ORCA – Online Research @ Cardiff

This is an Open Access document downloaded from ORCA, Cardiff University's institutional repository:https://orca.cardiff.ac.uk/id/eprint/144354/

This is the author's version of a work that was submitted to / accepted for publication.

Citation for final published version:

Guo, Dong and Zhou, Peng 2021. The rise of a new anchor currency in RCEP? A tale of three currencies. Economic Modelling 104 , 105647. 10.1016/j.econmod.2021.105647

Publishers page: http://dx.doi.org/10.1016/j.econmod.2021.105647

Please note:
Changes made as a result of publishing processes such as copy-editing, formatting and page numbers may not be reflected in this version. For the definitive version of this publication, please refer to the published source. You are advised to consult the publisher's version if you wish to cite this paper.

This version is being made available in accordance with publisher policies. See http://orca.cf.ac.uk/policies.html for usage policies. Copyright and moral rights for publications made available in ORCA are retained by the copyright holders.

The Rise of a New Anchor Currency in RCEP? A Tale of Three Currencies

Dong GUO[1], Peng ZHOU[2]

Abstract: We propose a flow-based criterion (intensity of use) and a stock-based criterion (stability of value) for choosing an anchor currency. This conceptual framework is applied to analyzing the RCEP region. According to the estimated TVP-VAR model, the influence of the US dollar in the region was weakened during the global financial crisis and the COVID pandemic, creating an opportunity for both Chinese Yuan and Japanese Yen to compete for the anchor currency. In terms of the intensity criterion, China accounts for the largest share in the regional share, but Yen seems to have an upper hand in the stability criterion. The sophisticated cooperative-competitive relationship between China and Japan may prolong the birth of a new anchor currency. Before then, US dollar still holds the role and the RCEP regional trade is subject to excessive volatility.

Highlights:

- Using USD as the anchor currency in RCEP can create excessive volatility.
- The role of USD in the region was weakened after the global financial crisis.
- CNY and JPY are two major candidates for the anchor currency in RCEP.
- CNY is in a stronger position in terms of intensity criterion over JPY.
- JPY is in a stronger position in terms of stability criterion over CNY.

JEL Classifications: F13; F33; F45.

Keywords: RCEP; TVP-VAR; Anchor Currency; Internationalization

[1] No.18 Fuxingmenwai Street, Xicheng District, Beijing, China. Email: antoineguo@qq.com
[2] Corresponding author. D47 Aberconway Building, Column Drive, Cardiff, UK, CF10 3EU. Tel: +44 (0)2920688778. Email: zhoup1@cardiff.ac.uk

1 Introduction

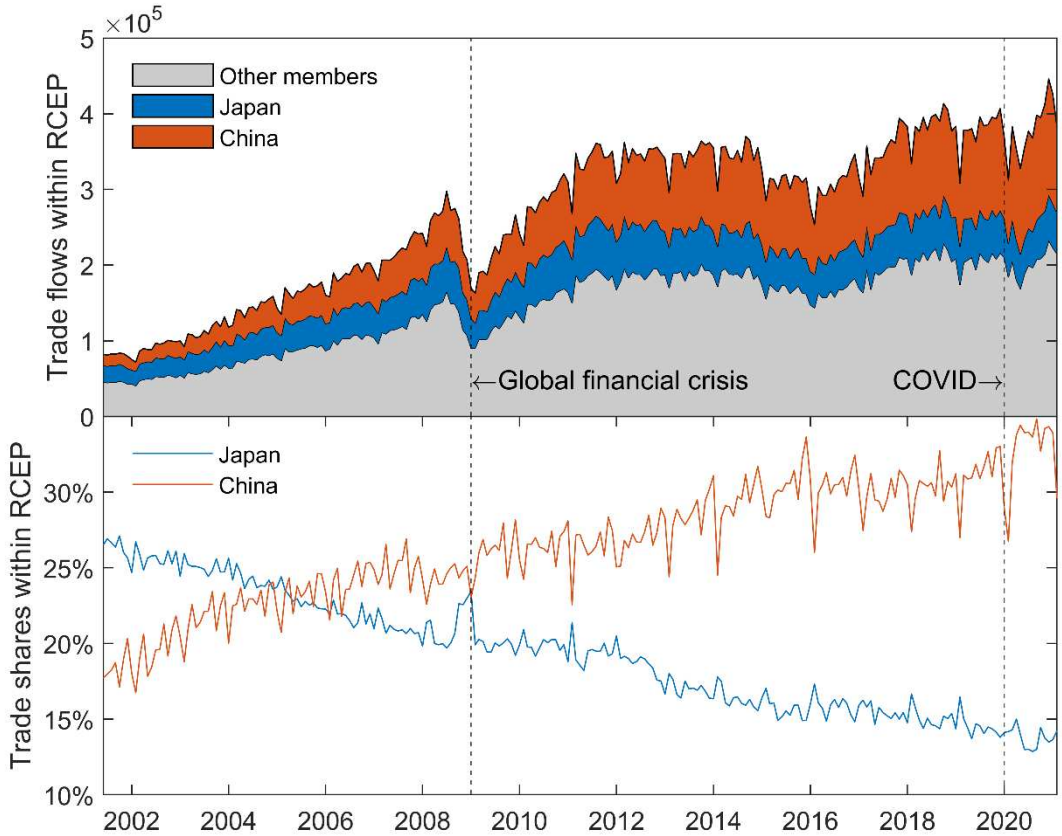
Fifteen Asian countries signed the Regional Comprehensive Economic Partnership (RCEP) in November 2020. The trade deal, promoted by ASEAN for years, will create the most populous economic region in the world accounting for about 30 percent of global GDP. Tariff reductions and financial facilities among the members are estimated to boost the regional trade by $428 billion (Petri & Plummer, 2020). It sends a major signal of multilateral trade integration in contrast to the burgeoning Protectionism in other parts of the world since 2016 (e.g., US-China trade war, Brexit). In fact, RCEP was pushed forward by the sudden withdrawal of the US from a competing trade deal Trans-Pacific Partnership which does not include China (Balistreri & Tarr, 2020).

