the U.S. dollar, stabilize to the euro, stabilize to the euro under EU Enlargement, or float. Both figures are extended from Hassan et al. (2025).

that this phase shift occurs approximately when the average tariff on U.S. imports and exports exceeds 26%. As of the writing of this article, the average tariff on U.S. imports and exports is about 12% (The Budget Lab at Yale, 2025).

This shift in safety profiles fundamentally alters the incentives for small open economies. Small countries maximize their welfare by stabilizing to the safest available currency. The bottom panel of Figure 3 plots the welfare of a small stabilizing country under different anchor choices.

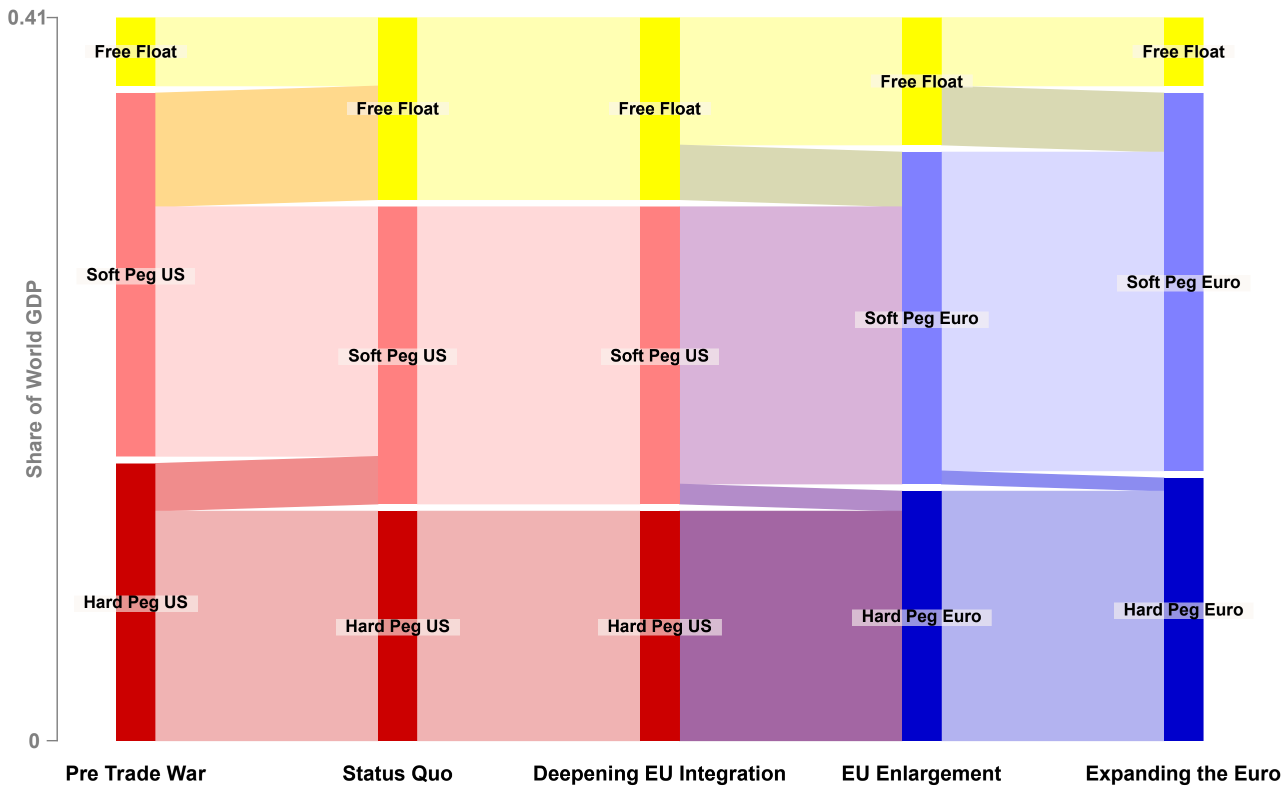
For low tariffs, the dollar remains the optimal anchor. However, as trade wars intensify and tariffs increase, the insurance value provided by the dollar diminishes. Once the tariff exceeds the critical threshold, the welfare gain from pegging to the euro exceeds that of pegging to the dollar.

The dashed and dotted lines in the two graphs also show how this critical value interacts with EU enlargement. When comparing only to the eurozone itself, the critical tariff is at 26%. However, if European politicians took decisive steps to integrate the economies of EU, EFTA, and accession countries, the critical tariff drops to 6%. In this sense, nationalistic U.S. trade policy – with average tariffs on U.S. imports and exports around 12% – makes it easier for Europe to supply the safest currency worldwide.

Figure 4 visualizes the current structure of the world monetary system and how these progressively more integrated European policies reshape the world monetary system. The chart plots the model-predicted optimal stabilization decision of every country in the world, with each block scaled by the country's share of world GDP. An optimal stabilization strength $\Omega^{\mathcal{T},m}$ above 75% is classified as a hard peg (dark red if relative to the U.S. dollar, dark blue if relative to the euro), between 25% and 75% as a soft peg (light red or light blue), and below 25% as a free float (yellow). Ribbons between adjacent columns indicate countries that maintain or switch their stabilization regimes as Europe progresses through the integration steps.

The leftmost column shows the structure of the world monetary system in 2024, before the onset of the U.S. trade war: the U.S. dollar serves as the anchor for 39% of world GDP, with only the handful of largest countries floating. The second column shows the same structure, taking the model-

Figure 4: Model Predicted Exchange Rate Arrangements under Different Levels of European Integration



Notes: This figure plots the model-predicted optimal stabilization decision under different scenarios using the size distribution of 181 countries/regions in 2023 (World Bank data). The left column labeled "Pre Trade War" sets all tariffs to 0; all the remaining columns assume a US tariff of 12%, and represent different EU integration scenarios: status quo, deepening EU integration, EU enlargement, and expanding the euro. Since in this paper, we discuss the dollar, the euro, and the RMB as potential anchors, we exclude the United States, the eurozone, and China from the graph for consistency. Each block consists of countries scaled by their GDP share. Countries are sorted by their sizes with the largest at the top. Optimal strength of stabilization ($\Omega^{\mathcal{T},m}$) above 75 percent is classified as hard peg; between 25 percent and 75 percent is classified as soft peg; and under 25 percent is classified as free floating. Ribbons between bars indicate countries maintaining or switching stabilization policies as a result of the change in the effective size of the eurozone.

predicted impact of the trade-war into account. It shows the dollar block weakened by the average tariffs on U.S. imports and exports of 12%, but the dollar remains dominant. Moving rightward, each successive column adds one of the integration steps developed above — full synchronization of supply shocks across current EU members; enlargement of the bloc to include the UK, EFTA, and accession countries; and, in the final column, formal adoption of the euro by those countries as well. With each step, European shocks become more important drivers of the world-market price of traded goods. EU enlargement triggers a phase-shift, where the euro supplants the dollar as the principal anchor of the international monetary system.

Fiscal Implications. In addition to these possible structural shifts, these policies carry significant implications for government budgets, interest rates, and the cost of capital of the countries involved.

For the United States, an average tariff of 12% (moving from the first to the second column) implies higher borrowing costs. In our model, U.S. real interest rates increase by 0.42 percentage points relative to a small open economy. And the higher cost of capital causes the U.S. capital stock to decline by 0.38%, with real wages falling by 0.13%. For the eurozone, this shift in U.S. tariff policy raises its safety premium. Our calibration predicts that, following U.S. tariffs, EU interest rates decline by 0.10 percentage points relative to a small open economy, the capital stock increases by 0.11%, and real wages rise by 0.04%.

Moreover, a EU enlargement, as presented by the second-to last column of Figure 4 would further reduce EU interest rates by 0.67 percentage points, increase the capital stock by 0.74%, and increase real wages by 0.25%.

These shifts in interest rates carry significant implications for fiscal sustainability. To put the magnitudes into perspective, we apply the model-implied rate changes to the outstanding government debt of both regions as of the third quarter of 2025. We therefore impose a level-shift to the yield curve, i.e., an increase in yields across all maturities equal to the one predicted by our model.[25] For the United States, with outstanding government debt of \$37.6 trillion,[26] the 0.42 percentage point increase in interest rates that comes with a 12% tariff implies an increase in annual interest payments of approximately \$159 billion. This increase in debt-servicing costs arises solely from the loss of the dollar's safety premium. For the European Union, with general government gross debt of approximately €13.9 trillion,[27] the 0.10 percentage point decrease in interest rates translates to an annual saving of approximately €14 billion. The EU enlargement would translate into additional savings of approximately €93 billion per year.

A Transatlantic Bloc with a Common External Tariff

So far, we identified the conditions under which the euro overtakes the dollar as the world's anchor currency. An immediate corollary is that the euro can inherit that role only if the EU itself remains open to global trade. Next, we sharpen this condition: refraining from unilateral tariffs is not enough — joining a transatlantic bloc with a common external tariff dissipates the very openness premium that would otherwise transfer to the euro.

