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GEOPOLITICAL FRAGMENTATION, SOVEREIGN DEBT, AND DOLLAR DOMINANCE

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ABSTRACT

Countries borrow in dollars because dollar debt markets are deep and liquid. This paper develops a theory of when that dominance becomes fragile because countries have inherited dollar liabilities but increasingly earn yuan-linked revenues. In the model, countries begin with dollar-denominated sovereign debt. Geopolitical fragmentation raises their yuan revenue share through two channels: higher trade barriers with dollar-linked markets shift exports toward yuan-linked markets, and higher costs of using dollars in that trade make yuan settlement more attractive. Governments then face a choice: repay dollar debt using revenues that are less dollar-linked, default, or restructure into yuan. The paper identifies a liquidity spillover from restructuring: dollar-to-yuan restructurings deepen yuan debt markets, lowering refinancing costs and encouraging additional restructurings. The model shows when fragmentation produces limited restructuring and when it triggers a self-reinforcing shift from dollar debt to yuan debt. A cascade requires the liquidity feedback from yuan restructuring to be stronger than the dispersion in countries' yuan revenue exposure.

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1 Introduction

Dollar debt markets are deep and liquid, making dollar borrowing attractive to governments across the world. But this can create a mismatch: the currency of the debt need not match the currency generated by the country's exports. This paper studies how geopolitical fragmentation can make that mismatch more severe. By changing trade patterns and the currencies used to settle trade payments, fragmentation can leave countries with dollar liabilities but a growing share of foreign-currency revenues linked to yuan. The central question is whether this shift can turn dollar-denominated sovereign debt into a currency-mismatch problem that makes restructuring into yuan attractive. The issue is therefore a balance-sheet one: inherited dollar claims may become harder to sustain when trade and settlement shift repayment capacity toward another currency bloc.

To address this question, we develop a model with three components: export revenues whose currency composition changes with fragmentation, a sovereign debt problem in which governments choose among repayment, default, and restructuring, and currency-specific debt markets whose liquidity depends on how many claims are denominated in each currency. The model starts from a dollar-dominant equilibrium: countries have dollar-denominated liabilities because dollar markets are initially deeper and cheaper.

To guide and motivate the model, we document four empirical facts. First, China is a major lender to many developing and emerging economies, but Chinese-creditor loans are often denominated in dollars rather than yuan. Second, dollar export invoicing is related to export exposure to the United States, so changes in export destinations can change the currency composition of export revenues. Third, for a substantial set of countries, dollar public-debt exposure exceeds dollar export-invoicing exposure. This is the mismatch at the center of the paper. Finally, recent episodes show that dollar-to-yuan restructuring is an available policy margin: Kenya converted Chinese railway loans from dollars into yuan, while Ethiopia and Zambia have been linked to similar discussions. These facts establish the empirical setting for the model: dollar liabilities can remain in place even as export revenues become less dollar-linked, making restructuring into yuan a relevant sovereign-debt choice.

In the model, the shift in revenue currency changes the government's debt problem. A country

that owes dollars can continue repaying in dollars, but repayment becomes more costly when revenues are increasingly yuan-linked. It can default, but default is costly. Or it can restructure and refinance into yuan. Restructuring becomes attractive when yuan-linked revenues are high enough and yuan refinancing costs are low enough.

The key amplification comes from debt-market liquidity. Yuan restructuring generates an aggregate liquidity spillover: as more sovereign claims are denominated in yuan, the yuan debt market becomes deeper and refinancing costs fall. Lower yuan refinancing costs make restructuring more attractive for other governments. Restructuring decisions are therefore strategic complements: each restructuring can make subsequent restructurings more likely. The paper studies when this feedback remains limited and when it generates a self-reinforcing restructuring cascade.

The model delivers three main implications. First, through trade reallocation and trade-payment settlement, fragmentation raises countries' yuan revenue exposure and makes yuan restructuring attractive for a larger set of borrowers. Second, because yuan refinancing costs fall as yuan debt markets deepen, one country's restructuring increases the incentive for others to restructure. Third, this feedback can generate a restructuring cascade. Fragmentation does not mechanically imply de-dollarization: a cascade arises only when the liquidity gains from yuan restructuring are strong enough relative to the dispersion in countries' yuan exposure.

Contribution to the literature. Our paper contributes to the following strands of literature.

Dominant currencies in trade and debt markets. This paper builds on work studying why particular currencies dominate international transactions. In goods markets, Gopinath et al. (2020) show how dominant-currency pricing shapes exchange-rate pass-through and international adjustment, while Amiti et al. (2022) and Mukhin (2022) study the endogenous choice and emergence of invoicing currencies through firm-level price-setting complementarities. A related literature emphasizes complementarities between trade and finance. Gopinath and Stein (2021) show that dollar invoicing raises demand for dollar finance, while deeper dollar banking makes dollar invoicing more attractive. Chahrour and Valchev (2022) develop a model in which a dominant currency emerges from complementarities between portfolio returns and the use of that currency to finance trade, and Chahrour and Valchev (2023) use this framework to study whether geoeconomic conflict

can threaten dollar dominance. Farhi and Maggiori (2018) analyze how safe-asset provision and reserve-currency status shape the international monetary system, while Maggiori et al. (2020) show how currency denomination affects global capital allocation. Bahaj and Reis (2026) study how PBOC swap lines can jump-start international RMB use through complementarities between the currency of working capital and sales invoicing, while Benguria and Novy (forthcoming) provide empirical evidence on this link using the experience of Argentina.

On the debt side, Coppola et al. (2023) show that liquidity externalities can make one currency the dominant unit of denomination in global debt contracts: deeper markets lower the cost of issuing in that currency, which reinforces its use. Our paper builds on this liquidity-externality logic but applies it to a different margin. In Coppola et al. (2023), the externality operates through the denomination of new debt issuance. In our model, the key margin is the restructuring of inherited dollar sovereign debt: governments decide whether to repay, default, or convert an existing stock of dollar claims into yuan claims, and this stock adjustment can deepen yuan debt markets and encourage further restructurings. Eren and Malamud (2022) provide a risk-based theory of dominant-currency debt. Our paper also relates to the original-sin literature (Eichengreen et al., 2003; Jeanne, 2003; Engel and Park, 2022), which studies why emerging economies borrow in foreign currency and how foreign-currency debt creates currency-mismatch vulnerabilities.

Sovereign debt, default, and restructuring. The paper also relates to the sovereign-debt literature on default and restructuring. Standard sovereign-default models, such as Arellano (2008), study governments' incentives to repay or default when debt is difficult to enforce. Cole and Kehoe (2000) show how rollover beliefs can generate self-fulfilling sovereign debt crises. Corsetti et al. (2004) study related coordination forces in currency crises with large and small traders. Bolton and Jeanne (2007) study how the structure and seniority of sovereign debt affect restructuring incentives and the efficiency of crisis resolution. Cruces and Trebesch (2013) document that restructuring terms and haircuts have persistent effects on market access and spreads, highlighting that restructuring is a costly and discontinuous adjustment margin, and Asonuma and Trebesch (2016) show that restructuring outcomes differ systematically between preemptive and post-default episodes.

Geopolitical fragmentation, China lending, and RMB internationalization. Our work belongs to an emerging literature on geopolitical fragmentation, surveyed by Mohr and Trebesch (2025) and

Clayton et al. (2026). Gopinath et al. (2025) map international trade fragmentation along geopolitical lines, while Boz et al. (2025) provide evidence on trade invoicing in a fragmenting world economy, documenting both the continued dominance of the dollar and the gradual expansion of yuan invoicing.

The paper also relates to work documenting China's role as a major international creditor. Horn et al. (2021) show that China has become one of the largest official creditors to developing and emerging economies, with many claims missing from standard debt statistics. Gelpern et al. (2023) study loan contracts between Chinese state-owned creditors and sovereign borrowers, emphasizing their distinctive contractual terms and limited transparency. Horn et al. (2023) show that China has also provided emergency financing through rescue loans and central bank swap lines. Finally, Prasad (2017), Eichengreen and Kawai, eds (2015) and Clayton et al. (2025) are examples of work on the internationalization of China's currency.

Our main contribution to these literatures is to identify sovereign restructuring as a channel through which geopolitical fragmentation can weaken dollar debt dominance. Existing theories emphasize that dominant currencies persist because trade, finance, and liquidity reinforce one another, especially in the denomination of new transactions. We study a different margin: governments have inherited dollar liabilities, but fragmentation makes export revenues less dollar-linked. This creates a discrete sovereign-debt problem. Governments can repay in dollars, default, or restructure into yuan. Restructuring matters because it changes the stock of claims in each currency. If enough dollar claims are converted into yuan claims, yuan debt markets deepen, yuan refinancing costs fall, and further restructurings become more attractive. The paper characterizes when this process remains gradual and when it produces a tipping point away from dollar debt dominance.

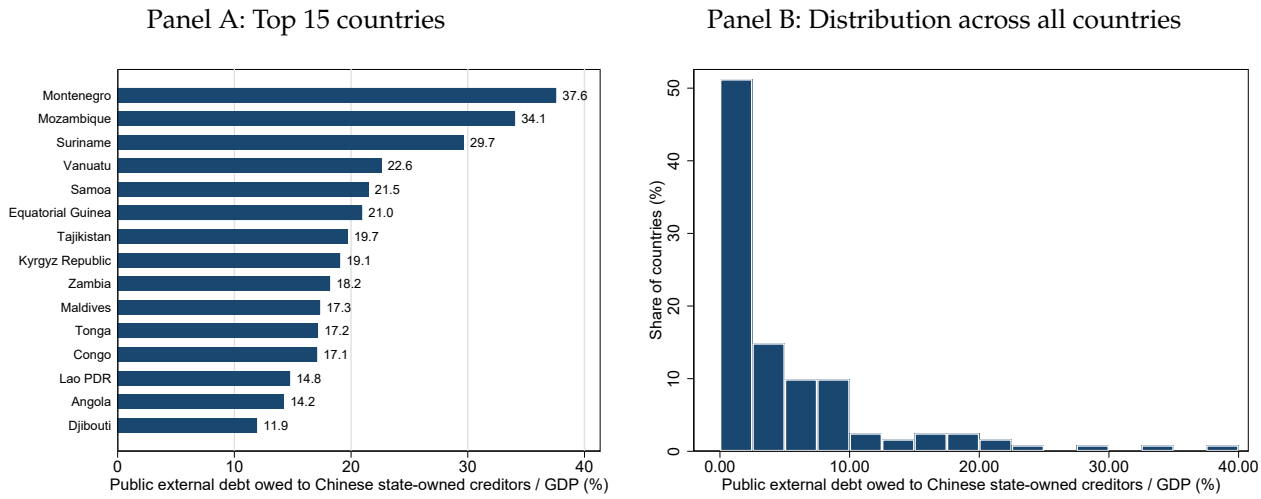
The paper proceeds as follows. Section 2 presents motivating facts. Section 3 develops the model. Section 4 characterizes debt-denomination equilibrium, comparative statics, tipping conditions, the legacy-debt restructuring channel, and policy competition between currency blocs. Section 5 concludes.

2 Empirical Motivation

Four facts motivate the model and map onto its building blocks.

Fact 1: China is a major lender, and Chinese lending is often denominated in dollars. China is an important creditor for many developing and emerging economies. Figure 1 shows that, in 2019, public and publicly guaranteed debt owed to Chinese state-owned creditors was large relative to GDP in many developing countries. For the top 15 countries, it exceeded 10% of GDP.

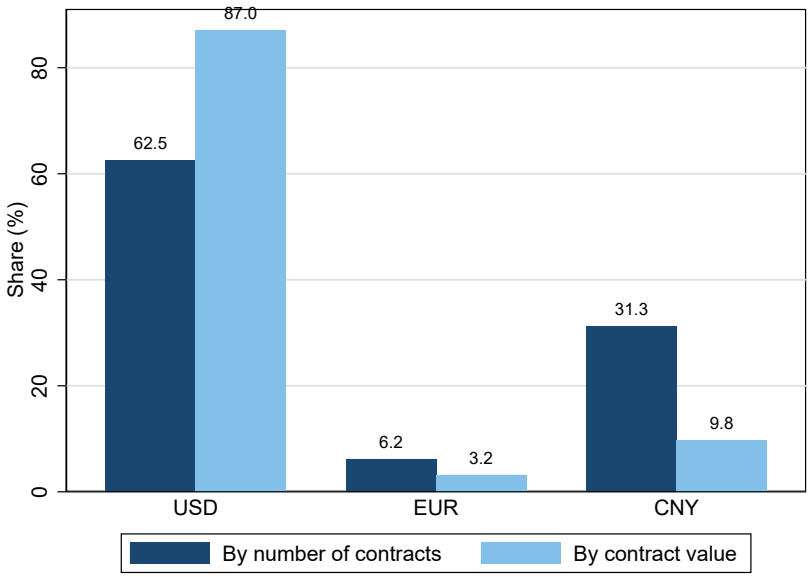
Figure 1: Public external debt owed to Chinese state-owned creditors over GDP: top 15 countries



Notes: This figure plots the ratio of public and publicly guaranteed debt owed to Chinese state-owned creditors over GDP in 2019, using the data from Horn et al. (2021). Panel A plots this ratio for the top 15 countries, while panel B plots a histogram of the distribution across 121 countries with available data.

Figure 2 shows that these creditor relationships do not imply yuan-denominated debt. Using the loan-contract data assembled by Gelpern et al. (2023), we find that Chinese-creditor loan contracts are predominantly denominated in dollars: USD accounts for 62.5 percent of contracts and 87.0 percent of loan commitments. This fact motivates the model's initial condition: countries can owe substantial debt to Chinese creditors while still carrying dollar-denominated liabilities.