In global and regional development, economic integration is always accompanied by financial integration (Fry-McKibbin et al., 2018). The US dollar (USD) has been the *de facto* anchor currency (i.e., which currency to peg) for most countries engaging in international trade and investment since the Bretton Wood System. USD is extensively adopted as the medium of exchange and/or as the unit of account for the traded goods and services even if the US is not part of the trade. Nevertheless, the wide use of dollars inevitably leads to excessive volatilities in in regional trade volume because USD is susceptible to uncertainties outside the region such as monetary policies in the US (Rey, 2016). As a result, there has been a tendency for regional trade to choose alternative anchor currencies other than dollars (Zhang, 2014). An interesting anecdote of this trend is the currencies adopted in drug trafficking. According to the World Drug Report (United Nations, 2020, Booklet 3), currencies used by drug cartels exhibit a clear regional feature. In the two largest opium production zones, USD dominates the drug trade in Central America (Mexico and Colombia), while euro (EUR) is widely circulated in the Golden Crescent (Iran, Afghanistan, and Pakistan). Ironically but arguably, drug dealers must know the optimal currencies to minimize financial risks in the riskiest international business. More generally, USD is constantly challenged by currencies that are more intensively used in regional trade such as Japanese Yen (JPY) during 1980s (Malliaris, 2002) and EUR during 2000s (Fischer, 2016). Since the global financial crisis, many countries have openly questioned the viability of the dollar-based monetary and financial system in regional trade (Chiţu et al., 2014). For example, an increasing proportion of oil trade is made using other currencies like EUR. Australia signed an agreement to accept CNY in iron ore trade since 2017. CNY-denominated crude oil futures market was launched in 2018 (Ji & Zhang, 2019). Korea and China renewed the $59 billion currency swap in 2020.

The fast economic growth of China and its expanding weight in the regional trade provide a potential for CNY to establish a new currency bloc after the “dollar bloc” and the “euro bloc” (Fischer, 2016). Transaction-level evidence shows that CNY has been increasingly adopted as

a vehicle currency in merchandise trade and FDI, but its global use decreases by geographic distance and economic connections (Liu et al., 2019). Thus, the internationalization ambition of CNY should start with East and Southeast Asia. In recent years, CNY is shown to be more closely linked with the ASEAN countries than USD and JPY (Caporale et al., 2018) given that the RCEP trade system has gradually developed into a China-centred regional supply chain. Figure 1 shows the growing importance of China in trade within the RCEP region (from 18% to 35%) with a waning share of Japan (from 26% to 14%), especially after the financial crisis.

Figure 1 Trade flows within RCEP region



Source: Wind Data Service. Trade flow is the sum of import and export with other members in RCEP.

On the one hand, most intermediate goods produced in RCEP members flow into China, rather than into Japan and the US, for further value-added processes, which form an important part of the global value chain. On the other hand, an increasing proportion of final goods manufactured in RCEP and the rest of the world are exported to and consumed in China thanks to its growing national income and demand. China has become a crucial connecting point of the two value chains.

In the literature on Optimal Currency Area (OCA), the trade integration within a potential currency bloc is identified as a decisive factor of an anchor currency choice (Fischer, 2016). As shown above, China plays a key part in the RCEP region, but Japan has been a traditional

influencer in Asia for decades. In fact, both CNY and JPY are in good positions to challenge the anchor role currently assumed by USD. Moreover, financial assets and liabilities denominated by potential anchor currencies have been increasingly paid attention to in the empirical OCA literature (Meissner & Oomes, 2009). To perform a more comprehensive evaluation the three candidate currencies, other factors are also considered, such as shock symmetry (Picard & Worrall, 2020) and colony ties (Klein & Shambaugh, 2012). To better understand these factors, remember that an anchor currency is essentially a currency, so it also has three basic functions of money as defined in any undergraduate economics textbook:

(i) Medium of exchange. It can be used in international trade by countries other than the issuer of the anchor currency. A currency with this function is also known as the vehicle currency (Picard & Worrall, 2020).
(ii) Store of value. It can be used as foreign exchange reserves.
(iii) Unit of account. It can be used to denominate assets and liabilities.

We can group the three functions into two general types. First, as a medium of exchange, the anchor currency needs to be intensively used in the region (measured by the share of regional trade). This is a flow-based criterion focusing on the *intensity* of use (the intensity criterion). In general, a high intensity of use implies a greater effect of that currency on the regional trade. Second, to achieve the other two functions, it requires the value of the anchor currency to be relatively stable (measured by the volatility and correlations of shocks). This is a stock-based criterion focusing on the *stability* of value (the stability criterion). Arguably, there seems to be a trade-off between the two criteria. A more intensively used currency is more likely to suffer from uncertainties outside the trade partners, while a stable currency cannot accommodate sizeable capital flows, as illuminated by the "impossible trinity".

An optimal balance between the two criteria depends on various theoretical assumptions, which are beyond the scope of the present paper. Instead, we aim to empirically investigate the competitiveness of USD, CNY, and JPY as the anchor currency for RCEP in terms of the two criteria with the help of a quantitative model. The intended contribution of the paper is both practical and methodological. We explore a very pragmatic issue of the new trade agreement, which can inspire further discussions of the financial integration after the economic integration. In addition, the two conceptual criteria proposed and applied in this paper also provide a new angle to review the literature on OCA.

2 Methodology

To capture the evolving effects and volatilities of different currencies, we adopt the time-varying parameter VAR (TVP-VAR) approach in a Bayesian tradition (Primiceri, 2005). It has been applied to empirical studies in international trade (He et al., 2020) and international finance

(Wong et al., 2020). The key advantage of the TVP-VAR model is that it can accommodate both stochastic coefficients and volatilities of the VAR model (Cogley & Sargent, 2003). This is essential for our purpose because the relative roles of the three candidate currencies, USD, JPY, and CNY, are changing over time.

