Financial Interdependence and Currency Internationalization

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Abstract

Does China's financial opening necessarily involve currency internationalization? To study how incumbent (U.S.) and rising (China) powers compete under financial interdependence, we develop a model of reserve asset demand featuring network effects. Our analysis shows that asset liquidity and currency liquidity interact to shape the timing of RMB internationalization. At early stages of financial development, China benefits from issuing in dollar because participation in the dollar system enhances the liquidity of its asset. As China's financial markets deepen, incentives reverse: issuing in RMB allows China to internalize network effects and erode the dollar's dominance, leading to a discrete shift toward market fragmentation. The transition dynamics are further shaped by U.S. sanctions, financial repression, and the response of third countries. These results highlight how financial interdependence transforms cooperation into rivalry in the evolution of the international financial order.

Keywords: Currency Competition, Weaponized Interdependence, Financial Fragmentation, Kindleberger Trap, Financial Sanction, Financial Repression

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1 Introduction

China has become increasingly active in international financial markets, both as a major lender and as a growing issuer of financial assets. At the same time, it has sought to promote its currency, making RMB internationalization a central component in its path to expanding influence in the global financial system.

This paper studies the optimal timing for RMB internationalization as China continues to develop its financial markets. We ask whether China's rise as an international financial power necessarily involves promoting RMB as a global currency, or China can expand its influence within the existing dollar-based system. Our analysis emphasizes the interdependent nature of international financial markets. Because financial activities exhibit strong network effects, U.S. and Chinese actions influence each other. Understanding the timing of China's potential move away from the dollar system therefore requires examining the strategic interaction between U.S. and Chinese policies, and how it evolves with China's financial development.

To model financial interdependence between the two powers, we develop a model of network effects in global asset markets. Building on prior works that microfound network effects through search frictions, we introduce a richer search environment with two stages. In the first stage, asset sellers search for financial intermediaries who specialize in a particular currency denomination. In the second stage, condition on a successful match, the intermediary contacts a potential buyer.

Compared to standard search protocols, where matching occurs directly between buyers and sellers, introducing a new layer of currency-specialized intermediaries allows us to capture network effects at the currency level in addition to the asset level. A larger currency area makes it easier for sellers of any assets denominated in this currency to find intermediaries who can facilitate their trade, while a larger asset market makes it easier for intermediaries to locate buyers for that asset.

Under this market structure, an asset's desirability depends not only on the size of its own market but also on the size of the currency area to which it belongs. More concretely, as more investors hold the U.S. Treasury, the Treasury market becomes more liquid, and this market depth makes U.S. Treasury even more attractive; on top of this standard liquidity effect, a broader in-

vestor base holding dollar-denominated assets enhances liquidity in the dollar system as a whole, increasing the appeal of all dollar assets.

This two-tier network effect allows sovereign issuers' currency choices to influence the desirability of their assets, giving rise to spill-over effects between assets, currencies, and countries. When an issuer denominates its asset in a particular currency, it increases the liquidity of the entire currency area, which may benefit other assets in that currency area more than its own asset. In this paper, we study how this consideration generates a dynamic tension for the challenger, and shapes its incentives and behavior.

Compared with Coppola, Krishnamurthy, and Xu (2023), our framework shifts the locus of the currency choice. In their model, two countries are committed to their respective currency areas, while market participants (global firms in their setting) choose the currency denomination of their assets. By contrast, our paper studies the strategic decision of a country to join or exit another country's currency area. In our setting, not only do market participants (global investors in our case) choose between assets based on their desirabilities, but sovereign actors also strategically select their currency denomination to influence these desirabilities. The novel assumption in our model is that liquidity operates at two distinct but interconnected levels, which allows us to capture the strategic interaction between asset markets and currency systems.

Baseline Results. Our setting allows us to treat financial development and currency dominance as distinct concepts. The central question we examine is when these two objectives coincide and when they diverge from the perspective of economic incentives.

To study this question, we assume China's financial sophistication increases gradually, driven by an exogenous process that raises the intrinsic desirability of Chinese assets over time. The U.S. always issues its Treasury in dollar, while China can choose between dollar and yuan. The sizes of assets and currency areas are endogenous, and, through network effects, influence asset desirability given issuers' currency choices. Both countries aim to maximize the market share of their respective assets, while a unit mass of investors choose assets based on their desirabilities.

When China's financial sophistication is relatively low, it benefits from issuing dollar-denominated assets. By joining the dollar system, China pools its assets with the broader dollar area and gains from the liquidity of a larger currency network. At the same time, China's participation strengthens the liquidity of the dollar system, benefiting other dollar assets. In this regime, China reinforces the existing dollar-centered system.

As China's financial sophistication rises, incentives reverse. Once China's debt market becomes sufficiently large relative to that of the U.S., the U.S. benefits more from China's participation in the dollar system than China benefits from the U.S. participation. At this point, China has a strong incentive to denominate its assets in yuan, since doing so reduces the desirability of U.S. assets more than that of Chinese assets. Since investors choose assets based on their *relative* desirability, China can increase its market share by exiting the dollar system. This transition occurs once China's financial development crosses a critical threshold, leading to a fragmentation of global asset markets.

Interestingly, this threshold lies *above* the point at which China's financial sophistication reaches parity with the U.S. When Chinese and U.S. markets are similar in size, pooling their assets within the dollar system expands the overall currency area, which increases the desirability of both assets. As a result, China remain willing to develop within the existing dollar system, even after its financial sector catches up with and begins to surpass that of the U.S.

However, the advantage of remaining in the dollar system eventually diminishes. As China's financial market continues to grow, the key objective shifts from enhancing the *absolute* attractiveness of Chinese assets to improving their *relative* desirability compared to U.S. assets. At this stage, the incentive to transition to an RMB-centered system dominates, and China's exit generates a sharp, discontinuous adjustment in the dollar system.

This result offers a potential explanation of the observed gradual pace of RMB internationalization, which has lagged behind China's rapid expansion in international trade and financial activities. For example, China continues to hold large quantities of U.S. Treasury and other dollar-denominated assets, and a substantial share of its external lending and borrowing remains denom-

inated in dollars. Our analysis suggests that, from China's perspective, there can be an extended period during which deepening financial integration within the dollar system remains optimal for China, even after it surpasses the U.S. in financial sophistication.

Financial Sanction and Financial Repression. We next study what happens when the U.S. possesses the power to sanction China within the dollar system. Financial sanction lowers the contribution of the dollar area's size to the desirability of China's asset, provided that China remains in the dollar area. If China instead issues its assets in yuan, the sanction has no effect.

When China's financial sophistication is low, it continues to issue dollar assets even under sanction, as the benefits of participating in the dollar system outweigh the associated costs. In this region, the sanction benefits the U.S. market share at the expense of China.

However, as China's financial sector grows, the sanction can precipitate an earlier exit from the dollar system. In an intermediate range of China's financial development, the sanction induces China to switch to yuan-denominated issuance sooner than it would in the absence of sanctions. In this case, the sanction segments global asset markets and hurts U.S. economic interests by reducing its market share. On the other hand, when China reaches a level of financial development at which it would issue yuan assets even without sanction, the sanction policy becomes irrelevant.

This discussion shows that financial sanctions have non-monotonic effects on the U.S. market share, depending on China's level of financial development. This result echoes the insight of Clayton et al. (2024b) that trade sanctions are effective only when the "incentive compatibility" condition of the targeted country is satisfied. In our setting, financial sanctions can harm China when it remains committed to the dollar system, but they also weaken China's incentive to stay within the dollar bloc. As a result, sanctions may accelerate China's exit and generate unintended consequences that ultimately undermine U.S. interests.

In addition to sanctions, we also consider a simple form of financial repression that the U.S. can impose on its domestic investors, which requires them to hold only U.S. assets. This policy increases the size and liquidity of the dollar system, which benefits all dollar assets including U.S.

Treasury. Surprisingly, when the mass of investors captive to the dollar system is sufficiently large, this policy can keep China *permanently* in the dollar system, even after it surpasses the U.S. in financial sophistication. In comparison, a higher level of U.S. financial sophistication only delays China's exit, but cannot prevent it from happening eventually.

This result suggests that financial repression may serve as a powerful tool for maintaining dollar dominance. Since the dollar system becomes more fragile when the U.S. puts foreign countries under financial sanction, our results provide a rationale for the combined usage of financial repression and sanction, even though the former policy is directed toward domestic investors while the latter is directed toward foreign countries.

International Spill-Over Effects. Finally, we introduce additional foreign issuers. For expositional convenience, we consider three countries: the U.S., China, and Europe. Both China and Europe can choose to denominate their assets in dollars, yuan, or euros, while the U.S. remains committed to issuing dollar assets.

We hold the levels of U.S. and European financial sophistication fixed and vary that of China. When China's financial sophistication is low, all countries choose to issue dollar-denominated assets. As China becomes sufficiently large, both China and Europe issue assets in yuan. In both cases, there is a unique equilibrium.

However, in the intermediate range of China's financial sophistication, multiple equilibria emerge. In one equilibrium, both China and Europe denominate their assets in dollar; in another, both choose yuan. In this region, China's and Europe's currency choices become strategically complementary, reflecting the strength of the currency-level network effects. As a result, the transition between currency systems can involve substantial coordination dynamics and heightened volatility.

