

1. Introduction

- ❖ The 2008-9 global financial crisis has aroused serious concerns on inherent vulnerability of the current international monetary system.
- ❖ Many monetary economists urged China, the largest goods trading nation, to internationalize its currency, renminbi (RMB). (Zhou, 2009; Dorrucchi and McKay, 2011)
- ❖ In response, the People's Bank of China (PBoC, central bank), began to strategically internationalize RMB in 2009. (Figure 1)
- ❖ However, as China is still a developing country with draconian foreign exchange and financial controls, the RMB internationalization would indubitably elicit new uncertainties in the international economy. (Kroeber, 2013)
- ❖ For example, the internationalization of RMB would pose great challenges in assessing the trade frictions between China and other economies, especially the United States and the European Union.
- Jin et al. (2018) developed a two-country, two goods model to investigate the key implications of the Chinese style currency internationalization on the international price system.
- The purpose of this research is to extend Jin et al. (2018)'s model to investigate the implications of international currency liquidity premium and tariffs on local currency internationalization.

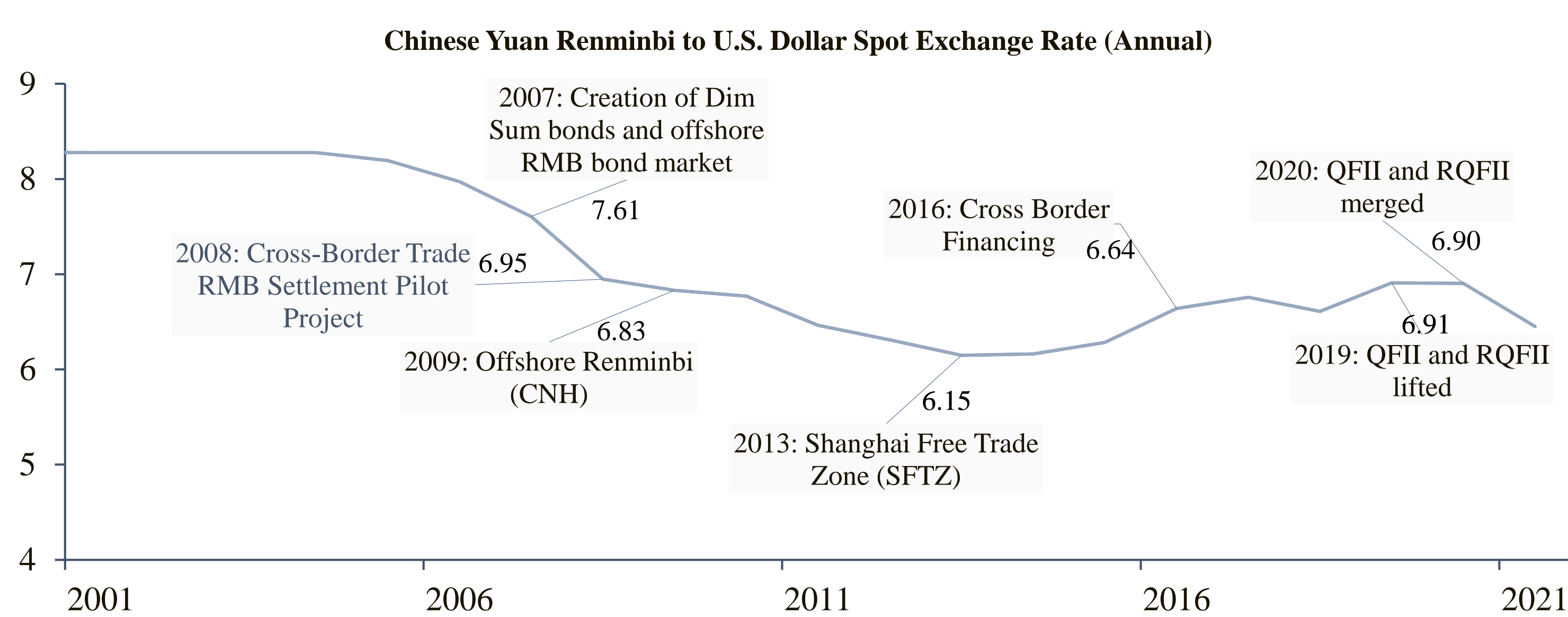


Figure 1. Big Events of RMB Internationalization
Source: FRED

3. Implications

3.1 Currency Internationalization Condition

- Define the real exchange rate as $\varepsilon = e\bar{P}_u/\bar{P}_c$. Then we can derive the following RMB-USD coexistence condition:

$$\frac{1-\theta}{1+\tau_c} < \varepsilon < 1 + \tau_u$$

- ❖ Violations to either boundary condition would yield a zero or negative goods price in international price system and hence cannot be practically sustainable.
- ❖ Under free trade, $\tau_i = 0$ and $1 - \theta < \varepsilon < 1$. RMB on one side must be overvalued ($\varepsilon < 1$) against its balanced level while on the other side it cannot be overvalued too much: the overvaluation rate must be smaller than θ .
- ❖ The condition will be loosened by $\tau_c, \tau_u > 0$, i.e., to some extent, trade frictions would sustain international economic stability during currency internationalization.