Without losing generality, we remove the means of each series, so that the intercepts can be omitted from the specification. Consider a structural VAR(p) model:

$$\mathbf{A}\mathbf{y}_t = \mathbf{B}_1\mathbf{y}_{t-1} + \cdots + \mathbf{B}_p\mathbf{y}_{t-p} + \boldsymbol{\epsilon}_t, \text{ where } \boldsymbol{\epsilon}_t \sim N(\mathbf{0}_K, \boldsymbol{\Sigma}) \quad [1]$$

$\mathbf{y}_t$ is a $K \times 1$ vector of endogenous variables. It is straightforward to determine the recursive structure of the four variables in the TVP-VAR model. First, influences of currencies depend on their relative importance or shares in the global trade (USA > China > Japan), so USD affects CNY, and both affect JPY. Second, prices determine quantities, so the trade flow should be the last variable in $\mathbf{y}_t$. $\mathbf{B}_1, \ldots, \mathbf{B}_p$ are $K \times K$ coefficient matrices. The lower triangle matrix $\mathbf{A}$ with ones on the diagonal effectively assumes recursive causality among the endogenous variables. This is a popular identification strategy in VAR literature. $\boldsymbol{\epsilon}_t$ is a vector of independently distributed structural shocks, so the covariance matrix $\boldsymbol{\Sigma}$ is diagonal. Pre-multiply the inverse matrix $\mathbf{A}^{-1}$ on both sides of equation [1] to obtain the reduced-form of the VAR model:

$$\mathbf{y}_t = \boldsymbol{\Gamma}_1\mathbf{y}_{t-1} + \cdots + \boldsymbol{\Gamma}_p\mathbf{y}_{t-p} + \boldsymbol{\xi}_t, \text{ where } \boldsymbol{\xi}_t \sim N(\mathbf{0}_K, \boldsymbol{\Omega}) \quad [2]$$

where $\boldsymbol{\Gamma}_s \equiv \mathbf{A}^{-1}\mathbf{B}_s$ $(s = 1, \ldots, p)$ is the reduced-form coefficients and $\boldsymbol{\Omega} \equiv \mathbf{A}^{-1}\boldsymbol{\Sigma}\mathbf{A}'^{-1}$ is the symmetric covariance matrix of reduced shocks $\boldsymbol{\xi}_t \equiv \mathbf{A}^{-1}\boldsymbol{\epsilon}_t$. Following the convention in Primiceri (2005), we stack the pK^2 coefficients in a coefficient vector $\boldsymbol{\beta}$ and the regressors in a matrix $\mathbf{X}_t$ in order to write equation [2] more compactly:

$$\mathbf{y}_t = \mathbf{X}_t'\boldsymbol{\beta} + \boldsymbol{\xi}_t, \text{ where } \mathbf{X}_t' \equiv \mathbf{I}_K \otimes \left[\mathbf{y}_{t-1}', \ldots, \mathbf{y}_{t-p}'\right] \quad [3]$$

Similarly, the $\frac{K(K-1)}{2}$ parameters in $\mathbf{A}$ and the K parameters in $\boldsymbol{\Sigma}$ can be stacked in two vectors $\mathbf{a}$ and $\mathbf{h}$ where $h_k \equiv \ln \sigma_k^2$ $(k = 1, \ldots, K)$. In a general TVP-VAR model, all parameters can change over time, so we should add time scripts for $\mathbf{a}_t$, $\boldsymbol{\beta}_t$, and $\mathbf{h}_t$, which are assumed to follow random walks:

$$\mathbf{a}_t = \mathbf{a}_{t-1} + \boldsymbol{\epsilon}_t^{\mathbf{a}}, \text{ where } \boldsymbol{\epsilon}_t^{\mathbf{a}} \sim N\left(\mathbf{0}_{\frac{K(K-1)}{2}}, \boldsymbol{\Sigma}^{\mathbf{a}}\right) \quad [4]\text{A}$$

$$\boldsymbol{\beta}_t = \boldsymbol{\beta}_{t-1} + \boldsymbol{\epsilon}_t^{\boldsymbol{\beta}}, \text{ where } \boldsymbol{\epsilon}_t^{\boldsymbol{\beta}} \sim N\left(\mathbf{0}_{pK^2}, \boldsymbol{\Sigma}^{\boldsymbol{\beta}}\right) \quad [4]B$$

$$\mathbf{h}_t = \mathbf{h}_{t-1} + \boldsymbol{\epsilon}_t^{\mathbf{h}}, \text{ where } \boldsymbol{\epsilon}_t^{\mathbf{h}} \sim N\left(\mathbf{0}_K, \boldsymbol{\Sigma}^{\mathbf{h}}\right) \quad [4]C$$

Note that [3] is effectively the measurement equation of a state space model, and [4]ABC are the transition equations. For simplicity, the covariances among the structural shocks ($\boldsymbol{\epsilon}_t^{\mathbf{a}}$, $\boldsymbol{\epsilon}_t^{\boldsymbol{\beta}}$, $\boldsymbol{\epsilon}_t^{\mathbf{h}}$) are assumed to be zero. The initial conditions specified in Table 1 are assumed to follow standard prior distributions in the Bayesian literature (Nakajima, 2011). A different set of priors are also used to provide a robustness check (see Appendix). The estimation of this model is performed using standard Markov Chain Monte Carlo (MCMC) procedures (Primiceri, 2005).

Table 1 Prior distributions of initial conditions

	Prior Distribution	**Prior Mean**	**Prior Std. Dev.**
$\mathbf{a}_0$	Normal	0	1
$\boldsymbol{\Sigma}_0^{\mathbf{a}}$	Inverse Gamma	10	0.01
$\boldsymbol{\beta}_0$	Normal	0	1
$\boldsymbol{\Sigma}_0^{\boldsymbol{\beta}}$	Inverse Wishart	10	0.01
$\mathbf{h}_0$	Normal	1	5
$\boldsymbol{\Sigma}_0^{\mathbf{h}}$	Inverse Gamma	10	0.01

3 Data

The data used to estimate the TVP-VAR model are monthly time series spanning from 2006M2 to 2021M2 (181 months). The value of USD is measured by the USD index relative to a basket of foreign currencies (created by Bloomberg). It provides a good indicator of the strength of USD in the global money market. The value of CNY is (inversely) measured by USD/CNY exchange rate or USD denominated by CNY. A rise in USD/CNY rate means a stronger USD relative to CNY. Similarly, the value of JPY is measured by JPY/CNY exchange rate or JPY denominated by CNY. A rise in JPY/CNY means a stronger JPY relative to CNY. The total trade flows are calculated as the sum of bilateral exports and imports among all member countries within RCEP. To make the data ready for TVP-VAR, monthly percentage changes of exchange rates and year-on-year (YOY) percentage changes of trade flow are used to stationarize the data.