This excessive volatility point builds on Nurkse (1944); Farhi and Maggiori (2018). Nurkse (1944) highlights the run-like feature of the multi-polar monetary system, in which capital flows fluctuate between competing currency blocs. Farhi and Maggiori (2018) formalizes this idea in a bank-run framework, emphasizing the time-consistency problem faced by sovereign issuers and

showing multiple equilibria can arise due to self-fulfilling runs. In comparison, our mechanism relies on network effects, which also generate multiple equilibria but do not require a dynamic or intertemporal setup.

Moreover, sanctions on one foreign country can produce unintended spill-over effects on other foreign countries. Reducing the desirability of one country's dollar asset weakens the dollar system as a whole, and incentivizes other foreign countries to exit the dollar bloc. For example, when U.S. sanctions on China prompt an early Chinese exit, they also encourage Europe to leave. Conversely, sanctions on a third country can incentivize China to establish its own currency bloc and attract foreign participants, undermining dollar dominance at an earlier stage of its financial development. As a result, to the extent that the strength of the dollar system is derived from not only the U.S. but also foreign countries' participation, these spill-over effects make it difficult for the U.S. to unilaterally enforce sanctions without harming its own interests.

The Kindleberger Trap. Our results connect to broader concepts in international relations. Underscoring the interdependence between China and the current international order, Nye (2023) coined the concept of the *Kindleberger Trap*. As Nye observed, "thus far, however, Chinese behavior has sought not to overthrow the liberal world order from which it benefits, but to increase its influence within it." China not only gains from the existing system, but also has the potential to contribute to its stability. However, if U.S. policy isolates or pressures China, Nye warned, China may cease providing global public goods and become a free rider, risking a repeat of the 1930s, when, as Charles Kindleberger argued, the U.S. replaced the U.K. as the leading global power but failed to sustain international economic stability.

Nye's view contrasts with the *Thucydides Trap* popularized by Allison (2015), which emphasizes the tendency toward conflict when a rising power threatens to displace the established one. Our results offer a synthesis of these two perspectives. When a rising power shapes the desirability of the existing system, a situation that initially resembles the Kindleberger Trap may evolve into a Thucydides Trap at a later stage. Thus, instead of treating these concepts as static descriptions

of the U.S.-China relationship, it is more fruitful to view them as two possible regimes within a broader process of transition dynamics.

As a result, our analysis gives rise to a more nuanced view of the Kindleberger Trap. When China is less financially developed and stays in the dollar area, its growth also improves the overall liquidity of the dollar system, making it even more attractive to other participants. In this case, consistent with Nye's argument, not only does China benefit from the dollar area's liquidity, but the dollar area also benefits from China's growth. However, this mutually beneficial relationship will not last forever. The competition between asset issuers under network effects predicts that, when China gains sufficient financial sophistication, it is incentivized to exit the dollar area and form its own currency bloc.

Furthermore, sanctions have unintended consequences. When China is committed to staying in the dollar system, the U.S. sanction unilaterally harms China and benefits the U.S., giving rise to an "intensive-margin" effect. However, the sanction also reduces the attractiveness of staying in the dollar bloc, precipitating China's exit. This "extensive-margin" effect leads to a premature fragmentation of global asset markets, which also harms U.S. interests. This dynamic also mirrors Nye's formulation of the Kindleberger Trap: policy that pressures a rising power can undermine the very system it was meant to protect.

Finally, with multiple countries, multiple equilibria lead to even more instability. The Kindleberger Trap also manifests itself as China's pivotal role in equilibrium selection. China's participation stabilizes the dollar system by encouraging other countries to stay. Conversely, U.S. sanctions precipitate the emergence of multiple equilibria, in which case foreign countries may coordinate to exit the dollar system together.

Literature. This paper contributes to the emerging literature on how countries coordinate and compete in international financial markets. Clayton, Maggiori, and Schreger (2023) propose a framework for a hegemon to exert influence through trade network. Pflueger and Yared (2024) study the feedback between military spending, geopolitical risk, and government financing. Jiang

and Richmond (2023) study the strategic complementarity in reserve asset issuance. Broner, Martin, Meyer, and Trebesch (2024) propose a theory to describe the strategic interplay between a hegemon and a challenger in economic activities. Our paper focuses specifically on how network effects influence the strategic interaction between an incumbent hegemon and a rising challenger in financial markets.

Our paper is also related to a growing literature on China's financial opening. Bahaj and Reis (2020) study China's liquidity provision through central bank swap lines. Horn, Reinhart, and Trebesch (2021) examine its overseas lending, and Jiang (2025) studies its spill-over effects on developing countries. Bahaj and Reis (2024) document the structure of China's onshore/offshore parallel currency system. Clayton, Dos Santos, Maggiori, and Schreger (2025) study China's strategy to internationalize its currency through reputation building, and Clayton, Dos Santos, Maggiori, and Schreger (2024a) study currency competition under this framework. Coppola, Krishnamurthy, and Xu (2025) study currency development through liquidity provision.

Our paper is also related to recent works on international asset allocation. Koijen and Yogo (2020); Jiang et al. (2024, 2025b); Fang et al. (2025); Chaudhary et al. (2024); Pellegrino et al. (2025) use bilateral holdings data to study the determinants of cross-border asset allocation. Our paper provides a complementary theoretical perspective by focusing on the strategic decisions of sovereign issuers on the supply side. This is particularly relevant in light of the increasing role of government policies in reserve asset markets (Jiang et al., 2025a; Acharya and Laarits, 2026).

A separate literature studies how the incumbent seller of a network good sets the price to deter entry (Fudenberg and Tirole, 2000). Compared to corporate monopolists studied in this setting, sovereign actors have a broader set of tools beyond price setting at their disposal. Our paper studies how they use sanction to influence the challenger's incentives.

The rest of the paper is organized as follows. Section 2 presents the model and its equilibrium outcomes. Section 3 studies the effects of U.S. financial sanctions and financial repression on the timing of RMB internationalization. Section 4 introduces additional foreign countries, and studies how multiple equilibria arise and respond to sanction. Section 5 concludes.

2 Model

We consider a setting in which an incumbent hegemon (U.S.) competes with a challenger (China) in the provision of reserve assets. There are three investment options: a U.S. asset, a Chinese asset, and an outside option such as gold or crypto assets, which are indexed by $i \in \{us, cn, outside\}$. For the U.S. and Chinese assets, we use $currency_i$ to denote the asset's currency denomination, which can be either $dollar$ or $yuan$. Each asset has a unique currency denomination, while a currency may denominate multiple assets.

There is a unit mass of savers who choose among the assets. Each saver invests their wealth in exactly one of the three options, and the size of each asset is given by the total amount of wealth invested in it. We abstract away from floating exchange rates. Let $s(i)$ denote the size of asset i, and let $s(currency_i)$ denote the size of the currency area to which asset i belongs, defined as the total size of all assets issued in that currency.

Our setting is intentionally stylized in order to capture a broad range of scenarios. Because the proposed search framework is broadly applicable, the resulting theoretical insights extend beyond the specific context of reserve asset markets. They can inform related questions such as the choice of invoice currency in international trade, the choice of currency denomination in foreign investments, and the selection of clearing systems for cross-border payments.

2.1 Microfoundation of Network Effects

The key ingredient of our model is the network effect: when more savers hold the U.S. asset, it becomes more liquid, and its market depth makes it even more attractive to marginal investors. Conversely, if enough savers switch to the Chinese asset, that asset becomes more liquid and therefore more attractive. Coppola et al. (2023) provide a microfoundation for this mechanism through search frictions in asset markets.

Our model departs from the existing literature by distinguishing between two types of liquidity: the liquidity of a specific *asset* and the liquidity of the *currency system* to which that asset

belongs. To microfound this distinction, we propose a new search process intermediated by financial intermediaries.

There is an infinite horizon $t \in \{0, 1, 2, ...\}$. Each period is divided into two sub-periods, t and t^+. In sub-period t, savers choose among the available assets. In the following sub-period t^+, a fraction λ of randomly selected savers experience a liquidity shock, which forces them to liquidate their asset holdings.

When a saver is hit by the liquidity shock, it searches for a buyer to liquidate its asset. The search process is subject to frictions, and the probability of finding a buyer depends on both the liquidity of the asset and the liquidity of the currency system. If the search is successful, the saver is matched with another saver who has not experienced the liquidity shock. In this case, the seller can sell its asset at its par value. If the search fails, the saver is forced to sell its asset at a fire-sale price of $\delta < 1$ to a specialized distressed buyer. Regardless of the buyer's identity, the asset is held until the next period $t + 1$, when it can be traded again at par.

Our key departure from classic search models is to introduce a two-stage search process that emphasizes the role of the currency area. Both stages are intermediated by financial intermediaries. In the first stage, a seller searches for an intermediary who specializes in the currency denomination of the asset. In the second stage, if the match between the seller and the intermediary is successful, the matched intermediary contacts a potential buyer.

Stage 1: Seller to Intermediary. The search process in the first stage is modeled in the standard way. There is a unit mass of financial intermediaries, and each specializes in a particular currency denomination. We assume that the mass of intermediaries for a given currency is proportional to the size of that currency area. The number of meetings between sellers of asset i and intermediaries in the corresponding currency area $currency_i$ is increasing in their respective masses:

$$n(match) = \kappa[\ \underbrace{\lambda s(i)}_{\text{mass of sellers}}\ ]^{\phi} \cdot [\ \underbrace{s(currency_i)}_{\text{mass of intermediaries}}\ ]^{\phi}, \quad \text{with} \quad \phi > 0.$$

This setup follows closely the standard matching function used in Duffie et al. (2005) (setting $\phi = 1$) and Coppola et al. (2023) (considering general ϕ values). Following these works, we assume $\phi > 1/2$. Under this condition, doubling the masses of sellers and intermediaries more than doubles the number of matches, capturing the presence of network effects.