Figure 2: Currency denomination of Chinese loan contracts

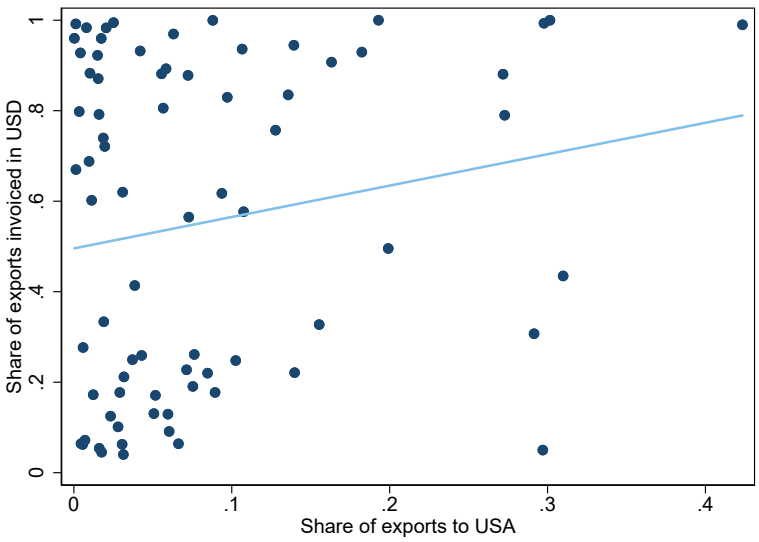


Notes: The dark blue bars represent the share of contracts denominated in USD, EUR and CNY in the dataset of contracts by Chinese state-creditors assembled by Gelpern et al. (2023), which spans the period 1990-2025. The light blue bars represent the share of loan commitments (measured in USD).

Fact 2: Dollar export invoicing depends on export exposure to the United States. Figure 3 plots the share of exports to the United States against the share of exports invoiced in dollars. Countries that export more to the United States tend to invoice a larger share of their exports in dollars. At the same time, dollar invoicing is common even among countries with limited direct export exposure to the United States. For countries with a US export share below 5%, for example, the mean USD invoice share is 52%. The figure shows why changes in export destinations can change the currency composition of export revenues, while also illustrating the broad reach of dollar invoicing.

Fact 3: Dollar debt exposure can exceed dollar export-invoicing exposure. Figure 4 compares the dollar share of public external debt with the dollar share of export invoicing. The 45-degree line marks the point where the two shares are equal. Countries below the line have more dollar exposure on the debt side than on the export-invoicing side. A substantial share of countries lie below this line, reflecting the mismatch emphasized in our model.

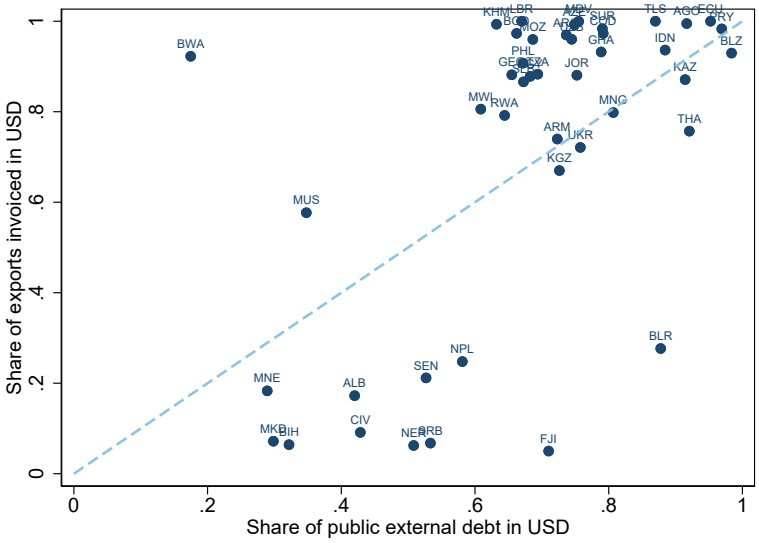
Figure 3: Share of exports to the USA and share of exports invoiced in USD



Notes: This figure plots a scatterplot between the share of exports to the US in the horizontal axis and the share of exports invoiced in USD in the vertical axis. The sample corresponds to 75 countries with available data in 2019. Export data is obtained from COMTRADE. Trade invoicing data is obtained from Boz et al. (2022).

Fact 4: Dollar-to-yuan restructuring has emerged as a policy margin. Recent episodes show that governments are considering or undertaking the conversion of Chinese dollar loans into yuan-denominated claims. Kenya converted Chinese railway loans from dollars into yuan in 2025, with reporting indicating lower annual debt-service costs (Bloomberg News, 2025c). Ethiopia later entered talks with China to convert part of its Chinese dollar debt into yuan-denominated loans (Bloomberg News, 2025b), and Zambia was reported to be watching the Kenya deal closely (Bloomberg News, 2025a). While these episodes do not imply that a global restructuring wave is underway, they show that dollar-to-yuan restructuring is a real policy option for governments with dollar liabilities to Chinese creditors.

Figure 4: Share of public debt in USD and share of exports invoiced in USD



Notes: This figure plots a scatter plot between the share of public external debt in USD in the horizontal axis and the share of exports invoiced in USD in the vertical axis. The sample corresponds to 44 countries with available data in 2019. The dotted line corresponds to the 45-degree line. The share of public debt in USD is obtained from the World Bank's International Debt Statistics, and is limited to low and middle income countries. Trade invoicing data is obtained from Boz et al. (2022).

Together, these facts motivate the model. Countries can owe substantial debt to Chinese creditors while still owing dollars. When export destinations change, the dollar share of export invoicing can change as well. In some countries, dollar liabilities already exceed dollar export-invoicing exposure. Recent restructuring episodes also show that converting Chinese dollar loans into yuan is a real policy option. The model studies how geopolitical fragmentation can bring these pieces together: by making dollar debt more mismatched, by making yuan restructuring more attractive, and by allowing restructurings to spill over through lower yuan refinancing costs.

3 Model

Our framework is as follows. Governments initially borrow in dollars because dollar debt markets are deeper and more liquid than yuan debt markets. Geopolitical fragmentation then changes the currency composition of export revenues. Higher trade barriers with the dollar bloc redirect trade toward yuan-linked markets, while greater frictions in dollar settlement make yuan invoicing

more attractive in those transactions. As revenues become less dollar-linked, governments with inherited dollar liabilities face a choice: continue repaying in dollars, default, or restructure into yuan. Restructuring becomes more attractive when yuan-linked revenues are high and yuan refinancing conditions improve.

Yuan borrowing and restructuring also affect future financing conditions. As more sovereign claims are denominated in yuan, yuan debt markets become deeper and refinancing costs fall, increasing the attractiveness of yuan borrowing for other governments. Thus, the mass of countries that borrow or restructure in yuan is key in our model.

We model this environment as follows. There are two large liquidity blocs indexed by $c \in \{D, Y\}$, where D denotes the dollar bloc and Y the yuan bloc. There is a continuum of small open economies indexed by $i \in [0, 1]$. Each country is atomistic and raises resources in international capital markets. External sovereign debt can be denominated in dollars or yuan.[1]

Let

$$n \equiv n_Y \in [0, 1] \tag{1}$$

denote the mass of countries borrowing in yuan. The mass borrowing in dollars is $n_D = 1 - n$.

The next four subsections characterize the main components of the environment. Section 3.1 determines the currency composition of export revenues. Section 3.2 derives currency-specific borrowing costs from secondary-market liquidity. Section 3.3 studies individual debt-denomination choices. Section 3.4 introduces inherited dollar liabilities, default, and restructuring.

3.1 Trade, invoicing, and revenue currency exposure

We model fragmentation as a shift in trade and settlement away from the dollar bloc. Countries export to both blocs, but higher trade barriers with the dollar bloc redirect exports toward yuan markets. At the same time, fragmentation makes dollar settlement less convenient in yuan-bloc transactions, increasing the share of exports invoiced in yuan. Together, these changes raise the yuan share of export revenues.

[1] We assume that each country issues debt in a single currency. This reflects the fixed costs of maintaining issuance programs, legal documentation, clearing arrangements, and investor bases across multiple currencies. Our focus is on how many countries use each currency. Allowing countries to issue in multiple currencies would smooth individual choices, but it would not eliminate the aggregate adoption externality. Appendix B.2 provides a simple fixed cost foundation for this assumption.

Country i exports to both blocs $m \in \{D, Y\}$. Demand in destination m is isoelastic,

$$x_{im} = A_{im} p_{im}^{-\sigma}, \qquad \sigma > 1, \tag{2}$$

where $A_{im} > 0$ and p_{im} is the consumer price. Exporters face increasing marginal costs in total shipments,

$$C_i(x_{iD}, x_{iY}) = \frac{1}{1+\lambda}(x_{iD} + x_{iY})^{1+\lambda}, \qquad \lambda > 0. \tag{3}$$

Trade costs are iceberg. In particular, $\tau_D \geq 1$ denotes the iceberg trade cost associated with exporting to the dollar bloc, so higher values of τ_D capture greater fragmentation with dollar-bloc markets.

We show in Appendix A.1 that optimal export revenues satisfy

$$r_{iD} = K A_{iD} \tau_D^{1-\sigma} S_i^{-\alpha}, \tag{4}$$

$$r_{iY} = K A_{iY} \tau_Y^{1-\sigma} S_i^{-\alpha}, \tag{5}$$

where $K > 0$ is a constant independent of destination and trade costs, $S_i = A_{iD}\tau_D^{1-\sigma} + A_{iY}\tau_Y^{1-\sigma}$, and $\alpha = \frac{\lambda(\sigma-1)}{1+\lambda\sigma} \in (0, 1)$. We see that an increase in τ_D reduces revenues from dollar markets and redirects exports toward yuan markets, implying $\partial r_{iD}/\partial \tau_D < 0$ and $\partial r_{iY}/\partial \tau_D > 0$ for every country i.

We assume that exports to the dollar bloc are dollar-invoiced. For a yuan-bloc relationship j, the buyer can pay in either dollars or yuan. The transaction cost of dollar invoicing is

$$\chi_D = \bar{\chi}_D - a_L L_D + \mu \zeta_D, \qquad a_L > 0,\ \mu > 0, \tag{6}$$

where L_D is dollar settlement liquidity and ζ_D is the dollar-settlement fragmentation wedge that governs the relative cost of using dollars in yuan-bloc trade. The cost of yuan invoicing is

$$\chi_Y(j) = \bar{\chi}_Y - a_L L_Y + \varepsilon_j, \tag{7}$$

where L_Y is yuan settlement liquidity and $\varepsilon_j \sim F_i$ has density $f_i > 0$ on the relevant support.

A yuan-bloc relationship uses yuan invoicing when $\chi_Y(j) \leq \chi_D$. Hence, we can calculate the share of yuan-bloc exports invoiced in yuan as

$$\psi_i(L_D, L_Y) = F_i(z), \tag{8}$$

where

$$z = \bar{\chi}_D - \bar{\chi}_Y + a_L(L_Y - L_D) + \mu\zeta_D. \tag{9}$$

Notice that the partial derivatives are $\psi_{i,\zeta} = f_i(z)\mu > 0$, $\psi_{i,L_Y} = f_i(z)a_L > 0$, and $\psi_{i,L_D} = -f_i(z)a_L < 0$, which implies the share of exports to the yuan bloc invoiced in yuan is increasing in the fragmentation wedge ζ_D, increasing in the settlement liquidity of the yuan L_Y, and decreasing in the settlement liquidity of the dollar L_D.

Lastly, noting that dollar export revenues are $X_i^D = r_{iD} + (1 - \psi_i)r_{iY}$, and yuan export revenues are $X_i^Y = \psi_i r_{iY}$, we can define the yuan revenue share as

$$s_i = \frac{X_i^Y}{X_i^D + X_i^Y} = \frac{\psi_i r_{iY}}{r_{iD} + r_{iY}}. \tag{10}$$

The next proposition summarizes how fragmentation affects the currency composition of export revenues.

Proposition 1 (Fragmentation raises yuan revenue exposure)**.** *If* $\partial r_{iD}/\partial\tau_D < 0$ *and* $\partial r_{iY}/\partial\tau_D > 0$*, then* $\partial s_i/\partial\tau_D > 0$ *and* $\partial s_i/\partial\zeta_D > 0$*.*

Proposition 1 states that the yuan revenue share is increasing both in the dollar bloc trade barrier τ_D and dollar-settlement fragmentation wedge ζ_D.

3.2 Debt-market liquidity

Each country raises $B > 0$ at date 0 by issuing one-period external sovereign debt. Debt can be denominated in either dollars or yuan. Let $c_i \in \{D, Y\}$ denote the currency chosen by country i.

We assume that sovereign debt markets exhibit liquidity spillovers. Currencies used by more sovereign borrowers are easier to trade in secondary markets and command better financing terms.

Let n_c denote the mass of countries issuing debt in currency c. Market depth for currency c is

given by

$$\mathcal{L}_c(n_c) = K_c + \eta n_c, \qquad \eta > 0, \tag{11}$$

where K_c captures exogenous market depth and ηn_c captures the liquidity associated with a larger stock of sovereign claims. Dollar markets are initially deeper, so $K_D > K_Y$.