3.2 Price Ratio of Chinese and US Goods

- Normalizing $\bar{P}_i = 1$, we have:

$$\frac{P_{h,c}}{P_{h,u}} = \left[\frac{\left(\frac{\varepsilon(1+\tau_c)}{1-\theta} \right)^{1-\theta} - 1}{\left(\frac{1+\tau_u}{\varepsilon} \right)^{1-\theta} - 1} \right]^{\frac{1}{1-\theta}}$$

- ❖ The price ratio decreases to zero for complements while increases to infinity for substitutes during RMB internationalization. As the liquidity of dollars diminishes, the exchange rate ε and the tariffs τ_c and τ_u must be adjusted accordingly to avoid the collapse of international price system.

3.3 International Price Stability

- Suppose the real exchange rate misalignment is proportional to the dollar liquidity premium: $\varepsilon = 1 - \lambda\theta$, where $0 < \lambda < 1$ is a given parameter. Then it follows that

$$\lim_{\theta \rightarrow 0} \frac{P_{h,c}}{P_{h,u}} = \left[\frac{(1+\tau_u)^\theta}{\lambda} - \frac{1}{(1+\tau_c)^\theta} \right]^{\frac{1}{1-\theta}}$$

- ❖ Even if the real exchange rate converges to its balanced level, the price ratio of Chinese and US goods would still be indefinite. The sensitive response of the price ratio to the adjustment trajectory implies that the equilibrium international prices/incomes may not necessarily converged during currency internationalization.

2. The Model

2.1 Aggregate Consumption

- The aggregate consumption in country $i = c$ (China), u (US), is defined as:

$$C_i = \left[0.5^{1/\theta} C_{i,h}^{1-1/\theta} + 0.5^{1/\theta} C_{i,f}^{1-1/\theta} \right]^{\frac{1}{1-1/\theta}}$$

- where $C_{i,h}, C_{i,f}$ are total consumptions on the home (exportable) and foreign (importable) goods, respectively;
- θ is the elasticity of substitution between two goods: $\theta > 1$ implies the two goods are gross substitutes, while $0 < \theta < 1$ implies the two goods are gross complements.

2.2 Aggregate Prices

- Accordingly, the aggregate consumer price in country i , is:

$$\bar{P}_i = \left[0.5(P_{i,h})^{1-\theta} + 0.5(P_{i,f})^{1-\theta} \right]^{\frac{1}{1-\theta}}$$

- where $(P_{i,h})$ and $(P_{i,f})$ are prices of home and foreign goods; \bar{P}_i is the targeted price/ inflation level.
- In particular, the aggregate consumer prices are assumed constants, as inflation-targeting has become a primary tool for monetary controls in most major economies.

2.3 International Price System

- ❖ In international markets, dollar-holders can directly use dollars to purchase Chinese goods from exporting agencies or designated free trade zones in China.
- ❖ However, the Chinese consumers must first convert RMB to dollars To purchase US exportable goods.
- Using $0 < \theta < 1$ to represent the liquidity premium of dollar over RMB in the international trade and finance, the international price system can be developed as:

$$P_{c,f} = e(1 + \tau_c)P_{u,h}/(1 - \theta)$$

$$P_{c,f} = (1 + \tau_u)P_{u,h}/e$$

- where e is the RMB price of dollar; τ_i is the tariff rates.

4. Remarks

- ✓ In this paper, we particularly introduce the concept of liquidity premium to proxy the level of currency internationalization. This measure differs from the sovereign risk premium widely used in the foreign exchange market. A most recent example can be Putin's new policy to prop up the value of the Russian currency by demanding that "unfriendly countries" must use rubles to purchase the Russian oils and gases on March 23, 2022.



Figure 2. USD/RUB for Year 2022

- ✓ In the model, both countries adopt inflation-targeting monetary policies, which might incur trade frictions or even trade wars to sustain international economic stability. Another possible scenario is that the two countries' home goods' prices/incomes diverge, even if the real exchange rate converge to its balanced level. To some extent, a country may encounter painful trade-off between sustaining inflation-targeting policy and stimulating economic growth.

- Disclaimer: The opinions expressed in this research are solely those of the authors.

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