Given this matching function, the probability of finding a counterparty from the perspective of a seller is equal to the number of meetings per seller:

$$p(match) = \frac{n(match)}{\lambda s(i)} = \kappa[\ \underbrace{\lambda s(i)}_{\text{mass of sellers}}\ ]^{\phi-1} \cdot [\ \underbrace{s(currency_i)}_{\text{mass of intermediaries}}\ ]^{\phi}.$$

In standard settings, the currency area coincides with the specific asset market: $s(i) = s(currency_i)$, which implies $p(match) = \kappa\lambda^{\phi-1}s(i)^{2\phi-1}$. In this case, $\phi > 1/2$ is also the necessary condition for an increase in asset size to raise the probability of finding an intermediary. When $\phi < 1/2$, the presence of additional sellers instead crowds out each seller's matching probability.

Stage 2: Intermediary to Buyer. Once a seller is matched with an intermediary specializing in the currency denomination of the asset, the intermediary contacts a potential buyer. For a trade to occur, the potential buyer must satisfy two conditions. First, the buyer must not have been hit by the liquidity shock. We assume that any saver unaffected by the shock has sufficient balance sheet capacity to purchase the asset. Second, the buyer must hold not only the same currency but also the same asset. This latter assumption captures the idea that investing in an asset requires expertise and familiarity, which are more likely to be found among existing holders of that asset.

We assume that, for the intermediary in a given currency area, the probability of finding a buyer who holds the same asset is increasing in the share of that asset within the currency area:

$$p(contact|match) = \left(\frac{s(i)}{s(currency_i)}\right)^{\psi}, \quad \text{with} \quad \psi > 0.$$

Intuitively, as more savers hold a given asset within a currency area, it becomes easier for intermediaries to locate a suitable buyer. Conversely, smaller assets generate less trading interest, less

dealer activity, and weaker price discovery, which reduces the effective share of participants in the currency area who are visibly holding–and willing to trade—the asset. As a special case, if $\psi = 1$, the intermediary finds a random buyer within the currency area with equal probability.

Let us first consider a baseline case with $\psi = \phi$, so that the strength of the network effect at the asset level is the same as the currency level. In this case, the probability of finding a buyer is

$$p_{baseline}(success) = p(match) \cdot p_{baseline}(contact|match) = \kappa\lambda^{\phi-1}s(i)^{2\phi-1},$$

which is identical to the result in Coppola et al. (2023) and is independent of the size of the currency area $s(currency_i)$. Intuitively, if intermediaries locate buyers with the same intensity as sellers locate intermediaries, our setup collapses to the standard two-sided search process that occurs directly between sellers and buyers, rendering intermediaries a frictionless pass-through. Therefore, the additional layer of intermediation preserves the core intuition of the matching function in Duffie et al. (2005), while extending it to operate jointly at the currency and asset levels.

Returning to the general case, the overall probability of finding a buyer is given by

$$p(success) = p(match) \cdot p(contact|match) = \kappa\lambda^{\phi-1}s(i)^{\psi+\phi-1} \cdot s(currency_i)^{\phi-\psi}. \quad (1)$$

Recall that $\phi > 1/2$ by assumption. In order for the probability of finding a buyer to be increasing in both the size of the currency area and the size of the asset, the search parameters must satisfy

$$\psi + \phi > 1 \text{ and } \phi > \psi. \quad (2)$$

The first condition $\psi + \phi > 1$ ensures that the network effects at asset and currency levels are strong enough. We have already assumed that $\phi > 1/2$, so that doubling sellers and intermediaries more than doubles the number of matches in the first stage. Additionally, we also need ψ to be large enough for size to play a meaningful role in the second stage of the search process.

The second condition $\phi > \psi$ implies that size confers a greater advantage through network

effects in the currency market than in the asset market. Holding asset size constant, a larger currency area has two opposing effects. On the one hand, sellers benefit from a thicker intermediary market in the first stage; on the other hand, intermediaries have to face a larger pool of potential counterparties in the second stage, within which buyers of the asset constitute a smaller share.

The condition $\phi > \psi$ ensures that the thickening of the intermediary market dominates the dilution effect, so that a larger currency area increases the probability of successful trade. This assumption is plausible if specialized intermediaries possess greater expertise and resources in locating counterparties than individual investors do in finding intermediaries, so that currency size plays a more significant role in the first stage than in the second stage.

Under these conditions, the matching probability function (1) successfully captures network externalities at both currency and asset levels: each additional holder of $currency_i$ facilitates the first-stage search process between sellers and intermediaries at the currency level, while each additional holder of asset i raises the visibility of this asset to intermediaries within that currency area.

Utility Function. Finally, we adopt a simple specification for savers' utility function. Recall that a saver has a payoff of 1 if it is not hit by the liquidity shock or if it successfully finds a buyer condition on being hit by the shock. If the saver fails to find a buyer, it must liquidate the asset at the fire-sale price δ. Assume savers are risk-neutral. The expected payoff from holding asset i is given by

$$\begin{aligned}\pi(i) &= (1-\lambda)\cdot 1 + \lambda p(success)\cdot 1 + \lambda(1-p(success))\cdot\delta \\ &= 1-\lambda+\lambda\delta+(1-\delta)\kappa\lambda^{\phi}s(i)^{\psi+\phi-1}\cdot s(currency_i)^{\phi-\psi},\end{aligned}$$

which is increasing in the two determinants of liquidity: the size of the currency area $s(currency_i)$ and the size of the asset $s(i)$.

To obtain a tractable expression for analytical purposes, we consider a linear expansion of the

payoff with respect to log currency size $\log(s(currency_i))$ and log asset size $\log(s(i))$:

$$\pi(i) \approx c + \alpha \log s(i) + \beta \log s(currency_i).$$

This log-linear approximation is equivalent to assuming that doubling the asset size or currency size from 1% to 2% of the market has the same effect on the asset's desirability as doubling the size from 10% to 20%. This is a convenient and economically natural feature when liquidity depends on market thickness and search intensity, which are plausibly governed by relative scale rather than absolute changes in market share.

Finally, the desirability of asset i also depends on other features such as the issuer's sophistication and credibility. We capture these issuer-level features with a reduced-form term $\theta(i)$, which we refer to as the issuer's *financial sophistication*. For example, U.S. assets are historically perceived to have higher institutional quality than Chinese assets, implying $\theta(\text{us}) > \theta(\text{cn})$. More generally, $\theta(i)$ can be extended to incorporate the asset's yield, credit risk, and currency risk which influence its desirability, as in quantitative asset demand systems (Koijen and Yogo, 2019, 2020; Jiang et al., 2024). We abstract from these considerations to focus on endogenous supply policies by sovereign issuers.

In addition, each agent faces an idiosyncratic preference shock $\epsilon_k(i)$ for asset i, which is independent across agents and assets and follows a Type I extreme value distribution. This assumption yields logit expressions for asset market shares commonly used in the demand system literature.

The utility of saver k from holding asset i is therefore given by

$$u_k(i) = \alpha \log s(i) + \beta \log s(currency_i) + \theta(i) + \epsilon_k(i), \qquad \text{for } i \in \{us, cn\}, \tag{3}$$

which captures network effects at both asset and currency levels. Since $\alpha > 0$ and $\beta > 0$, savers prefer assets with larger market size and those denominated in currencies with broader usage.

For the outside asset $i \in \{outside\}$, we assume that it cannot be traded through the search process, and normalize its utility to zero: $u_k(outside) = 0$.

2.2 Macro Synthesis

The preference specified by Eq. (3) allows us to derive aggregate market shares in closed form. We obtain the following aggregate demand curves for U.S. and Chinese assets:

$$s(i) = \frac{\exp(\alpha \log s(i) + \beta \log s(currency_i) + \theta(i))}{1 + \sum_{j \in \{us,cn\}} \exp(\alpha \log s(j) + \beta \log s(currency_j) + \theta(j))}, \quad i \in \{us, cn\},$$

while $s(outside) = 1 - s(us) - s(cn)$ denotes the share of the outside option. U.S. and Chinese assets compete not only with each other, but also against alternative investment opportunities available in the rest of the world.

In this setting, asset sizes are endogenous to the currency choices of issuers. We assume that the U.S. commits to issuing its securities in dollar: $currency_{us} = dollar$. China, on the other hand, can choose whether to issue its securities in dollar or yuan: $currency_{cn} \in \{dollar, yuan\}$. If China remains in the dollar system, the combined pool of U.S. and Chinese dollar assets makes the dollar system even more liquid and attractive. In this case, the demand for U.S. and Chinese assets follows

$$s(i) = \frac{\exp(\alpha \log s(i) + \beta \log s(dollar) + \theta(i))}{1 + \sum_{j \in \{us,cn\}} \exp(\alpha \log s(j) + \beta \log s(dollar) + \theta(j))}, \quad i \in \{us, cn\},$$

where $s(dollar) = s(us) + s(cn)$ denotes the size of the dollar system.

In comparison, if China exits the dollar system and issues its assets in yuan, the demand is given by

$$s(i) = \frac{\exp(\alpha \log s(i) + \beta \log s(i) + \theta(i))}{1 + \sum_{j \in \{us,cn\}} \exp(\alpha \log s(j) + \beta \log s(j) + \theta(j))}, \quad i \in \{us, cn\},$$

where the size of each currency area coincides with the size of its corresponding asset: $s(dollar) = s(us)$ and $s(yuan) = s(cn)$.