Consider a world where the U.S. and EU impose a common external tariff τ^{Bloc} on the rest of the world, creating a large internal market that is partially separated from the global economy. Unlike the unilateral-tariff scenario, the tariff wedge is now shared between the two large economies:

$$\lambda_T^{US} - \lambda_T = \lambda_T^{EU} - \lambda_T = \frac{1}{\theta^{US} + \theta^{EU}} \tau^{Bloc} \left(\theta^{US} c_T^{US} + \theta^{EU} c_T^{EU} \right). \tag{15}$$

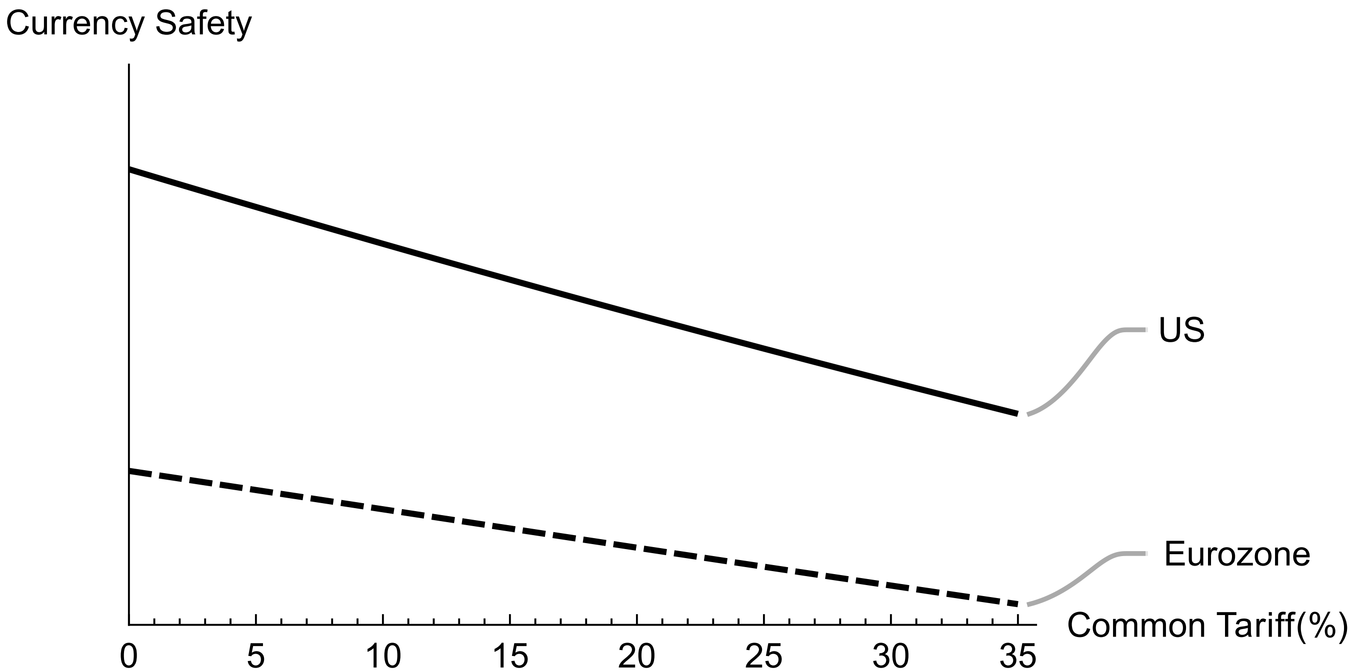
It implies that the price of traded goods in both economies diverges from that of the world market. As the external tariff rises, the covariance of *both* the dollar and the euro with the global stochastic discount factor diminishes.

[25]These estimates assume the higher rate applies to all outstanding debt, which in practice would materialize gradually as existing obligations are refinanced at new rates.

[26]Source: U.S. Department of the Treasury, https://fiscaldata.treasury.gov/datasets/historical-debt-outstanding/historical-debt-outstanding

[27]Source: Eurostat, https://ec.europa.eu/eurostat/web/products-euro-indicators/w/2-22012026-ap

Figure 5: Safety of Currencies under US-EU Trade Bloc.



Notes: This figure plots the covariance of the US exchange rate and the euro exchange rate with the global stochastic discount factor (currency safety) under different levels of the common tariff that the US and the eurozone jointly impose on the rest of the world.

Figure 5 shows the safety of the U.S. dollar and the Euro as a function of a common external tariff. Unlike in Figure 3, the two curves do not cross, but asymptote towards each other. As tariff rates rise, the effective size of both economies shrinks. While the absolute safety gap between the two currencies gradually narrows, the simultaneous decline in the euro's effective size prevents it from overtaking the dollar. As a result, the U.S. dollar maintains its anchor status, albeit weakened by the external tariff, up to a point where small countries turn to Japan or China as an alternative anchor. Even when the U.S. retains its anchor status, however, the model implies that both bloc members bear costs from reduced openness: higher interest rates, lower capital accumulation, and lower wages.

For the United States, the safety premium erodes less than in the unilateral-tariff scenario owing to the larger internal market of the bloc. With a common tariff of 12% on all imports and exports, U.S. interest rates increase by 0.34 percentage points, the capital stock declines by 0.32%, and wages fall by 0.11%. EU interest rates rise by 0.18 percentage points, the capital stock declines by 0.14%, and wages fall by 0.05%.

A bilateral trade bloc thus does not replicate the currency benefits of multilateral openness. By jointly raising external tariffs, the U.S. and EU jointly reduce their currencies' covariance with the world-market price of traded goods, which in turn potentially allows a more open third economy to capture the center of the international monetary system.

3.3 External II: Capital-Account Openness

Up to this point, we have framed the contest for anchor status as a competition between the dollar and the euro, omitting the renminbi, the currency of the world's second-largest economy, from our discussion. In this section, we show that Chinese capital controls are akin to tariff policy in our model and therefore inhibit the spillover of domestic shocks to the world-market price of traded goods, eroding the imposing country's effective size and its currency's safety. By restricting the ability of Chinese residents to hold foreign securities — and of foreigners to hold Chinese securities — China's capital account walls off domestic shocks from international markets, so that they are absorbed largely at home rather than transmitted to the world-market price of traded goods. From the perspective of a small stabilizing economy, the renminbi therefore behaves as the currency of a much smaller economy than China's GDP share would suggest, and is thus unavailable as a viable anchor.

To see why these restrictions matter for currency safety in our model, recall that financier households trade country-specific stocks and risk-free bonds in international markets in the first period. The portfolios they choose are not incidental; they are the key mechanism through which risk is shared across borders and, hence, through which a country's shocks reach the global stochastic discount factor. As shown in Hassan, Mertens, and Wang (2024), the portfolios that decentralize the (Pareto-efficient) allocation of consumption under freely floating exchange rates require each country's intermediary to hold a balanced mix of domestic and foreign stocks and bonds, calibrated so that the value of the intermediary's net foreign claims rises and falls in step with the country's demand for traded goods. Concretely, when a country's currency appreciates and its firms gain value relative to foreign firms, the intermediary's portfolio value appreciate alongside, providing the resources to finance an expansion of imports. When the country's currency depreciates, foreigners' claims on the domestic intermediary appreciate, and traded goods flow in the opposite direction.

These fluctuations in the relative value of cross-border claims underpin the cross-border movement of traded goods in equilibrium. Each country's net exports of traded goods $1 - C_T^n$ must equal its current account in equilibrium. Financing that current account requires a corresponding movement in the financial account that the financier intermediary executes through the international portfolio. In the extreme case in which domestic households cannot hold any claims on foreigners and vice versa, the financial account is mechanically zero, the current account is mechanically zero, and the country cannot transmit any of its country-specific shocks to international markets through trade — so that $c_T^n = 0$ regardless of the realization of domestic shocks.

Capital controls thus play, on the financial side, the same role tariffs play on the goods side: they weaken the link between domestic shocks and the world-market price of traded goods, eroding the imposing country's impact on the world-market price of traded goods. In this sense, quantity restrictions on the current account can be reinterpreted as a wedge on the marginal utility of traded goods across countries (Costinot, Lorenzoni, and Werning, 2014; Jeanne, 2013; Erten, Korinek, and Ocampo, 2021).

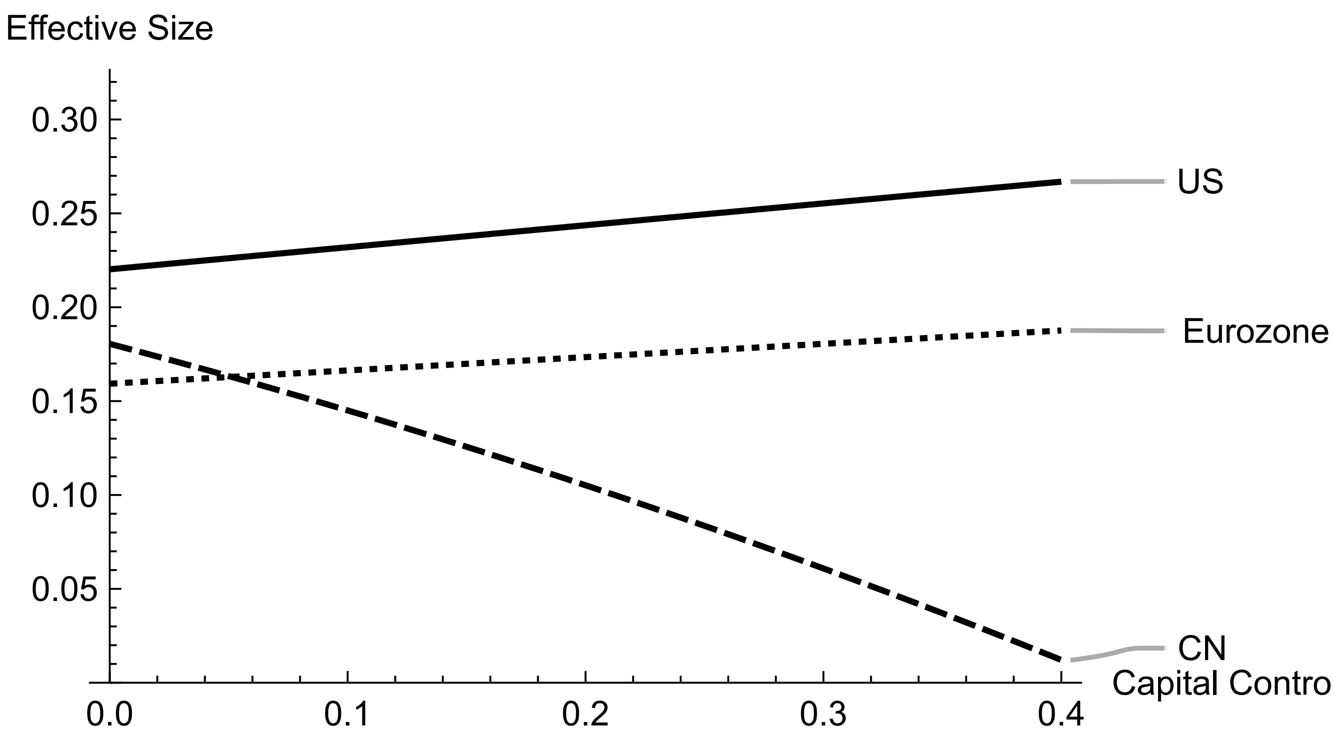
To formalize this idea in our current framework, consider China imposing capital controls that limit the size of claims Chinese residents can hold on foreigners, and vice versa, so that its current account is constrained state-by-state to be a fraction of what it would have been under freely floating exchange rates,

$$c_T^{ch} = (1 - \kappa^{ch}) c_T^{ch\star} \tag{16}$$

where $\kappa^{ch} \in (0, 1)$ measures the degree of Chinese capital controls with $\kappa^{ch} = 1$ representing a fully closed financial account and $\kappa^{ch} = 0$ an entirely open account.[28]

Figure 6 shows the effect of such capital controls in the context of our model. It plots the Chinese economy's effective size as a function of κ^{ch}. Interestingly, even modest capital controls can make a

Figure 6: Effective Sizes and Capital Controls.



