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The Anatomy of the internationalization of the RMG

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Abstract

Using daily data between 2019 and 2021, this study examines the influence of the renminbi (henceforth RMB) on all currencies globally. It finds that the RMB's influence is significant and the largest among the CNY, USD, GBP, JPY and EUR for ten countries, which we call the "RMB bloc" countries. These are mainly small countries in Africa and Latin America, and their main export products are commodities, particularly minerals. There was no sign of the "RMB bloc" emerging in Asia. In addition, I analyze the determinants for becoming an "RMB bloc" country and find that commodity exports per GDP are the most important and robust determinant. China's loans are significant but negative, reflecting that China's overseas loans are exclusively denominated in the US dollar. The overall result shows that there is a long way to go for the RMB to become the third international currency next to the USD and euro. For Asian countries' currencies, the US dollar's dominance is unchanged, and China's influence remains negligible. Countries that are "RMB bloc" are typically small economies with a high dependence on commodity exports.

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Anatomy of the Internationalization of the Renminbi

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Abstract

Using daily data between 2019 and 2021, this study examines the influence of the renminbi (henceforth RMB) on all currencies globally. It finds that the RMB's influence is significant and the largest among the CNY, USD, GBP, JPY and EUR for ten countries, which we call the "RMB bloc" countries. These are mainly small countries in Africa and Latin America, and their main export products are commodities, particularly minerals. There was no sign of the "RMB bloc" emerging in Asia. In addition, I analyze the determinants for becoming an "RMB bloc" country and find that commodity exports per GDP are the most important and robust determinant. China's loans are significant but negative, reflecting that China's overseas loans are exclusively denominated in the US dollar. The overall result shows that there is a long way to go for the RMB to become the third international currency next to the USD and euro. For Asian countries' currencies, the US dollar's dominance is unchanged, and China's influence remains negligible. Countries that are "RMB bloc" are typically small economies with a high dependence on commodity exports.

JEL Classification Code: E6, F3, F4

Keywords: Exchange rate, China, currency regime, exports.

Introduction

China makes no secret of its intention to make the RMB the third international currency, next to the US dollar and euro. According to the IMF's currency composition of official foreign exchange and reserves (COFER), the RMB's weight in the world's reserve currency remains low at 2.8%, but is expected to grow in the future. According to SWIFT, the RMB's share as a payment currency stands at 2.2% of the total (5th

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of all currencies), and the share has been rising². China also established its own transaction system with Russia in April 2022 (System of Transfer of Financial Messages, SPFS) to counteract western dominance in the international financial architecture. By 2022, the RMB surpassed the Japanese yen in international payment rankings (fourth place). The RMB is becoming an increasingly important currency for Russia after its invasion of Ukraine³.

Against this backdrop, this study examined two aspects. First, I tested the influence of the RMB (compared with other major reserve currencies) at the global level using the Frankel and Wei (1994) methodology, as well as the methodology of Kawai and Pontines (1996). This identifies “RMB bloc” countries, which are defined in this study as countries whose currency is influenced more strongly by the RMB than any other major currency with statistical significance. After identifying “RMB bloc” countries, I examined the determinants for being an “RMB bloc” country, using a logit model with trade, commodity trade, foreign direct investment (FDI), and debt owed to China as explanatory variables.

Literature

Currency blocs

Frankel and Wei (1994) were the first to examine currency blocs. They use monthly exchange rate data to estimate the influence of major currencies (USD, GBP, JPY, DM, and AUD) using the weekly exchange rate between 1979 and 1992 on Asian currencies. They regressed the % change of the US dollar to various currencies using the Swiss Franc as the numeraire. Their finding is that the US dollar is the overwhelming currency of choice of major East Asian currencies⁴. They could not examine the influence of the RMB because the RMB was tied strongly to the US dollar.

Their model is widely used to examine the influence of currencies. The recent studies in the context of the RMB bloc is summarized in Table 1. Henning (2012), Subramanian and Kessler (2013), Kawai and Pontines (2016), and Tovar and Nor (2018) modified Frankel and Wei’s (1994) model to control for the multicollinearity issue by running the regression without the US Dollar (Tovar and Nor, 2018) or RMB (Kawai and Pontines, 2016) and conducting a two-step regression akin to the Wald test (explained later).

They used this methodology because of the collinearity of the RMB, which is still high because China uses a managed float exchange rate regime.

² SWIFT, RMB Tracker

³ “How the Ukraine war could boost China’s global finance ambitions,” Financial Times, March 8, 2022.

⁴ Korean Won, Singapore Dollar, Hong Kong Dollar, New Taiwan Dollar, Malaysian Ringgit, Philippine Peso, Thai Baht

Table 1: Recent studies of “RMB blocs” and their methodologies

	Data frequency and period	Geographical scope	Numeraire Currency	Model used	Conclusion
Henning (2012)	Daily, July 22, 2005 to July 2, 2009	East Asia	SDR	Frankel and Wei (1996)	RMB role significant for a few Asian countries
Subramanian and Kessler (2013)	Daily, July 22, 2005 to July 2, 2009 divided into 6 subperiods	East Asia and BRICs	SDR	Frankel and Wei (1996) with constraints (the coefficients should add up to one)	<i>De facto</i> RMB zone in Asia
Kawai and Pontines (2016)	Daily, 2005-2007 or 2011	East Asia	NZD and CHF	Modified Frankel and Wei (1994) similar to Subramanian Kessler	The USD continues to be the dominant currency in Asia
Tovar and Nor (2018)	Monthly, 2011-2015	Global	USD	Modified Kawai and Pontines (2016)	Some influence of RMB on BRICs countries
This study	Daily, 2019-2021	Global	NZD	Frankel and Wei (1994) and Kawai and Pontines (2016)	

The determinants of currency blocs

The second part of this study examines why a country chooses the RMB as an anchor currency. In this stream of literature, Modell (1961) sets forth various conditions for a country to reap the maximum benefit from adopting a common currency. The conditions include free movement of labor, the existence of a fiscal union, and a similarity in the business cycle, among others. His idea became the backbone for the creation of the Eurozone. Heller (1978) argues that country size, openness, international financial integration, inflation, and foreign trade patterns determine the choice of exchange rate system.

More recently, Meissner and Oomes (2009) study the determinants of the exchange rate regime and conclude that trade is an important determinant factor in choosing a currency anchor. According to their study, “the benefits of using a particular anchor increase with the amount of trade with countries using the same anchor.” Therefore, this study analyzes the determinants of “RMB blocs,” and asks what makes a country tie its currency to the RMB.

Analysis

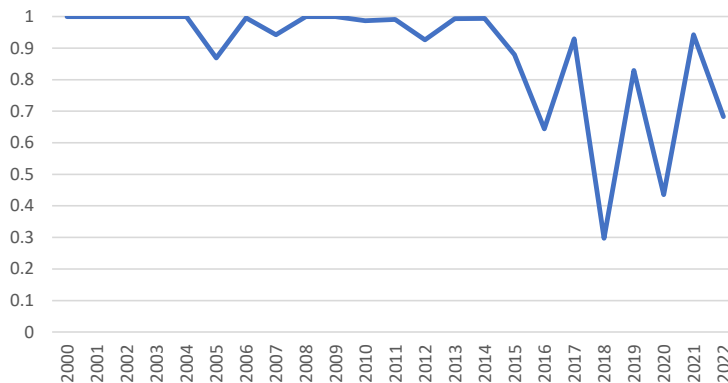
Classification of a currency zone

I use high-frequency (daily) data from January 1, 2019 to the end of 2021 and Frankel and Wei's (1996) methodology as the baseline. Although the correlation between the USD and RMB has decreased since China began increasing the flexibility of its currency vis-à-vis the dollar, the correlation of % change is still high at 0.91 (Table 2); however, this figure is meaningfully lower than Kawai and Pontines' (0.99). Nevertheless, to overcome the potential multicollinearity issue, I used both Frankel and Wei's (1994) and Kawai and Pontines' (2016) methodologies.