It is worth noting that the market size $s(i)$ appears on both sides of these equations. This is because demand for an asset increases with its liquidity, while liquidity improves with market size.

This feedback mechanism captures the network effects at the core of our model, which shape the strategic interaction between U.S. and Chinese asset issuers.

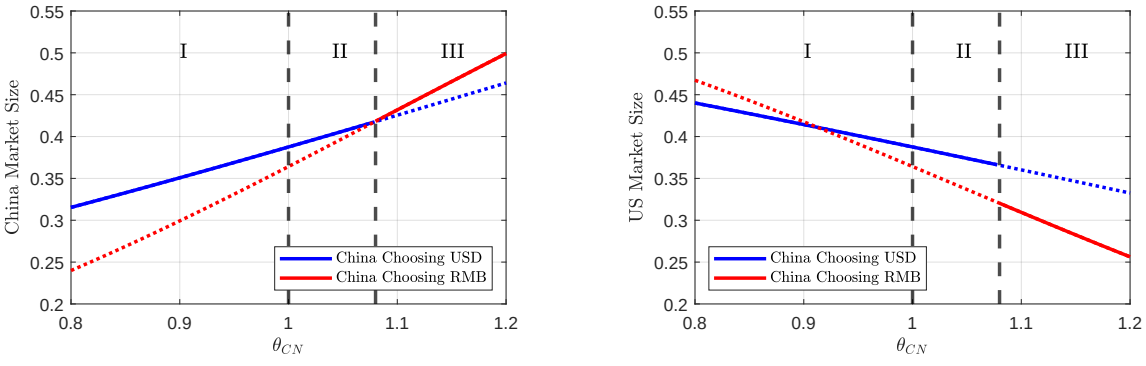
2.3 Equilibrium

The equilibrium consists of the asset shares $s(us)$ and $s(cn)$, together with China's currency denomination choice $currency_{cn} \in \{dollar, yuan\}$, such that (i) asset sizes satisfy the aggregate demand functions given China's currency choice, and (ii) China's currency choice maximizes its market share.

To illustrate the model's implications, we set the level of U.S. financial sophistication to $\theta(us) = 1$, and vary China's financial sophistication $\theta(cn)$ from 0.8 to 1.2. For each parameter configuration, the model admits a unique equilibrium. Intuitively, increases in θ(cn) can be interpreted as the gradual development of China's financial system over time.

Figure 1 reports the sizes of Chinese and U.S. assets $s(cn)$ and $s(us)$ as functions of China's financial sophistication $\theta(cn)$. The blue curve represents the case in which China chooses to issue in dollar, and the red curve represents the case in which China chooses to issue in yuan.

Panel (a) shows that under both currency regimes a higher quality of the Chinese asset $\theta(cn)$



(a) Size of Chinese Assets (b) Size of U.S. Assets

Figure 1: Equilibrium Results under Different Development Stages of China's Financial Sophistication

increases its size. However, the relative size under these two currency choices depends on the value of $\theta(cn)$. When $\theta(cn)$ is low, the blue curve lies above the red curve: for a less developed issuer, pooling its asset within the U.S. dollar system is more attractive because of the liquidity benefits associated with the dollar's larger network.

When $\theta(cn)$ is high, the ranking reverses: once China's financial sophistication becomes sufficiently high, the benefits of issuing in yuan dominates. Intuitively, if China issues in dollar terms, it supports the liquidity of the entire dollar system. When China is sufficiently large, China's participation in the dollar system benefits the U.S. asset even more than the Chinese asset. Therefore, while issuing in yuan terms lowers the liquidity of the Chinese asset, it lowers the U.S. asset even more. Since the market share depends on the relative desirability of U.S. and Chinese assets, this shift creates an incentive for China to denominate its assets in yuan.

As a result, we expect China to issue its asset in dollar when $\theta(cn)$ is low, and switch to yuan when $\theta(cn)$ is high. To visualize the dominant strategy, we use solid lines to represent equilibrium outcomes under the optimal currency choice, and use dotted lines to depict the counterfactual outcomes under the alternative strategy.

Interestingly, the desirability of the two strategies intersects at a threshold θ^* above $1 = \theta(\text{us})$. This means that China has an incentive to remain in the dollar system even when its financial sophistication is on par with the U.S. In this case, China and U.S. behave like an implicit duopoly, prioritizing taking over market shares from the outside option rather than competing against each other. By pooling their assets within the dollar system, both countries benefit from a larger and more liquid network, which enhances the desirability of their assets.

Only when China's financial sophistication $\theta(cn)$ becomes sufficiently higher than that of the U.S. $\theta(us)$ does it become optimal for China to issue in yuan. At this point, China has an incentive to exit the dollar system and promote its own RMB network because it can inflict more damage on the dollar system than on itself, thereby increasing its relative market share. As China develops, the strategic focus shifts from competing against the outside option to competing directly with the U.S. asset. While integration into the dollar system is optimal in the former case, strategic decoupling

becomes optimal in the latter.

The observation that China eventually exits the dollar area is a general result. When China is relatively small, both China and the U.S. have an incentive to pool within the same currency area, as this allows them to jointly capture market share from the outside asset. However, as China grows, this margin becomes less important. Instead, the direct competition between China and the U.S. becomes the dominant force.

We summarize this result in the following proposition.

Proposition 1. *For* $0 < \alpha, \beta < 1$ *and* $0 < \alpha + \beta < 1$,

(a) there exists a unique cutoff level of China's financial sophistication θ^* *such that China chooses to issue its asset in dollar if* $\theta(cn) < \theta^*$*, and chooses to issue in yuan if* $\theta(cn) > \theta^*$*;*

(b) the cutoff threshold θ^* *is strictly above* $\theta(us) = 1$*. China issues in yuan only after its financial sophistication surpasses that of the U.S.*

Appendix A.1 presents the proof. Through the lens of the network effect, we can see that the Kindleberger Trap mentioned in the introduction section can morph into the Thucydides Trap: whether China chooses to preserve the status quo depends on its incentive, which in turn depends on its relative level of financial sophistication. The fact that China's timing to leave the dollar system occurs after its financial sophistication surpasses that of the U.S. could reflect a *first-mover advantage*: as long as the incumbent hegemon is committed to its currency system, the challenger has to be sufficiently stronger to have an incentive to challenge the existing order.

Panel (b) reports the U.S. asset size $s(us)$ as a function of China's financial sophistication $\theta(cn)$. As China switches to the RMB system at the threshold $\theta(\text{cn}) = \theta^*$, we observe a discrete jump in the U.S. market share, even when China's financial sophistication $\theta(cn)$ increases in a continuous manner. This discontinuity reflects a potential dollar liquidity crisis, in which a major foreign participant leaves the dollar system and triggers a sudden contraction in the size and attractiveness of the dollar area.

In summary, the model delivers three regions that characterize China's optimal strategy as its financial sophistication $\theta(cn)$ increases over time.

In Region I, as China is much smaller than the U.S., the optimal strategy is to join the dollar system. In this region, not only does China benefit from a stronger dollar system, but its own growth also benefits the dollar system.

In Region II, even after China surpasses the U.S. in financial sophistication, it still finds it beneficial to remain in the dollar system. In this sense, absolute strength in China's financial system does not immediately translate into dominance, as network benefits from the dollar system continue to outweigh the gains from fragmentation.

In Region III, when China surpasses the U.S. by a large margin, it finally decides to switch to an RMB system. This switch produces a discrete jump in the dollar system, generating a sharp contraction in the size and liquidity of the dollar system.

3 Effects of Financial Sanction and Financial Repression

In this section, we introduce two types of U.S. policies that may influence China's incentive to remain within the dollar system: financial sanction and financial repression. Financial sanction refers to policies that directly target Chinese assets within the dollar system, such as freezing assets or restricting Chinese entities' access to U.S. financial markets. Such measures reduce the benefits that Chinese issuers derive from participating in the dollar system.

Financial repression, in contrast, refers to policies that require a share of (U.S. domestic) investors to hold U.S. assets, thereby increasing demand for U.S. assets and expanding the size of the dollar system. We analyze the effects of these policies on China's incentive to remain within or exit the dollar system.

3.1 Financial Sanction

We first consider the possibility that the U.S. imposes financial sanctions on China. Such sanctions reduce the benefits Chinese assets obtain from being part of the dollar system when China issues assets denominated in dollar. Formally, we scale the coefficient β by a factor $\kappa < 1$ when China is

under sanction:

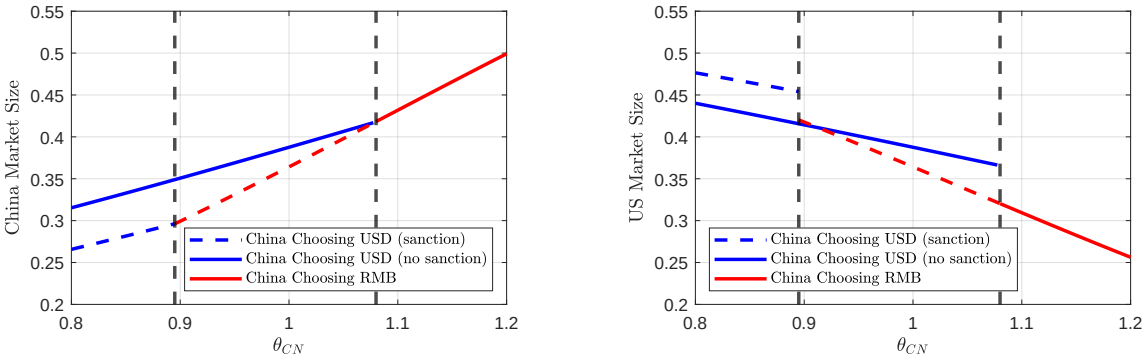
$$u_k(cn) = \alpha \log s(cn) + \kappa\beta \log s(dollar) + \theta(cn) + \epsilon_k(cn), \quad \text{when China issues in dollar.}$$

The Chinese asset still derives value from its own size $s(cn)$ and its own financial sophistication $\theta(cn)$. While the asset size is endogenous, financial sophistication is unaffected by the sanction. Moreover, sanctions do not affect the Chinese asset if it leaves the dollar system.