Investors are risk neutral. With probability $\lambda_\ell \in (0,1)$, an investor must liquidate the bond before maturity. Selling a bond denominated in currency c involves a proportional liquidation discount $\delta_c(\mathcal{L}_c)$ satisfying

$$\delta_c'(\mathcal{L}_c) < 0, \qquad \delta_c''(\mathcal{L}_c) > 0. \tag{12}$$

More liquid sovereign debt markets therefore have smaller liquidation losses. Larger markets may benefit from narrower bid-ask spreads, deeper dealer balance sheets, or a broader investor base. The key assumption is simply that sovereign claims denominated in more widely used currencies are easier to trade.

Let $R^* > 1$ denote the world gross risk-free interest rate. Competitive pricing implies that a unit face-value claim denominated in currency c is priced at

$$P_c(n_c) = \frac{1 - \lambda_\ell \delta_c(\mathcal{L}_c(n_c))}{R^*}. \tag{13}$$

The implied gross repayment per unit borrowed is

$$q_c(n_c) = \frac{1}{P_c(n_c)} = \frac{R^*}{1 - \lambda_\ell \delta_c(\mathcal{L}_c(n_c))}. \tag{14}$$

As more countries issue debt in a given currency, that market becomes more liquid, liquidation discounts fall, and borrowing becomes cheaper. In equilibrium,

$$q_c'(n_c) < 0. \tag{15}$$

Appendix A.4 contains the derivation.

3.3 Currency mismatch and debt denomination

Debt service must be paid in the currency specified by the contract, while repayment resources arrive in the currency composition determined by trade and invoicing. Let $s_i \in [0,1]$ denote the yuan share of export revenues derived in Section 3.1. A country whose trade and invoicing patterns become increasingly linked to the yuan bloc may therefore still need to service inherited dollar liabilities.

If the country repays dollar debt, the yuan share $s_i \in [0,1]$ must be converted into dollars. If it repays yuan debt, the dollar share $1 - s_i$ must be converted into yuan. We assume that currency conversion is costly, with proportional resource cost $\xi > 0$. The assumption captures a simple balance-sheet friction: repayment becomes more expensive when the currency composition of revenues and liabilities is misaligned.

Under dollar debt, the total repayment cost per unit borrowed is

$$C_i^D(s_i, n) = (1 + \xi s_i) q_D (1 - n), \tag{16}$$

while under yuan debt the repayment cost per unit borrowed is

$$C_i^Y(s_i, n) = (1 + \xi(1 - s_i)) q_Y(n). \tag{17}$$

The first term in each expression reflects financing costs, while the second captures the resource cost generated by currency mismatch. Appendix B.1 shows that this proportional formulation can be derived as a tractable special case of a more general cash-management problem.

A country compares the repayment costs associated with the two currencies. Define the private gain from issuing yuan debt as

$$H(s, n) = C^D(s, n) - C^Y(s, n). \tag{18}$$

Using (16) and (17),

$$H(s, n) = (1 + \xi s) q_D (1 - n) - (1 + \xi(1 - s)) q_Y(n). \tag{19}$$

Country i chooses yuan debt whenever $H(s_i, n) \geq 0$. The terms $q_D(1-n)$ and $q_Y(n)$ capture financing conditions in dollar and yuan debt markets, while $(1+\xi s)$ and $(1+\xi(1-s))$ capture the cost of converting revenues into the repayment currency. Countries with greater yuan revenue exposure therefore find yuan debt more appealing because it reduces mismatch costs ($H_s(s,n) > 0$). At the same time, broader yuan adoption improves financing conditions in yuan debt markets, further increasing the benefit of yuan borrowing ($H_n(s,n) > 0$). Derivations are provided in Appendix A.5.[2]

Since $H_s > 0$, denomination choice admits a cutoff representation. Let $\bar{s}(n)$ denote the yuan revenue share that makes a country indifferent between dollar and yuan debt:

$$H(\bar{s}(n), n) = 0. \tag{20}$$

Solving for the cutoff yields

$$\bar{s}(n) = \frac{(1+\xi)q_Y(n) - q_D(1-n)}{\xi\left[q_D(1-n) + q_Y(n)\right]}. \tag{21}$$

Countries with $s_i \geq \bar{s}(n)$ choose yuan debt, while countries with lower yuan exposure remain in dollars.

We focus on the interior case in which $\bar{s}(n) \in [0,1]$ for all relevant adoption levels. This rules out parameter values under which one currency strictly dominates regardless of revenue composition.[3]

The cutoff depends on aggregate yuan adoption through financing conditions. As more countries borrow in yuan, yuan debt markets deepen and yuan financing becomes cheaper, so countries require less yuan revenue exposure to issue in yuan. This monotonicity property is summarized in the next proposition.

Proposition 2 (Cutoff complementarity)**.** *Under the interiority condition above, the yuan-borrowing threshold is decreasing in aggregate yuan adoption:*

$$\bar{s}'(n) < 0. \tag{22}$$

[2]Formally, $H_s > 0$ implies a single-crossing property in revenue exposure, while $H_n > 0$ implies strategic complementarities in currency denomination choices.

[3]The conditions $q_Y(n) \leq (1+\xi)q_D(1-n)$ and $q_D(1-n) \leq (1+\xi)q_Y(n)$ for all n ensure that neither currency dominates for all revenue shares at a given adoption level.

Currency denomination choices therefore exhibit strategic complementarities: broader yuan adoption makes yuan borrowing more attractive for other countries.

3.4 Legacy dollar debt, default, and restructuring

Countries do not enter fragmentation episodes with a blank balance sheet. They begin with inherited dollar liabilities accumulated when dollar debt markets were deeper and more liquid. After fragmentation shifts trade and invoicing patterns, governments may find themselves servicing dollar debt with increasingly yuan-linked revenues.

At the start of the fragmentation episode, country i has inherited dollar debt with face value $F_i^D > 0$. Given its post-fragmentation revenue exposure to the yuan s_i, the government faces three options: continue repaying the inherited dollar debt, default outright, or restructure and refinance into yuan.

If the country continues repaying the inherited dollar debt, the repayment cost is

$$C_i^{\text{repay}} = (1 + \xi s_i) F_i^D. \tag{23}$$

Countries with more yuan-linked revenues therefore face larger mismatch costs when servicing dollar liabilities.

Outright default avoids repayment but imposes exclusion, legal, output, and geopolitical costs:

$$C_i^{\text{default}} = \Omega_i. \tag{24}$$

The third option is to restructure the inherited dollar debt into yuan debt. Existing creditors accept recovery rate $\rho_i \in (0, 1]$, while yuan-bloc lenders refinance the recovered value in yuan markets. Let

$$\mathcal{R}_Y(n) = q_Y(n) \tag{25}$$

denote the gross repayment obligation associated with yuan borrowing. Let $\kappa_i \geq 0$ denote the direct cost of restructuring. The total cost of restructuring into yuan is then

$$C_i^{\text{restr}} = \left[1 + \xi(1 - s_i)\right] \mathcal{R}_Y(n) \rho_i F_i^D + \kappa_i. \tag{26}$$

The restructuring problem contains the same two forces as the denomination problem. Countries with more yuan-linked revenues face lower mismatch costs under yuan debt, while broader yuan adoption improves liquidity in yuan refinancing markets. As repayment capacity becomes less dollar-linked, inherited dollar debt becomes harder to service and restructuring into yuan becomes more attractive. Countries therefore face a choice between continuing to service dollar liabilities and restructuring into yuan.[4]

Restructuring dominates continued repayment when

$$s_i \geq s_i^R(n) \equiv \frac{\rho_i \mathcal{R}_Y(n)(1+\xi) + k_i - 1}{\xi[1 + \rho_i \mathcal{R}_Y(n)]}, \tag{27}$$

and restructuring dominates outright default when

$$s_i \geq s_i^\Omega(n) \equiv \frac{\rho_i \mathcal{R}_Y(n)(1+\xi) + k_i - \omega_i}{\rho_i \mathcal{R}_Y(n)\xi}, \tag{28}$$

where $k_i = \frac{\kappa_i}{F_i^D}$ and $\omega_i = \frac{\Omega_i}{F_i^D}$. Country i restructures into yuan whenever

$$s_i \geq \tilde{s}_i(n) \equiv \max\{s_i^R(n), s_i^\Omega(n)\}. \tag{29}$$

We focus on the economically relevant region in which restructuring costs are not prohibitively large and outright default remains costly relative to restructuring.[5] The restructuring problem inherits the same complementarity as the denomination problem: broader yuan adoption improves yuan refinancing conditions and lowers the restructuring threshold. As more countries restructure into yuan, countries require less yuan-linked revenue to find restructuring attractive. The next proposition formalizes this monotonicity property.

Proposition 3 (Yuan restructuring is self-reinforcing)**.** *Under the conditions above, the restructuring threshold is decreasing in aggregate yuan adoption:*

$$\tilde{s}_i'(n) < 0. \tag{30}$$

[4]The baseline treats default as a discrete sovereign option. Appendix B.5 extends the environment to stochastic repayment capacity and priced default risk. The core monotonicity and fixed-point results are unchanged.

[5]Formally, we assume $k_i < 2 + \xi$ and $\omega_i > k_i$.

4 Equilibrium and Main Results

This section characterizes equilibrium in the baseline debt-denomination problem and then applies the same fixed-point logic to legacy-dollar-debt restructuring. The first part shows how currency-specific liquidity can sustain dominant-currency equilibria and generate tipping dynamics. The second part applies this logic to the central margin of the paper: whether inherited dollar liabilities are repaid, defaulted on, or restructured into yuan. All proofs are presented in Appendix A.

4.1 Debt-denomination equilibrium

Countries differ in their exposure to yuan-linked revenues. Let G denote the cross-country distribution of yuan revenue shares s_i, with continuous density g on support $[s_{\min}, s_{\max}] \subseteq [0,1]$.

Given aggregate yuan adoption n, country i chooses yuan debt whenever $s_i \geq \bar{s}(n)$. Aggregate yuan borrowing is therefore determined by the fraction of countries whose revenue exposure lies above the cutoff:

$$T(n) \equiv 1 - G(\bar{s}(n)). \tag{31}$$

A debt-denomination equilibrium is a fixed point $n^* \in [0,1]$ satisfying

$$n^* = T(n^*). \tag{32}$$

An equilibrium requires consistency between individual borrowing decisions and aggregate market liquidity. Countries choose their borrowing currency taking financing conditions as given, but those financing conditions depend on how many countries borrow in each currency. Under the interiority conditions above, this feedback admits at least one fixed point.

Proposition 4 (Existence)**.** *Assuming $q_Y(n) \leq (1+\xi) q_D(1-n)$ and $q_D(1-n) \leq (1+\xi) q_Y(n)$ for all $n \in [0,1]$ (no one currency dominates regardless of revenue composition), at least one debt-denomination equilibrium exists.*

Existence alone does not characterize the shape of the equilibrium mapping. The next proposition shows that the equilibrium mapping is increasing: broader yuan adoption induces additional countries to switch into yuan borrowing.

Proposition 5 (Strategic complementarities)**.** *At every n such that $g(\bar{s}(n)) > 0$,*

$$T_n(n) = g(\bar{s}(n))[-\bar{s}'(n)] > 0. \tag{33}$$

As more countries borrow in yuan, yuan debt markets deepen and financing conditions improve, reinforcing further yuan adoption.

The model also delivers a simple comparative static. Any force that shifts the distribution of repayment capacity toward yuan-linked revenues increases equilibrium yuan adoption. In particular, fragmentation that reallocates trade and invoicing toward the yuan bloc shifts the distribution G to the right and increases yuan borrowing in equilibrium.

Corollary 1 (Fragmentation and yuan adoption)**.** *Suppose fragmentation shifts the distribution of yuan revenue shares to the right in the sense of first-order stochastic dominance. Then both the least and greatest debt-denomination equilibria are weakly increasing in fragmentation.*

4.2 Dominance, multiplicity, and tipping

International borrowing may become concentrated in a single currency when liquidity advantages are sufficiently strong. An all-dollar equilibrium exists when no country finds it optimal to issue yuan debt while yuan markets remain illiquid:

$$s_{\max} < \bar{s}(0) = \frac{(1+\xi)q_Y(0) - q_D(1)}{\xi[q_D(1) + q_Y(0)]}. \tag{34}$$

Similarly, an all-yuan equilibrium exists when every country prefers yuan debt once yuan markets become sufficiently liquid:

$$s_{\min} > \bar{s}(1) = \frac{(1+\xi)q_Y(1) - q_D(0)}{\xi[q_D(0) + q_Y(1)]}. \tag{35}$$

The next proposition summarizes the conditions under which dollar-dominant and yuan-dominant equilibria arise.

Proposition 6 (Dominant-currency equilibria)**.** *If* (34) *holds, $n = 0$ is an equilibrium. If* (35) *holds, $n = 1$ is an equilibrium. If both conditions hold, dollar-dominant and yuan-dominant equilibria coexist.*

Dollar dominance does not arise from an intrinsic preference for dollar contracts. Instead, a currency that is already widely used benefits from deeper and more liquid debt markets. When most countries borrow in dollars, dollar financing remains cheap while yuan financing remains expensive, making dollar borrowing attractive even for countries with substantial yuan-linked revenues.

The possibility of multiple equilibria also creates the possibility of tipping dynamics. Consider an interior equilibrium $n^* \in (0,1)$ satisfying

$$n^* = T(n^*). \tag{36}$$

The relevant object is the slope of the equilibrium mapping:

$$T_n(n^*) = g(\bar{s}(n^*))[-\bar{s}'(n^*)]. \tag{37}$$

The strength of the amplification depends on both components of (37). The term $-\bar{s}'(n^*)$ measures how strongly financing conditions respond to broader yuan adoption through debt-market liquidity, while $g(\bar{s}(n^*))$ measures how many countries lie close to the switching threshold. When many countries are near indifference, even a small improvement in yuan financing conditions can trigger a large increase in yuan borrowing. The next proposition characterizes when this amplification is strong enough to generate tipping dynamics.