Notes: The figure plots effective country sizes as a function of the degree of capital controls in China, κ^{ch}, where $\kappa^{ch} = 0$ corresponds to a fully open capital account and $\kappa^{ch} = 1$ to a fully closed one. Effective size is the GDP share an economy would need under the baseline model — with free trade and free capital flows — to generate the same covariance between its currency and the world-market price of traded goods as it actually does under the indicated configuration. At $\kappa^{ch} = 0$, China's effective size coincides with its actual GDP share of 17%.

currency wholly unattractive as an anchor.

Quantifying the extent of China's capital controls is not straightforward. However, the available data indicate that cross-border holdings between China and the rest of the world are a fraction of what they would be in a fully open economy.

Quantifying the precise value of κ^{ch} is not straightforward. The Chinn–Ito index of de jure capital-account openness (Chinn and Ito, 2006) compiles four binary measures of restrictions on cross-border financial transactions from the IMF's *Annual Report on Exchange Arrangements and*

[28]In Appendix A.9 we show that for each $\kappa^{ch} \in (0, 1)$ there exists a tariff $\tau^{cn} > 0$ on Chinese imports and exports that is formally equivalent, though the mapping between the two is non-linear.

Exchange Restrictions; in its normalized form, the index runs from zero — assigned to the most closed countries in the sample — to one, assigned to the most open. In the 2023 vintage, China scores 0.13, in the company of India, Russia, Brazil, and Pakistan, while the United States and every Eurozone member state for which the index is reported score at or near the maximum of one. The absolute degree of closedness at the bottom of this scale is itself unobserved, so the index cannot pin down κ^{ch} precisely.

Nevertheless, these numbers plainly suggest that κ^{ch} is substantially larger than zero, so that, to date, the renminbi is not in serious contention to function as the world's anchor currency in our model. Consistent with this interpretation, the renminbi has substantially less traction as a target for exchange-rate stabilization than the euro. In the most recent update of the Ilzetzki, Reinhart, and Rogoff (2019) classification, roughly 28% of countries (accounting for some 15% of world GDP) anchor de facto to the euro, while no country anchors to the renminbi.

China's Capital-Account Liberalization

A natural question is what happens if China decides to liberalize its capital account. A growing body of scholarship has begun to examine how China might pursue currency internationalization (Clayton et al., 2025). One implication of our analysis is that successful Chinese capital-account liberalization would transform the contest for anchor status from a two-way competition between the dollar and the euro into a three-way race: with an open capital account, China's effective size would expand toward something closer to its share of world GDP (17%), making the renminbi a more viable target for stabilization, particularly if the Chinese economy continues to grow as a share of world GDP.

To analyze this possibility, consider a scenario where the Chinese economy grows to account for 30% of world GDP and thus eclipses that of the United States in sheer size; and China fully abolishes its tariffs and capital controls. In this case, the United States, the European Union, and the rest of the world could defend the dollar's anchor status by maintaining free trade among themselves but jointly imposing a tariff τ^{CN} on China. The tariff wedge then takes the same form as in the unilateral-tariff scenario of Section 3.2, but is now applied solely to China:

$$\lambda_T^{CN} = \lambda_T + \tau^{CN} c_T^{CN}. \tag{17}$$

This wedge prevents Chinese demand and supply shocks from spilling over into the global pricing of traded goods. Despite China's economic size, its currency therefore remains risky from the perspective of a global investor; the United States and the European Union, by contrast, remain fully integrated with each other and the rest of the world, preserving their currencies' covariance with global risk.

Figure 7 illustrates the evolution of the international monetary system under this configuration, assuming China grows to be 30% of world GDP, surpassing the U.S. (26%) as the largest economy in the world.

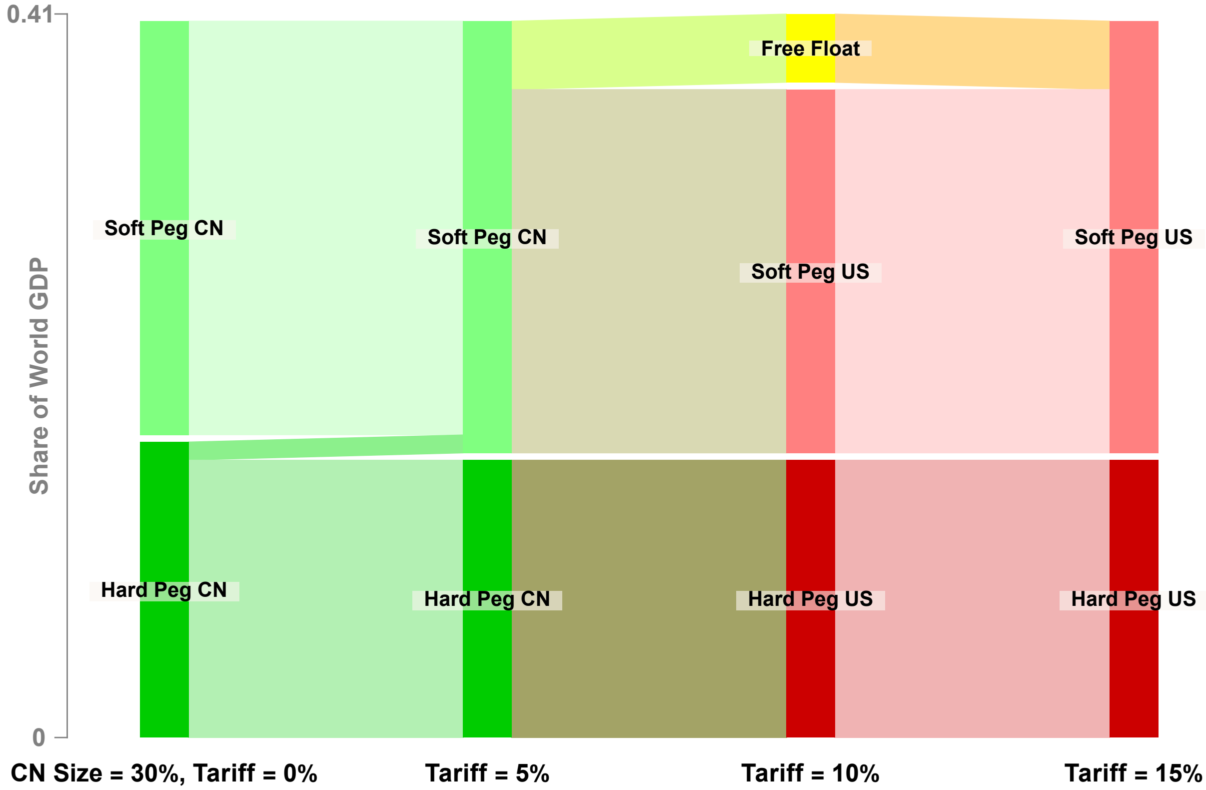
With China being the largest economy, all countries except the U.S. and the eurozone maintain currency stabilization against the renminbi.[29] At τ^{ch} =5%, the renminbi's anchor currency status already weakens, and at a tariff level of 10%, the US dollar regains its anchor currency status despite China being the largest economy. This result illustrates that, in a close competition between three large currencies, even modest restrictions on free trade can have a large effect on their relative attractiveness as anchors.

Deepening the Euro Safe-Asset Market

A caveat concerns the supply of Euro-denominated bonds. In our analysis, the euro can emerge as an alternative anchor once it becomes the safest currency. In practice, however, the lack of a large supply of common safe assets comparable to the market for U.S. Treasuries may make it more difficult to target the euro. Several authors argue that issuing joint eurozone debt—often discussed

[29]Note that countries that issue candidate anchor currencies (the U.S., the eurozone, and China) are excluded from Figure 7.

Figure 7: Transition of Exchange Rate Regimes under Tariffs on China.



Notes: This figure plots the model-predicted distribution of optimal stabilization decisions under varying Chinese tariff scenarios using the size distribution of 181 countries/regions (World Bank data) in 2023, assuming China grows to be 30% of world GDP. The U.S., the eurozone, and China are excluded from the graph. Each block consists of countries scaled by their GDP share. Countries are sorted by their sizes with the smallest at the top.

as Eurobonds—would strengthen the euro's international role by expanding the supply of safe euro-denominated assets (Corsetti et al., 2016). In this sense, the euro may face a constraint analogous to that of the renminbi: just as China's closed capital account prevents the renminbi from serving as the world's anchor currency, the absence of a deep and unified market for euro-denominated safe assets may make it more difficult to perform currency interventions that target the euro.