As shown in the descriptive statistics (Table 2), JPY witnessed a decline in value (-0.05%) with a high volatility (2.29%), while CNY gained a strong upward trend (0.13%) with a low volatility (0.78%). The USD lies in between JPY and CNY in terms of both mean and standard deviation. In line with Figure 1, there is a secular growth of the trade flow within RCEP (0.57%) mainly attributed to the growth of trade with China. The ADF and KPSS tests show that the

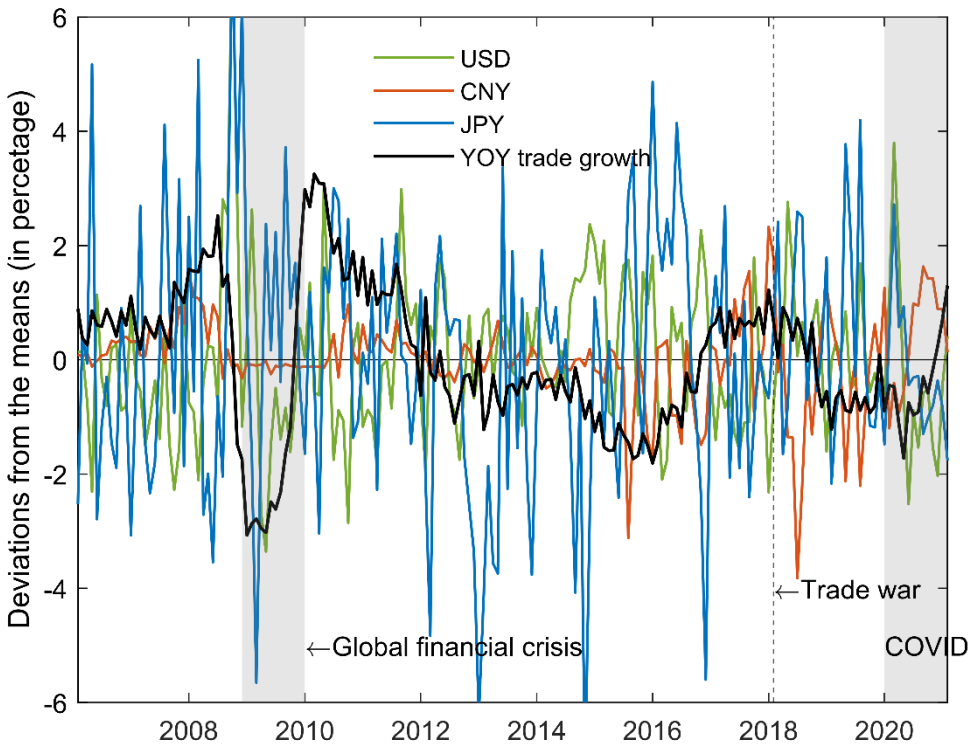
stationarized series are all I(0) processes. The correlation matrix in Table 2 suggests that CNY has a more significant correlation with the regional trade than USD and JPY.

Table 2 Descriptive statistics of stationarized series (monthly percentage change)

	USD index	**USD/CNY**	**JNY/CNY**	**Trade**
No. of Obs.	181	181	181	181
Mean	0.0735	0.1258	-0.0476	0.5691
Std. Dev.	1.3854	0.7830	2.2868	1.2406
Stationarity				
ADF test	-8.3987***	-7.5003***	-10.2254***	-3.0026***
KPSS test	0.1450*	0.2452**	0.1312*	0.4100***
Correlation				
USD index	1			
CNY/USD	-0.4185***	1		
JNY/CNY	-0.0152	-0.2198***	1	
Trade	-0.0385	0.2417***	-0.0631	1

Table notes: significance level, * 10%, ** 5%, *** 1%.

Figure 2 The Monthly Percentage Change of Exchange Rates and Trade Flows



Source: Wind Data Service.

Figure 2 plots the stationarized series $\mathbf{y}_t$, i.e., monthly percentage changes in USD, CNY, JPY, and trade. JPY has the highest volatility especially during the global financial crisis. USD also fluctuates but with a relatively constant volatility. CNY used to have a very stable exchange

rate pegged to USD even during the financial crisis. The volatility started to rise since August 2015 when the People's Bank of China changed the USD/CNY central parity quoting mechanism (Das, 2019).

4 Empirical Results

To determine the optimal lag length for the TVP-VAR model, specifications with different lag lengths ($p = 1, \ldots, 4$) are estimated. Most (quarterly) macroeconomic models follow an AR(1) process (Smets & Wouters, 2007), which is equivalent to a lag length of 3 months in a monthly data model. In our case, however, all information criteria (AIC, BIC, and DIC) support $p = 1$ month rather than $p = 3$ months because all information criteria penalize the number of parameters. As shown in Table 3, as p rises, the number of parameters grows fast due to the "curse of dimensionality", outweighing the benefits of overparameterization. As a robustness check, we apply a wider range of priors, but the specification of $p = 1$ remains robust.

Table 3 Model selection with different lag lengths

p	**No. of Parameters**	**AIC**	**BIC**	**DIC**
1	26	2009.4	1957.4	2070.3
2	42	2838.5	2754.5	3430.9
3	58	4579.4	4463.4	4866.4
4	74	8964.8	8816.8	9274.1

Table notes: AIC = Akaike information criterion; BIC = Bayesian information criterion; DIC = Deviance information criterion.

4.1 Posterior Estimation of Parameters

Given the large number of parameters in the TVP-VAR, the common practice in the Bayesian literature is not to report the complete estimated model, but to focus on several key structural parameters. We select the contemporaneous effects (i.e., a_{41}, a_{42}, and a_{43} in matrix $\mathbf{A}$) and lagged effects (i.e., β_{41}, β_{42}, and β_{43} in matrix $\boldsymbol{\beta}$) of the three currencies on trade. The effects are evolving over time, especially after the global financial crisis and the US-China trade war. For example, during 2008-2009, the sudden depreciation of USD and JPY coincided with a sharp plummet in the regional trade, which is in line with the greater contemporaneous effects (the first column of Figure 3). The trade frictions between the US and China from early 2018 raised the lagged influence of USD and JPY in the RCEP region (the second column of Figure 3), while reduced the lagged effect of CNY (less negative). It is also noted that the COVID pandemic does not alter the trend after the trade war.