Proposition 7 (Tipping and currency cascades)**.** *Let $n^* \in (0,1)$ satisfy $n^* = T(n^*)$. If*

$$T_n(n^*) > 1, \tag{38}$$

then n^* is a locally unstable tipping point under best-response dynamics. For adoption levels in a neighborhood above n^*, adoption rises; for adoption levels in a neighborhood below n^*, adoption falls. If n^* is the unique unstable threshold between adjacent stable equilibria, it separates their basins of attraction.

The proposition distinguishes gradual reallocation from a currency cascade. Tipping requires either a strong liquidity externality, a large mass of countries near the switching margin, or both. In those cases, fragmentation shocks that initially appear modest can generate large equilibrium shifts

in global debt denomination. The next subsection applies this logic to the central margin of the paper: restructuring inherited dollar liabilities into yuan-denominated claims.

4.3 Legacy debt and restructuring cascades

We now turn from new debt-denomination choices to the aggregate implications of legacy dollar-debt restructuring, which is the central mechanism in the paper. Countries enter the fragmentation episode with inherited dollar liabilities. They cannot costlessly choose a new denomination for that stock of debt. Instead, they decide whether to keep servicing dollar claims, default, or restructure those claims into yuan.

For simplicity, suppose that the restructuring parameters are common across countries, so that all countries face the same restructuring threshold $\tilde{s}(n)$. A country restructures inherited dollar debt into yuan whenever its yuan-linked revenue share exceeds this threshold:

$$s_i \geq \tilde{s}(n). \tag{39}$$

The restructuring threshold falls with aggregate yuan restructuring. As more sovereign claims are restructured into yuan, yuan debt markets deepen and refinancing costs decline, making restructuring attractive even for countries with lower yuan-linked revenue exposure.

Given aggregate yuan restructuring n, the mass of countries that want to restructure is therefore

$$T^R(n) \equiv 1 - G(\tilde{s}(n)). \tag{40}$$

A restructuring equilibrium is a fixed point satisfying

$$n = T^R(n) = 1 - G(\tilde{s}(n)). \tag{41}$$

The equilibrium condition requires consistency between individual restructuring incentives and aggregate yuan-market liquidity. Countries take yuan refinancing conditions as given, but those conditions depend on how many countries restructure into yuan.

This fixed-point structure is the same as in the denomination problem, but the economic object is different. The endogenous variable is no longer only the currency of new borrowing. It is the

stock of inherited dollar liabilities that is refinanced into yuan claims. This stock adjustment is what allows restructuring decisions to affect the depth of yuan debt markets and, in turn, the incentives of other governments to restructure.

Proposition 8 (Fragmentation creates a yuan-restructuring coordination problem)**.** *Suppose fragmentation shifts the distribution of yuan revenue shares to the right in the sense of first-order stochastic dominance and suppose* $\tilde{s}'(n) < 0$*. Then the restructuring mapping*

$$T^R(n) \equiv 1 - G(\tilde{s}(n)) \tag{42}$$

is increasing in n and shifts upward with fragmentation.

The proposition highlights how inherited dollar debt can become fragile under fragmentation. As more countries restructure into yuan, refinancing conditions in yuan debt markets improve, making restructuring attractive for additional sovereigns. At the same time, fragmentation raises yuan-linked revenue exposure, increasing the number of countries whose repayment capacity is better aligned with yuan debt than with inherited dollar liabilities.

The same mechanism can generate restructuring cascades. Consider an interior restructuring equilibrium n_R^* satisfying

$$n_R^* = T^R(n_R^*). \tag{43}$$

The relevant slope condition is

$$g(\tilde{s}(n_R^*))[-\tilde{s}'(n_R^*)] > 1. \tag{44}$$

The condition therefore reflects two reinforcing factors: how strongly yuan refinancing improves, and how many countries cluster near the restructuring margin. When enough countries carry meaningful yuan-linked revenue exposure, even a modest improvement in refinancing conditions can tip a broad shift away from inherited dollar debt. The next proposition characterizes when this feedback generates a restructuring cascade.

Proposition 9 (Dollar-debt restructuring can trigger currency switching)**.** *Suppose* (41) *has an interior fixed point* n_R^* *satisfying condition* (44)*. Then* n_R^* *is a locally unstable restructuring threshold. For restructuring levels in a neighborhood above* n_R^**, yuan restructuring expands; for restructuring levels in*

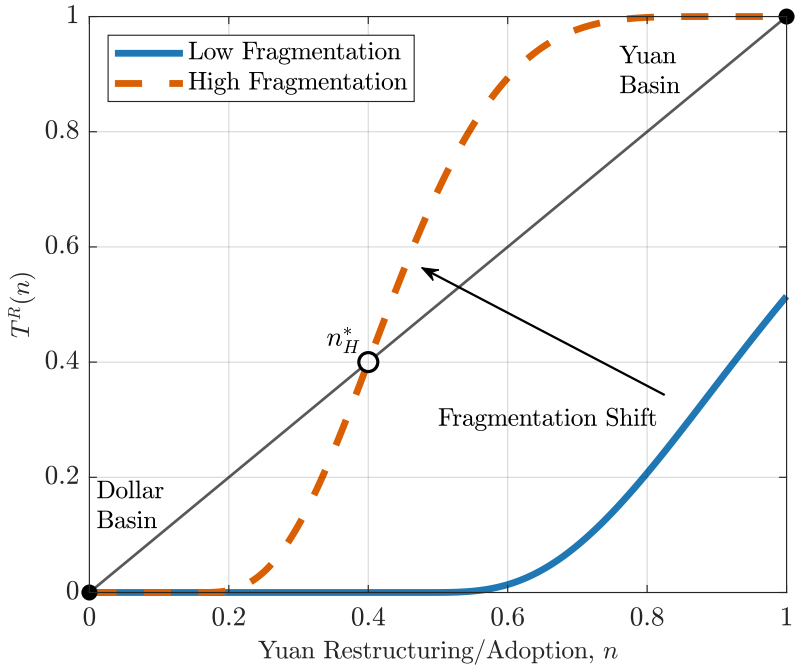
a neighborhood below n_R^*, yuan restructuring contracts. If n_R^* is the unique unstable threshold between adjacent stable restructuring equilibria, it separates their basins of attraction.

The instability is the source of the cascade. If restructuring is slightly below n_R^*, yuan markets remain too thin, the restructuring threshold remains too high, and fewer countries want to restructure than the current mass of yuan claims. Adoption therefore contracts back toward the dollar equilibrium. If restructuring is slightly above n_R^*, yuan markets become deep enough to lower refinancing costs, the restructuring threshold falls, and more countries want to restructure than the current mass of yuan claims. Adoption then expands further. The interior fixed point is therefore not a stable long-run outcome; it is the boundary between the dollar basin and the yuan basin.

Figures 5 and 6 illustrate this logic using the restructuring block of the model. Figure 5 plots the restructuring map $T^R(n)$ against the 45-degree line. Intersections are restructuring equilibria. Under low fragmentation, the map lies below the 45-degree line for every positive level of yuan restructuring, so the only restructuring equilibrium is $n = 0$: inherited dollar dominance is unique. Under high fragmentation, the distribution of yuan revenue exposure shifts to the right. Inherited dollar dominance remains locally stable because, when yuan markets are thin, the restructuring cutoff is still high. But the high-fragmentation map crosses the 45-degree line three times: at $n = 0$, at an interior unstable threshold n_H^*, and at $n = 1$.

Figure 6 gives the corresponding threshold interpretation. The solid curve is $\tilde{s}(n)$, the yuan revenue exposure required for restructuring. Its downward slope reflects the liquidity feedback: as n rises, yuan debt markets deepen and the restructuring threshold falls. The horizontal ranges represent the cross-country distribution of yuan revenue exposure under low and high fragmentation. Under low fragmentation, the distribution remains sufficiently dollar-linked that the restructuring map stays below the 45-degree line for all positive adoption levels; yuan restructuring cannot be self-sustaining. Under high fragmentation, the distribution shifts upward, placing more countries near the restructuring margin and, once yuan markets deepen, above the threshold. Once restructuring crosses the interior threshold, the decline in refinancing costs induces additional countries to restructure into yuan, making the shift self-reinforcing.

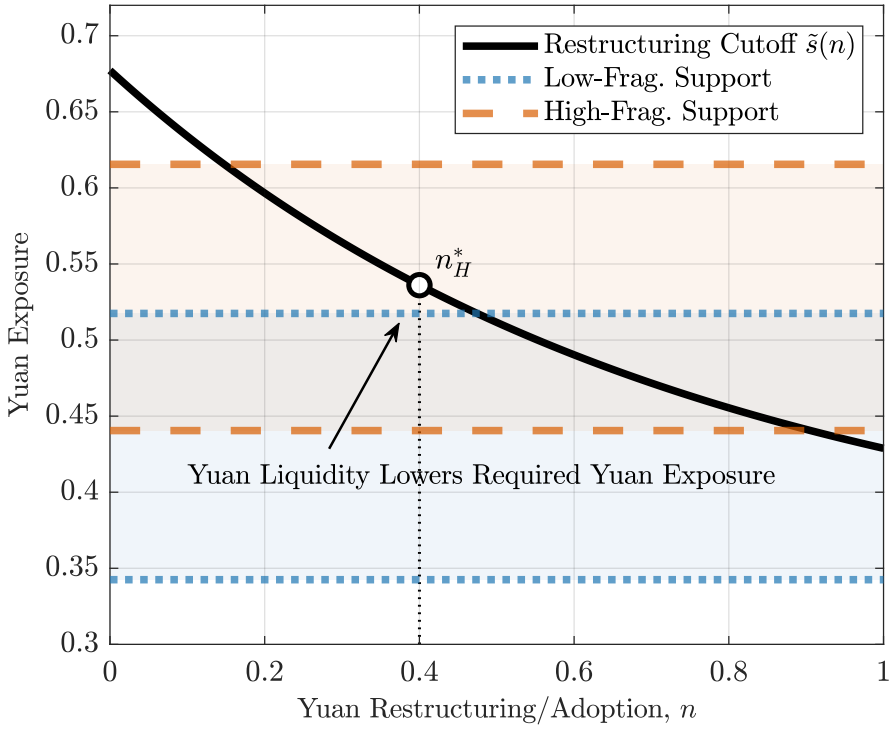
Figure 5: Restructuring Map and Tipping Dynamics under Low and High Fragmentation



Notes: The figure plots the restructuring map $T^R(n) = 1 - G(\tilde{s}(n))$ against the 45-degree line. Intersections are restructuring equilibria. Under low fragmentation, inherited dollar dominance is the unique restructuring equilibrium. Under high fragmentation, the map admits three fixed points: stable inherited dollar dominance, an unstable interior threshold n_H^*, and stable yuan dominance. The exercise is illustrative and not calibrated. Appendix A.17 reports the functional forms and parameter values.

Default and restructuring therefore play a central role in the transition between currency regimes. Countries cannot simply redenominate inherited dollar liabilities. The transition occurs through default, negotiated restructuring, or refinancing into yuan debt. If only a small mass of countries restructures, the adjustment remains limited and dollar dominance persists. If a sufficiently large mass restructures, the resulting stock of yuan claims deepens yuan debt markets, lowers yuan refinancing costs, and induces further restructuring away from dollar debt. Fragmentation does not mechanically imply de-dollarization; it creates the conditions under which dollar dominance can become fragile.

Figure 6: Restructuring Thresholds and Currency Cascades



Notes: The figure plots the restructuring cutoff $\tilde{s}(n)$ and the support of the cross-country distribution of yuan revenue exposure under low and high fragmentation. Under low fragmentation, inherited dollar dominance is the unique restructuring equilibrium. Under high fragmentation, restructuring becomes self-sustaining once adoption exceeds the unstable threshold n_H^*. The exercise is illustrative and not calibrated. Appendix A.17 reports the functional forms and parameter values.

4.4 A closed-form restructuring cascade

The previous results characterize restructuring cascades in a general environment. This subsection provides a simple closed-form example that makes the cascade condition transparent. The example is intended to illustrate the mechanism, not replace the general results.

Suppose countries enter the fragmentation episode with one unit of inherited dollar debt and choose between repaying the dollar debt or restructuring into yuan debt. For simplicity, we abstract from outright default in this subsection. The appendix shows how the same logic extends to the full model.

Assume yuan revenue shares are uniformly distributed:

$$s_i \sim U[m-h, m+h], \qquad 0 < m-h < m+h < 1, \tag{45}$$

where m captures average yuan revenue exposure and h measures cross-country heterogeneity. Fragmentation shifts the distribution toward yuan-linked revenues, increasing m.

Suppose the restructuring threshold is affine in aggregate yuan restructuring:

$$\tilde{s}(n) = a - \Lambda n, \tag{46}$$

where a is the baseline yuan revenue exposure required for restructuring when yuan debt markets are thin, and $\Lambda > 0$ measures the strength of the liquidity feedback. Appendix A.15 derives this from a tractable special case where mismatch costs are additive rather than multiplicative. The tipping results of Propositions 8 and 9 do not depend on it.