4 Conclusion

The structure of the world's monetary system, settled since the end of World War II, is now openly debated. The accompanying policy and scholarly discussion has largely focused on institutional features: the depth of the U.S. Treasury market, the architecture of dollar-clearing infrastructure, and the geopolitical alliances that backstop the dollar's reserve role. In this paper, we have offered a complementary framework, one that ties a currency's safety and anchor status to economic fundamentals: the size and openness of the issuing economy. A currency is safe in our model to the extent that the issuer's domestic shocks move world goods prices; an economy is an attractive anchor to the extent that smaller countries can import that safety by stabilizing against it. Tariffs erode the issuer's effective size on the goods side, capital controls on the financial side, and together they influence the safety of a currency.

This framework reframes Europe's policy options as three levers acting on the effective size of the euro. The first — internal integration and enlargement — is within European institutional reach and, in our model, may be sufficient on its own, against the backdrop of U.S. tariffs and a closed Chinese capital account, to install the euro at the center of the international monetary system. The second — trade openness — exposes Europe both to opportunity (when the U.S. or China withdraws from global trade) and to risk (when the U.S. returns to free trade). The third — capital-account openness — is the reason in our framework that excludes the renminbi from the anchor contest.

The fiscal stakes are substantial. Under plausible tariff and capital-account configurations, the erosion of safe haven status can raise sovereign debt-servicing costs by hundreds of billions of dollars annually, with comparable savings accruing to the economy that inherits the role. These magnitudes reflect only the safety-premium channel and exclude the additional costs of trade diversion and reduced competition.

Our fundamentals-based framework is silent on institutional questions that practitioners rightly emphasize — the operational depth of payments infrastructure, the credibility of legal commitments to investor protection, the role of geopolitical alliances in backstopping a currency's reserve status. We view these institutional features as complements rather than substitutes for the size-and-openness logic developed here, and we expect the most consequential shifts in the international monetary order to emerge from their interaction.

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A Details on Model Setup and Results

In this appendix, we provide additional details on the setup of our model, formally derive its equilibrium conditions, and present analytical results in the case with market segmentation ($\psi < 1$). For clarity, some portions of the model setup are reiterated from Section 2. A full derivation appears in Hassan, Mertens, and Zhang (2023) and Hassan et al. (2025).

A.1 Economic Environment

There are two discrete time periods, $t = 1, 2$. A unit measure of households $i \in [0, 1]$ is partitioned into N subsets of measure θ^n, where each partition represents the constituent households of a country. These include the United States (u), the EU (e), China, Japan, and a continuum of smaller countries. We use m to denote the country conducting an exchange rate stabilization. Households make investment decisions in the first period. All consumption occurs in the second period. We let ω denote the state of the world in the second period.

Households derive utility from consuming an index of a country-specific nontraded good, $C_{N,2}$, and a freely traded good, $C_{T,2}$, in each state ω, where:

$$C_2(i,\omega) = C_{T,2}(i,\omega)^{\alpha} C_{N,2}(i,\omega)^{1-\alpha} \tag{A.1}$$

and $\alpha \in (0, 1)$. Each household exhibits constant relative risk aversion according to:

$$U(i) = \frac{1}{1-\gamma}\, \mathbb{E}\left[C_2(i,\omega)^{1-\gamma}\right], \tag{A.2}$$

where $\gamma > 1$ is the coefficient of relative risk aversion. Country-level non-supply variation enters through a country-specific monetary shock μ^n that revalues the nominal bond held by consumer households (introduced in Section A.2 below). The monetary shock μ^n is normally distributed with

$$\mu^n \sim N\left(+\tfrac{1}{2}\sigma_\mu^2, \sigma_\mu^2\right),$$

chosen so that $\mathbb{E}[\exp(-\mu^n)] = 1$.

Each household owns a firm producing the local nontraded good using a Cobb-Douglas production technology:

$$Y_{N,2}(i,\omega) = \exp(\eta^n)K(i)^\nu, \tag{A.3}$$

where $0 < \nu < 1$ is the capital share and η^n is a country-specific productivity shock with

$$\eta^n \sim N\left(-\tfrac{1}{2}\sigma_N^2, \sigma_N^2\right).$$

Each household supplies one unit of labor inelastically and owns one unit of capital, which it can sell to its own firm or to any other firm in the world. In the second period, each household is also endowed with one unit of a traded consumption good.

A.2 Financial Markets and Budget Constraints

Within each country, a fraction $1-\psi$ of households lack access to financial markets. These households are labeled "consumers" and only own a nominal bond issued by the domestic financial intermediary. The bond is indexed to the country's consumer price index but is exposed to the country-specific monetary shock μ^n introduced in Section A.1: in each state ω the bond pays off $P^{n*}(\omega)\exp(-\mu^n(\omega))$ traded goods, where $P^{n*}(\omega)$ is the price level under the freely-floating exchange rate regime without tariffs. The consumer's problem thus involves maximizing expected utility subject to their budget constraint:

$$P_2^n(\omega)\hat{C}_2(i,\omega) \leq P_2^{n,*}(\omega)\exp(-\mu^n(\omega)),$$

where we use a hat to denote consumer quantities. They simply allocate their payoff across the two goods, spending a fraction α on the traded good and $1-\alpha$ on the nontraded good:

$$\hat{C}^n_T(\omega) = \frac{\alpha P^{n*}(\omega)\exp(-\mu^n(\omega))}{Z^n_P(\omega)Z^n_T(\omega)}, \tag{A.4}$$

$$\hat{C}^n_N(\omega) = \frac{(1-\alpha)P^{n*}(\omega)\exp(-\mu^n(\omega))}{P^n_N(\omega)}. \tag{A.5}$$

The remainder of the country's assets—all shares in domestic and international firms, the first-period endowments of traded goods, and the first-period country-specific transfer—are held by a domestic financial intermediary, which is owned and managed by the remaining mass ψ of households ("financiers"). The financiers' problem in the second period is to maximize expected utility (A.2) subject to the budget constraint:

$$\begin{aligned} Z^n_P(\omega)Z^n_T(\omega)C^n_T(\omega) + P^n_{2,N}(\omega)C^n_{2,N}(\omega) \le \frac{1}{\psi}\left(\sum_{l\in\{1,\dots,N\}} A^n_l P^l_{2,N}(\omega)Y^l_{2,N}(\omega) + Y^n_{2,T}\right) \\ - \frac{1-\psi}{\psi}P^{n,*}_2(\omega)\exp(-\mu^n(\omega)), \end{aligned} \tag{A.6}$$

where $Z^n_P(\omega)$ is the state-contingent tax that the central bank imposes to implement a stabilization, $Z^n_T(\omega)$ is the state-contingent tariff imposed by the government in country n, and A^n_l denotes the holdings of stocks in the nontraded sector of country l. The term $-\frac{1-\psi}{\psi}P^{n,*}_2(\omega)\exp(-\mu^n(\omega))$ on the right-hand side is the financier's per-capita cost of servicing the consumer household's nominal bond; this is the channel through which the monetary shock μ^n enters the financier intermediary's consolidated resources and, in turn, the global stochastic discount factor.

In the first period, financiers choose their portfolio of stocks and bonds to maximize expected utility in the second period. Their first-period budget constraint reads:

$$\sum_l A^n_l Q^l_N + Q_K K^n_N \le W^n_0, \tag{A.7}$$

where Q_N^l denotes the first-period price of stocks in country l, Q_K is the price of capital, W_0^n represents initial household wealth in terms of the traded goods in the first period, and

$$W_0^n = Q_N^n + Q_K + \kappa^n + \bar{Z}^n,$$

where κ_n is a transfer that equalizes the marginal utility of wealth across households under a no-tariff and no-stabilization regime, and $\bar{Z}$ ensures this is also true when tariff or stabilization policies are conducted.

Since stocks and capital are freely traded among financiers in international markets, all households must be marginal to investing in all stocks and bonds, and all firms must be marginal to purchasing an additional unit of capital. As a result, the stochastic discount factors are equalized in equilibrium across countries:

$$\frac{\Lambda_T^n(\omega)}{\Lambda_{T,1}^n} = \frac{\Lambda_T^l(\omega)}{\Lambda_{T,1}^l} \qquad \forall\, n, l. \tag{A.8}$$

We denote the stochastic discount factor by $Q(\omega)$.

A.3 Stabilization

This appendix fully characterizes the stabilization policy described in Section 2. The central bank of a manipulating country (m) chooses a target country t and a degree of stabilization $\Omega^{\mathcal{T},m} \in [0, 1]$. As stated in the main text, a stabilization is a policy that reduces the variance of the log real exchange rate of country m relative to the target t by a factor of $(1 - \Omega^{\mathcal{T},m})^2$, while preserving its conditional mean:

$$\text{var}\left[s^{m,t}\right] = (1 - \Omega^{\mathcal{T},m})^2 \ \text{var}\left[s^{m,t*}\right], \tag{A.9}$$

$$\mathbb{E}\left[s^{m,t} \mid \{K^n\}\right] = \mathbb{E}\left[s^{m,t*} \mid \{K^n\}\right], \tag{A.9b}$$

where asterisks denote the freely floating counterfactual and $\Omega^{\mathcal{T},m} = 1$ represents a hard peg.

The government implements the stabilization using two

instruments: a first-period lump-sum transfer $\bar{Z}^m$ paid to each household, and a second-period state-contingent tax $Z_P^m(\omega)$ on the domestic consumption of traded goods. As shown in Section 2, the per-capita resource cost of the stabilization is given by equation (10). In this paper, we set $\Delta\text{Res} = 0$, so that the lump-sum transfer is adjusted to exactly offset the expected cost of the tax scheme and all revenues (positive or negative) are rebated to the country's financier households.