Frankel and Wei methodology

Although Kawai and Pontines' (2016) methodology overcomes multicollinearity, it still has some drawbacks: the assumption that all the coefficients add up to one is rather strong, unless the country is taking a basket peg. Moreover, using the error term as explanatory variables might lead to heteroskedasticity and underestimation of the standard errors. In addition, in the last five years, the correlation between the USD and RMB has decreased (Figure 1). Therefore, I use Frankel and Wei's (1996) methodology as my main model and Kawai and Pontines' (2014) for robustness.

Figure 1: correlation of the RMB and USD by year



Correlation for each year is calculated using daily data: Source: Bloomberg

The difference between this methodology and Frankel and Wei's (1994) is the data frequency and the choice of numeraire. We used daily instead of weekly data, and the NZ Dollar instead of the Swiss Franc for the numeraire because the high correlation of the euro with the Swiss Franc makes the fluctuation of the euro disproportionately lower than other currencies. Similarly, I did not use special drawing rights (SDR) as the numeraire because the USD and euro's weights are high. Table 2 shows the correlations between explanatory variables. The correlation between the % change of the USD and that of the RMB (with the NZD as numeraire) is 0.91; thus, multicollinearity may be a potential issue.

$$\Delta \log \left(\frac{x}{NZD} \right)_t = a_0 + a_1 \Delta \log \left(\frac{USD}{NZD} \right)_t + a_2 \Delta \log \left(\frac{EUR}{NZD} \right)_t + a_3 \Delta \log \left(\frac{GBP}{NZD} \right)_t + a_4 \Delta \log \left(\frac{YEN}{NZD} \right)_t + a_5 \Delta \log \left(\frac{RMB}{NZD} \right)_t + u \quad [1]$$

Table 2: Correlation of explanatory variables (numeraire: NZD)

	d.log(USD/NZD)	d.log(EUR/NZD)	d.log(GBP/NZD)	d.log(JPY/NZD)	d.log(CNY/NZD)
d.log(USD/NZD)	1.00				
d.log(EUR/NZD)	0.80	1.00			
d.log(GBP/NZD)	0.55	0.59	1.00		
d.log(JPY/NZD)	0.79	0.77	0.51	1.00	
d.log(CNY/NZD)	0.91	0.77	0.55	0.71	1.00

Kawai and Pontines methodology

To control for potential multicollinearity, which may still be an issue despite the much lower correlation of the RMB and USD in recent years, I also use Kawai and Pontine's (2016) methodology, which orthogonalizes the RMB from the other currencies, including the USD:

$$\Delta \log \left(\frac{x}{NZD} \right)_t = a_0 + a_1 \Delta \log \left(\frac{USD}{NZD} \right)_t + a_2 \Delta \log \left(\frac{EUR}{NZD} \right)_t + a_3 \Delta \log \left(\frac{GBP}{NZD} \right)_t + a_4 \Delta \log \left(\frac{YEN}{NZD} \right)_t + a_6 \hat{\omega}$$

$$\text{Where } \hat{\omega} = \Delta \log \left(\frac{RMB}{NZD} \right)_t - \left[\hat{\varphi}_0 + \hat{\varphi}_1 \Delta \log \left(\frac{USD}{NZD} \right)_t + \hat{\varphi}_2 \Delta \log \left(\frac{EUR}{NZD} \right)_t + \hat{\varphi}_3 \Delta \log \left(\frac{GBP}{NZD} \right)_t + \hat{\varphi}_4 \Delta \log \left(\frac{YEN}{NZD} \right)_t \right] \quad [2]$$

Then, they subtract $\hat{\omega}$ from both sides based on the assumption that the weights of the explanatory variables add up to one; thus,

$$\Delta \log \left(\frac{x}{NZD} \right)_t - \hat{\omega} = \gamma_0 + \gamma_1 \left[\Delta \log \left(\frac{USD}{NZD} \right)_t - \hat{\omega} \right] + \gamma_2 \left[\Delta \log \left(\frac{EUR}{NZD} \right)_t - \hat{\omega} \right] + \gamma_3 \left[\Delta \log \left(\frac{GBP}{NZD} \right)_t - \hat{\omega} \right] + \left[\gamma_4 \Delta \log \left(\frac{YEN}{NZD} \right)_t - \hat{\omega} \right] + v \quad [3]$$

With the assumption that:

$$\gamma_5 = 1 - \gamma_1 - \gamma_2 - \gamma_3 - \gamma_4 \quad [4]$$

γ_5 thus defined, is the coefficient on the RMB, with statistical significance measured by the standard null-hypothesis test.

Thus, with the constraint above, this is essentially a Wald test. This methodology solves the multicollinearity issue, although the assumption that the weights of all five currencies (USD, EUR, GBP, JPY, and RMB) add up to one is a strong assumption. Therefore, I report the results for both methodologies.

Both approaches are applied to 171 currencies worldwide. I define a country as an “RMB bloc” country where the coefficients of RMB a_5 in [1] or γ_5 in [4] are the highest. I also used the latest daily data from the beginning of 2020 to the end of 2021.

Results

Both the models were tested for 171 currencies. The results are reported in the Appendix. When the coefficient on $dlog$ (RMB/NZD) is the largest and statistically significant at 5% or less, the currency is defined as “RMB bloc.” Several countries were identified using both Frankel and Wei’s (1994) and Kawai and Pontines’ (2016) methodologies, and some are different. Both methodologies identified several African countries and Mexico as RMB bloc countries (Table 3). The only “RMB bloc” Asian country is South Korea (under Frankel and Wei’s methodology). The geographical representation of the currency bloc is shown in Figure 2(a) and 2(b). It is clear that the US dollar’s (dark blue) international currency status is undoubtable in both methodologies. The euro’s influence is seen in some African countries, especially West and Central CFA countries, probably because of the colonial relationship with France—the CFA Franc was fixed to the French Franc. The results were double checked for consistency with the IMF’s Annual Report on Exchange Arrangements and Exchange Restrictions. According to the IMF, eight of the countries use the US dollar as a domestic currency. However, the dollar is widely accepted in many countries, such as Zimbabwe, Puerto Rico, Cambodia, and many Caribbean countries, which is also confirmed by the analysis.

Table 3: RMB Bloc using both methodologies

	Frankel and Wei (1994)	Kawai and Pontines (2016)
RMB Bloc in both methodologies	Eswatini	Eswatini
	Lesotho	Lesotho
	Mexico	Mexico
	Namibia	Namibia
	Swaziland	Swaziland
	South Africa	South Africa
Difference between two methodologies	South Korea	Norway
	Chile	Australia
	Colombia	Brazil
	Turkey	

Looking at Figure 2(a) and 2(b), which uses both methodologies, the RMB bloc is not spreading in Asia, but rather in Africa and Latin America. Table 4 shows the regression results for East Asian countries, and the results show that the effect of the RMB is positive and statistically significant for all ASEAN countries (except Myanmar), but the coefficients are substantially lower than that of the US dollar in most cases. The Japanese yen coefficient is small and negative. It is noteworthy that no ASEAN countries (those that share borders with China) are classified as “RMB bloc.” East Asia is still overwhelmingly tied to the US dollar. The Japanese yen has a marginal *negative* effect on Asian currencies. The failure of the Japanese yen to become Asia’s regional currency is well documented by Ito et al. (2010). This result applies to both Frankel and Wei’s (1994), and Kawai and Pontines’ (2016) methodologies. Turkey being “RMB bloc” (in Figure 2(a)) is noteworthy, given its geographical importance which binds the western and eastern parts of the world. Although these “RMB bloc” countries are not major trading partners for China, China is an important trading partner for them. In addition, their exports are primarily commodity products.