Given aggregate restructuring n, countries restructure into yuan whenever

$$s_i \geq a - \Lambda n. \tag{47}$$

The aggregate restructuring mapping is therefore

$$T^R(n; m) = \Pr[s_i \geq a - \Lambda n]. \tag{48}$$

Using the uniform distribution,

$$T^R(n; m) = \begin{cases} 0, & a - \Lambda n \geq m + h, \\ \dfrac{m + h - a + \Lambda n}{2h}, & m - h < a - \Lambda n < m + h, \\ 1, & a - \Lambda n \leq m - h. \end{cases} \tag{49}$$

An equilibrium satisfies

$$n = T^R(n; m). \tag{50}$$

On the interior region, the slope of the restructuring mapping is

$$\frac{\partial T^R(n; m)}{\partial n} = \frac{\Lambda}{2h}. \tag{51}$$

The expression makes the cascade condition especially transparent. The parameter Λ measures the strength of the liquidity feedback, while h measures cross-country heterogeneity in revenue exposure. Greater dispersion weakens the amplification mechanism because fewer countries lie near the restructuring margin at any point in time. When countries are instead concentrated near the switching threshold, small declines in refinancing costs can trigger large shifts into yuan restructuring.

Under the uniform specification, the slope condition reduces to

$$\Lambda > 2h. \tag{52}$$

A restructuring cascade arises when the liquidity feedback is strong relative to cross-country heterogeneity. The next proposition shows that sufficiently strong liquidity feedback generates multiple restructuring equilibria separated by an unstable tipping threshold.

Proposition 10 (Closed-form restructuring cascade)**.** *Suppose* (45)–(46) *hold. If*

$$a > m + h \qquad \text{and} \qquad a - \Lambda < m - h, \tag{53}$$

then the two inequalities imply $\Lambda > 2h$. The restructuring game has three equilibria: $n = 0$, $n = n^*$, and $n = 1$, where

$$n^* = \frac{a - m - h}{\Lambda - 2h}. \tag{54}$$

The equilibria $n = 0$ and $n = 1$ are locally stable under best-response dynamics, while n^* is unstable.

The proposition illustrates how fragmentation changes the likelihood of a restructuring cascade. Higher fragmentation raises average yuan revenue exposure m, lowering the tipping threshold:

$$\frac{\partial n^*}{\partial m} = -\frac{1}{\Lambda - 2h} < 0. \tag{55}$$

Similarly, lower baseline yuan refinancing costs, lower restructuring costs, or stronger official support reduce the baseline restructuring threshold a and lower the critical mass of restructuring needed to trigger a transition toward yuan-denominated sovereign debt.

The closed-form example summarizes the main mechanism of the paper in a simple way.

Fragmentation alone does not mechanically eliminate dollar dominance. Instead, it lowers the amount of yuan restructuring needed for liquidity feedback effects to become self-reinforcing.

4.5 Policy competition between liquidity blocs

The previous subsection shows that the location of the unstable threshold depends on the baseline restructuring threshold a, the average yuan exposure of borrower revenues m, and the strength of the yuan-liquidity feedback Λ. We now use the same closed-form case to interpret policy competition between the incumbent and challenger currency blocs. The point is not that either bloc directly chooses the currency regime. Rather, each bloc changes the cost of remaining in dollar debt, the cost of restructuring into yuan, or the liquidity feedback created by yuan-denominated sovereign claims.

In the closed-form environment, the restructuring cutoff is

$$\tilde{s}(n) = a - \Lambda n, \tag{56}$$

and, when $\Lambda > 2h$, the unstable restructuring threshold is

$$n^* = \frac{a - m - h}{\Lambda - 2h}. \tag{57}$$

The incumbent dollar bloc defends dollar dominance by raising this threshold. It can do so by making dollar repayment or refinancing less costly, by reducing dollar-settlement risk, or by preserving the liquidity and safety of dollar claims. In practice, this may involve policies such as Federal Reserve liquidity swap lines, multilateral rescue packages, or dollar-denominated debt reprofiling arrangements that ease rollover pressure during periods of stress. Federal Reserve swap lines, for example, give foreign central banks the capacity to provide U.S. dollar funding in their jurisdictions during crises (Board of Governors of the Federal Reserve System, 2025). IMF and multilateral rescue packages can similarly reduce rollover pressure and default premia on dollar liabilities. In the model, these interventions raise the relative attractiveness of staying in dollars. In the closed-form notation, they raise a or weaken the relative yuan feedback Λ, thereby increasing the critical mass required for a yuan restructuring cascade.

The challenger yuan bloc instead seeks to make yuan restructuring easier and more attractive at the margin. This can occur through official liquidity provision, the expansion of yuan-based payment infrastructure, or policies that increase the usefulness of yuan claims in trade and sovereign finance. Chinese authorities have promoted renminbi internationalization through RMB clearing banks, the Cross-Border Interbank Payment System (CIPS), PBOC swap lines, and bilateral trade-settlement agreements (von Beschwitz, 2024). IMF evidence shows that RMB use in cross-border payments remains limited globally but is substantially higher in economies with swap-line access and offshore clearing-bank infrastructure (Perez-Saiz and Zhang, 2023). Chinese rescue lending provides an additional institutional counterpart: Horn et al. (2023) document that the PBOC swap-line network has operated as a form of international emergency lending, with more than USD 170 billion in liquidity support extended to crisis countries. In the model, these interventions lower a by reducing the private cost of yuan refinancing or raise Λ by strengthening the liquidity spillovers associated with yuan-denominated sovereign claims.

In the closed-form environment, these policies operate by shifting the location of the unstable restructuring threshold and therefore the boundary between dollar and yuan dominance. The next proposition shows how changes in a, m, and Λ affect the critical mass required for a yuan restructuring cascade.

Proposition 11 (Policy instruments and basin boundaries)**.** *Suppose the closed-form restructuring environment satisfies $\Lambda > 2h$, so that the unstable threshold is*

$$n^* = \frac{a - m - h}{\Lambda - 2h}. \tag{58}$$

At an interior unstable threshold with an all-dollar equilibrium at $n = 0$,

$$\frac{\partial n^*}{\partial a} > 0, \qquad \frac{\partial n^*}{\partial m} < 0, \qquad \frac{\partial n^*}{\partial \Lambda} < 0. \tag{59}$$

Policies that lower the relative cost of yuan restructuring, increase yuan-linked repayment exposure, or strengthen yuan liquidity spillovers reduce the critical mass required for a yuan restructuring cascade. Policies that make dollar repayment or refinancing cheaper, preserve dollar settlement, or weaken the relative yuan feedback increase the critical mass required for a cascade.

The proposition formalizes policy competition as competition over basin boundaries. A dollar-bloc rescue package need not permanently eliminate the appeal of yuan finance; it only needs to keep enough marginal countries below the restructuring threshold. Symmetrically, a yuan-bloc intervention need not make yuan debt cheaper for all countries; it only needs to move a sufficient mass of countries above the threshold so that private liquidity feedback takes over. Targeted interventions can therefore matter disproportionately when the economy is close to the unstable threshold. The incumbent defends dollar dominance by preserving the safety and liquidity of dollar claims; the challenger expands by lowering the cost of yuan restructuring and internalizing the network value of additional yuan claims.

4.6 Equilibrium implications and comparative statics

This section establishes two sets of results. The first concerns how fragmentation affects sovereign borrowing incentives and equilibrium currency adoption under general functional forms. Fragmentation raises yuan-linked revenues, the yuan borrowing threshold falls with aggregate yuan adoption, and the equilibrium adoption map shifts upward with fragmentation. Both the least and greatest equilibria are nondecreasing in fragmentation. Dollar dominance is therefore sustained by market depth rather than by any intrinsic preference of Chinese or other non-U.S. lenders for dollar contracts.

The second set of results studies when gradual reallocation gives way to a cascade. Tipping arises when the liquidity feedback is sufficiently strong relative to cross-country heterogeneity in yuan revenue exposure. In that case, even modest fragmentation shocks can generate large equilibrium shifts, and fragmentation may create multiplicity where dollar dominance was previously unique. The central margin in the model is the restructuring of inherited dollar debt rather than only new issuance. Restructuring moves the stock of sovereign claims across currency regimes, and it is this stock adjustment that generates the liquidity externality.

The closed-form environment makes the policy competition transparent. Dollar-bloc interventions raise the critical mass required for a cascade, while yuan-bloc interventions lower it. Policy interventions therefore matter most when the economy is close to the tipping threshold. Appendix B.4 provides a simple microfoundation for the policy-lender wedge, and Appendix C

sketches an equilibrium-selection refinement.

5 Conclusion

Geopolitical fragmentation has renewed interest in the stability of the international monetary system and dollar dominance. We have shown that fragmentation can weaken dollar debt dominance when governments continue to owe dollars but increasingly earn revenues linked to other currency blocs. Fragmentation can redirect trade away from dollar-linked markets, increase the use of yuan settlement, and make export revenues less dollar-linked. Dollar liabilities that were once cheap and liquid can therefore become harder to service and more likely to be restructured.

The model shows how this mismatch can spread. Countries with more yuan-linked revenues have stronger incentives to refinance in yuan. When they restructure inherited dollar debt into yuan, they deepen yuan-denominated sovereign debt markets. That lowers yuan refinancing costs and makes restructuring more attractive for other governments. Individual balance-sheet problems can therefore generate a global liquidity feedback.

Fragmentation makes yuan restructuring more attractive, but it does not by itself imply a cascade. A cascade requires a strong liquidity externality and enough countries close to the switching margin. The model therefore does not predict inevitable de-dollarization; it identifies when dollar debt dominance is robust and when it can fail abruptly.

As geopolitical fragmentation continues, the relevant question is how changes in trade and settlement reshape the currency composition of sovereign balance sheets. Even gradual shifts in repayment capacity can matter if they lead governments to restructure inherited dollar claims and thereby deepen alternative debt markets. In this sense, the future of dollar debt dominance depends on the interaction between borrower balance sheets and debt-market liquidity.

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A Proofs and Derivations

A.1 Derivation of export revenue equations

Suppress country subscripts. Destination demand is $x_m = A_m p_m^{-\sigma}$, so inverse demand is $p_m = A_m^{1/\sigma} x_m^{-1/\sigma}$. Let $\widetilde{A}_m = A_m \tau_m^{1-\sigma}$ absorb the iceberg trade cost. Revenue delivered to the producer from destination m is

$$R_m(x_m) = \widetilde{A}_m^{1/\sigma} x_m^{(\sigma-1)/\sigma}. \tag{60}$$

The firm solves

$$\max_{x_D, x_Y \geq 0} \sum_{m \in \{D,Y\}} \widetilde{A}_m^{1/\sigma} x_m^{(\sigma-1)/\sigma} - \frac{1}{1+\lambda}(x_D + x_Y)^{1+\lambda}. \tag{61}$$

Let $X = x_D + x_Y$. For an interior solution, the first-order condition for destination m is

$$\frac{\sigma-1}{\sigma} \widetilde{A}_m^{1/\sigma} x_m^{-1/\sigma} = X^{\lambda}. \tag{62}$$

Solving for x_m:

$$x_m = \left(\frac{\sigma-1}{\sigma}\right)^{\sigma} \widetilde{A}_m X^{-\lambda\sigma}. \tag{63}$$

Summing over destinations:

$$X = \left(\frac{\sigma-1}{\sigma}\right)^{\sigma} (\widetilde{A}_D + \widetilde{A}_Y) X^{-\lambda\sigma}, \tag{64}$$

which rearranges to

$$X^{1+\lambda\sigma} = \left(\frac{\sigma-1}{\sigma}\right)^{\sigma} (\widetilde{A}_D + \widetilde{A}_Y). \tag{65}$$

Destination revenue is $r_m = \widetilde{A}_m^{1/\sigma} x_m^{(\sigma-1)/\sigma}$. Substituting the optimal x_m and using the expression for X:

$$r_m = K \widetilde{A}_m (\widetilde{A}_D + \widetilde{A}_Y)^{-\lambda(\sigma-1)/(1+\lambda\sigma)}, \tag{66}$$

where $K > 0$ absorbs constants independent of destination and trade costs. Since $\widetilde{A}_m = A_m \tau_m^{1-\sigma}$ and $S = \widetilde{A}_D + \widetilde{A}_Y$, this yields (4)–(5) with $\alpha = \lambda(\sigma-1)/(1+\lambda\sigma)$. The exponent satisfies $\alpha \in (0,1)$ because the numerator $\lambda(\sigma-1)$ is positive and the denominator $1+\lambda\sigma$ exceeds the numerator, as $1 + \lambda\sigma - \lambda(\sigma-1) = 1 + \lambda > 0$.

A.2 Trade reallocation derivatives

Let

$$\phi_{iD} = \frac{A_{iD}\tau_D^{1-\sigma}}{S_i} \in (0,1) \tag{67}$$

be the dollar-bloc share of adjusted demand. Using $S_i = A_{iD}\tau_D^{1-\sigma} + A_{iY}\tau_Y^{1-\sigma}$,

$$\frac{\partial \log S_i}{\partial \log \tau_D} = (1-\sigma)\phi_{iD}. \tag{68}$$

Using (4),

$$\frac{\partial \log r_{iD}}{\partial \log \tau_D} = (1-\sigma) - \alpha(1-\sigma)\phi_{iD} \tag{69}$$

$$= -(\sigma-1)(1-\alpha\phi_{iD}) < 0, \tag{70}$$

because $\sigma > 1$, $\alpha \in (0,1)$, and $\phi_{iD} \in (0,1)$, so $1 - \alpha\phi_{iD} > 0$. Revenue to the yuan-bloc destination depends on τ_D only through S_i, so

$$\frac{\partial \log r_{iY}}{\partial \log \tau_D} = -\alpha(1-\sigma)\phi_{iD} = \alpha(\sigma-1)\phi_{iD} > 0. \tag{71}$$

Thus $\partial r_{iD}/\partial \tau_D < 0$ and $\partial r_{iY}/\partial \tau_D > 0$. □

A.3 Proof of Proposition 1

Recall $s_i = \psi_i r_{iY}/(r_{iD} + r_{iY})$.