Figure 2 reports the equilibrium outcomes when the U.S. sanctions China. The dashed lines represent the equilibrium outcomes when China is under sanction. For comparison, the solid lines show the equilibrium outcomes when China is not under sanction, which correspond to the baseline case in Figure 1.

The sanction unambiguously reduces the size of Chinese assets when China chooses to issue its assets in dollar. As shown in Panel (a), the solid blue line is always above the dashed blue line. As a result, financial sanction discourages China from issuing assets in dollar, and hence lowers the threshold at which China switches to issuing in yuan. In this calibration with $\kappa = 3/4$, China transitions to the RMB system even before its financial sophistication surpasses that of the U.S.

Interestingly, the sanction has opposite effects on the size of the U.S. asset, depending on the



(a) Size of Chinese Assets (b) Size of U.S. Assets

Figure 2: Equilibrium under Sanction

level of China's financial sophistication $\theta(cn)$. When $\theta(cn)$ is low, China remains in the dollar system even under sanction. At this stage, the sanction always benefits the U.S. market share at the expense of China's market share. As we see in Panel (b), which reports the U.S. market size, the solid blue line is below the dashed blue line in the left region.

When $\theta(cn)$ is in the intermediate range delimited by the two vertical dashed lines, China chooses to issue in yuan when it is under sanction, but would have chosen to issue in dollar if it were not under sanction. At this point, the sanction lowers the size and hence the desirability of the entire dollar system. The world financial market becomes segmented, resulting in lower market shares for both U.S. and Chinese assets. As a result, the sanction hurts U.S. interests: as we see in Panel (b), the dashed red line (the sanction case) is below the solid blue line (the no-sanction case).

This is also a relevant region to consider the Kindleberger Trap. If the U.S. policy discourages China's participation in the dollar system, it will also weaken the entire dollar system. Even from a narrow perspective of maximizing the U.S. market share, the sanction can be counterproductive.

Finally, when $\theta(cn)$ is large, China chooses to issue in yuan regardless of whether it is under sanction. In this case, the sanction has no effect on the sizes of U.S. and Chinese assets.

This discussion reveals that financial sanction gives rise to two countervailing effects, which we can think of as the "intensive-margin" effect and the "extensive-margin" effect. The "intensive-margin" effect captures the effect of the sanction when China remains in the dollar system, whereas the "extensive-margin" effect captures the effect of the sanction on the threshold at which China exits the dollar system. The former always benefits the U.S. at the expense of China, whereas the latter can hurt the U.S. by triggering a "premature" segmentation of the world financial market. This contrast also implies that the hegemon (the U.S. in this case) has a higher incentive to impose sanction when the challenger (China) is small, because smaller countries are more "captive" to the hegemon's currency system as they would not leave the system even when sanctioned.

3.2 Financial Repression

Next, we consider a simple form of financial repression. Suppose a fraction μ of the world savers consists of U.S. institutional investors who are restricted to holding U.S. debt. The remaining fraction $1-\mu$ of savers are free to choose among available assets, who we refer to as *active investors*. This form of financial repression can be implemented through various channels, such as reserve requirements for banks, investment mandates for institutional investors, or regulatory constraints on pension funds.

Let $s^a(i)$ denote the share of asset i held by active investors, while $s(i)$ continues to denote asset i's aggregate market share, which is given by

$$s(us) = (1-\mu)s^a(us) + \mu,$$
$$s(cn) = (1-\mu)s^a(cn).$$

If China issues assets in dollar, the demand for U.S. and Chinese assets by active investors is given by

$$s^a(i) = \frac{\exp(\alpha \log s(i) + \beta \log s(dollar) + \theta(i))}{1 + \sum_{j\in\{us,cn\}} \exp(\alpha \log s(j) + \beta \log s(dollar) + \theta(j))}, \quad i \in \{us, cn\},$$

where $s(dollar) = s(us) + s(cn)$ captures the size of the dollar system.

In contrast, if China exits the dollar system and issues assets in yuan, the demand for U.S. and Chinese assets by active investors becomes

$$s^a(i) = \frac{\exp(\alpha \log s(i) + \beta \log s(i) + \theta(i))}{1 + \sum_{j\in\{us,cn\}} \exp(\alpha \log s(j) + \beta \log s(j) + \theta(j))}, \quad i \in \{us, cn\},$$

where the size of the currency area coincides with the size of the asset market: $s(dollar) = s(us)$ and $s(yuan) = s(cn)$.

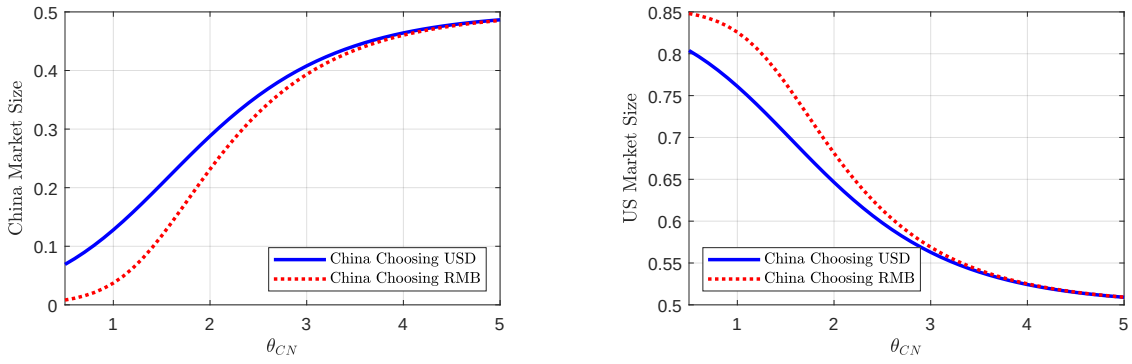
Figure 3 reports the equilibrium outcomes when the U.S. imposes financial repression on its domestic investors. We set $\mu = 1/2$, so that half of all savers are captive to the U.S. asset market.

As before, the blue curves represent the equilibrium outcomes when China issues its assets in dollar, and the red curves represent the equilibrium outcomes when China issues its assets in yuan.

The presence of captive investors implies that the U.S. Treasury market accounts for at least a share $\mu = 1/2$ of total asset holdings. This captive demand enhances the liquidity of the dollar system, which in turn attracts active investors to hold dollar-denominated assets. Consequently, for any given level of China's financial sophistication $\theta(cn)$, the overall size of the U.S. asset market is larger under financial repression.

More strikingly, China strictly prefers to issue its assets in dollar, regardless of its level of financial sophistication $\theta(cn)$. To understand this result, recall the intuition for why China switches to yuan when its financial sophistication is sufficiently high in the baseline case: in the absence of financial repression, exiting the dollar system reduces the liquidity of the Chinese asset, but it reduces the liquidity of the U.S. asset even more, which makes the Chinese asset more desirable relative to the U.S. asset.

However, when a "critical mass" of captive investors are committed to dollar assets, not only is their demand for dollar assets unaffected by China's decision to exit the dollar system, but their holdings also sustain the liquidity of the dollar system and make it attractive for active investors. In other words, financial repression creates a funding advantage for the U.S. that cannot be under-



(a) Size of Chinese Assets (b) Size of U.S. Assets

Figure 3: Equilibrium under Financial Repression

mined by the competitor's high financial sophistication. As a result, China does not gain enough relative advantage by leaving the dollar system to compensate for the loss in liquidity of its own assets, even when its financial sophistication is very high.

We can summarize this result in the following proposition.

Proposition 2. *If* $0 < \alpha, \beta < 1$ *and* $0 < \alpha + \beta < 1$*, for all* $\mu > 1/2$*, China strictly prefers to issue its assets in dollar, even when its level of financial sophistication* $\theta(cn)$ *approaches infinity.*

Appendix A.2 presents the proof. Given this general insight, the U.S. may have an incentive to impose financial repression on its domestic investors in conjunction with financial sanctions on China. By increasing the size and liquidity of the dollar system, financial repression raises the cost for China to exit that system. Under such a policy mix, financial sanctions can reduce the market share of Chinese assets within the dollar system, without inducing China to withdraw from it. As such, financial repression can amplify the effectiveness of financial sanctions.

4 International Spill-Over

In this final section, we introduce a third strategic issuer, which we refer to as Europe. We consider a three-country economy, in which the U.S. remains committed to issuing its assets in dollar, while both China and Europe can choose the currency denomination of their assets. In particular, China and Europe may issue in dollar, coordinate on a joint non-dollar bloc, or operate in separate currency areas.

Equilibrium is defined similarly as before, except that now we need to solve for the sizes of U.S., Chinese, and European assets $s(us)$, $s(cn)$, and $s(eu)$, as well as China's and Europe's choices of currency denomination $currency_{cn}$ and $currency_{eu}$ from $\{dollar, yuan, euro\}$.