Figure 2(a) Currency Zones using Frankel and Wei's methodology

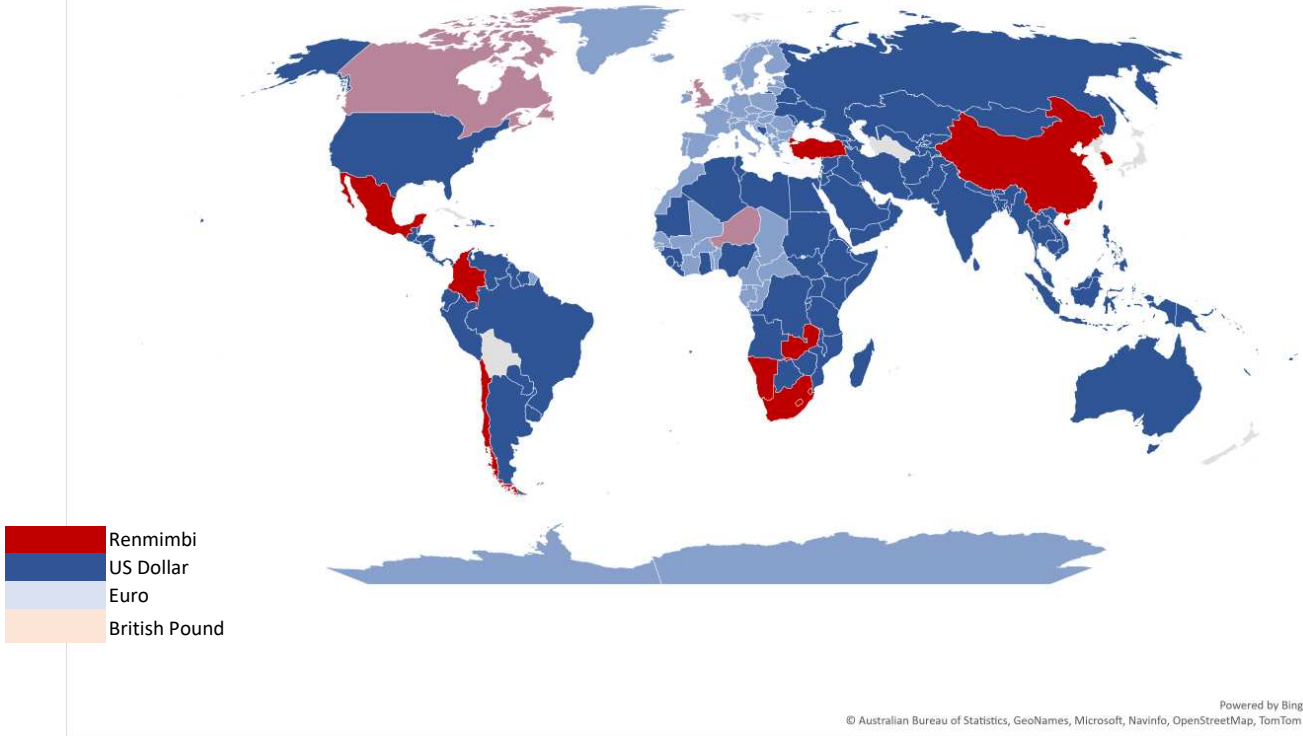


Figure 2(b) Currency Zones using Kawai and Pontines' methodology

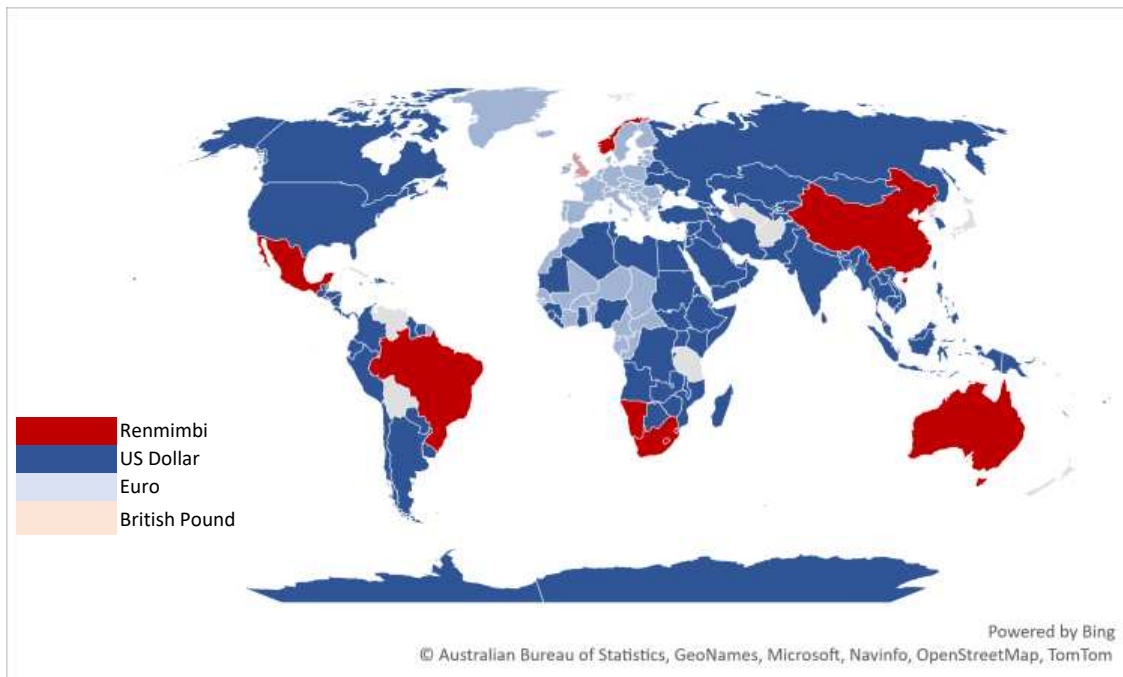


Table 4: The influence of major currencies on East Asian countries

Frankel and Wei (1994) approach

Country	USD	EUR	GBP	JPY	CNY	Adj R	D/W
Brunei	0.4880 *** (0.031)	0.0516 ** (0.024)	0.0884 *** (0.016)	-0.0110 ** (0.017)	0.2710 *** (0.029)	0.33	1.60
Cambodia	0.9714 *** (0.034)	-0.0163 (0.026)	-0.0298 * (0.017)	0.0058 ** (0.019)	0.0630 * (0.032)	0.73	2.39
Hong Kong	0.9678 *** (0.006)	0.0026 (0.004)	0.0010 (0.003)	-0.0034 *** (0.003)	0.0277 *** (0.005)	0.96	2.12
Indonesia	0.4620 *** (0.007)	0.1412 *** (0.054)	0.1205 *** (0.035)	-0.0853 ** (0.039)	0.3679 *** (0.065)	0.60	2.21
South Korea	0.4110 *** (0.072)	0.0625 (0.056)	0.0784 ** (0.037)	-0.0655 ** (0.041)	0.4946 *** (0.068)	0.61	2.74
Laos	1.0048 *** (0.033)	-0.0117 (0.025)	0.0016 (0.017)	-0.0059 ** (0.018)	-0.0095 (0.031)	1.00	2.98
Malaysian Ringgit	0.5796 *** (0.0388)	0.0378 (0.030)	0.0663 *** (0.020)	-0.0416 ** (0.022)	0.3394 *** (0.036)	0.22	2.36
Myanmar	0.9051 *** (0.116)	-0.0140 (0.091)	0.0188 (0.060)	-0.0975 * (0.066)	0.1047 (0.109)	0.55	1.89
Philippines	0.7666 *** (0.043)	0.0007 (0.034)	0.0472 ** (0.022)	-0.0259 ** (0.024)	0.2229 *** (0.041)	0.77	2.90
Singapore	0.3569 *** (0.023)	0.1269 *** (0.018)	0.0923 *** (0.011)	-0.0100 ** (0.013)	0.2774 *** (0.021)	0.90	1.79
Taiwan	0.7432 *** (0.028)	0.0182 (0.022)	0.0262 * (0.014)	-0.0227 ** (0.016)	0.2439 *** (0.026)	1.00	2.98
Thailand	0.6429 *** (0.050)	-0.0125 (0.039)	0.0347 (0.026)	-0.0117 ** (0.029)	0.2886 *** (0.048)	0.96	1.93
Vietnam	0.9671 *** (0.016)	0.0042 (0.012)	-0.0074 (0.008)	0.0165 *** (0.009)	0.0260 * (0.015)	0.97	1.81