Among the continuum of tax policies that implement the stabilization, we focus on the unique linear form in the second-period shocks. In log-linearized form, the state-contingent tax is

$$z_p^m = \sum_j \left(X_N^j \, y_N^j \; + \; X_\mu^j \, \mu^j \right), \tag{A.10}$$

where the $2N$ coefficients $\{X_N^n, X_\mu^n\}_{n=1}^N$ are pinned down by requiring that each state-contingent coefficient of the stabilized real exchange rate equals $(1-\Omega^{\mathcal{T},m})$ times the corresponding coefficient in the freely floating equilibrium. With these coefficients solved, one can plug z_p^m into the equilibrium system to write consumption, prices, and the resource cost (10) in closed form as functions of the primitives of the model.

A.4 Tariff

We assume that the government of the United States (country u) imposes a tariff on the traded good in the form of:

$$Z_T^u(\omega) = 1 + \tau^u \left(1 - \frac{1}{C_{T,\text{agg}}^u(\omega)} \right), \tag{A.11}$$

$$Z_T^n(\omega) = 1 \qquad \forall \, n \neq u, \tag{A.12}$$

where $C^u_{T,\text{agg}}(\omega) = \psi C^u_T(\omega) + (1-\psi)\hat{C}^u_T(\omega)$ is the aggregate consumption of the traded goods in the United States. When imposing a tariff of τ^u on imported goods (met with retaliation), the total expenditure on the trade good in the U.S. is given by

$$1 + (1+\tau^u)(C^u_{T,\text{agg}}(\omega) - 1) = C^u_{T,\text{agg}} + \tau^u(C^u_{T,\text{agg}} - 1).$$

Dividing by $C^u_{T,\text{agg}}$ yields the average price of the traded goods $Z^u_T(\omega)$. Log-linearizing (A.11) yields equation (11) in the main text.

A.5 Market Clearing and Equilibrium

The market-clearing conditions for the traded and nontraded goods in the second period are given by:

$$\sum_n \theta^n \left(\psi C^n_{2,T}(\omega) + (1-\psi)\hat{C}^n_{2,T}(\omega)\right) = 1, \tag{A.13}$$

$$\psi C^n_{2,N}(\omega) + (1-\psi)\hat{C}^n_{2,N}(\omega) = Y^n_{2,N}(\omega). \tag{A.14}$$

The first-order conditions for optimal consumption by the financier households in the second period are:

$$\frac{\alpha\left((C^n_T(\omega))^\alpha (C^n_N(\omega))^{1-\alpha}\right)^{1-\gamma} (C^n_T(\omega))^{-1}}{Z^n_P(\omega) Z^n_T(\omega)} = \Lambda_T(\omega), \tag{A.15}$$

$$\frac{(1-\alpha)\left((C^n_T(\omega))^\alpha (C^n_N(\omega))^{1-\alpha}\right)^{1-\gamma} (C^n_N(\omega))^{-1}}{P^n_N(\omega)} = \Lambda_T(\omega), \tag{A.16}$$

where $\Lambda_T(\omega)$ is the Lagrangian multiplier associated with the budget constraint (A.6). The first-order condition with respect to the aggregate consumption bundle $C^n(\omega)$ pins down the real price level in each country:

$$\left((C_T^n(\omega))^{\alpha}(C_N^n(\omega))^{1-\alpha}\right)^{-\gamma} = \Lambda_T(\omega)P^n(\omega). \tag{A.17}$$

A.6 Log-linear System of Equations

We solve for allocations in the second period by log-linearizing the first-order conditions around the deterministic steady state—the point at which the variances of all shocks are zero and all firms have a capital stock fixed at the deterministic steady-state level. Lowercase variables denote logs. We let $\lambda_{T,1}^n$ denote the log Lagrange multiplier on the first-period budget constraint for a household in country n. The natural log of the stochastic discount factor is given by

$$q = \lambda_T^n - \lambda_{T,1}^n. \tag{A.18}$$

We can then write the log-linear first-order conditions for the financier households in the second period as

$$z_T^n + z_p^n + q + \lambda_{T,1}^n = (1-\gamma)(\alpha c_T^n(\omega) + (1-\alpha)c_N^n(\omega)) - c_T^n(\omega) + \log(\alpha), \tag{A.19}$$

$$p_N^n + q + \lambda_{T,1}^n = (1-\gamma)(\alpha c_T^n(\omega) + (1-\alpha)c_N^n(\omega)) - c_N^n(\omega) + \log(1-\alpha). \tag{A.20}$$

The log-linear optimal consumption choices of the consumer households are given by:

$$\hat{c}_T^n = p^{n*} - \mu^n - z_p^n - z_T^n + \log(\alpha), \tag{A.21}$$

$$\hat{c}_N^n = p^{n*} - \mu^n - p_N^n + \log(1-\alpha), \tag{A.22}$$

where the $-\mu^n$ term in each expression reflects the log of the bond payoff $\exp(-\mu^n)$ introduced in equations (A.4)–(A.5), and $z_p^m = \log(Z_P(\omega))$, $z_T^u = \tau^u(\psi c_T^u + (1-\psi)\hat{c}_T^u$, with $z_p^n = 0$, $\forall n \neq m$, $z_T^n = 0$,

$\forall n \neq u$. The log-linear resource constraints are:

$$\psi c_N^n + (1-\psi)\hat{c}_N^n = y_N^n, \tag{A.23}$$

$$\sum_n \theta^n \left(\psi c_T^n + (1-\psi)\hat{c}_T^n\right) = 0. \tag{A.24}$$

The log-linear first-order condition with respect to consumption yields the price level of the final consumption bundle:

$$p^n + q + \lambda_{T,1}^n = -\gamma(\alpha c_T^n + (1-\alpha)c_N^n). \tag{A.25}$$

To conduct our numerical analysis, we solve for the equilibrium in which the United States imposes a tariff of τ, and an arbitrary manipulating country m can implement a stabilization of strength $\Omega^{\mathcal{T},m}$. We proceed in two steps:

1. We solve for allocations under the freely-floating exchange rate regime with no tariffs by setting $Z_P^n(\omega) = Z_T^n(\omega) = 1$. We have a system of $6N+1$ equations: resource constraints (A.13) and (A.14); FOCs (A.4), (A.5), (A.15), (A.16), and (A.17) to solve for $6N+1$ unknowns: $c_T^n, c_N^n, \hat{c}_T^n, \hat{c}_N^n, p_N^n, p^n$, and λ_T. We denote the solution of this system with freely floating exchange rates and no tariffs with asterisks. Importantly, we solve for the price of the consumption bundle under the freely floating exchange rate regime with no tariffs, $p^{n,*}$, which determines the consumption of the consumers within each country who do not have access to financial markets.

2. We solve for the state-contingent tax z_p^m that implements the stabilization in the manipulation country m by plugging the expressions for $p^{n,*}\ \forall n$ and z_T^u into our first-order conditions and assuming the state-contingent tax takes the linear form in (A.10). We then solve for the parameters X_N^n and X_μ^n such that $\text{var}[s^{m,t}] = (1-\Omega^{\mathcal{T},m})^2\ \text{var}[s^{m,t*}]$. We can then plug the expression for z_p^m into our solution, which allows us to write consumption and prices in terms of the primitives of the model.

A.7 Derivation of Equation (8)

The country n risk-free bond pays off P^{n*} units of the traded good at maturity, where P^{n*} is the price level under freely floating exchange rates. We derive the value of the risk-free bond, V_P^n, by applying the asset pricing equation to the bond payoff:

$$V_P^n = \mathbb{E}\left[\Lambda_T^* P^{n*}\right],$$

where Λ_T^* denotes the stochastic discount factor. The country n risk-free rate (in levels), R^n, is the inverse of the price of the risk-free bond:

$$R^n = \frac{1}{V_P^n}.$$

Putting the previous two equations together yields $\mathbb{E}\left[\Lambda_T^* P^{n*}\right] R^n = 1$. As a result, the risk-free rates of countries f and n are related as follows:

$$\mathbb{E}\left[\Lambda_T^* P^{f*}\right] R^f = \mathbb{E}\left[\Lambda_T^* P^{n*}\right] R^n = 1.$$

If the stochastic discount factor and prices are log-normal,

$$\begin{aligned} & \mathbb{E}\left[\Lambda_T^* P^{f*}\right] R^f = \mathbb{E}\left[\Lambda_T^* P^{n*}\right] R^n \\ \Leftrightarrow \quad & \mathbb{E}\left[\exp\left(\lambda_T^* + p^{f*} + r^{f*}\right)\right] = \mathbb{E}\left[\exp\left(\lambda_T^* + p^{n*} + r^{n*}\right)\right] \\ \Leftrightarrow \quad & \mathbb{E}\left[\lambda_T^* + p^{f*}\right] + \frac{1}{2}\operatorname{var}\left(\lambda_T^* + p^{f*}\right) + r^{f*} = \mathbb{E}\left[\lambda_T^* + p^{n*}\right] + \frac{1}{2}\operatorname{var}\left(\lambda_T^* + p^{n*}\right) + r^{n*}. \end{aligned}$$

Expanding the variance terms and canceling $\operatorname{var}(\lambda_T^*)$ from both sides:

$$\mathbb{E}\left[p^{f*}\right] + \frac{1}{2}\operatorname{var}\left(p^{f*}\right) + \operatorname{cov}\left(\lambda_T^*, p^{f*}\right) + r^{f*} = \mathbb{E}\left[p^{n*}\right] + \frac{1}{2}\operatorname{var}\left(p^{n*}\right) + \operatorname{cov}\left(\lambda_T^*, p^{n*}\right) + r^{n*}.$$

Rearranging:

$$r^{f*} + \mathbb{E}\left[p^{f*} - p^{n*}\right] + \frac{1}{2}\operatorname{var}\left(p^{f*}\right) - \frac{1}{2}\operatorname{var}\left(p^{n*}\right) - r^{n*} = -\operatorname{cov}\left(\lambda_T^*, p^{f*} - p^{n*}\right).$$