Figure 3 Bayesian Estimation of Selected Time-Varying Coefficients

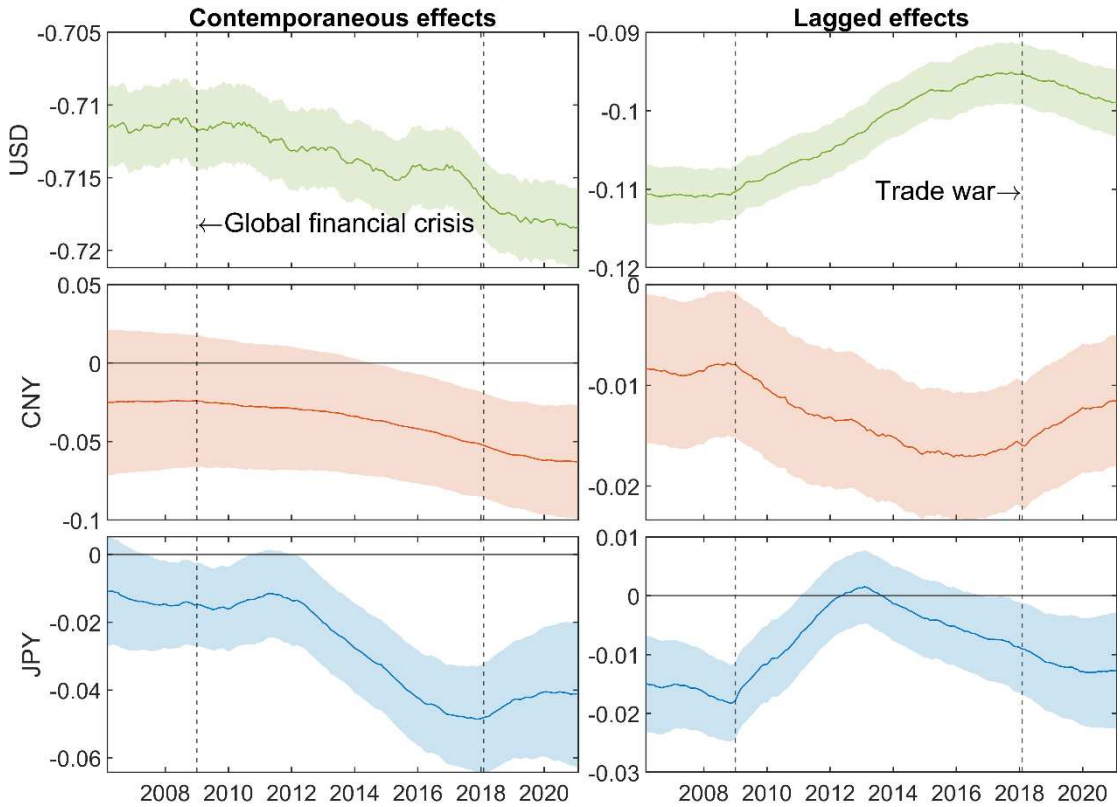


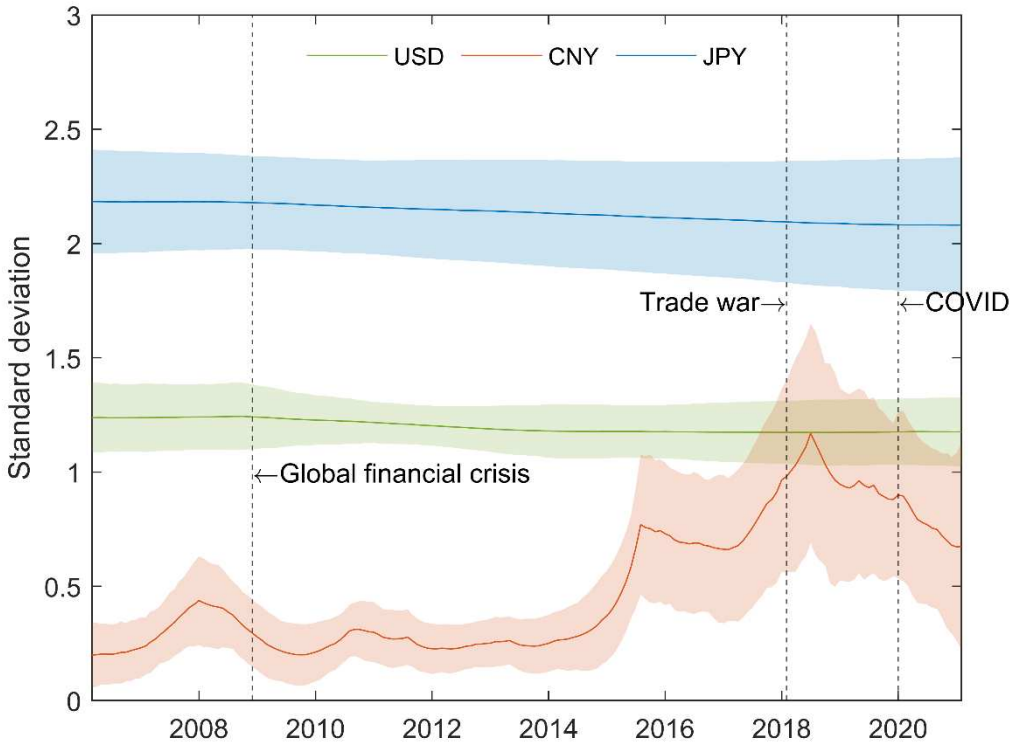
Figure notes: The shaded areas are Bayesian 95% credible intervals (the counterparts of confidence intervals in frequentist econometrics). The estimation results are robust to a different choice of prior (see Appendix).