Kawai and Pontines (2016) approach

Country	USD	EUR	GBP	JPY	CNY	Adj R	D/W
Brunei	0.7131 *** (0.020)	0.0655 ** (0.025)	0.1005 *** (0.016)	-0.0206 (0.018)	0.1414 *** (0.016)	0.85	2.27
Cambodia	1.0238 *** (0.021)	-0.0130 (0.026)	-0.0270 (0.017)	0.0035 (0.019)	0.0127 (0.016)	0.89	2.58
Hong Kong	0.9908 *** (0.003)	0.0040 (0.004)	0.0023 (0.003)	-0.0044 (0.003)	0.0073 ** (0.003)	1.00	1.88
Indonesia	0.7677 *** (0.043)	0.1600 *** (0.055)	0.1369 *** (0.036)	-0.0983 ** (0.039)	0.0337 (0.034)	0.59	1.84
South Korea	0.8219 *** (0.046)	0.0879 (0.058)	0.1006 *** (0.038)	-0.0831 * (0.042)	0.0727 * (0.036)	0.56	2.43
Laos	0.9969 *** (0.020)	-0.0122 (0.025)	0.0012 (0.017)	-0.0056 (0.018)	0.0197 (0.016)	0.90	2.49
Malaysia	0.8616 *** (0.025)	0.0552 * (0.032)	0.0815 *** (0.021)	-0.0536 ** (0.023)	0.0555 *** (0.020)	0.82	2.00
Myanmar	0.9921 *** (0.071)	-0.0086 (0.091)	0.0235 (0.059)	-0.1012 (0.066)	0.0943 * (0.056)	0.38	2.16
Philippines	0.9517 *** (0.027)	0.0121 (0.034)	0.0572 ** (0.022)	-0.0338 (0.025)	0.0128 (0.021)	0.82	2.11
Singapore	0.5874 *** (0.015)	0.1411 *** (0.019)	0.1047 *** (0.013)	-0.0199 (0.014)	0.1867 *** (0.012)	0.89	2.25
Thailand	0.8826 *** (0.032)	0.0023 (0.040)	0.0476 * (0.026)	-0.0220 (0.029)	0.0895 *** (0.025)	0.74	1.88
Vietnam	0.9887 *** (0.010)	0.0056 (0.012)	-0.0062 (0.008)	0.0156 * (0.009)	-0.0036 (0.008)	0.97	1.80

Determinants of RMB Bloc

Next, we examine what motivates countries to synchronize their currencies with the RMB. Trade is an obvious candidate, especially in terms of commodity exports. Similarly, FDI stocks, debt from China, and financial openness may also matter. This problem arises because of the small number of countries that are classified as “RMB bloc” (10 under the Frankel and Wei methodology, and 9 under the Kawai and Pontines methodology), and they are mostly small and underdeveloped economies. Therefore, the number of explanatory variables is limited. A logit model was used to assess what causes a country to participate in the RMB zone.

Methodology and data

I use a logit model to examine what makes a country tie its currency to the RMB, primarily or secondarily. The logit model was chosen instead of the probit model because it fits the data better according to the higher likelihood ratio.

The explanatory variables are:

- Trade (Export and Import) with China per GDP, in natural logs
- Commodity trade with China per GDP, in natural logs
- Export to China per total export
- Import to China per total export
- Stock of FDI position from China
- Debt from China
- Capital Openness Index (Chinn-Ito CA Open index)⁵

Bilateral trade data are obtained from the UN COMTRADE database (the data are taken from 2019 to eliminate the effect of the COVID-19 pandemic⁶). Commodity trade is a dummy variable that takes the value of one when a country is classified as a commodity exporter by the IMF⁷. Commodities are classified using the SITC version 4, following the UNCTAD product groups and composition (primary commodities are defined as SITC 0, 1, 2, 3, 4, and 68)⁸. The FDI position is based on a coordinated investment survey from the IMF⁹. Chinese loan data are taken from Horn et al.’s (2020) database of the

⁵ Chinn-Ito (2006). I use the latest data, which is 2019. https://web.pdx.edu/~ito/Chinn-Ito_website.htm

⁶ The OECD documents that trade plunged in 2020 because of the pandemic and recovered in 2021 albeit not completely.

⁷ Aslam, et al. 2016.

⁸ <https://unstats.un.org/wiki/display/I2CG/A.++Standard+International+Trade+Classification%2C+Revision+4>

⁹ <https://data.imf.org/CDIS>.

complications of 5,000 loans and grants to 512 countries between 1949 and 2017 (the stock of debt as of 2017 is used for this study). The dataset compiled by Horn et al. (2020)¹⁰ is especially noteworthy in that the study uncovered China’s loans that were hidden (from official statistics), using a broad range of existing data sources, historical archives, and existing literature to build a new and more accurate database. They find that the official statistics of Chinese loans grossly overestimates actual loans. Table 5 presents the summary statistics.

Table 5: Summary Statistics

	# of Obs	Mean	St Dev	Min	Max
Log (Commodity Export to China per GDP)	143	-6.211	2.688	-17.100	-0.799
Export to China, % of Total Export	152	0.078	0.129	0.000	0.889
Import to China, % of Total Imports	155	0.137	0.080	0.018	0.457
Trade with China (Export+Import) per GDP	152	-2.963	0.785	-5.687	0.435
Log (Debt per GDP)	149	-5.586	2.369	-13.696	1.124
Log (FDI per GDP)	91	-3.579	1.752	-9.094	-0.886
CA Open	168	0.391	1.584	-1.924	2.322

I use the logit model where y is 1 when a country is classified as “RMB bloc,” using Frankel and Wei’s (1994) approach and zero otherwise, thus:

$$P(y^{(i)} = 1) = \frac{1}{1 + \exp(-(\beta_0 + \beta_1 x_1^{(i)} + \dots + \beta_p x_p^{(p)}))} \quad [5]$$

For the robustness check, I ran the same model using “RMB bloc” as defined by Kawai and Pontines (2016).

Results

Table 6 (a) presents the results of the logit regression using Frankel and Wei’s (1994) approach.

¹⁰ The data is available at: <https://sites.google.com/view/sebastianhorn/data>

Two explanatory variables are significant for all specifications: log of commodity exports per GDP and log of debt per GDP. Debt per GDP has a negative sign, but this can be explained by Chinese loans to emerging economies being exclusively denominated in the USD. Thus, countries peg their currency to the RMB to promote their exports to China (or stabilize their income from commodity exports to China in terms of local currency). Exports to China per total exports, imports from China per total exports, log of trade with China per GDP, and the log of FDI are all insignificant.

Table 6(b) presents the results of the robustness check using Kawai and Pontines' (2016) methodology. Again, despite some differences in RMB zone countries, commodity exports per GDP are significant at the 10% level. The log of debt per GDP is negative, and although it is not significant at the 10% level, the P-values are close to 10% (0.13 – 0.23), showing that there is probably an association between debt per GDP and the choice of currency regime (dollar peg instead of RMB peg, as the debt is denominated in USD).

Appendix III shows “RMB bloc” countries’ (both by Frankel and Wei’s (1994) and Kawai and Pontines’ (2016) methodologies) export partners and products. Aside from Brazil and Norway, China is their main export partner and commodities, especially minerals, are their main export product.