Effect of τ_D. The invoicing share ψ_i depends on ζ_D and settlement liquidities but not directly on τ_D, so

$$\frac{\partial s_i}{\partial \tau_D} = \frac{\psi_i\left(r_{iY,\tau} r_{iD} - r_{iY} r_{iD,\tau}\right)}{(r_{iD} + r_{iY})^2}. \tag{72}$$

By the trade-reallocation result in Appendix A.2, $r_{iY,\tau} > 0$ and $r_{iD,\tau} < 0$, so both terms in the numerator are positive and $\partial s_i/\partial \tau_D > 0$.

Effect of ζ_D. Holding destination revenues fixed,

$$\frac{\partial s_i}{\partial \zeta_D} = \frac{\psi_{i,\zeta} r_{iY}}{r_{iD} + r_{iY}} = \frac{f_i(z)\mu\, r_{iY}}{r_{iD} + r_{iY}} > 0, \tag{73}$$

because $f_i(z) > 0$, $\mu > 0$, $r_{iY} > 0$, and total revenues are positive. □

A.4 Proof that debt-market depth lowers required repayment

From (14), $q_c(n_c) = R^*/[1 - \lambda_\ell \delta_c(\mathcal{L}_c(n_c))]$. Since $\delta_c \in [0,1)$ and $\lambda_\ell \in (0,1)$, we have $\lambda_\ell \delta_c(\mathcal{L}_c) < 1$, so the denominator is strictly positive and the bond price $P_c = 1/q_c > 0$ is well-defined. Differentiating with respect to n_c:

$$q_c'(n_c) = \frac{R^* \lambda_\ell \delta_c'(\mathcal{L}_c(n_c))\mathcal{L}_c'(n_c)}{[1 - \lambda_\ell \delta_c(\mathcal{L}_c(n_c))]^2}. \tag{74}$$

By the liquidity assumptions in Section 3.2, $\mathcal{L}_c'(n_c) = \eta > 0$ and $\delta_c' < 0$. The denominator is strictly positive. Therefore $q_c'(n_c) < 0$. □

A.5 Proof of the single-crossing and complementarity claims

Single crossing ($H_s > 0$). Differentiating (18) with respect to s:

$$H_s(s,n) = \xi q_D(1-n) + \xi q_Y(n) = \xi[q_D(1-n) + q_Y(n)] > 0, \tag{75}$$

since $\xi > 0$ and face values are strictly positive.

Complementarity ($H_n > 0$). Differentiating (18) with respect to n, using $\frac{d}{dn} q_D(1-n) = -q_D'(1-n)$:

$$H_n(s,n) = -(1 + \xi s) q_D'(1-n) - (1 + \xi(1-s)) q_Y'(n). \tag{76}$$

By Appendix A.4, $q_D'(1-n) < 0$ and $q_Y'(n) < 0$. Therefore $-(1+\xi s)q_D'(1-n) > 0$ and $-(1 + \xi(1-s))q_Y'(n) > 0$, giving $H_n > 0$. □

A.6 Proof of Proposition 2

The cutoff $\bar{s}(n)$ satisfies $H(\bar{s}(n), n) = 0$. By Appendix A.5, $H_s > 0$ everywhere on the interior, so the implicit-function theorem applies. Differentiating the identity with respect to n:

$$H_s(\bar{s}(n), n)\bar{s}'(n) + H_n(\bar{s}(n), n) = 0, \qquad \text{hence} \qquad \bar{s}'(n) = -\frac{H_n(\bar{s}(n), n)}{H_s(\bar{s}(n), n)} < 0, \tag{77}$$

because $H_n > 0$ and $H_s > 0$. □

A.7 Proof of Proposition 3

Let $x = \rho_i \mathcal{R}_Y(n) > 0$. Since $\mathcal{R}_Y(n) = q_Y(n)$ and $q'_Y(n) < 0$, we have $x'(n) = \rho_i \mathcal{R}'_Y(n) < 0$.

Repayment branch. From (27), writing in terms of x:

$$s_i^R(x) = \frac{x(1+\xi) + k_i - 1}{\xi(1+x)}. \tag{78}$$

Differentiating by the quotient rule:

$$\frac{\partial s_i^R}{\partial x} = \frac{(1+\xi)\xi(1+x) - \xi[x(1+\xi) + k_i - 1]}{\xi^2(1+x)^2} = \frac{2 + \xi - k_i}{\xi(1+x)^2}. \tag{79}$$

Under the restructuring-region restrictions in Section 3.4, $k_i < 2 + \xi$, so $\partial s_i^R / \partial x > 0$. Since $x'(n) < 0$, we obtain $(s_i^R)'(n) < 0$.

Default branch. From (28), writing in terms of x:

$$s_i^\Omega(x) = \frac{(1+\xi)}{\xi} + \frac{k_i - \omega_i}{x\xi}. \tag{80}$$

Differentiating:

$$\frac{\partial s_i^\Omega}{\partial x} = -\frac{k_i - \omega_i}{x^2\xi} = \frac{\omega_i - k_i}{x^2\xi} > 0, \tag{81}$$

under the restructuring-region restrictions in Section 3.4, which requires $\omega_i > k_i$. Since $x'(n) < 0$, we obtain $(s_i^\Omega)'(n) < 0$.

Global monotonicity. Since both $s_i^R(n)$ and $s_i^\Omega(n)$ are strictly decreasing in n, their pointwise maximum $\tilde{s}_i(n) = \max\{s_i^R(n), s_i^\Omega(n)\}$ is also globally decreasing in n, not only on each differentiable branch. This follows from the fact that for any $n_1 < n_2$, $\tilde{s}_i(n_1) = \max\{s_i^R(n_1), s_i^\Omega(n_1)\} > \max\{s_i^R(n_2), s_i^\Omega(n_2)\} = \tilde{s}_i(n_2)$, where each component inequality holds because each branch is strictly decreasing. □

A.8 Proof of Proposition 4

By the interiority condition in Section 3.3, $\bar{s}(n) \in [0,1]$ for all $n \in [0,1]$. The distribution G of yuan revenue shares is continuous, so $T(n) = 1 - G(\bar{s}(n))$ is a continuous map from $[0,1]$ into $[0,1]$. Brouwer's fixed-point theorem implies that at least one fixed point exists. □

A.9 Proof of Proposition 5

Differentiating $T(n) = 1 - G(\bar{s}(n))$:

$$T_n(n) = -g(\bar{s}(n))\bar{s}'(n) = g(\bar{s}(n))[-\bar{s}'(n)]. \tag{82}$$

At any n where $g(\bar{s}(n)) > 0$, this is strictly positive because Proposition 2 gives $\bar{s}'(n) < 0$.

For the upward shift, let $\widetilde{G}$ be a rightward shift of G, so that $\widetilde{G}(s) \leq G(s)$ for all s. The associated map $\widetilde{T}(n) = 1 - \widetilde{G}(\bar{s}(n))$ satisfies, for every n,

$$\widetilde{T}(n) = 1 - \widetilde{G}(\bar{s}(n)) \geq 1 - G(\bar{s}(n)) = T(n). \tag{83}$$

□

A.10 Proof of Corollary 1

Construct the least fixed point by monotone iteration from zero: $n^0 = 0$, $n^{k+1} = T(n^k)$. Since T maps $[0,1]$ into itself, $n^1 = T(0) \geq 0 = n^0$. Given $n^{k+1} \geq n^k$, monotonicity of T gives $n^{k+2} = T(n^{k+1}) \geq T(n^k) = n^{k+1}$, so the sequence is non-decreasing. It is bounded above by one, hence convergent. The limit $n_{\min}$ satisfies $n_{\min} = T(n_{\min})$ by continuity. Iterating from $\hat{n}^0 = 1$ similarly converges to the greatest fixed point $n_{\max}$.

Now compare two distributions G and $\widetilde{G}$, where $\widetilde{G}$ is shifted to the right of G. Let $T(n) = 1 - G(\bar{s}(n))$ and $\widetilde{T}(n) = 1 - \widetilde{G}(\bar{s}(n))$. Proposition 5 implies $\widetilde{T}(n) \geq T(n)$ for all n. Starting both iterations at zero, induction gives $\widetilde{n}^k \geq n^k$ for every k: if $\widetilde{n}^k \geq n^k$, then, since $\widetilde{T}$ is increasing by Proposition 5,

$$\widetilde{n}^{k+1} = \widetilde{T}(\widetilde{n}^k) \geq \widetilde{T}(n^k) \geq T(n^k) = n^{k+1}. \tag{84}$$

Taking limits gives that the least fixed point under $\widetilde{G}$ is weakly larger. The same argument starting from one gives the result for the greatest fixed point. □

A.11 Proof of Proposition 6

At $n = 0$, country i prefers yuan debt if and only if $s_i \geq \bar{s}(0)$. If condition (34) holds, then

$$s_{\max} < \bar{s}(0).$$

Thus no country has a high enough yuan revenue share to choose yuan debt. Hence $G(\bar{s}(0)) = 1$ and

$$T(0) = 1 - G(\bar{s}(0)) = 0,$$

so $n = 0$ is a fixed point.

At $n = 1$, country i prefers yuan debt if and only if $s_i \geq \bar{s}(1)$. If condition (35) holds, then

$$s_{\min} > \bar{s}(1).$$

Thus every country has a high enough yuan revenue share to choose yuan debt. Hence $G(\bar{s}(1)) = 0$ and

$$T(1) = 1 - G(\bar{s}(1)) = 1,$$

so $n = 1$ is a fixed point.

Coexistence of the two corner equilibria requires

$$\bar{s}(1) < s_{\min} \leq s_{\max} < \bar{s}(0).$$

This can hold because Proposition 2 implies $\bar{s}(1) < \bar{s}(0)$. Hence the support of revenue exposure can lie strictly between the two cutoff values. □

A.12 Proof of Proposition 7

Define $\Phi(n) = T(n) - n$. At the interior fixed point n^*, $\Phi(n^*) = 0$. Its derivative is $\Phi'(n^*) = T_n(n^*) - 1$. If condition (38) holds, then $\Phi'(n^*) > 0$. By continuity, $\Phi(n) > 0$ for n slightly above

n^*, so $T(n) > n$ and best-response dynamics push adoption upward. For n slightly below n^*, $\Phi(n) < 0$, so $T(n) < n$ and adoption falls. Hence n^* is a locally unstable tipping point. If this locally unstable fixed point is the unique threshold between two adjacent stable fixed points, it separates their basins of attraction. □

A.13 Proof of Proposition 8

By the same argument as Proposition 5, with $\tilde{s}(n)$ in place of $\bar{s}(n)$:

$$T_n^R(n) = -g(\tilde{s}(n))\tilde{s}'(n) > 0, \tag{85}$$

because $g > 0$ on the support and $\tilde{s}'(n) < 0$ (Proposition 3). If $\widetilde{G}$ is a rightward shift of G, then $\widetilde{G}(s) \leq G(s)$ for all s, and for every n:

$$\widetilde{T}^R(n) = 1 - \widetilde{G}(\tilde{s}(n)) \geq 1 - G(\tilde{s}(n)) = T^R(n). \tag{86}$$

Hence restructuring decisions are strategic complements and fragmentation shifts the restructuring map upward. □

A.14 Proof of Proposition 9

By the same argument as Proposition 7, with T^R and $\tilde{s}$ in place of T and $\bar{s}$. Let $\Phi^R(n) = T^R(n) - n$. At n_R^*, $\Phi^R(n_R^*) = 0$ and $(\Phi^R)'(n_R^*) = T_n^R(n_R^*) - 1 > 0$ under condition (44). By continuity, for restructuring levels slightly above n_R^*, the map satisfies $T^R(n) > n$ and restructuring expands; for restructuring levels slightly below n_R^*, the map satisfies $T^R(n) < n$ and restructuring contracts. Hence n_R^* is a locally unstable restructuring threshold. If this locally unstable fixed point is the unique threshold between adjacent stable restructuring equilibria, it separates their basins of attraction. □

A.15 Proof of Proposition 10

Step 1: Deriving the affine cutoff. Normalize inherited dollar debt to one. Dollar repayment costs

$$C_i^D(s_i) = R_D + \xi s_i, \tag{87}$$

where R_D is the gross repayment burden and ξs_i captures the resource cost of converting yuan-linked revenues into dollars. This treats dollar financing costs as a fixed constant R_D, which is a simplification relative to the general model where the dollar repayment cost $(1+\xi s_i)q_D(1-n)$ depends on aggregate yuan adoption n through the dollar debt-market liquidity term $q_D(1-n)$. The closed-form example holds q_D fixed in order to isolate the yuan-market liquidity feedback in a tractable way; all qualitative results carry over to the general case. Yuan restructuring requires old creditors to accept recovery rate $\rho \in (0,1]$, and the gross yuan refinancing cost is linear in aggregate yuan restructuring:

$$R_Y(n) = R_Y^0 - \ell n, \qquad \ell > 0. \tag{88}$$

The total cost of yuan restructuring is

$$C_i^Y(s_i, n) = \rho R_Y(n) + \kappa + \xi(1 - s_i). \tag{89}$$

Country i restructures into yuan when $C_i^Y(s_i,n) \le C_i^D(s_i)$. Substituting and rearranging:

$$\rho(R_Y^0 - \ell n) + \kappa + \xi - R_D \le 2\xi s_i \quad \Leftrightarrow \quad \rho R_Y^0 + \kappa + \xi - R_D - \rho\ell n \le 2\xi s_i \quad \Leftrightarrow \quad s_i \ge a - \Lambda n, \tag{90}$$

where

$$a = \frac{\rho R_Y^0 + \kappa + \xi - R_D}{2\xi}, \qquad \Lambda = \frac{\rho\ell}{2\xi} > 0. \tag{91}$$

This establishes the cutoff representation (46).