4.1 The Rise of Multiple Equilibria

We fix the U.S. level of financial sophistication at $\theta(us) = 1$, and Europe's at $\theta(eu) = 0.5$, while varying China's $\theta(cn)$ from 0.8 to 1.2. Figure 4 plots the equilibrium market shares of Chinese and

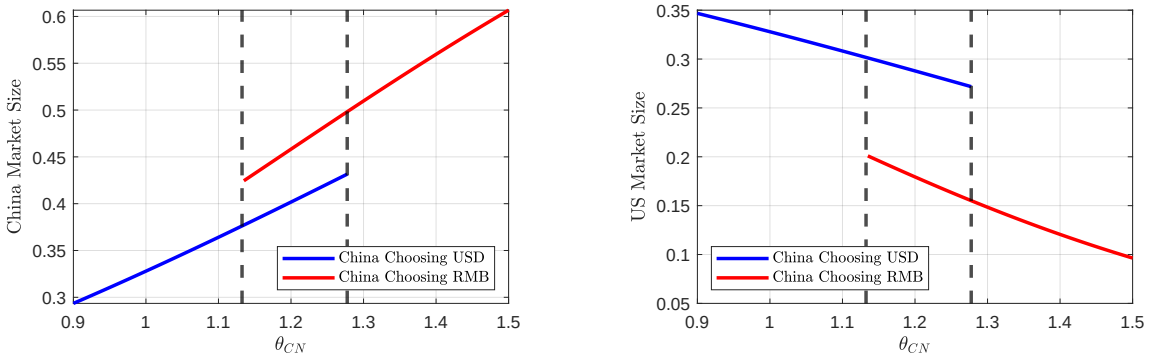
U.S. assets as functions of $\theta(cn)$.

We observe two possible equilibria in this setting. In the *dollar-dominant equilibrium*, both China and Europe choose to issue their assets in dollar, joining the dollar system. In the *yuan-dominant equilibrium*, both countries instead issue their assets in a non-dollar bloc, exiting the dollar system. For concreteness, we assume that China and Europe join the yuan bloc in the latter case.

When China has a low level of financial sophistication $\theta(cn)$, it chooses to issue its assets in dollar. In this case, Europe also finds it optimal to issue its assets in dollar, as it benefits from the liquidity of a larger dollar system.

When $\theta(\text{cn})$ is high, China switches to issuing in yuan. Europe then follows and also issues in yuan, which strictly dominates issuing in an isolated euro area. As a result, China's exit from the dollar system is amplified by Europe's simultaneous departure, leading to a larger contraction in the dollar system.

More interestingly, there exists an intermediate range of $\theta(cn)$ in which these two equilibria co-exist. In this region, the strength of the dollar system is self-reinforcing: if either China or Europe remains in the dollar system, its contribution to the liquidity of the dollar system is sufficiently large to induce the other country to stay as well. Conversely, if one country exits, the resulting



(a) Size of Chinese Assets (b) Size of U.S. Assets

Figure 4: Multiple Equilibria with Three Countries

decline in dollar liquidity prompts the other to leave, leading to a coordinated shift away from the dollar system.

The mechanism underlying this multiplicity differs from that in Farhi and Maggiori (2018), although coordination plays a central role in both settings. Farhi and Maggiori (2018) emphasize the dominant issuer's incentive to devalue ex post after placing assets with foreign investors, making time inconsistency the key friction. In contrast, our model highlights network effects across multiple foreign countries, which make each country's participation decision interdependent.

As a result, when one foreign country (e.g., China) threatens to exit the dollar system, potentially in response to pressure from the hegemon, it can trigger a bandwagon effect that induces other countries (e.g., Europe) to follow. Conversely, a commitment by China to remain in the dollar system encourages others to stay. This positive externality represents another manifestation of the Kindleberger Trap in our framework.

We can summarize these results more generally in the following proposition.

Proposition 3. *For $0 < \alpha, \beta < 1$ and $0 < \alpha + \beta < 1$, there exists unique cutoff levels of China's financial sophistication θ^d and θ^y, such that*

(i) for $\theta(cn) < \theta^y$, the dollar-dominant equilibrium is the unique equilibrium;

(ii) for $\theta^y < \theta(cn) < \theta^d$, the dollar-dominant equilibrium and the yuan-dominant equilibrium co-exist;

(iii) for $\theta(cn) > \theta^d$, the yuan-dominant equilibrium is the unique equilibrium.

4.2 Spill-Over Effects of Sanction on China

The bandwagon effect described above gives rise to additional unintended consequences when the U.S. imposes financial sanction on a foreign country. First, consider the case in which the U.S. sanctions China, reducing the desirability that Chinese assets derive from participation in the dollar system by a factor $\kappa < 1$. Such a sanction not only affects China directly but also weakens the dollar system as a whole, thereby increasing Europe's incentive to leave the dollar system.

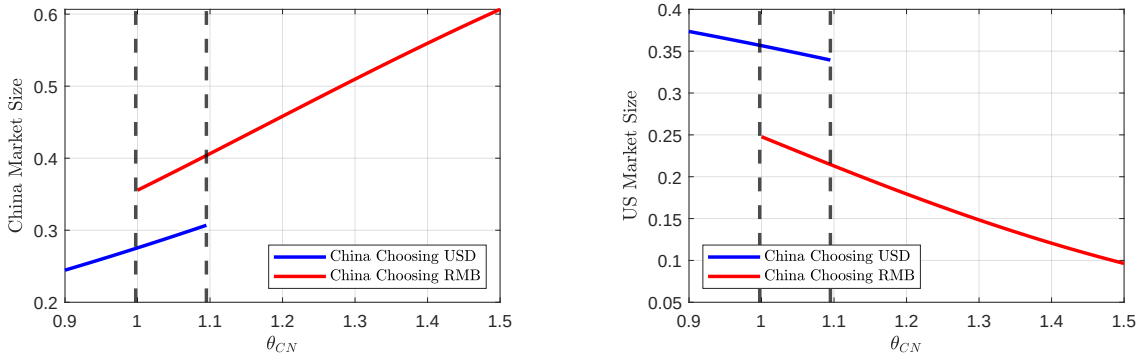
Figure 5 reports the equilibrium outcomes when the U.S. sanctions China. The calibration

is identical to that in Figure 4, except that China loses a fraction $1 - \kappa = 1/4$ of the benefits associated with the size of the dollar area. As a result, both the dollar-dominance threshold and the yuan-dominance threshold, represented by the two dashed lines in the figure, shift to the left.

On the one hand, the sanction make dollar issuance less attractive for China, inducing it to switch to yuan at a lower level of financial sophistication $\theta(\text{cn})$. On the other hand, by weakening the dollar system as a whole, the sanction makes the dollar-dominant equilibrium more fragile, causing it to break down at a lower level of $\theta(\text{cn})$.

While these effects are already present in the two-country model, they generate additional spill-over effects in the presence of a third country. In particular, when China exits the dollar system, it also encourages Europe to follow, further reducing the size and liquidity of the dollar system. Consequently, although multiple equilibria still arise over an intermediate range of $\theta(\text{cn})$, the yuan-dominant equilibrium emerges earlier, and the dollar-dominant equilibrium disappears sooner.

Therefore, when the strength of the dollar system is derived from not only U.S. but also other countries' participation, these international spill-over effects become important. They limit the effectiveness of unilateral sanctions, as such policies can weaken the dollar system itself and impose costs on the U.S.



(a) Size of Chinese Assets (b) Size of U.S. Assets

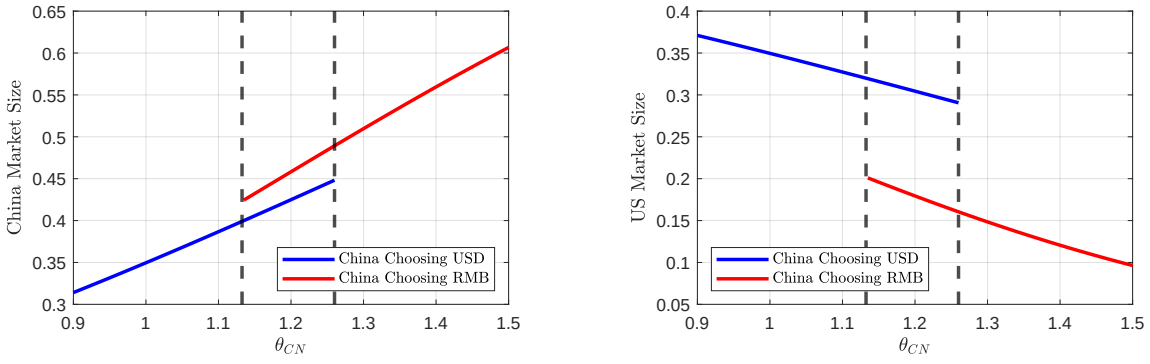
Figure 5: Multiple Equilibria with Three Countries, with Sanction on China

4.3 Spill-Over Effects of Sanction on the Third Country

The U.S. sanction on the third country (Europe) also generates important spill-over effects. Under this sanction, if Europe issues its asset in dollar, its asset loses $1-\kappa$ of the desirability it normally derives from participation in the dollar system:

$$u_k(eu) = \alpha \log s(eu) + \kappa\beta \log s(dollar) + \theta(eu) + \epsilon_k(eu), \quad \text{when Europe issues in dollar.}$$

Figure 6 presents the equilibrium outcomes. Compared to the baseline case without sanction in Figure 4, the threshold above which the dollar-dominant equilibrium ceases to exist shifts leftward, whereas the threshold above which the yuan-dominant equilibrium emerges remains unchanged. The difference lies in China's level of financial development. First, consider the threshold on the right, above which the dollar-dominant equilibrium ceases to exist: this is when China has a sufficiently high level of financial sophistication $\theta(cn)$ to sustain the yuan-dominant equilibrium condition on Europe's participation. When Europe is under sanction and thus derives less value from remaining in the dollar system, it has a stronger incentive to exit the dollar bloc. This, in turn, encourages China to leave the dollar bloc earlier, causing the dollar-dominant equilibrium to break down.