Although we do not have currency invoice data, Boz et al. (2020) point out the RMB’s increasing influence as an invoicing currency, reflecting the increasing presence of China as it promotes RMB invoicing practice in trade. Hence, it is conceivable that the trade between China and these small commodity exporters is denominated in RMB. Therefore, to avoid unwanted fluctuations in commodity import revenue, exporters have an incentive to have their currency co-move with the RMB¹¹.

¹¹ Frankel and Saiki (2002) propose that small commodity exporters should adopt alternative currency regimes, that is, they should peg their currency to the main commodity price.

Table 6(a): RMB bloc determinants (Based on Frankel and Wei, 1994)

Dependent Variable RMB Bloco (1 if a country is 'RMB bloc' country using revised version of Frankel and Wei, 1994)

	[1]	[2]	[3]	[4]	[5]
Log (Commodity Export per GDP)	0.82*			0.64*	1.31*
	(0.49)			(0.37)	(0.72)
Export_to_China per Total Export			1.03		-8.86
			(2.97)		(8.49)
Import from China per Total Import			-0.36		-9.74
			(5.64)		(8.85)
Log(Export and Import with China per GDP)	-0.68		0.48		-0.02
	(1.09)		(0.72)		(1.27)
Log (Debt per GDP)	-0.85**	-0.95***		-0.87**	-0.95***
	(-0.39)	(0.37)		(0.38)	(0.41)
Log(FDI per GDP)	0.14	0.38		-0.01	0.02
	(0.45)	(0.34)		(0.44)	(0.45)
CA Open	-0.73	-0.71		-0.76	-0.71
	(-1.34)	(0.52)		(0.54)	(0.54)
# of Observation	77	88	152	77	77
Pseudo R ²	0.32	0.24	0.02	0.320	0.40
LR Chi2(1)	15.23	11.88	1.41	14.82	18.65
Prob>Chi2	0.0094	0.007	0.7	0.005	0.009

Note: In parenthesis are standard deviations
Constant Term not Reported

***, **, * denote 1%, 5%, and 10% significance levels, respectively.

Table 6(b): Determinants of RMB bloc (Based on Kawai and Pontines, 2016)

	[1]	[2]	[3]	[4]	[5]
Log (Commodity Export per GDP)	1.09*			0.69*	1.49*
	(0.61)			(0.39)	(0.82)
Export_to_China per Total Export			-3.59		-7.13
			(6.08)		(7.86)
Import from China per Total Import			3.46		-9.69
			(3.05)		(9.26)
Log(Export and Import with China per GDP)	-1.34		-0.05		-0.62
	(1.39)		(0.74)		(1.57)
Log (Debt per GDP)	-0.38	-0.56		-0.46	-0.46
	(0.36)	(0.35)		(0.36)	(0.39)
Log(FDI per GDP)	-0.21	0.18		-0.25	-0.24
	(-0.45)	(0.34)		(0.46)	(0.49)
CA Open	-0.69	-0.72		-0.71	-0.65
	(0.56)	(0.58)		(0.57)	(0.57)
# of Observation	77	88	152	77	77
Pseudo R ²	0.25	0.110	0.03	0.220	0.330
LR Chi2(1)	9.27	4.21	1.88	8.2	11.99
Prob>Chi2	0.09	0.24	0.5979	0.08	0.1

***, **, * denote 1%, 5%, and 10% significance levels, respectively.

Conclusion

Unlike the findings in recent literature, this study found that the RMB “bloc” is not emerging in East Asia. Using Frankel and Wei’s (1994) methodology, this study identified 10 “RMB bloc” countries, which are mostly small, underdeveloped countries. Using Kawai and Pontines’ (2016) methodology, seven out of ten countries are classified as RMB zones. South Korea was the only East Asian country that was classified as RMB bloc (using Frankel and Wei’s methodology).

We also tested for the main driver of correlations with the RMB and found that the single most important factor is commodity exports. Indeed, looking at the list of countries, most are developing or underdeveloped commodity exporters. This implies that these countries have strong ties with China in terms of commodity exports, and pegging their currency to the RMB is an attempt to promote or stabilize their income stream from commodity exports.

China has emerged as a powerhouse in trade, but it is far from being a financial powerhouse. The recent mortgage loan fallout highlights the lack of transparency and proper regulatory systems in China’s financial sector. Its financial market is still closed to cross-border flows; thus, there are many obstacles to overcome before the RMB becomes a global currency equivalent to the US dollar and euro.

Bibliography

- Aslam, A., Beidas-Strom, S., Koczan, Z., Celasun O., & Bems. R. (2016). Trading on Their Terms? Commodity Exporters in the Aftermath of the Commodity Boom. *IMF Working Papers 2016/027*.
- Boz, E., & Casas, C., Georgiadis, G., Gopinath, G., Helena, L.M., Mehl., A & Tra. N.(2020). "Patterns in invoicing currency in global trade," Working Paper Series 2456, European Central Bank.
- Tovar, M.C.E., & Nor, M. (2018). Reserve Currency Blocs: A Changing International Monetary System? *IMF Working Papers 2018/020*.
- Chinn, M. D. and Ito, H. (2006). What Matters for Financial Development? Capital Controls, Institutions, and Interactions, *Journal of Development Economics*, Volume 81(1), 163-192.
- Frankel, J., & Saiki, A. (2002). A Proposal to Anchor Monetary Policy by the Price of the Export Commodity. *Journal of Economic Integration*, 17(3), 417–448.
- Frankel, J., and Wei, S. (1994). Yen Bloc or dollar bloc? Exchange rate policies of the East Asian Countries," in Takatoshi Ito and Anne Krueger, ed., *Macroeconomic Linkage: Savings, Exchange Rates, and Capital Flows*, 295-333.
- Financial Times (2022). How the Ukraine war could boost China’s global finance ambitions, March 8, 2022.
- Heller, H. R. (1978). Determinants of Exchange Rate Practices. *Journal of Money, Credit and Banking*, 10(3), 308–321.
- Henning, R.C. (2012). "Choice and coercion in East Asian exchange rate regimes," Working Paper Series WP12-15, Peterson Institute for International Economics.
- Horn, S., Reinhart, C.M., & Trebesch, C. (2021). China's overseas lending, *Journal of International Economics*, vol. 133(C), <https://doi.org/10.1016/j.jinteco.2021.103539>
- Ito, T., Koibuchi, S., Sato, K., and Shimizu, J. (2010). "Why has the yen failed to become a dominant invoicing currency in Asia? A firm-level analysis of Japanese Exporters’ invoicing behavior," NBER Working Paper No. 16231.
- Kawai, M., & Pontines, V. (2016), "Is there really a renminbi bloc in Asia? A modified Frankel-Wei methodology", *Journal of International Money and Finance*, vol. 62, pp. 72-97.
- Meissner, C.M. and Oomes, N. (2006), Why do countries peg the way they peg? the determinants of anchor currency choice. *World Economy & Finance Research Programme Working Paper No. 0009*

Mora, C.E.T., and Nohd, T. 2018. "Reserve Currency Blocs: A Changing International Monetary System?" IMF Working Papers 08/20, IMF.

Mundell, R. A. (1961). "A Theory of Optimum Currency Areas." *The American Economic Review*, 51(4), 657–665.