Step 2: Equilibrium map and fixed points. With $s_i \sim U[m-h, m+h]$ and cutoff $c(n) = a - \Lambda n$, the mass of countries restructuring is $T^R(n;m) = \Pr[s_i \ge c(n)]$. This yields the piecewise map (49).

Corner equilibria. $n = 0$ is an equilibrium if $T^R(0;m) = 0$, which requires $a \ge m + h$. Under the strict inequality $a > m + h$, the entire mass of countries has $s_i < a$, so $T^R(0) = 0$ and the zero

equilibrium is locally stable (the map is zero in a neighborhood of zero).

$n = 1$ is an equilibrium if $T^R(1; m) = 1$, which requires $a - \Lambda \leq m - h$. Under the strict inequality $a - \Lambda < m - h$, the cutoff $a - \Lambda$ lies below the support, so all countries restructure and $T^R(1) = 1$. The full-yuan equilibrium is locally stable.

Interior equilibrium. On the interior segment, the fixed-point equation is

$$n = \frac{m + h - a + \Lambda n}{2h}.$$

It rearranges to $(2h - \Lambda)n = m + h - a$. The two conditions in (53) together imply $\Lambda > 2h$: subtracting $a - \Lambda < m - h$ from $a > m + h$ gives $\Lambda > 2h$ directly, so this is not an independent requirement. With $\Lambda > 2h$:

$$n^* = \frac{a - m - h}{\Lambda - 2h}. \tag{92}$$

The condition $a > m + h$ implies $n^* > 0$, and $a - \Lambda < m - h$ implies $a - m - h < \Lambda - 2h$, so $n^* < 1$. Hence $n^* \in (0, 1)$.

Stability. The interior slope $\Lambda/(2h) > 1$ when $\Lambda > 2h$, so the interior equilibrium is unstable under best-response dynamics. For n slightly above n^*, the map exceeds the diagonal; for n slightly below, it lies below.

Comparative statics. Differentiating $n^* = (a - m - h)/(\Lambda - 2h)$ directly:

$$\frac{\partial n^*}{\partial m} = -\frac{1}{\Lambda - 2h} < 0, \qquad \frac{\partial n^*}{\partial a} = \frac{1}{\Lambda - 2h} > 0. \tag{93}$$

Fragmentation lowers the threshold through a rise in m. Lower baseline yuan restructuring costs, lower direct restructuring costs κ, or stronger official support each lower a and thus lower n^*. □

A.16 Default option in the closed-form example

The closed-form example focuses on the choice between dollar repayment and yuan restructuring. Adding outright default at cost Ω is straightforward. Restructuring must now be cheaper than both repayment and default. The comparison with repayment gives the cutoff $a - \Lambda n$ derived above.

The comparison with default gives:

$$\rho(R_Y^0 - \ell n) + \kappa + \xi(1 - s_i) \leq \Omega \quad \Leftrightarrow \quad s_i \geq b - \mu n, \tag{94}$$

where

$$b = \frac{\rho R_Y^0 + \kappa + \xi - \Omega}{\xi}, \qquad \mu = \frac{\rho \ell}{\xi} = 2\Lambda. \tag{95}$$

Note that $\mu = 2\Lambda$: the liquidity slope on the default branch is twice as large as on the repayment branch. Consequently, the cascade condition on the default branch is $\mu > 2h$, i.e., $\rho\ell/\xi > 2h$, which is a strictly weaker requirement than the repayment-branch condition $\Lambda > 2h$, i.e., $\rho\ell/(2\xi) > 2h$. A cascade is therefore easier to sustain when countries are near the default margin, because yuan refinancing only needs to dominate default, whereas on the repayment branch it must dominate continued dollar repayment.

The full yuan-restructuring cutoff is $\hat{s}(n) = \max\{a - \Lambda n, b - \mu n\}$. The maximum of two strictly decreasing affine functions is strictly decreasing, so restructuring decisions remain strategic complements. On any interval where one branch binds, the equilibrium map has the piecewise form (49) with the relevant intercept and slope. A cascade obtains on that interval if the active slope exceeds $2h$, with the default branch requiring a weaker condition as noted above.

A.17 Numerical illustration behind Figures 5 and 6

This appendix reports the functional forms and parameter values used to generate Figures 5 and 6. The exercise is a numerical illustration of the restructuring block of the model, not a full calibration. Its purpose is to show a smooth version of the fixed-point logic in Proposition 9 using the same objects that appear in the model: a restructuring cutoff, a distribution of yuan revenue exposure, and liquidity-based yuan refinancing costs.

The numerical example is disciplined in one limited respect by the Kenya debt-conversion episode discussed in Section 2. Kenya reportedly converted Chinese railway loans from dollars into yuan and reduced annual debt service by about USD 215 million (Bloomberg News, 2025c). Relative to an original loan amount of roughly USD 5 billion, this corresponds to an annual saving of about 4.3 percent of face value. We use this number only as an order-of-magnitude anchor

for the private gain from restructuring near the cutoff. The Kenya episode does not discipline the cross-country distribution of revenue exposure, the size of the fragmentation shock, or the strength of the aggregate liquidity feedback. Those objects are chosen to illustrate the tipping region characterized analytically in the main text.

The numerical example uses the restructuring map

$$T_{\Delta}^{R}(n) = 1 - G_{\Delta}(\tilde{s}(n)), \tag{96}$$

where Δ indexes the fragmentation shift in yuan revenue exposure. The restructuring cutoff is the repayment branch of the general cutoff in Section 3.4:

$$\tilde{s}(n) = \frac{\rho q_Y(n)(1+\xi) + \kappa - 1}{\xi[1 + \rho q_Y(n)]}. \tag{97}$$

The default branch is assumed not to bind in this numerical illustration. Including the default branch would replace (97) with the maximum of the repayment and default cutoffs, as in Section 3.4, and would not change the fixed-point logic.

Yuan refinancing costs are generated by the liquidity-pricing block of Section 3.2. Specifically,

$$\mathcal{L}_Y(n) = K_Y + \eta_Y n, \tag{98}$$

$$\delta_Y(n) = \bar{\delta}_Y \exp[-\gamma_Y L_Y(n)], \tag{99}$$

$$q_Y(n) = \frac{R^*}{1 - \lambda_\ell \delta_Y(n)}. \tag{100}$$

Thus a larger mass of yuan restructurings increases yuan debt-market depth, lowers liquidation discounts, and reduces the gross repayment cost associated with yuan refinancing.

The cross-country distribution of yuan revenue exposure is smooth. Let

$$s_i = s_{\min} + \Delta + \omega u_i, \qquad u_i \sim \text{Beta}(\alpha_s, \beta_s), \tag{101}$$

where Δ shifts the distribution to the right under fragmentation. The associated CDF is

$$G_{\Delta}(s) = F_{\text{Beta}}\left(\frac{s - s_{\min} - \Delta}{\omega}; \alpha_s, \beta_s\right), \tag{102}$$

with the argument truncated to the unit interval outside the support. The beta distribution is used only to obtain a smooth density of countries around the restructuring margin. This density is the numerical counterpart of the term $g(\tilde{s}(n))$ in the general slope condition.

The parameter values are:

Object	Parameter	Value	Interpretation
Risk-free return	R^*	1.04	Annual gross safe return normalization
Liquidity shock	λ_ℓ	0.50	Probability of early liquidation
Initial yuan depth	K_Y	0.00	Exogenous yuan-market capacity
Liquidity feedback	η_Y	2.00	Effect of yuan restructuring on depth
Liquidation loss scale	$\bar{\delta}_Y$	0.2667	Liquidation discount when markets are thin
Depth elasticity	γ_Y	0.64	Sensitivity of discounts to market depth
Mismatch cost	ξ	0.23	Cost of repaying in a mismatched currency
Recovery rate	ρ	0.85	Recovery rate in restructuring
Direct restructuring cost	κ	0.06	Cost normalized by inherited debt
Exposure lower bound	$s_{\min}$	0.3425	Lower support before fragmentation
Exposure range	ω	0.175	Width of exposure support
Exposure distribution	(α_s, β_s)	$(4, 4)$	Smooth density around the margin
Fragmentation shift	Δ_H	0.098	High-fragmentation shift in exposure

These values imply

$$q_Y(0) = 1.20, \qquad q_Y(1) = 1.08, \tag{103}$$

so yuan refinancing costs fall as yuan debt-market depth rises. The restructuring cutoff falls from

$$\tilde{s}(0) = 0.6772 \qquad \text{to} \qquad \tilde{s}(1) = 0.4288. \tag{104}$$

Under low fragmentation, the exposure support is

$$[s_{\min}, s_{\min} + \omega] = [0.3425, 0.5175]. \tag{105}$$

Under high fragmentation, the support shifts to

$$[s_{\min} + \Delta_H, s_{\min} + \Delta_H + \omega] = [0.4405, 0.6155]. \tag{106}$$

The parameterization is chosen to illustrate how fragmentation can create, rather than merely shift, a restructuring cascade. Under low fragmentation, the distribution of yuan revenue exposure remains sufficiently dollar-linked that the restructuring map lies below the 45-degree line for every positive adoption level:

$$T_0^R(n) < n \qquad \text{for all } n \in (0, 1]. \tag{107}$$

Hence the unique equilibrium under low fragmentation is dollar dominance. Under high fragmentation, the exposure distribution shifts to the right. When yuan markets are thin, the restructuring cutoff remains above the support of the high-fragmentation exposure distribution, so dollar dominance remains locally stable. But when yuan markets are sufficiently deep, the cutoff falls below the support, so the all-yuan allocation is also locally stable. In the middle of the distribution, the adoption map is steep:

$$\max_n g_{\Delta_H}(\tilde{s}(n))[-\tilde{s}'(n)] > 1, \tag{108}$$

which generates an interior locally unstable tipping point.

The resulting fixed points are approximately

$$\text{low fragmentation:} \qquad n = 0, \tag{109}$$

$$\text{high fragmentation:} \qquad n = 0, \quad n_H^* = 0.4001, \quad n = 1. \tag{110}$$

Thus, in this numerical illustration, fragmentation changes the global structure of equilibria. Under low fragmentation, dollar dominance is unique. Under high fragmentation, dollar dominance remains an equilibrium, but a yuan-dominant equilibrium also appears. The interior point n_H^* is unstable: restructuring levels below n_H^* return to dollar dominance, while restructuring levels above n_H^* move the economy into the basin of attraction of yuan dominance.

Finally, the local private gain from restructuring is in the range suggested by the Kenya episode. For a country whose yuan revenue exposure is 10 percentage points above the restructuring cutoff,

the model implies a gain from restructuring of about 4.5 percent of inherited face value near the high-fragmentation tipping point. This is close to the 4.3 percent annual debt-service saving suggested by the Kenya conversion. The exercise therefore anchors the magnitude of the private restructuring gain while leaving the cross-country exposure distribution, the fragmentation shift, and the liquidity feedback illustrative. It shows the same mechanism as the closed-form example: local restructuring remains limited when the economy is below the unstable threshold, but a sufficiently large mass of yuan restructurings lowers yuan refinancing costs enough to move the economy into the basin of attraction of the yuan equilibrium.

A.18 Proof of Proposition 11

In the closed-form environment, the unstable threshold is

$$n^* = \frac{a - m - h}{\Lambda - 2h}, \tag{111}$$

defined when $\Lambda > 2h$ and the parameter restrictions in Proposition 10 imply $n^* \in (0, 1)$. Differentiating with respect to a gives

$$\frac{\partial n^*}{\partial a} = \frac{1}{\Lambda - 2h} > 0. \tag{112}$$

Differentiating with respect to m gives

$$\frac{\partial n^*}{\partial m} = -\frac{1}{\Lambda - 2h} < 0. \tag{113}$$

Finally,

$$\frac{\partial n^*}{\partial \Lambda} = -\frac{a - m - h}{(\Lambda - 2h)^2}. \tag{114}$$

At an interior unstable threshold with an all-dollar equilibrium at $n = 0$, the condition $a > m + h$ holds. Hence $a - m - h > 0$, and therefore

$$\frac{\partial n^*}{\partial \Lambda} < 0. \tag{115}$$

A lower threshold means that a smaller exogenous mass of restructurings is needed to enter the basin of attraction of the yuan equilibrium. A higher threshold means that a larger mass is needed.

This proves the proposition.

B Additional Microfoundations and Extensions

B.1 General Currency-Mismatch Technology

The linear mismatch specification follows from proportional conversion costs. A more direct cash-management formulation gives the same qualitative results. Suppose a country with total repayment resources X has dollar resources $(1-s)X$ and yuan resources sX. To repay a dollar face value F, it converts only the shortfall:

$$z^D(F,s) = \max\{F - (1-s)X, 0\}, \tag{116}$$

at strictly convex cost $\Gamma(z)$ with $\Gamma(0) = 0$, $\Gamma' > 0$, $\Gamma'' \geq 0$. Dollar repayment costs

$$C^D(F,s) = F + \Gamma(z^D(F,s)). \tag{117}$$

For yuan debt, the conversion shortfall is $z^Y(F,s) = \max\{F - sX, 0\}$ and $C^Y(F,s) = F + \Gamma(z^Y(F,s))$.

In the interior region where both shortfalls are strictly positive:

$$\frac{\partial}{\partial s}\left[C^D(F,s) - C^Y(F,s)\right] = X\Gamma'(z^D) + X\Gamma'(z^Y) > 0. \tag{118}$$

This is the single-crossing property of Appendix A.5 in a general formulation. The proportional-cost specification in the main text, with $\Gamma(z) = \xi z$, is the tractable special case that delivers closed-form expressions.