Now turn to the cross-section dimension of Figure 3. The magnitude of influence of USD (both contemporaneous and lagged effects) is always larger than JPY and CNY. As argued earlier, it is unfavourable for a region to adopt an anchor currency with excessive influence and volatility. In contrast, CNY seems to be a good candidate as the anchor currency, since its fluctuations have the smallest impact on the regional trade (the *stability* criterion) and China accounts for the highest trade share within the RCEP region (the *intensity* criterion). In fact, JPY has similar attributes in terms of both criteria, but the main competition is between USD and CNY. To see this, there is a clear negative correlation in the (lagged) effects between USD and CNY, which suggests that the influences of USD and CNY wane and wax inversely. This pattern does not exist between USD and JPY or between JPY and CNY.

Coefficients ($\mathbf{A}$ and $\boldsymbol{\beta}$) determine the magnitudes of effects of shocks, while volatilities ($\mathbf{h}_t$) determine the magnitude of the shocks *per se*. The estimated standard deviations of the three currencies are plotted in Figure 4. The volatilities of USD and JPY hardly change over the entire sample period, suggesting relatively stable exchange rate regimes in the two countries. The volatility of CNY was very low before 2015, because China maintained a strictly regulated peg to USD. Even after 2015 as the central bank in China allowed for greater forex market

freedom, the volatility of CNY is still the lowest among the three currencies despite a temporary surge during the US-China trade war in 2018. This ranking is in line with the descriptive statistics reported in Table 2.

Figure 4 Bayesian Estimation of Selected Time-Varying Volatilities



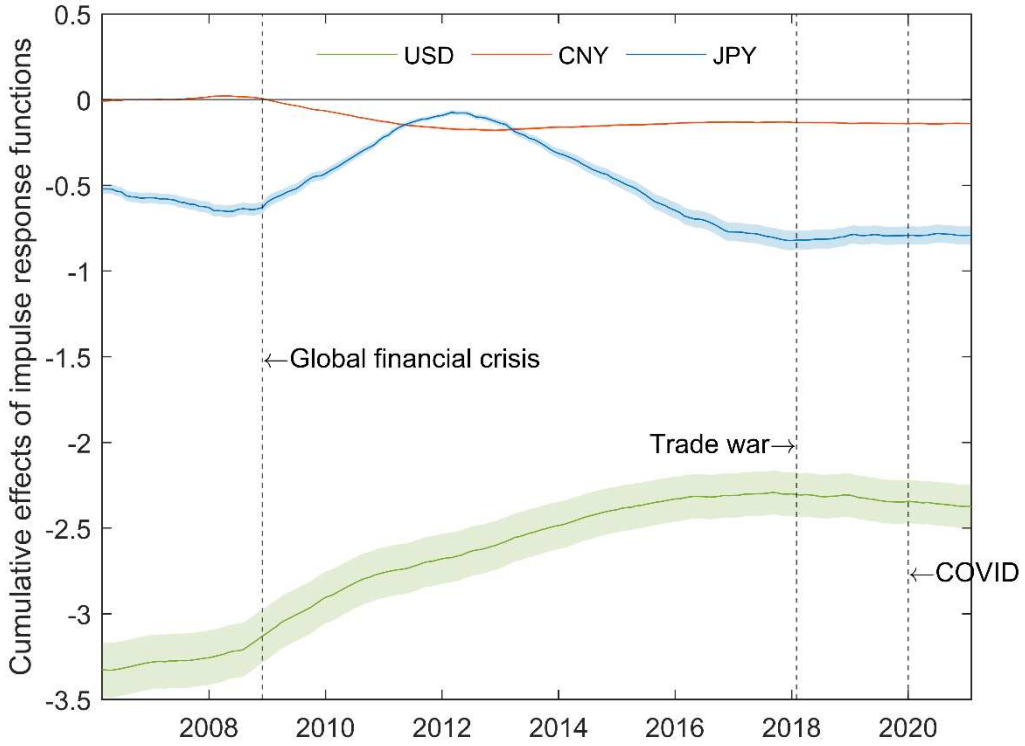
Notes: The shaded areas are Bayesian 95% credible intervals (the counterparts of confidence intervals in frequentist econometrics).

4.2 Impulse Response Functions

To better summarize the effects of shocks on trade flows, impulse response functions (IRFs) are usually used to combine the estimated coefficients in an intuitive way. However, in the TVP-VAR context, each date is associated with a unique set of IRFs. To parsimoniously demonstrate the time-varying effect of a currency shock on the trade flow, we plot the cumulative effects of IRFs of each month in Figure 5. It measures the total loss of the regional trade (in percentage) due to a positive currency shock (appreciation). For example, if USD appreciates by one standard deviation (1.39% according to Table 2), then the regional trade within RCEP will eventually drop by -3.3% in 2006 and by -2.4% in 2021. Consistent with the findings in subsection 4.1, the effect of USD is always bigger than that of JPY, which is then bigger than that of CNY. It confirms the advantage of CNY as a candidate anchor currency in term of

the stability criterion because it reduces the uncertainties of a common currency according to the OCA literature (Chari et al., 2020; Eichler & Karmann, 2011; Mundell, 1961).

Figure 5 The Cumulative Impulse Response Functions of the Three Currencies on Trade