Appendix I: Regression results for all sample countries (methodology: Frankel and Wei, 1996)

Country	USD		EUR		GBP		JPY		CNY		Adj R	D/W	IMF's AREAR classification
	Coeff	Stdev	Coeff	Stdev	Coeff	Stdev	Coeff	Stdev	Coeff	Stdev			
AFGHANISTAN	1.035392	0.134152	0.093329	0.105521	-0.000506	0.069416	-0.008557	0.076541	-0.147997	0.126966	0.33185	1.598015	Managed Floating
ALBANIA	0.216028	0.05065	0.86851	0.03984	-0.0785	0.026208	-0.043415	0.028899	0.043065	0.047937	0.729421	2.390152	Inflation Targeting
ALGERIA	0.751289	0.021505	0.28812	0.016915	0.011144	0.011128	-0.034891	0.012127	-2.69E-02	2.04E-02	0.944217	2.055291	Basket to range of countries
Andora	0.002306	0.003062	0.996081	0.002409	0.000876	0.001584	-0.004581	0.001747	0.002642	0.002898	0.998553	2.978847	Euroized
ANGOLA	0.904273	0.12593	0.124066	0.099053	-0.092839	0.065161	0.016281	0.07185	2.28E-02	1.19E-01	0.367847	1.855664	
ANGUILLA	1.058992	0.029786	-0.000397	0.023429	-0.038072	0.015412	-3.01E-05	0.016994	-0.044473	0.02819	0.91744	2.900299	
ARGENTINA	0.943993	0.145514	0.171414	0.114457	-0.032279	0.075295	-0.138769	0.083023	-0.013892	0.137719	0.275282	1.597127	
ARMENIA	1.057112	0.041436	-0.023766	0.032593	0.001403	0.021441	-0.0489	0.023642	-0.003762	0.039217	0.85045	1.746002	
ARUBA	1	1.87E-15	-3.16E-16	1.47E-15	5.33E-16	9.70E-16	-4.11E-16	1.07E-15	-2.63E-15	1.77E-15	1	2.623191	Dollar Peg
AUSTRALIA	-0.040154	0.046924	0.096052	0.036909	0.160451	0.02428	-0.114886	0.026773	0.139603	0.04441	0.135832	1.840038	
AZERBAIJAN	1.0388	0.020282	0.006845	0.015954	0.00181	0.010495	-0.017846	0.011572	-0.022608	0.019196	0.960355	2.856814	
BAHAMAS (THE)	0.996253	0.004818	-0.004589	0.003789	-0.00092	0.002493	0.003385	0.002749	0.004905	0.004559	0.997631	3.051684	Dollar Peg
BAHRAIN	0.997656	0.002365	0.000519	0.00186	-0.001319	0.001224	-0.000202	0.001349	0.001638	0.002238	0.999427	1.702275	Dollar Peg
BANGLADESH	1.001088	0.014534	-0.005679	0.011432	-0.002983	0.007521	-0.008141	0.008293	0.004243	0.013756	0.978555	2.651211	
BARBADOS	1.007138	0.046867	0.037821	0.036864	-0.001514	0.024251	-0.052365	0.02674	0.02367	0.044357	0.81846	2.92074	Dollar Peg
Belarus	0.67578	0.080877	0.10392	0.063616	0.046731	0.041849	-0.23639	0.046145	0.283527	0.076545	0.504478	1.719456	
Belgium	0.002284	0.003062	0.99607	0.002409	0.000872	0.001585	-0.004575	0.001747	2.68E-03	2.90E-03	0.998553	2.978847	Euro
BEZILE	1	4.89E-17	-1.77E-16	3.84E-17	-6.12E-17	2.53E-17	-3.49E-16	2.79E-17	-8.77E-16	4.63E-17	1	2.086153	Euro Peg Euro peg
BENIN	0.18752	0.052958	0.690055	0.041656	0.025822	0.027403	0.027897	0.030216	0.072127	0.050122	0.694797	2.411407	Dollar Peg
BERMUDA	1	4.89E-17	-1.77E-16	3.84E-17	-6.12E-17	2.53E-17	-3.49E-16	2.79E-17	-8.77E-16	4.63E-17	1	2.086153	
BHUTAN	0.626798	0.051262	0.016069	0.040321	0.074528	0.026525	-0.079158	0.029248	0.323598	0.048516	0.747142	1.970059	
BHUTAN	0.623712	0.050765	0.008537	0.03993	0.081907	0.026268	-0.07227	0.028964	0.318618	0.048045	0.74948	1.974677	
BOLIVIA (PLURINATIONAL STATE OF)	1.014526	0.020508	0.011718	0.016131	-0.00307	0.010612	-4.53E-03	0.0117E-02	-0.015957	0.019409	0.958981	2.718312	
BOSNIA AND HERZEGOVINA	0.837831	0.059999	0.090448	0.047194	0.103234	0.031046	0.009599	0.034233	-0.047955	0.056785	0.692801	2.117706	
BOTSWANA	1.63768	0.083206	-0.21826	0.065448	-0.066124	0.043054	0.162935	0.047473	-0.356437	0.078749	0.710463	2.557717	
Norway	-0.276316	0.086185	0.603642	0.067791	0.23797	0.044595	-0.48177	0.049173	2.73E-01	8.16E-02	0.191119	2.038608	
BRAZIL	0.318062	0.165888	0.119887	0.130483	0.037247	0.085837	-0.200616	0.094648	0.143226	0.157002	0.045873	2.253808	Inflation Targeting
BRUNEI DARUSSALAM	0.48796	0.031242	0.051632	0.024574	0.088425	0.016166	-0.010972	0.017825	0.270994	0.029569	0.862753	2.528614	
BULGARIA	-9.14E-05	0.013281	0.971105	0.010447	0.004466	0.006872	0.011076	0.007578	0.028096	0.01257	0.974077	2.93192	
BURUNDI	0.948595	0.046822	0.010081	0.036829	0.003189	0.024227	-0.021971	0.026714	0.054879	0.044314	0.812056	2.857738	
CABO VERDE	0.280053	0.061897	0.636879	0.048687	-0.002264	0.032028	0.082625	0.035316	0.000967	0.058582	0.636283	2.529942	Euro Peg