B.2 All-or-nothing denomination

The all-or-nothing currency choice follows from fixed currency-specific issuance costs. Suppose a sovereign must raise B and can split issuance between the two currencies, $b_D + b_Y = B$, at per-currency fixed costs $f_D, f_Y > 0$ capturing legal documentation, listing requirements, clearing

infrastructure, and investor-relations expenses. The sovereign minimizes

$$\min_{b_D, b_Y \geq 0} C^D(b_D; s, n) + C^Y(b_Y; s, n) + f_D \mathbf{1}\{b_D > 0\} + f_Y \mathbf{1}\{b_Y > 0\}, \tag{119}$$

subject to $b_D + b_Y = B$. When the gain from splitting issuance across two currencies is smaller than the total fixed cost $f_D + f_Y$, the optimum uses a single currency. A positive fixed cost preserves a discrete entry margin into yuan issuance or restructuring, which is the margin that creates debt-market liquidity spillovers.

B.3 Secondary-market liquidity and required repayment

The liquidity block does not impose a specific matching technology. A lender who buys a sovereign claim promising one unit of currency c at maturity faces a random liquidity shock with probability λ_ℓ. Conditional on the shock, the lender sells the claim at price $1 - \delta_c(\mathcal{L}_c)$ per unit of face value, where $\delta_c'(\mathcal{L}_c) < 0$. Competitive pricing at date 0 gives

$$P_c(n_c) = \frac{1 - \lambda_\ell \delta_c(\mathcal{L}_c(n_c))}{R^*}. \tag{120}$$

With $\mathcal{L}_c(n_c) = K_c + \eta n_c$, a larger mass of outstanding claims lowers the liquidation discount, raises the bond price, and reduces the face value required to raise a fixed amount of resources. This is the only liquidity property the model requires. It may arise from narrower bid-ask spreads, thicker dealer balance sheets, repo eligibility, benchmark-index inclusion, or a broader investor base.

B.4 Policy lender as an internalizer of network value

The policy-lender wedge discussed in Section 4.5 can be derived from an objective that values yuan-market depth. A private lender takes n as given and prices a yuan loan using $q_Y(n)$, ignoring the effect of its lending on future yuan liquidity. A yuan-bloc policy lender instead maximizes repayment value plus continuation value $V_Y(n)$ from yuan sovereign debt-market depth, where $V_Y'(n) > 0$. A lending program that moves mass Δn into yuan generates network value $V_Y(n + \Delta n) - V_Y(n)$. A share of this value is passed to borrowers through lower spreads, longer maturity, or swap-line access. In reduced form, the per-borrower transfer $\nu(n) \geq 0$ lowers the private

restructuring cutoff by reducing the effective cost of yuan refinancing. The wedge therefore reflects the internalization of a currency-network externality, not a primitive preference for yuan contracts.

B.5 Default costs and stochastic repayment capacity

The baseline model treats default as a discrete option with cost Ω_i. This section shows that the restructuring logic extends when repayment capacity is stochastic and default risk is priced by lenders.

Let dollar-denominated repayment resources be

$$Z_i^D(\tau_D, \zeta_D, \varepsilon_i) = \big(1 - s_i(\tau_D, \zeta_D)\big) A_i(\tau_D, \zeta_D) + \varepsilon_i, \tag{121}$$

where $A_i(\tau_D, \zeta_D)$ is total repayment capacity and ε_i is mean-zero with continuous distribution. A rise in dollar-bloc trade costs or dollar-settlement fragmentation raises s_i, reducing the dollar-revenue share. Let $\bar{Z}_i^D$ be the threshold below which repayment is dominated. The probability of dollar default or restructuring is $p_i^D(\tau_D, \zeta_D) = \Pr[Z_i^D(\tau_D, \zeta_D, \varepsilon_i) < \bar{Z}_i^D]$, which rises when fragmentation lowers dollar repayment resources. Suppose the liquidity shock and the default event are independent, conditional on (τ_D, ζ_D, n). Then the competitive date-0 price of a dollar claim with recovery $\rho_D \in [0, 1)$ in default is:

$$P_D(n_D, \tau_D, \zeta_D) = \frac{\big[1 - (1 - \rho_D) p_i^D(\tau_D, \zeta_D)\big]\big[1 - \lambda_\ell \delta_D(\mathcal{L}_D(n_D))\big]}{R^*}. \tag{122}$$

Higher fragmentation raises p_i^D, lowers $[1 - (1 - \rho_D)p_i^D]$, lowers P_D, and raises the face value required to raise a given amount of resources. This is an additional force toward yuan restructuring.

Proposition 12 (Stochastic default risk preserves the restructuring logic)**.** *Suppose fragmentation lowers dollar repayment resources in the sense of first-order stochastic dominance and lenders price dollar claims with recovery $\rho_D < 1$ under the conditional independence of default and liquidity risk. Then fragmentation raises the default premium on dollar refinancing. If yuan refinancing costs remain decreasing in aggregate yuan adoption, the yuan-restructuring cutoff remains decreasing in yuan adoption. The monotonicity and fixed-point results of the baseline model are unchanged, and tipping requires the same type of local slope condition.*

Proof. A FOSD decline in Z_i^D raises $p_i^D(\tau_D, \zeta_D)$. Since $\rho_D < 1$, the factor $1 - (1 - \rho_D)p_i^D$ is strictly decreasing in p_i^D, so P_D falls and the required dollar face value rises. Yuan restructuring still has a cutoff representation: the structural cost functions ((16)–(26)) retain their single-crossing property in s_i under the modified dollar costs. Specifically, define $\tilde{q}_D(n_D, \tau_D, \zeta_D) = 1/P_D(n_D, \tau_D, \zeta_D)$. The dollar repayment cost is $(1 + \xi s_i)\tilde{q}_D$, which is increasing in s_i because a higher yuan-revenue share implies a larger mismatch for dollar obligations. The yuan restructuring cost remains decreasing in s_i because a higher yuan-revenue share reduces the mismatch for yuan obligations. Therefore the payoff advantage of yuan restructuring relative to dollar repayment remains increasing in s_i, so the same single-crossing argument applies. Since $q_Y'(n) < 0$ is unchanged, the restructuring cutoff $\tilde{s}_i(n)$ remains decreasing in n by the same argument as Proposition 3. The aggregate restructuring map is therefore upward-sloping and shifts upward with fragmentation. An interior fixed point is locally unstable under the same type of slope condition as Proposition 9: the slope of the aggregate restructuring map must exceed one. □

C Global-Game Refinement

This appendix gives a standard incomplete-information refinement of the restructuring equilibrium. The refinement is not used for the main mechanism. Its purpose is to show how noisy private information can select a monotone equilibrium when the complete-information restructuring game has multiple equilibria. The argument is in the spirit of the global-games approach to equilibrium selection in coordination games; see Carlsson and van Damme (1993), Morris and Shin (1998), and Morris and Shin (2003).

Let $\theta \in \mathbb{R}$ denote the strength of the yuan financial system. A higher θ captures stronger yuan liquidity backstops, more credible swap-line arrangements, lower settlement frictions, or greater expected yuan debt-market depth. Each country observes its own yuan revenue exposure s_i and a private signal

$$x_i = \theta + \sigma\varepsilon_i, \qquad \sigma > 0, \tag{123}$$

where ε_i is idiosyncratic signal noise with continuous density. The prior and signal structure are assumed to satisfy the monotone likelihood-ratio property, so a higher signal shifts the posterior

distribution of θ upward in the sense of first-order stochastic dominance.

We formulate the refinement for the legacy-dollar-debt restructuring problem. To isolate the information friction, take the non-revenue restructuring parameters $(F^D, \rho, \kappa, \Omega)$ as common across countries, as in Section 4 when deriving the aggregate restructuring map. Equivalently, the same argument applies conditional on these parameters when they are observable country types. Let $a_i \in \{0, 1\}$ denote the country decision, where $a_i = 1$ means restructuring inherited dollar debt into yuan. Given aggregate yuan restructuring n and yuan-system strength θ, the cost of yuan restructuring is

$$C^{\text{restr}}(s_i, n, \theta) = \big(1 + \xi(1 - s_i)\big)\rho F^D R_Y(n, \theta) + \kappa, \tag{124}$$

where

$$R_{Y,n}(n, \theta) < 0, \qquad R_{Y,\theta}(n, \theta) < 0. \tag{125}$$

The first inequality is the yuan debt-market liquidity externality. The second says that a stronger yuan financial system lowers the cost of yuan refinancing.

The outside option to restructuring is the cheaper of continued dollar repayment and outright default:

$$C^{\text{out}}(s_i) = \min\{(1 + \xi s_i)F^D, \Omega\}. \tag{126}$$

The payoff gain from yuan restructuring is

$$\Delta(s_i, n, \theta) = C^{\text{out}}(s_i) - C^{\text{restr}}(s_i, n, \theta). \tag{127}$$

The payoff gain is increasing in yuan revenue exposure, aggregate yuan restructuring, and yuan-system strength. Formally,

$$\Delta_s(s_i, n, \theta) > 0, \qquad \Delta_n(s_i, n, \theta) > 0, \qquad \Delta_\theta(s_i, n, \theta) > 0 \tag{128}$$

wherever the derivatives exist. The first inequality follows because $C^{\text{out}}(s_i)$ is weakly increasing in s_i, while $C^{\text{restr}}(s_i, n, \theta)$ is strictly decreasing in s_i. The second and third follow from (125). At the kink in (126), the same monotonicity holds in the order sense.

A monotone cutoff strategy is a function $b(s)$ such that a country with revenue exposure s

restructures if and only if $x_i \geq b(s)$. Conditional on θ, the aggregate mass of countries restructuring under cutoff rule b is

$$N_b(\theta) = \int \left[1 - F_\varepsilon\left(\frac{b(s) - \theta}{\sigma}\right)\right] dG(s), \tag{129}$$

where F_ε is the distribution of signal noise and G is the cross-country distribution of revenue exposure. Since the density of ε_i is positive,

$$N_b'(\theta) = \int \frac{1}{\sigma} f_\varepsilon\left(\frac{b(s) - \theta}{\sigma}\right) dG(s) > 0. \tag{130}$$

For a country with type s and signal x, the expected payoff gain from restructuring is

$$V_b(s, x) = \mathbb{E}\left[\Delta(s, N_b(\theta), \theta) \mid x\right]. \tag{131}$$

Because $N_b(\theta)$ is increasing in θ and Δ is increasing in both n and θ, the term $\Delta(s, N_b(\theta), \theta)$ is increasing in θ. The monotone likelihood-ratio property then implies that $V_b(s, x)$ is increasing in x. Since Δ is increasing in s, $V_b(s, x)$ is increasing in s.

Assume standard dominance regions: for sufficiently low signals, dollar repayment or default strictly dominates restructuring for all s; for sufficiently high signals, restructuring into yuan strictly dominates for all s. Then the best response to any monotone cutoff rule is itself a cutoff rule. Let $\mathcal{T}b(s)$ denote the best-response cutoff, defined by

$$V_b(s, \mathcal{T}b(s)) = 0. \tag{132}$$

Proposition 13 (Type-dependent global-game cutoff)**.** *Suppose the signal structure satisfies the monotone likelihood-ratio property, the payoff gain satisfies* (128)*, the dominance regions above hold, and the monotone cutoff operator $\mathcal{T}$ has a unique fixed point. Then the incomplete-information restructuring game has a unique monotone cutoff equilibrium. It is characterized by a function $x^*(s)$ such that country i restructures into yuan if and only if*

$$x_i \geq x^*(s_i). \tag{133}$$

Moreover, $x^*(s)$ is weakly decreasing in s. Countries with greater yuan revenue exposure require weaker private signals about yuan-system strength to restructure into yuan.

Proof. Fix a monotone cutoff rule $b(s)$. Equation (130) shows that $N_b(\theta)$ is increasing in θ. Since Δ is increasing in n and θ, the composite function $\Delta(s, N_b(\theta), \theta)$ is increasing in θ. By the monotone likelihood-ratio property, a higher signal x shifts the posterior distribution of θ upward. Hence $V_b(s, x)$ is increasing in x.

The dominance regions imply that, for each s, $V_b(s, x) < 0$ for sufficiently low x and $V_b(s, x) > 0$ for sufficiently high x. Therefore the best response to b is a cutoff rule. Since Δ is increasing in s, $V_b(s, x)$ is increasing in s. Thus, for $s' > s$,

$$V_b(s', x) \geq V_b(s, x) \qquad \text{for every } x. \tag{134}$$

The signal threshold that makes the country indifferent cannot be higher for s' than for s. Hence the best-response cutoff $\mathcal{T}b(s)$ is weakly decreasing in s.

Under the standard global-game uniqueness condition, the monotone cutoff operator $\mathcal{T}$ has a unique fixed point $x^*(s) = \mathcal{T}x^*(s)$. The equilibrium strategy is therefore $a_i = 1\{x_i \geq x^*(s_i)\}$. Since the best-response cutoff is weakly decreasing in s, the equilibrium cutoff $x^*(s)$ is weakly decreasing in s. □

The comparative static is immediate. A fragmentation shock that raises a country's yuan revenue exposure lowers its signal threshold for restructuring:

$$s_i' > s_i \quad \Rightarrow \quad x^*(s_i') \leq x^*(s_i). \tag{135}$$

Thus incomplete information selects a monotone restructuring equilibrium without changing the substantive mechanism of the paper: higher yuan revenue exposure makes yuan restructuring attractive at weaker beliefs about yuan-system strength, and broader yuan restructuring remains self-reinforcing through the liquidity channel.