(a) Size of Chinese Assets (b) Size of U.S. Assets

Figure 6: Multiple Equilibria with Three Countries, with Sanction on Europe

Next, consider the threshold on the left, above which the yuan-dominant equilibrium emerges. It remains unchanged because, at this stage, China is relatively small and Europe is even smaller. Even if Europe is willing to coordinate on a yuan bloc, the combined size of China and Europe is still insufficient to make the yuan bloc more attractive to China than the dollar bloc that contains both the U.S. and China. As a result, China continues to prefer remaining in the dollar system, regardless of Europe's action.

Although we refer to the third country as Europe, this mechanism also helps interpret the impact of U.S. sanctions on Russia. Following the removal of Russian banks from SWIFT, which restricted their ability to conduct cross-border payments, Russia increasingly relied on China's financial infrastructure, including the Cross-Border Interbank Payment System (CIPS), to facilitate international transactions. Russia also shifted toward invoicing key exports such as oil in yuan rather than dollar. Our theoretical exercise suggests that such sanctions on Russia can make the broader dollar system more fragile, highlighting the spillover effects of sanctions on the international currency system.

5 Conclusion

In this paper, we study the competition between an incumbent hegemon (the U.S.) and a challenger (China) in the provision of reserve assets through the lens of a model featuring network effects in global financial markets. The strategic interaction between the two competing powers gives rise to rich and evolving dynamics.

From this perspective, the challenger neither inherently opposes nor fully aligns with the incumbent, but rather navigates a complex landscape of strategic trade-offs. Rather than viewing the relationship between the two powers as being permanently trapped in a zero-sum game, it may be more fruitful to consider how their incentives vary across stages of development and evolve over time.

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Appendix

A Proof

A.1 Proof of Proposition 1

Proof. **Equilibrium shares under dollar issuance.**

Suppose China issues assets in dollars. Let $s_{us,dollar}$ and $s_{cn,dollar}$ denote the equilibrium market shares of U.S. and Chinese assets. The fixed-point system is, for $i \in \{us, cn\}$,

$$s_{i,dollar} = \frac{\exp\Big(\alpha \log s_{i,dollar} + \beta \log(s_{us,dollar} + s_{cn,dollar}) + \theta_i\Big)}{1 + \sum_{j\in\{us,cn\}} \exp\Big(\alpha \log s_{j,dollar} + \beta \log(s_{us,dollar} + s_{cn,dollar}) + \theta_j\Big)}.$$

Dividing the equation for $s_{cn,dollar}$ by that for $s_{us,dollar}$ gives

$$\frac{s_{cn,dollar}}{s_{us,dollar}} = e^{\frac{\theta-1}{1-\alpha}}.$$

Let $S_{dollar} = s_{us,dollar} + s_{cn,dollar} < 1$. Then, we have

$$S_{dollar} = s_{cn,dollar}(1 + e^{\frac{1-\theta}{1-\alpha}}).$$

Substituting into the equation system yields

$$\begin{aligned} s_{cn,dollar} &= \frac{s_{cn,dollar}^{\alpha} S_{dollar}^{\beta} \exp(\theta)}{1 + s_{us,dollar}^{\alpha} S_{dollar}^{\beta} \exp(1) + s_{cn,dollar}^{\alpha} S_{dollar}^{\beta} \exp(\theta)} \\ &= s_{cn,dollar}^{\alpha} S_{dollar}^{\beta} \exp(\theta)(1 - S_{dollar}). \end{aligned}$$

We obtain an implicit equation determining $s_{cn,dollar}$:

$$1 = s_{cn,dollar}^{\alpha+\beta-1} \left(1 + e^{\frac{1-\theta}{1-\alpha}}\right)^{\beta} e^{\theta} \Big(1 - (1 + e^{\frac{1-\theta}{1-\alpha}}) s_{cn,dollar}\Big). \tag{D}$$

Standard properties of the logit system imply that, for each θ, equation (D) admits a unique solution, which we denote by $s_{cn,dollar}(\theta)$.

Equilibrium shares under yuan issuance.

If China issues assets in yuan, let $s_{us,yuan}$ and $s_{cn,yuan}$ denote the equilibrium shares of U.S. and Chinese assets. The equilibrium shares are characterized by:

$$s_{i,yuan} = \frac{\exp\big(\alpha \log s_{i,yuan} + \beta \log s_{i,yuan} + \theta_i\big)}{1 + \sum_{j\in\{us,cn\}} \exp\big(\alpha \log s_{j,yuan} + \beta \log s_{j,yuan} + \theta_j\big)}, \qquad i \in \{us, cn\}.$$

The equilibrium ratio becomes

$$\frac{s_{cn,yuan}}{s_{us,yuan}} = e^{\frac{\theta-1}{1-\alpha-\beta}}.$$

Let $S_{yuan} = s_{us,yuan} + s_{cn,yuan} < 1$. A similar derivation yields

$$1 = s_{cn,yuan}^{\alpha+\beta-1} e^{\theta} \Big(1 - (1 + e^{\frac{1-\theta}{1-\alpha-\beta}}) s_{cn,yuan}\Big). \tag{Y}$$

For each θ, this equation has a unique solution, denoted as $s_{cn,yuan}(\theta)$.

Step 1: Yuan is dominated when $\theta \leq 1$.

For convenience, define the right-hand sides of equations (D) and (Y):

$$F_{dollar}(s,\theta) = s^{\alpha+\beta-1}A(\theta)^{\beta}e^{\theta}\Big(1 - A(\theta)s\Big),$$
$$F_{yuan}(s,\theta) = s^{\alpha+\beta-1}e^{\theta}\Big(1 - B(\theta)s\Big),$$

where $A(\theta) \equiv 1 + e^{\frac{1-\theta}{1-\alpha}}$ and $B(\theta) \equiv 1 + e^{\frac{1-\theta}{1-\alpha-\beta}}$. Both F_{dollar} and F_{yuan} are decreasing in s:

$$\frac{\partial F_{dollar}}{\partial s}(s,\theta) = A(\theta)^{\beta}e^{\theta}s^{\alpha+\beta-2}\left[(\alpha+\beta-1) - (\alpha+\beta)A(\theta)s\right] < 0$$
$$\frac{\partial F_{yuan}}{\partial s}(s,\theta) = e^{\theta}s^{\alpha+\beta-2}\left[(\alpha+\beta-1) - (\alpha+\beta)B(\theta)s\right] < 0$$

Moreover, $S_{dollar} < 1$ and $S_{yuan} < 1$ imply that $1 - A(\theta)s_{cn,dollar}(\theta) > 0$ and $1 - B(\theta)s_{cn,yuan}(\theta) > 0$.

When $\theta \leq 1$, $B(\theta) \geq A(\theta)$ and $A(\theta)^{\beta} > 1$. Moreover, for $\theta \leq 1$ and $s > 0$, $1 - B(\theta)s > 0$ implies $1 - A(\theta)s > 0$. Hence, for every $s > 0$ satisfying $1 - B(\theta)s > 0$, we have

$$\frac{F_{dollar}(s,\theta)}{F_{yuan}(s,\theta)} = A(\theta)^{\beta}\frac{1 - A(\theta)s}{1 - B(\theta)s} > 1 \quad \Rightarrow \quad F_{dollar}(s,\theta) > F_{yuan}(s,\theta).$$

Evaluating this inequality at $s = s_{cn,yuan}(\theta)$ yields

$$F_{dollar}(s_{cn,yuan}(\theta),\theta) > F_{yuan}(s_{cn,yuan}(\theta),\theta) = 1.$$

In comparison, $F_{dollar}(s_{cn,dollar}(\theta),\theta) = 1$, so $F_{dollar}(s_{cn,dollar}(\theta),\theta) < F_{dollar}(s_{cn,yuan}(\theta),\theta)$. Since F_{dollar} is decreasing in s, it follows that

$$s_{cn,yuan}(\theta) < s_{cn,dollar}(\theta) \qquad \text{for all } \theta \leq 1.$$

Step 2: Yuan dominates dollar for sufficiently large θ.

Similar to Step 1, our strategy is to show

$$F_{dollar}(s,\theta) < F_{yuan}(s,\theta)$$

for $\theta \to \infty$ and $s = s_{cn,yuan}(\theta)$.