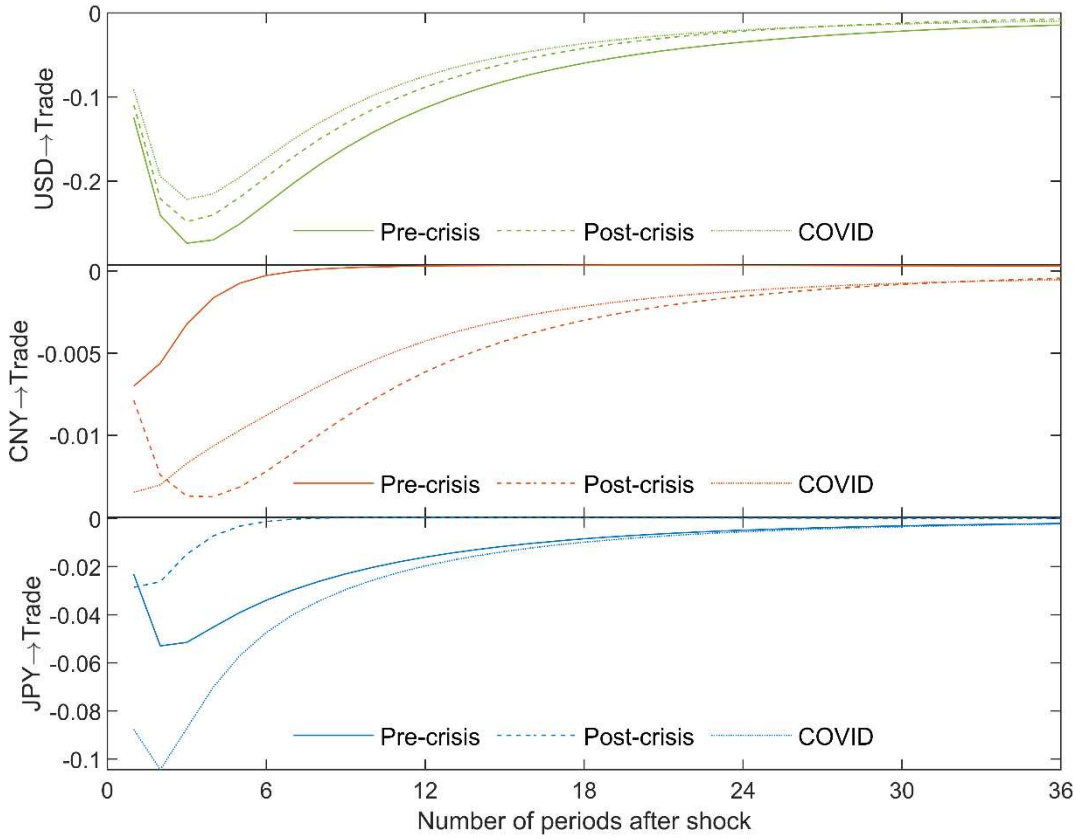


Notes: The shaded areas are Bayesian 95% credible intervals (the counterparts of confidence intervals in frequentist econometrics).

Moreover, Figure 5 shows a new feature, which was not salient in the coefficient analysis (Figure 3)—the cumulative response of the regional trade to USD decreases over time, while the effects of CNY and JPY seem to increase in a competing fashion. The effect of CNY peaked around 2012, which coincides with the trough of the effect of JPY. To summarize, the declining influence of USD is shared by CNY and JPY, and CNY is the biggest winner.

To better visualize the dynamics of the TVP-VAR system, we plot IRFs of three selected points in time: 2007M1 (pre-crisis), 2009M1 (post-crisis), and 2021M1 (COVID pandemic). Three significant patterns are found in Figure 6. First, the effect of USD on trade gradually diminishes after the global financial crisis. This trend is reinforced during the COVID pandemic. Second, the inverse happens to CNY. During the pandemic, the effect of CNY on trade becomes less persistent compared to the post-crisis period. Third, the effect of JPY declines after the financial crisis and then increases during the COVID period.

Figure 6 The 6-Month Ahead Trade Responses to Currency Shocks



It confirms the observations of Figure 5—USD is phasing out while CNY and JPY are weighing in. There are three critical events. The first is the global financial crisis, after which the influence of CNY started to increase. The second is the US-China trade war since 2018, which weakened CNY but strengthened JPY. The third is the COVID pandemic, during which the influence of USD continued to diminish. Therefore, the timing of RCEP signing up posed both CNY and JPY in good positions against USD in the region.

Compared to JPY, CNY has an additional advantage apart from meeting the flow-based and stock-based criteria. As CNY enters an appreciation cycle in 2020, it makes CNY-denominated assets more attractive since China has a long-term trade deficit within the region. By holding CNY as a reserve currency, RCEP members can indirectly benefit from the fast economic growth within China.

Another practical implication of the model is that using USD as the unit of account in RCEP trade can lead to an exchange rate trap to exacerbate the trade imbalance. For example, if USD appreciates due to causes outside the RCEP region, then the overall trade within the region will drop even if the US is not involved with any of the trade. Furthermore, a stronger USD means a weaker JPY, so the rest of the RCEP will undergo a greater deficit with Japan. This spill-over effect of USD unnecessarily disturbs the trade volume and composition if USD is still used as

the anchor currency for the regional trade. In contrast, the spill-over effect of USD through CNY is much weaker because the cumulative effect of CNY on trade is much smaller.

5 Conclusions and Policy Implications

We summarize and compare the empirical findings in Table 4. The influence of USD in the RCEP region is fading away since the global financial crisis and the COVID pandemic reinforces this trend. As a result, the benefits of using USD as the anchor currency for the region can no longer justify the excessive uncertainties it induced. Switching from USD to an intramural currency as the anchor currency is both an exogenous opportunity and an endogenous need. It is shown that CNY enjoys a clear advantage in terms of the stability criterion over JPY, but JPY is in a similar position to CNY in terms of the intensity criterion. However, given the historical influences of USD and JPY, there is still a long way for CNY to win a dominant position for the anchor currency in RCEP region.

Table 4 Comparison of the three currencies as anchor currency in RCEP

Criterion	Measure	USD	CNY	JPY
Intensity	Trade share	Weak	Strong	Medium
Stability	Contemporaneous effect	Weak	Medium	Strong
	Lagged effect	Weak	Strong	Strong
	Total effect	Weak	Strong	Medium
	Volatility	Medium	Strong	Weak
Reputation	Foreign exchange reserve	Strong	Weak	Medium

Notes: Contemporaneous effect and lagged effect are measured by VAR coefficients shown in Figure 3. Total effect is measured by the sums of impulse responses in the first 36 months after shocks shown in Figure 5.

For the policymakers, we propose the following two practical suggestions based on the empirical findings. First, China is running a trade deficit with RCEP in general, so it is difficult to further promote the intensity of use of CNY in the short run. Therefore, for China, the key strategy lies in the stability criterion to entrench the upper hand over Japan. More attractive CNY-denominated assets, such as the so-called "panda bonds" and FDI, can expand the impacts of CNY. On the contrary, Japan is running a trade surplus with RCEP, so there is room to further increase its proportion in the regional trade. Therefore, Japan's momentum lies in the intensity criterion to compete with China. The choice between CNY and JPY is essentially a competition between flow-based and stock-based benefits.