We define $\Delta\mathbb{E}\left[s^{f,n*}\right] = \log\left(\mathbb{E}\left[P^{f*}\right]/\mathbb{E}\left[P^{n*}\right]\right) = \mathbb{E}\left[p^{f*}\right] + \frac{1}{2}\operatorname{var}(p^{f*}) - \mathbb{E}\left[p^{n*}\right] - \frac{1}{2}\operatorname{var}(p^{n*})$. With this definition:

$$r^{f*} + \Delta\mathbb{E}\left[s^{f,n*}\right] - r^{n*} = \operatorname{cov}\left[\lambda_T^*, p^{n*} - p^{f*}\right].$$

A.8 Stocks in the Non-traded Sector

Dividend payments under free trade satisfy:

$$p_N^{n*} + y_N^{n*} = \frac{(\gamma - \psi)(1-\alpha)}{\psi(1-\alpha) + \gamma\alpha}\left(\bar{y}_N - y_N^n\right) + \frac{\gamma(1-\psi)}{\psi(1-\alpha) + \gamma\alpha}\left(\bar{\mu} - \mu^n\right). \tag{18}$$

A.9 Capital Control

In this section, we show that capital control in the form of (16) can be achieved by imposing a tariff τ^{CN} on China that satisfies the following relationship:

$$1 - \kappa^c = \frac{\gamma + (\gamma-1)(\alpha-1)\psi}{\gamma + (\gamma-1)(\alpha-1)\psi + (1-\theta^{CN})\Big[\gamma - (\gamma-1)\psi\Big]\tau^{CN}} \tag{19}$$

The accompanying mathematical notebook contains a derivation.

B Differentiated Traded Goods

In this section, we extend the baseline model of Section 2 along two dimensions: (1) each country produces its own variety of the traded good, which is an imperfect substitute for the varieties of other countries; and (2) the endowment of each country-specific variety is stochastic. The purpose of the exercise is to verify that the safety properties of the large country's risk-free bond and of its stocks in the nontraded sector are robust to these extensions. By contrast, we show that the sign of the spread on stocks in the *traded* sector depends on the elasticity of substitution between varieties—a Cole–Obstfeld effect (Cole and Obstfeld, 1991)—and is therefore not as robust in the same sense.

We retain the financier/consumer segmentation of the baseline and the monetary shocks μ^n that operate through it, working throughout at a general financier share ψ and with no tariffs or stabilization policies, so that $Z_P^n = Z_T^n = 1$. To streamline the exposition we restrict attention to the case in which shocks are uncorrelated across countries and across types. The key observation is that the differentiated-goods extension alters the equilibrium of Section 2 in only two places: it introduces the new variety-price relation (B.2) below, and it replaces the world traded-goods resource constraint with its stochastic counterpart (B.3). Every other optimality and market-clearing condition is exactly as in Appendix A. Because the new world-endowment term enters consumption, dividends, and the discount factor *symmetrically* across countries, and because traded-endowment shocks are uncorrelated with the supply and monetary shocks that drive currency risk, the cross-country safety rankings carry over unchanged.

B.1. Setup

Each household i in country n produces a differentiated variety of the traded good indexed by i. Shocks are common within each country: every household in country n is endowed with $Y_T^n(\omega)$ units of its own variety, where

$$y_T^n \sim N\left(-\tfrac{1}{2}\sigma_T^2, \sigma_T^2\right).$$

A representative firm aggregates these varieties into the traded composite using a CES technology,

$$\bar{Y}_T(\omega) = \left[\int_0^1 I_T(i,\omega)^{\frac{\varepsilon-1}{\varepsilon}}\, di\right]^{\frac{\varepsilon}{\varepsilon-1}}, \qquad \varepsilon > 0, \tag{B.1}$$

where $I_T(i,\omega)$ is the input of variety i and ε is the elasticity of substitution between any two varieties. The baseline model of Section 2 corresponds to the limit $\varepsilon \to \infty$ with $\sigma_T = 0$, in which case varieties are perfect substitutes and every household is endowed with one unit of the common traded good. We use the composite as the numéraire, so the composite price satisfies $P_T(\omega) = 1$.

Cost minimization by the aggregator yields the demand for variety i,

$$I_T(i,\omega) = \left(P_T^i(\omega)\right)^{-\varepsilon} \bar{Y}_T(\omega),$$

and the zero-profit condition $\int_0^1 P_T^i(\omega)^{1-\varepsilon}\, di = 1$. Because each household in country n receives the same endowment, market clearing for variety i requires $I_T(i,\omega) = Y_T^n(\omega)$ for all i in country n. Log-linearizing around the symmetric steady state ($Y_T^n = 1$) gives

$$p_T^n(\omega) = \frac{1}{\varepsilon}\left(\bar{y}_T(\omega) - y_T^n(\omega)\right), \qquad \bar{y}_T(\omega) = \sum_j \theta^j y_T^j(\omega), \tag{B.2}$$

so a variety in relatively short supply commands a higher relative price, with the elasticity of the price response governed by $1/\varepsilon$. Market clearing for the composite sums financier and consumer demand against the stochastic world endowment:

$$\sum_n \theta^n \left(\psi\, c_T^n(\omega) + (1-\psi)\, \hat{c}_T^n(\omega)\right) = \bar{y}_T(\omega), \tag{B.3}$$

which replaces the baseline constraint $\sum_n \theta^n \left(\psi c_T^n + (1-\psi)\hat{c}_T^n\right) = 0$ (equation (A.24)) with its stochastic counterpart.

B.2. Equilibrium Consumption and the Real Exchange Rate

The financiers' first-order conditions (A.15)–(A.16) and the consumer households' demands (A.4)–(A.5) are unchanged, since they are stated in terms of the composite traded good. Re-solving the log-linear system of Appendix A with the single modification that the world resource constraint (B.3) now carries $\bar{y}_T$ on its right-hand side, financier consumption of the composite traded good is

$$c_T^n(\omega) \;=\; \frac{\psi+(1-\psi)\alpha}{\psi}\,\bar{y}_T(\omega)+\frac{(1-\alpha)(\gamma-\psi)}{\psi(1-\alpha)+\gamma\alpha}\,(\bar{y}_N-y_N^n)+\frac{\gamma(1-\psi)}{\psi(1-\alpha)+\gamma\alpha}\,(\bar{\mu}-\mu^n) \tag{B.4}$$

Relative to equation (5) in the main text, the only new term is the one proportional to $\bar{y}_T$: when the world supply of traded goods is abundant, every country consumes more of the composite. The remaining cross-country risk-sharing terms are identical to the baseline, reflecting the fact that the composite is still freely shipped across borders and thus allows for risk-sharing in exactly the same way as when varieties are perfect substitutes.

Because $\bar{y}_T$ is common across countries, differencing (B.4) between countries n and f leaves the relative price of nontraded goods, and hence the bilateral real exchange rate, unchanged from the baseline:

$$s^{n,f}(\omega)=\frac{\gamma(1-\alpha)}{\psi(1-\alpha)+\gamma\alpha}\left(y_N^f-y_N^n\right)+\frac{\gamma(1-\alpha)(1-\psi)}{\psi(1-\alpha)+\gamma\alpha}\left(\mu^f-\mu^n\right), \tag{B.5}$$

which coincides with equation (5). Averaging across a continuum of trading partners whose idiosyncratic shocks wash out yields the broad real exchange rate index,

$$\bar{s}^n(\omega)=-\frac{\gamma(1-\alpha)}{\psi(1-\alpha)+\gamma\alpha}\,y_N^n-\frac{\gamma(1-\psi)(1-\alpha)}{\psi(1-\alpha)+\gamma\alpha}\,\mu^n, \tag{B.6}$$

which is identical to equation (6). The real exchange rate is thus driven purely by nontraded-supply and monetary shocks—shocks to the domestic traded endowment y_T^n move the price of the country's variety through (B.2) but have no effect on the real exchange rate, because only the common $\bar{y}_T$

enters consumption, and it does so symmetrically across countries.

B.3. The Stochastic Discount Factor and Bond Spreads

Combining the financier first-order conditions with (B.4) and the nontraded resource constraint (A.14) yields the log stochastic discount factor,

$$\lambda_T(\omega) \;=\; -\frac{\psi(1-\alpha)+\gamma\alpha}{\psi}\,\bar{y}_T(\omega) - \frac{(\gamma-\psi)(1-\alpha)}{\psi}\,\bar{y}_N(\omega) - \frac{\gamma(1-\psi)}{\psi}\,\bar{\mu}(\omega), \tag{B.7}$$

which extends equation (7) by adding a term proportional to the world supply of traded goods. An abundance of traded goods anywhere in the world lowers global marginal utility, but—crucially—it does so *in proportion to the producing country's share* θ^n, since the composite price (B.2) weights each variety by the size of the economy that supplies it. Shocks to larger countries' traded endowments thus move the global SDF more than equal-sized shocks to small countries, mirroring the mechanism already operating through $\bar{y}_N$ and $\bar{\mu}$ in the baseline.

Because $\bar{y}_T$ does not enter the bilateral exchange rate (B.5), and shocks are uncorrelated across countries and types, the covariance of the SDF with the payoff of country n's risk-free bond relative to country f's is exactly as in the baseline:

$$\operatorname{cov}\big[\lambda_T,\ p^n - p^f\big] = \frac{\gamma(\gamma-\psi)(1-\alpha)^2}{\psi[\psi(1-\alpha)+\gamma\alpha]}\big(\theta^n-\theta^f\big)\sigma_N^2 + \frac{\gamma^2(1-\psi)^2(1-\alpha)}{\psi[\psi(1-\alpha)+\gamma\alpha]}\big(\theta^n-\theta^f\big)\sigma_\mu^2. \tag{B.8}$$

This is precisely the baseline covariance (2). As there, it is strictly increasing in θ^n, so the currency of the largest economy remains the safest. The Euler equation (8) continues to hold, and therefore so does the ordering of real interest rates by country size. In this sense, the baseline result that the U.S. dollar is the world's safe currency is *fully robust* to the introduction of differentiated traded goods and stochastic traded endowments.