Note that $A(\theta) \to 1$ and $B(\theta) \to 1$ as $\theta \to \infty$. Fix θ and consider the difference

$$F_{yuan}(s,\theta) - F_{dollar}(s,\theta) = s^{\alpha+\beta-1}e^{\theta}\Big[(1 - B(\theta)s) - A(\theta)^{\beta}(1 - A(\theta)s)\Big].$$

Let $\varepsilon(\theta) := A(\theta) - 1 = e^{\frac{1-\theta}{1-\alpha}} > 0$, so that $\varepsilon(\theta) \to 0$ as $\theta \to \infty$. Taylor expansions around $\varepsilon(\theta) = 0$ give

$$A(\theta)^{\beta} = (1 + \varepsilon(\theta))^{\beta} = 1 + \beta\varepsilon(\theta) + o(\varepsilon(\theta)), \qquad A(\theta)^{\beta+1} = 1 + (\beta+1)\varepsilon(\theta) + o(\varepsilon(\theta)).$$

Moreover, since

$$\frac{B(\theta)-1}{A(\theta)-1} = \exp\left((1-\theta)\left(\frac{1}{1-\alpha-\beta} - \frac{1}{1-\alpha}\right)\right) \longrightarrow 0,$$

we have

$$B(\theta) - 1 = o(\varepsilon(\theta)).$$

Hence

$$1 - A(\theta)^{\beta} = -\beta\varepsilon(\theta) + o(\varepsilon(\theta)), \qquad A(\theta)^{\beta+1} - B(\theta) = (\beta+1)\varepsilon(\theta) + o(\varepsilon(\theta)).$$

Substituting into $F_{yuan}(s,\theta) - F_{dollar}(s,\theta)$ gives

$$F_{yuan}(s,\theta) - F_{dollar}(s,\theta) = s^{\alpha+\beta-1}e^{\theta}\left[\varepsilon(\theta)\big[s(\beta+1)-\beta\big] + o(\varepsilon(\theta))\right]$$

For sufficiently large θ, the share of Chinese assets $s_{cn,dollar}(\theta) \to 1$. So, we can find a sufficiently large θ such that $s_{cn,dollar}(\theta) > \frac{\beta}{\beta+1}$, and therefore

$$F_{yuan}(s_{cn,dollar}(\theta),\theta) - F_{dollar}(s_{cn,dollar}(\theta),\theta) > 0.$$

Since $F_{dollar}(s_{cn,dollar}(\theta),\theta) = 1$, we obtain

$$F_{yuan}(s_{cn,dollar}(\theta),\theta) > 1 = F_{yuan}(s_{cn,yuan}(\theta),\theta).$$

Because $F_{yuan}(s,\theta)$ is decreasing in s, it follows that

$$s_{cn,yuan}(\theta) > s_{cn,dollar}(\theta) \quad \text{for all sufficiently large } \theta.$$

Step 3: Uniqueness of the cutoff.
Implicit differentiation of equations (D) and (Y) yields

$$\frac{ds_{cn,dollar}}{d\theta} = \frac{(\alpha+\beta+\alpha e^{\frac{1-\theta}{1-\alpha}})s_{cn,dollar}}{(\alpha+\beta)(1-\alpha)\left(1+e^{\frac{1-\theta}{1-\alpha}}\right)}, \qquad \frac{ds_{cn,yuan}}{d\theta} = \frac{s_{cn,yuan}}{1-\alpha-\beta}.$$

Both derivatives are strictly positive. By continuity, there is at least one crossing point θ^* such that $s_{cn,yuan}(\theta^*) = s_{cn,dollar}(\theta^*)$. At any crossing point θ, we can verify that

$$\frac{ds_{cn,yuan}}{d\theta} > \frac{ds_{cn,dollar}}{d\theta}.$$

Define $\Delta(\theta) = s_{cn,yuan}(\theta) - s_{cn,dollar}(\theta)$. Step 1 implies $\Delta(\theta) < 0$ for $\theta \leq 1$, while Step 2 implies $\Delta(\theta) > 0$ for sufficiently large θ. Since $\Delta'(\theta) > 0$ at any crossing, the crossing point θ^* is unique. China issues assets in yuan if and only if $\theta > \theta^*$.

□

A.2 Proof of Proposition 2

Proof. For any $\mu > 1/2$, we can define $\delta = \mu - 1/2 > 0$. Recall that if China issues assets in dollar, the demand for U.S. and Chinese assets by active investors is given by

$$s^a_{i,dollar} = \frac{\exp(\alpha \log s_{i,dollar} + \beta \log(s_{us,dollar} + s_{cn,dollar}) + \theta_i)}{1 + \sum_{j\in\{us,cn\}} \exp(\alpha \log s_{j,dollar} + \beta \log(s_{us,dollar} + s_{cn,dollar}) + \theta_j)}, \quad i \in \{us, cn\};$$

if China issues assets in yuan, the demand for U.S. and Chinese assets by active investors is given by

$$s^a_{i,yuan} = \frac{\exp(\alpha \log s_{i,yuan} + \beta \log s_{i,yuan} + \theta_i)}{1 + \sum_{j\in\{us,cn\}} \exp(\alpha \log s_{j,yuan} + \beta \log s_{j,yuan} + \theta_j)}, \quad i \in \{us, cn\}.$$

Step 1. Compare the Chinese Asset against the U.S. Asset. If China issues assets in dollar, the relative desirability is

$$\frac{s^a_{cn,dollar}}{s^a_{us,dollar}} = \exp(-\alpha(\log s_{us,dollar} - \log s_{cn,dollar}) + \theta - 1).$$

If China issues assets in yuan, the relative desirability is

$$\frac{s^a_{cn,yuan}}{s^a_{us,yuan}} = \exp(-(\alpha+\beta)(\log s_{us,yuan} - \log s_{cn,yuan}) + \theta - 1).$$

For large enough θ, we have

$$\begin{aligned} 1/2 - \delta - \epsilon < s_{cn,yuan} < 1/2 - \delta, \quad 1/2 + \delta < s_{us,yuan} < 1/2 + \delta + \epsilon, \\ 1/2 - \delta - \epsilon < s_{cn,dollar} < 1/2 - \delta, \quad 1/2 + \delta < s_{us,dollar} < 1/2 + \delta + \epsilon \end{aligned}$$

for arbitrarily small $\epsilon > 0$.

Then,

$$\begin{aligned} \log s_{us,yuan} - \log s_{cn,yuan} > \log(1/2 + \delta) - \log(1/2 - \delta), \\ \log s_{us,dollar} - \log s_{cn,dollar} < \log(1/2 + \delta + \epsilon) - \log(1/2 - \delta - \epsilon). \end{aligned}$$

Given $\alpha, \beta > 0$, for small enough $\epsilon > 0$, we have

$$(\alpha+\beta)(\log s_{us,yuan} - \log s_{cn,yuan}) > \alpha(\log s_{us,dollar} - \log s_{cn,dollar}).$$

This step shows that China always has a greater market share between Chinese and U.S. assets when it issues in dollar than when it issues in yuan:

$$\frac{s^a_{cn,dollar}}{s^a_{us,dollar}} > \frac{s^a_{cn,yuan}}{s^a_{us,yuan}}.$$

Step 2. Compare U.S. and Chinese Assets against the Outside Option. If China issues assets in dollar, the relative desirability is

$$\frac{s^a_{cn,dollar} + s^a_{us,dollar}}{s^a_{outside,dollar}} = \exp(\alpha \log s_{cn,dollar} + \beta \log(s_{us,dollar} + s_{cn,dollar}) + \theta) + \exp(\alpha \log s_{us,dollar} + \beta \log(s_{us,dollar} + s_{cn,dollar}) + 1)$$

If China issues assets in yuan, the relative desirability is

$$\frac{s^a_{cn,yuan} + s^a_{us,yuan}}{s^a_{outside,yuan}} = \exp(\alpha \log s_{cn,yuan} + \beta \log s_{cn,yuan} + \theta) + \exp(\alpha \log s_{us,yuan} + \beta \log s_{us,yuan} + 1)$$

Again, for large enough θ,

$$\frac{s^a_{cn,dollar} + s^a_{us,dollar}}{s^a_{outside,dollar}} > \exp(\alpha \log(1/2 - \delta - \epsilon) + \beta \log(1 - \epsilon) + \theta) + \exp(\alpha \log(1/2 + \delta) + \beta \log(1 - \epsilon) + 1)$$

and

$$\frac{s^a_{cn,yuan} + s^a_{us,yuan}}{s^a_{outside,yuan}} < \exp(\alpha \log(1/2 - \delta) + \beta \log(1/2 - \delta) + \theta) + \exp(\alpha \log(1/2 + \delta + \epsilon) + \beta \log(1/2 + \delta + \epsilon) + 1)$$

Given $0 < \delta < 1/2$ and $\alpha, \beta > 0$, for small enough $\epsilon > 0$, we have $(1 - \epsilon) - (1/2 - \delta) > 1/2$ and $(1 - \epsilon) - (1/2 + \delta + \epsilon) > (1/2 - \delta)/2$, and we can ensure that these terms dominate the difference made by ϵ, so that

$$\exp(\alpha \log(1/2 - \delta - \epsilon) + \beta \log(1 - \epsilon) + \theta) > \exp(\alpha \log(1/2 - \delta) + \beta \log(1/2 - \delta) + \theta),$$
$$\exp(\alpha \log(1/2 + \delta) + \beta \log(1 - \epsilon) + 1) > \exp(\alpha \log(1/2 + \delta + \epsilon) + \beta \log(1/2 + \delta + \epsilon) + 1),$$

which implies that

$$\frac{s^a_{cn,dollar} + s^a_{us,dollar}}{s^a_{outside,dollar}} > \frac{s^a_{cn,yuan} + s^a_{us,yuan}}{s^a_{outside,yuan}}.$$

Thus, even in the limit $\theta \to \infty$, China gains a strictly higher market share by issuing in dollar than by issuing in yuan.

□