Second, to pave the path for a new anchor currency (either CNY or JPY), an improved financial infrastructure is due to catch up with the increasing need of international payment and currency settlement. The Chiang Mai Initiative Multilateralization (CMIM) agreement is one of such facilities among ASEAN+3 members. This regional currency swap arrangement involves a total amount of 240 billion USD to facilitate the regional trade, mostly RCEP members. China

and Japan respectively contribute 32% of the capital, forming a duopoly with both cooperation and competition. USD may have temporarily withdrawn, but the game between China and Japan is still on. And the arena is always overshadowed by the uncertainty of a new administration and trade policy in the US.

CRediT authorship contribution statement

Conceptualization: Dong Guo, Peng Zhou; Data curation: Dong Guo, Peng Zhou; Formal analysis: Dong Guo, Peng Zhou; Funding acquisition: Dong Guo, Peng Zhou; Investigation: Dong Guo, Peng Zhou; Methodology: Dong Guo, Peng Zhou; Project administration: Dong Guo, Peng Zhou; Resources: Dong Guo, Peng Zhou; Software: Dong Guo, Peng Zhou; Supervision: Dong Guo, Peng Zhou; Validation: Dong Guo, Peng Zhou; Visualization: Dong Guo, Peng Zhou; Roles/Writing - original draft: Dong Guo, Peng Zhou; Writing - review & editing: Dong Guo, Peng Zhou.

Declaration of Competing Interests

None.

References

BALISTRERI, E. J. & TARR, D. G. 2020. Comparison of deep integration in the Melitz, Krugman and Armington models: The case of The Philippines in RCEP. *Economic Modelling,* 85**,** 255-271.

CHARI, V. V., DOVIS, A. & KEHOE, P. J. 2020. Rethinking Optimal Currency Areas. *Journal of Monetary Economics,* 111**,** 80-94.

CHIŢU, L., EICHENGREEN, B. & MEHL, A. 2014. When did the dollar overtake sterling as the leading international currency? Evidence from the bond markets. *Journal of Development Economics,* 111**,** 225-245.

COGLEY, T. & SARGENT, T. J. 2005. Drifts and volatilities: monetary policies and outcomes in the post WWII US. *Review of Economic Dynamics,* 8**,** 262-302.

EICHLER, S. & KARMANN, A. 2011. Optimum Currency Areas in Emerging Market Regions: Evidence Based on the Symmetry of Economic Shocks. *Open Economies Review,* 22**,** 935-954.

FISCHER, C. 2016. Determining global currency bloc equilibria: An empirical strategy based on estimates of anchor currency choice. *Journal of International Money and Finance,* 64**,** 214-238.

FRY-MCKIBBIN, R., HSIAO, C. Y.-L. & MARTIN, V. L. 2018. Global and regional financial integration in East Asia and the ASEAN. *The North American Journal of Economics and Finance,* 46**,** 202-221.

HE, F., LUCEY, B. & WANG, Z. 2020. Trade policy uncertainty and its impact on the stock market -evidence from China-US trade conflict. *Finance Research Letters***,** 101753.

JI, Q., & ZHANG, D. (2019). China's crude oil futures: Introduction and some stylized facts. *Finance Research Letters, 28*, 376-380.

KAI TIM WONG, D. & WONG, A. 2020. Do the uncertainty-induced capital outflows matter in currency crisis? Evidence from the Hong Kong speculative attacks. *Finance Research Letters***,** 101643.

KLEIN, M. W. & SHAMBAUGH, J. C. 2012. *Exchange rate regimes in the modern era*, MIT press.

LIU, T., WANG, X. & WOO, W. T. 2019. The road to currency internationalization: Global perspectives and chinese experience. *Emerging Markets Review,* 38**,** 73-101.

MALLIARIS, A. G. 2002. Global monetary instability: The role of the IMF, the EU and NAFTA. *The North American Journal of Economics and Finance,* 13**,** 72-92.

MEISSNER, C. M. & OOMES, N. 2009. Why do countries peg the way they peg? The determinants of anchor currency choice. *Journal of International Money and Finance,* 28**,** 522-547.

MUNDELL, R. A. 1961. A theory of optimum currency areas. *The American economic review,* 51**,** 657-665.

NAKAJIMA, J. 2011. Time-Varying Parameter VAR Model with Stochastic Volatility: An Overview of Methodology and Empirical Applications. *Monetary and and Economic Studies,* 29**,** 107-142.

PETRI, P. & PLUMMER, M. 2020. *East Asia Decouples from the United States: Trade War, COVID, and East Asia's New Trade Blocs,* Washington, DC, Peterson Institute for International Economics.

PICARD, P. M. & WORRALL, T. 2020. Currency areas and voluntary transfers. *Journal of International Economics,* 127**,** 103390.

PRIMICERI, G. E. 2005. Time Varying Structural Vector Autoregressions and Monetary Policy. *The Review of Economic Studies,* 72**,** 821-852.

REY, H. 2016. International Channels of Transmission of Monetary Policy and the Mundellian Trilemma. *IMF Economic Review*, 64(1), 6-35.

UNITED NATIONS 2020. World Drug Report. United Nations Office on Drugs and Crime.

ZHANG, C. 2014. An information-based theory of international currency. *Journal of International Economics,* 93**,** 286-301.

Appendix

To provide a robustness check of our estimation results, we use a different set of prior distributions listed in Table 1. The priors for the robustness test are doubled of the baseline priors to make them less informative for the posterior, as listed in the following table.

	Prior Distribution	Prior Mean	Prior Std. Dev.
$\mathbf{a_0}$	Normal	0	1 (baseline)→2
$\mathbf{\Sigma_0^a}$	Inverse Gamma	10 (baseline)→20	0.01 (baseline)→0.1
$\mathbf{\beta_0}$	Normal	0	1 (baseline)→2
$\mathbf{\Sigma_0^\beta}$	Inverse Wishart	10 (baseline)→20	0.01 (baseline)→0.1
$\mathbf{h_0}$	Normal	1 (baseline)→2	5 (baseline)→10
$\mathbf{\Sigma_0^h}$	Inverse Gamma	10 (baseline)→20	0.01 (baseline)→0.1

We report the posterior distributions of the four key parameters of the TVP-VAR model at the mean over the sample period. It is shown that the estimated posteriors of parameters and the implied impulse response functions are robust to flatter priors.