CAMBODIA	0.971417	0.034319	-0.01625	0.026994	-0.029792	0.017758	0.00576	0.019581	0.063004	0.032481	0.893765	2.574466	Dollar Crawl-Like Arrangement
CAMEROON	0.034673	0.085609	0.90402	0.067338	0.028264	0.044298	-0.026662	0.048845	0.077895	0.081023	0.465561	2.651521	
CANADA	0.513478	0.052822	0.130846	0.041548	0.163649	0.027332	-0.26494	0.030138	0.11313	0.049992	0.540331	2.032175	
CAYMAN ISLANDS (THE)	1	1.75E-15	5.65E-16	1.38E-15	-7.06E-16	9.08E-16	-3.49E-16	1.00E-15	-8.77E-16	1.66E-15	1	2.523886	
CHILE	0.249593	0.115098	0.14221	0.090533	0.035587	0.095556	-0.418342	0.065669	0.587549	0.108932	0.21812	1.9006	Inflation Targeting
COLOMBIA	0.367	0.112816	0.018827	0.088738	-0.116839	0.058375	-0.436218	0.064368	0.580083	0.106773	0.258448	1.776378	Inflation Targeting
COMOROS (THE)	0.237188	0.039365	0.779711	0.030964	0.011991	0.020369	-0.093581	0.02246	6.41E-02	3.73E-02	0.80375	2.685063	Euro Peg
CONGO (THE DEMOCRATIC REPUBLIC OF THE)	0.986864	0.048279	0.012533	0.037975	0.011667	0.024982	-0.007393	0.027546	-0.041792	0.045693	0.793546	2.050545	
COSTA RICA	1.021552	0.049355	0.022187	0.038821	-0.004663	0.025538	-0.017715	0.02816	0.003387	0.046711	0.806981	2.180752	Inflation Targeting
CROATIA	-0.03224	0.016147	0.987452	0.012701	0.003431	0.008355	-0.0145	0.009213	0.039557	0.015282	0.959785	2.120811	Euro Peg
CUBA	0.976154	1.91447	0.198542	1.50872	0.037028	0.990622	-0.178559	1.092307	0.111969	1.811919	-0.003341	2.002128	
CURACAEO	1.120206	0.063387	0.008766	0.049858	-0.067815	0.032799	-0.011056	0.036166	-0.082032	0.059991	0.715684	2.202125	Dollar peg
CZECH REPUBLIC (THE)	-0.238134	0.053728	0.929813	0.042261	-0.150746	0.027801	-0.116764	0.030655	1.34E-01	5.09E-02	0.599086	2.206196	
DENMARK	-0.002713	0.002868	0.998357	0.002256	-0.000864	0.001484	0.003938	0.001637	-0.001801	0.002715	0.998734	2.447044	Dollar Currency Board
DJIBOUTI	0.993965	0.007322	0.005313	0.005759	-0.004146	0.003789	-0.00462	0.004178	0.010378	0.006693	0.99455	2.910516	Dollar Currency Board
DOMINICAN REPUBLIC (THE)	0.919332	0.072183	0.036768	0.056777	-0.016184	0.03735	0.028734	0.041184	0.099747	0.068316	0.671348	2.791754	
Dutch	0.001774	0.003068	0.995948	0.002413	0.001129	0.001587	-0.004291	0.00175	0.002963	0.002904	0.998548	2.981174	Euro
Ecuador	1	1.92E-15	-6.00E-16	1.51E-15	-9.81E-16	9.93E-16	6.23E-17	1.09E-15	1.75E-15	1.82E-15	1	2.614662	Dollarized
EGYPT	1.035918	0.020201	0.002823	0.015889	-0.001006	0.010453	-0.015992	0.011526	-0.011539	0.019119	0.960983	1.708078	
EL SALVADOR	1	1.83E-15	1.41E-15	1.44E-15	-1.54E-16	9.48E-16	-1.56E-15	1.05E-15	8.77E-16	1.73E-15	1	2.526893	Dollarized
ENTREA	1	2.02E-15	5.82E-16	1.59E-15	-6.81E-16	1.04E-15	1.21E-15	1.15E-15	-1.75E-15	1.91E-15	1	2.595189	
Estonia	0.002344	0.003065	0.996006	0.002411	0.000891	0.001586	-0.00458	0.001749	0.002643	0.002901	0.99855	2.979229	Euro
ETHIOPIA	1.016995	0.079518	0.012949	0.062547	-0.081269	0.041146	0.030776	0.045369	-0.002193	0.075258	0.61313	2.738279	
FALKLAND ISLANDS (THE) [MALVINAS]	2	3.34E-15	-6.36E-16	2.63E-15	-1	1.73E-15	-1.58E-15	1.91E-15	-8.77E-15	3.16E-15	1	2.564715	
FUJI	1.442467	0.051828	-0.010584	0.040767	-0.065158	0.026818	-0.00611	0.029571	-0.082458	0.049052	0.865985	2.698437	
Finland	0.002561	0.003068	0.996029	0.002413	0.00099	0.001588	-0.00468	0.001751	0.00242	0.002904	0.998547	2.975748	Euro
French	0.002245	0.003052	0.996005	0.0024	0.000966	0.001579	-0.004527	0.001741	0.002705	0.002888	0.998563	2.981987	Euro
FRENCH POLYNESIA	0.699996	0.058598	0.233574	0.046091	0.057705	0.030321	0.022915	0.033433	-0.0131	0.055459	0.692739	2.321075	
GAMBIA (THE)	0.965199	0.046933	-0.021915	0.036917	-0.034482	0.024285	0.020181	0.026778	0.044354	0.044419	0.813287	2.498568	
GEORGIA	0.895017	0.09272	-0.01133	0.072932	0.114616	0.047977	0.057353	0.052902	-0.015987	0.087754	0.519281	1.469416	Inflation Targeting
Germany	0.002062	0.003073	0.996387	0.002417	0.000545	0.00159	-0.004515	0.001754	0.002826	0.002909	0.998542	2.989052	Euro
GHANA	0.86394	0.078025	-0.064045	0.061373	-0.010878	0.040373	0.084618	0.044518	0.142469	0.073846	0.621796	2.418825	
GIBRALTAR	2	3.34E-15	-6.36E-16	2.63E-15	-1	1.73E-15	-1.58E-15	1.91E-15	-8.77E-15	3.16E-15	1	2.564715	
Greece	0.002316	0.003063	0.996081	0.									