B.4. Stocks in the Nontraded Sector

The payoff of stock in country n's nontraded sector, expressed in units of the traded composite, is $P^n_N(\omega)Y^n_N(\omega)$. Using the Cobb-Douglas relation $p^n_N = c^n_T - c^n_N$ (up to a constant) together with (B.4) and the nontraded resource constraint (A.14), we obtain

$$p^n_N(\omega) + y^n_N(\omega) \;=\; \bar{y}_T(\omega) + \frac{(\gamma-\psi)(1-\alpha)}{\psi(1-\alpha)+\gamma\alpha}\big(\bar{y}_N - y^n_N\big) + \frac{\gamma(1-\psi)}{\psi(1-\alpha)+\gamma\alpha}\big(\bar{\mu} - \mu^n\big). \tag{B.9}$$

This extends (18) by the same common $\bar{y}_T$ term that appears in consumption. Because $\bar{y}_T$ is common across countries, it washes out of the cross-country comparison, and the spread in log expected returns between two countries' nontraded stocks is

$$\log \mathbb{E}R\big[P^n_N Y^n_N\big] - \log \mathbb{E}R\big[P^f_N Y^f_N\big] = \frac{(\gamma-\psi)^2(1-\alpha)^2}{\psi[\psi(1-\alpha)+\gamma\alpha]}\big(\theta^f - \theta^n\big)\sigma^2_N + \frac{\gamma^2(1-\psi)^2}{\psi[\psi(1-\alpha)+\gamma\alpha]}\big(\theta^f - \theta^n\big)\sigma^2_\mu,$$

which is negative whenever $\theta^n > \theta^f$. Stocks in the larger country's nontraded sector therefore continue to pay *lower* expected returns, just as in the baseline. The safety property of U.S. nontraded equities is robust to the extension.

B.5. Stocks in the Traded Sector: Cole–Obstfeld Effect

The payoff of stock in country n's traded sector, in units of the composite, is $P^n_T(\omega)Y^n_T(\omega)$. From (B.2),

$$p^n_T(\omega) + y^n_T(\omega) \;=\; \frac{1}{\varepsilon}\,\bar{y}_T(\omega) + \frac{\varepsilon-1}{\varepsilon}\,y^n_T(\omega). \tag{B.10}$$

A positive endowment shock to country n's variety raises physical output by y^n_T but depresses its relative price by y^n_T/ε; the net effect on the value of the output depends on whether varieties are substitutes ($\varepsilon > 1$) or complements ($\varepsilon < 1$).

Using the SDF from (B.7) and the fact that $\text{cov}[\bar{y}_T,\, y^n_T] = \theta^n\sigma^2_T$, the cross-country spread in log expected returns on traded-sector stocks is

$$\log \mathbb{E}R\left[P_T^n Y_T^n\right] - \log \mathbb{E}R\left[P_T^f Y_T^f\right] = \left(\frac{\varepsilon - 1}{\varepsilon}\right)\frac{\psi(1-\alpha) + \gamma\alpha}{\psi}\left(\theta^n - \theta^f\right)\sigma_T^2. \tag{B.11}$$

The sign depends entirely on ε:

(i) If $\varepsilon > 1$ (varieties are substitutes), the larger country's traded-sector stocks pay *higher* expected returns. A negative shock to country n's endowment leaves the value of its output falling (the price increase does not fully offset the quantity decline), so its traded-sector stock pays off poorly precisely when marginal utility is high—the classic Cole–Obstfeld effect. This case also nests the baseline of Section 2 as $\varepsilon \to \infty$.

(ii) If $\varepsilon = 1$, the value of output $p_T^n + y_T^n = \bar{y}_T$ is perfectly insulated from the country-specific shock, and there is no spread across countries.

(iii) If $\varepsilon < 1$ (complements), the price response dominates the quantity response, so a negative endowment shock *raises* the value of country n's output. The larger country's traded-sector stock then becomes a better hedge against world consumption risk and pays *lower* expected returns.

In contrast to the unambiguous safety ranking of risk-free bonds and nontraded stocks, the direction of the spread on traded-sector stocks therefore hinges on the elasticity of substitution between varieties. This is why, in the main text, we frame the anchor-currency mechanism around bonds and nontraded equity: those are the asset classes for which the large-country safety premium is a model-robust implication.

C EU Integration Details

$$\text{cov}\left[\lambda_T^*, p^{EU*} - p^{f*}\right] = \frac{\gamma(\gamma-\psi)(1-\alpha)^2}{\psi[\psi(1-\alpha)+\gamma\alpha]}\,\sigma_N^2 \left[\left(\theta^{EU}-\theta^f\right) + \sum_{j\neq EU}\theta^j\rho_{j,EU} - \sum_{j\neq f}\theta^j\rho_{j,f}\right]$$
$$+ \frac{\gamma^2(1-\psi)^2(1-\alpha)}{\psi[\psi(1-\alpha)+\gamma\alpha]}\,\sigma_\mu^2 \left[\left(\theta^{EU}-\theta^f\right) + \sum_{j\neq EU}\theta^j\rho^\mu_{j,EU} - \sum_{j\neq f}\theta^j\rho^\mu_{j,f}\right]. \tag{20}$$

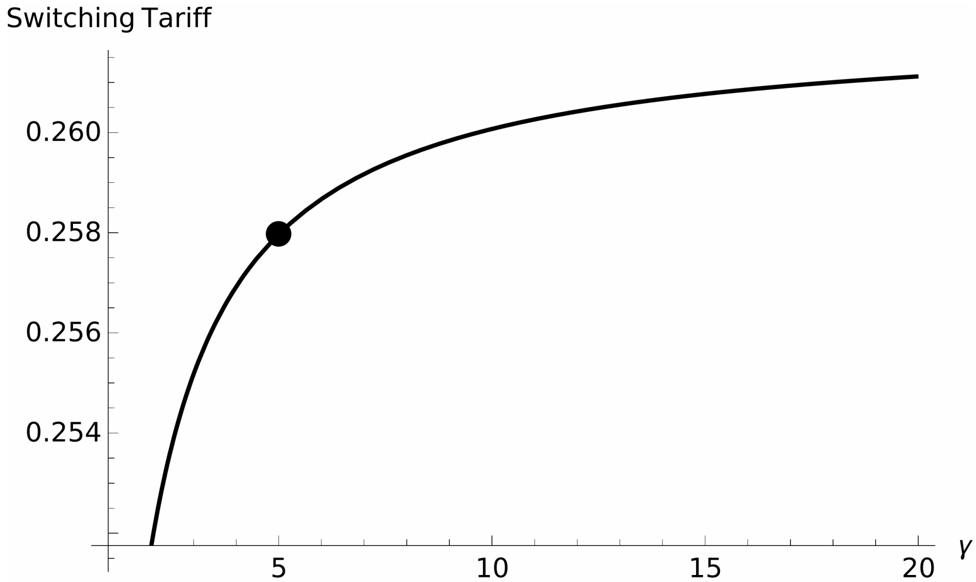
D Parameter Sensitivity

This appendix examines how the *switching tariff*—the level of U.S. protectionism at which a small country's optimal peg flips from the dollar to the euro—depends on the model's key structural parameters: the coefficient of relative risk aversion γ, the expenditure share on traded goods α, and the share of financier households ψ. For each parameter, we present two figures. The first plots the switching tariff as a function of the parameter, with a dot marking the baseline calibration. The second plots a small country's welfare under a peg to the dollar (solid) and under a peg to the euro (dashed) as functions of the U.S. tariff, for several values of the parameter; the intersection of the two welfare curves at each parameter value identifies the corresponding switching tariff.

Risk aversion (γ)

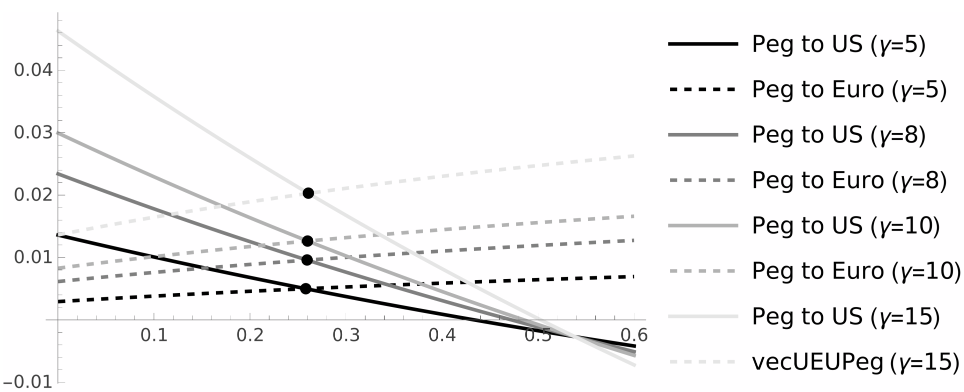
Figure 8 shows that the switching tariff is mildly increasing in γ but quantitatively close to flat: over the range $\gamma \in [2, 20]$ the threshold varies only between roughly 25% and 26%, with the baseline value of $\gamma = 5$ yielding a switching tariff of 25.8%. Intuitively, higher risk aversion magnifies the safety premium of both the dollar and the euro proportionally, so the parameter has only a second-order effect on the point at which the two pegs deliver equal welfare. Figure 9 confirms this: the peg-to-dollar and peg-to-euro welfare schedules shift upward as γ rises, but their crossing point moves only marginally to the right.

Figure 8: Switching Tariff and Risk Aversion (γ)



Notes: The vertical axis shows the switching tariff—the U.S. tariff rate at which a small country's optimal peg flips from the dollar to the euro—as a function of the coefficient of relative risk aversion γ. The dot indicates the baseline calibration ($\gamma = 5$), at which the switching tariff equals 25.8%. All other parameters are held at their baseline values.

Figure 9: Welfare Comparison across Pegs for Alternative γ

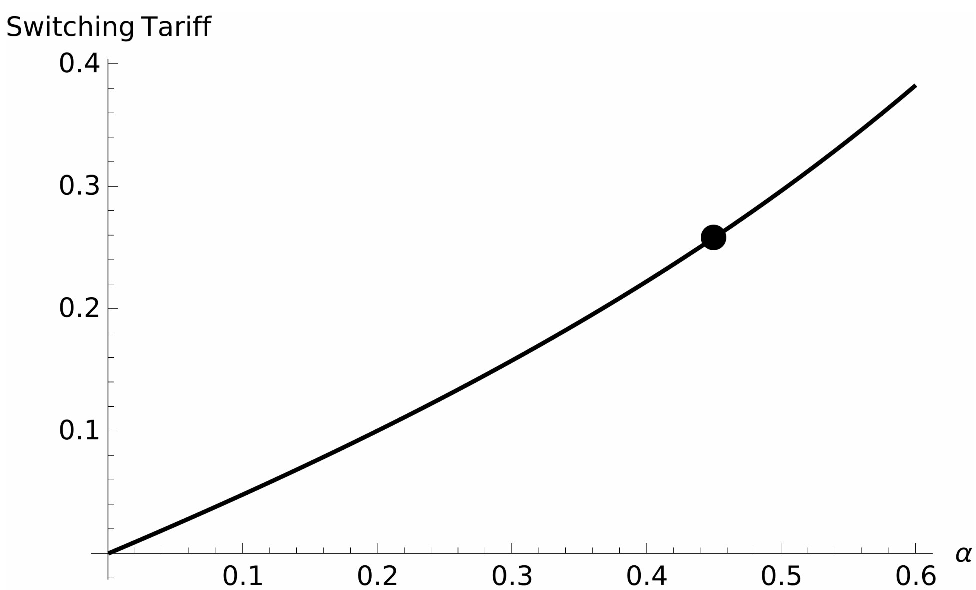


Notes: The figure plots a small country's welfare under a peg to the U.S. dollar (solid) and under a peg to the euro (dashed) as functions of the U.S. tariff, for $\gamma \in \{5, 8, 10, 15\}$ (darker lines correspond to lower γ). The intersection of each solid–dashed pair (marked by a dot) is the switching tariff for that value of γ. The crossing points shift only slightly with γ, consistent with the near-flat locus in Figure 8.

Traded share (α)

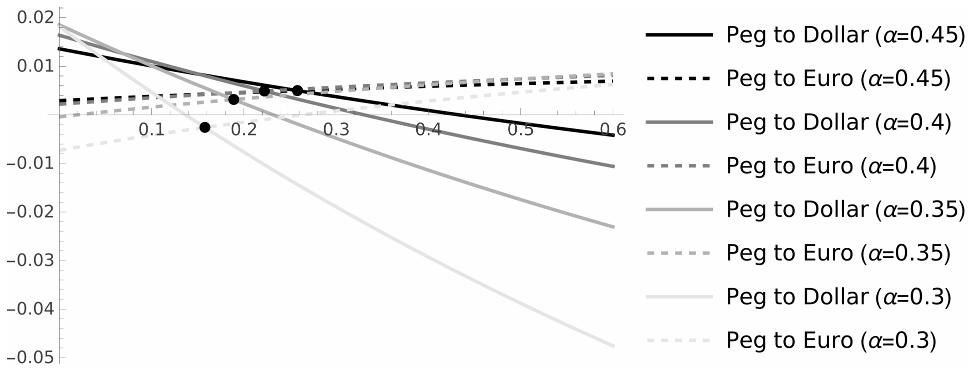
Figure 10 shows that the switching tariff is strongly increasing in the share of traded goods α, rising from near zero when α approaches zero to roughly 38% when $\alpha = 0.6$. At the baseline value $\alpha = 0.45$, the switching tariff equals 25.8%. The mechanism operates through the real exchange rate: a larger traded share amplifies the wedge between the price of nontraded and traded goods, which is the channel through which country size translates into currency safety. When α is small, traded-goods prices dominate and the safety differential between dollar and euro is weak, so even modest U.S. tariffs are enough to flip the optimal peg. When α is large, the dollar's safety premium is sizable and a much higher tariff is required to erode it. Figure 11 illustrates this directly: as α falls, the peg-to-dollar welfare schedule steepens and the crossing with the peg-to-euro schedule moves leftward.

Figure 10: Switching Tariff and Traded Share (α)



Notes: The vertical axis shows the switching tariff as a function of the expenditure share on traded goods α. The dot indicates the baseline calibration ($\alpha = 0.45$). The switching tariff is monotonically increasing in α, reflecting that a larger traded sector amplifies the safety premium of the dollar.

Figure 11: Welfare Comparison across Pegs for Alternative α

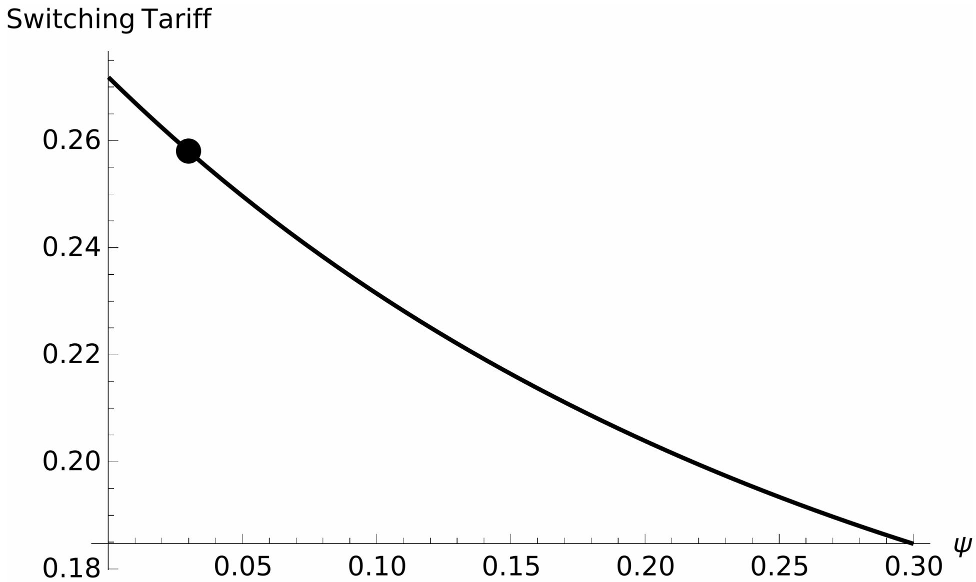


Notes: The figure plots welfare under a peg to the dollar (solid) and under a peg to the euro (dashed) as functions of the U.S. tariff, for $\alpha \in \{0.30, 0.35, 0.40, 0.45\}$ (darker lines correspond to higher α). The crossings (dots) trace out the switching-tariff locus of Figure 10: lower α shifts the crossing to substantially lower U.S. tariffs.

Financial-market participation (ψ)

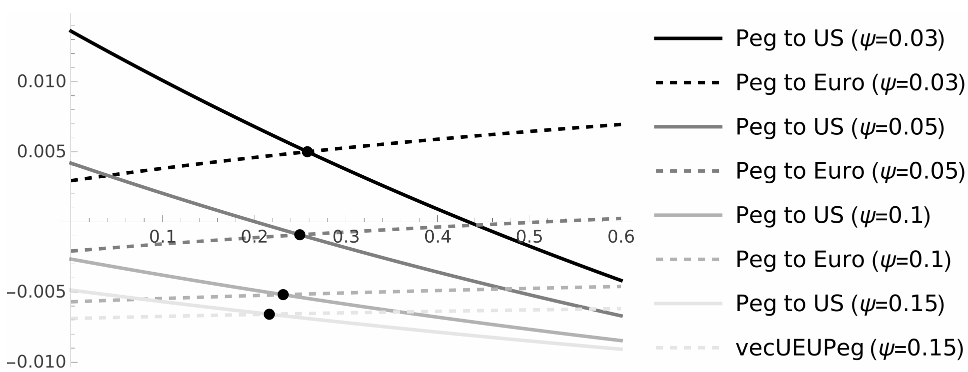
Figure 12 shows that the switching tariff is decreasing in the share of financier households ψ. The threshold falls from approximately 27% when ψ is close to zero to roughly 18% at $\psi = 0.3$, with the baseline value $\psi = 0.03$ delivering a switching tariff of 25.8%. As markets become more complete, the role of the global SDF in pricing currency risk shifts: a larger ψ raises the weight of the supply-shock channel relative to the demand-shock channel, so any given decline in the U.S. economy's effective trade integration produces a sharper deterioration in the dollar's safety. Figure 13 shows the corresponding welfare schedules: higher ψ shifts the peg-to-dollar curve to lower overall welfare levels. This narrows the baseline gap between the two pegs, pushing the crossing with the peg-to-euro curve to a lower tariff threshold.

Figure 12: Switching Tariff and Financial-Market Participation (ψ)



Notes: The vertical axis shows the switching tariff as a function of the share of financier households ψ. The dot indicates the baseline calibration ($\psi = 0.03$). The threshold declines with ψ, reflecting that more complete financial markets sharpen the response of the dollar's safety premium to U.S. trade isolation.

Figure 13: Welfare Comparison across Pegs for Alternative ψ



Notes: The figure plots welfare under a peg to the dollar (solid) and under a peg to the euro (dashed) as functions of the U.S. tariff, for $\psi \in \{0.03, 0.05, 0.10, 0.15\}$ (darker lines correspond to lower ψ). The crossings (dots) trace out the switching-tariff locus of Figure 12: higher ψ shifts the crossing to lower U.S. tariffs.