Country	USD		EUR		GBP		JPY		CNY		Adj R	D/W	AREAR
	Coeff	Stdev	Coeff	Stdev	Coeff	Stdev	Coeff	Stdev	Coeff	Stdev			
JORDAN	1	1.74E-15	-1.24E-15	1.37E-15	-4.34E-17	9.01E-16	-9.53E-16	9.94E-16	0	1.65E-15	1	2.45371	Dollar Peg
KAZAKHSTAN	0.751452	0.07081	-0.031902	0.055697	0.104736	0.03664	-0.064342	0.040401	0.165737	0.067017	0.596345	1.865951	
KENYA	0.952916	0.03179	0.044224	0.025005	-0.002269	0.016449	0.03209	0.018138	-0.035768	0.030087	0.902091	1.813213	
KOREA (THE REPUBLIC OF)	0.411035	0.072401	0.062538	0.056949	0.078449	0.037463	-0.06552	0.041309	0.494607	0.068523	0.588496	2.464567	
KUWAIT	0.97997	0.010166	0.002124	0.007996	0.010073	0.00526	0.004124	0.0058	0.001463	0.009621	0.989336	2.184214	
KYRGYZSTAN	1.027378	0.134208	0.177844	0.105565	-0.135393	0.069445	-0.053502	0.076573	0.009415	0.127019	0.370866	2.556245	
LAO PEOPLE'S DEMOCRATIC REPUBLIC (THE)	1.004754	0.033017	-0.011691	0.02597	0.001634	0.017084	-0.005937	0.018838	-0.009506	0.031248	0.896874	2.492551	
Latvian	0.002425	0.003059	0.996189	0.002406	0.000875	0.001583	-0.004634	0.001745	0.002501	0.002895	0.998556	2.974454	Euro
LEBANON	0.931535	0.051548	0.048183	0.040546	0.009657	0.026673	0.02942	0.029411	-0.041553	0.048786	0.770311	2.896867	Dollar Stabilized Arrangement
LESOTHO	-0.079398	0.128854	0.17106	0.101353	0.085688	0.066674	-0.345741	0.073518	0.450785	0.121952	0.055943	1.995313	Dollar Craw-Like Arrangement
LIBERIA	0.837718	0.433166	0.304884	0.340717	-0.025884	0.224137	-0.01896	0.247144	-0.110444	0.409963	0.036218	2.020513	
LIBYA	1.305078	0.722948	0.091628	0.568652	0.208203	0.374082	-0.202008	0.41248	0.179807	0.684223	0.032092	2.007697	
LIECHTENSTEIN	0.013062	0.03639	0.735525	0.028623	-0.003715	0.018829	0.240403	0.020762	0.029223	0.03444	0.84152	2.088112	
Lithuania	0.002032	0.003074	0.996543	0.002418	0.000855	0.001591	-0.004531	0.001754	0.002718	0.00291	0.998542	2.981453	Euro
Luxembourg	0.002284	0.003062	0.99607	0.002409	0.000872	0.001585	-0.004575	0.001747	0.002676	0.002898	0.998553	2.978278	Euro
MACAO	0.973308	0.008854	0.005407	0.006964	-0.000779	0.004581	0.006754	0.005052	0.011949	0.00838	0.991918	2.388343	
MADAGASCAR	1.003074	0.109724	-0.053372	0.086306	0.039766	0.056776	-0.010909	0.062604	-0.083839	0.103847	0.398753	2.473649	
MALAWI	1.027083	0.043744	-0.001871	0.034408	-0.038415	0.022635	-0.003608	0.024958	0.005285	0.0414	0.839069	2.598437	
MALAYSIA	0.57961	0.038828	0.037767	0.030541	0.066298	0.020091	-0.041604	0.022153	0.339403	0.036748	0.839708	1.969671	
MALDIVES	0.983353	0.049296	0.001922	0.038775	-0.027129	0.025508	-0.004847	0.028126	0.005241	0.046655	0.791818	2.604579	Dollar Stabilized Arrangement
MAURITANIA	1.005663	0.042863	0.033289	0.033715	-0.004391	0.022179	0.023854	0.024456	-0.058087	0.040567	0.840357	2.509448	
MAURITIUS	0.744466	0.093143	0.101871	0.073264	0.03854	0.048196	0.023266	0.053143	0.134705	0.088154	0.509816	2.70716	
MEXICO	0.158638	0.120584	0.053102	0.094848	0.269135	0.062395	-0.29761	0.0688	0.293716	0.114125	0.103605	1.91752	
MOLDOVA (THE REPUBLIC OF)	0.926423	0.050243	0.027243	0.03952	-0.011017	0.025998	-0.006032	0.028666	0.016746	0.047552	0.776404	1.437055	
MONGOLIA	0.98763	0.034762	0.079671	0.027343	-0.005402	0.017987	-0.017811	0.019833	-0.020135	0.0329	0.890571	2.466213	
MOROCCO	0.415483	0.028077	0.614459	0.022084	-0.024408	0.014528	-0.020784	0.016019	0.010954	0.026573	0.897254	1.786105	
MOZAMBIQUE	0.9843	0.093316	0.022422	0.0734	-0.01057	0.048285	0.022812	0.053241	-0.055364	0.088317	0.509952	1.98754	
MYANMAR	0.905083	0.116092	-0.013971	0.091315	0.01884	0.060071	-0.097522	0.066237	0.104701	0.109874	0.376203	2.157208	
NAMIBIA	-0.079398	0.128854	0.17106	0.101353	0.085688	0.066674	-0.345741	0.073518	0.450785	0.121952	0.055943	1.995313	
NEPAL	0.934572	0.05197	-0.008995	0.040878	0.011028	0.026891	-0.018082	0.029652	0.047601	0.049186	0.688892	2.024578	
NICARAGUA	1.047207	0.061626	0.042032	0.048473	-0.017627	0.031888	-0.026327	0.03161	-0.007177	0.058325	0.734444	2.880385	Dollar Crawling Peg
NIGERIA	0.868815	0.106081	0.07182	0.08344	-0.081338	0.05489	0.004388	0.060525	0.109739	0.100398	0.451578	2.604976	
Offshore RMB	0.128483	0.027821	0.060668	0.021883	-0.021928	0.014395	-0.052443	0.015873	0.774111	0.02633	0.90097	2.878067	
OMAN	1.002648	0.004487	0.00481	0.00353	-0.003653	0.002322	-0.003978	0.00256	-0.001485	0.004247	0.997942	2.582306	Dollar Peg
PAKISTAN	1.029431	0.071661	0.039691	0.056367	-0.057778	0.03708	0.007848	0.040887	-0.038842	0.067823	0.656169	1.842751	
PANAMA	1	4.89E-17	-1.77E-16	3.84E-17	-6.12E-17	2.53E-17	-3.49E-16	2.79E-17	-8.77E-16	4.63E-17	1	2.086153	Dollarized
PAPUA NEW GUINEA	1.019195	0.061569	0.083536	0.048428	0.050241	0.031858	-0.091169	0.035128	-0.004128	0.058271	0.726587	2.668374	
PARAGUAY	1.063085	0.059754	-0.019662	0.047001	-0.013523	0.030919	-0.022868	0.034093	-0.02779	0.056553	0.733033	1.89371	
PERU	0.716347	0.072546	-0.059481	0.057063	0.053412	0.037538	-0.122452	0.041391	0.275262	0.06866	0.571305	1.895087	
PHILIPPINES (THE)	0.766558	0.043393	0.000674	0.034132	0.047214	0.022453	-0.025868	0.024758	0.222896	0.041069	0.827281	1.707365	
POLAND	-0.265975	0.051565	1.042959	0.04056	0.091168	0.026682	-0.091284	0.029421	0.098002	0.048803	0.644197	2.047563	
Portuguese	0.002274	0.003061	0.996112	0.002408	0.000847	0.001584	-0.004615	0.001746	0.002686	0.002897	0.998554	2.977286	Euro
QATAR	0.999042	0.000889	-0.000884	0.000699	-6.51E-05	0.00046	0.000349	0.000507	0.001154	0.000842	0.999919	2.477665	Dollar Peg
REPUBLIC OF NORTH MACEDONIA	0.105011	0.035263	0.816584	0.027737	-0.010232	0.018247	-0.043156	0.02012	0.14003	0.033374	0.837925	2.757441	
ROMANIA	-0.017667	0.016334	0.969681	0.012848	0.010247	0.008452	-6.89E-05	0.009319	0.016087	0.015459	0.958506	1.9268	
RUSSIAN FEDERATION (THE)	0.330349	0.111536	0.001251	0.087731	0.12206	0.057713	-0.283045	0.063637	0.3301	0.105561	0.157299	2.093761	
Rwanda	0.855837	0.091554	-0.019931	0.072003	-0.07727	0.047366	0.173242	0.052228	-0.057708	0.086637	0.491105	2.8322	
SAINT HELENA, ASCENSION AND TRISTAN DA CU	2	3.34E-15	-4.77E-16	2.63E-15	-1	1.73E-15	-1.52E-15	1.90E-15	-7.02E-15	3.16E-15	1	2.570455	
SAMOA	1.084274	0.105031	-0.006182	0.082615	-0.119293	0.054347	-0.026311	0.059926	0.045183	0.099405	0.49198	2.587084	Euro Peg
SAO TOME AND PRINCIPE	0.535032	0.090109	0.319533	0.078077	0.047638	0.046626	0.052323	0.051412	0.086565	0.085282	0.48995	2.625353	
SAUDI ARABIA	1.00037	0.003447	-0.008054	0.002712	0.006069	0.001784	-0.004639	0.001967	0.003832	0.003263	0.998779	2.434993	Dollar Peg
SADR	1.37921	0.026461	-0.111416	0.020814	-0.058603	0.013692	-0.027966	0.015097	-0.204499	0.025044	0.94351	2.590175	
SERBIA	0.03082	0.021039	0.944394	0.016549	-0.003482	0.010887	-0.005837	0.012004	0.048801	0.019912	0.937156	2.667482	
SEYCHELLES	0.927825	0.331592	-0.051114	0.260822	-0.126163	0.171579	0.193003	0.189191	-0.080476	0.31383	0.067909	2.605195	
Shilling	0.002383	0.003062	0.996077	0.002408	0.000857	0.001584	-0.004606	0.001747	0.002603	0.002898	0.998553	2.979602	Euro
SIERRA LEONE	1.027411	0.064557	-0.006063	0.050779	-0.046369	0.033404	-0.012005	0.036833	3.90E-03	6.11E-02	0.70073	2.260722	
SINGAPORE	0.356918	0.023109	0.126873	0.018177	0.092305	0.011957	-0.010046	0.013185	0.27743	0.021871	0.905175	2.269418	
Slovenian	0.002307	0.003062	0.996081	0.002409	0.000875	0.001585	-0.004579	0.001747	0.002638	0.002898	0.998553	2.978754	Euro
SOLOMON ISLANDS	1.040903	0.119818	-0.02191	0.094246	0.008179	0.061999	0.018531	0.068363	-0.025372	0.1134	0.430493	2.745673	
SOMALIA	1.011336	0.111754	-0.015557	0.009246	0.0015	0.006082	-0.002564	0.006707	-4.56E-03	1.11E-02	0.985959	2.915433	
South Africa and Lesotho	-0.079398	0.128854	0.17106	0.101353	0.085688	0.066674	-0.345741	0.073518	0.450785	0.121952	0.055943	1.995313	
Spain	0.002306	0.003062	0.996081	0.002409	0.000876	0.001584	-0.004581	0.001747	0.002643	0.002903	0.998553	2.978847	Euro
SRI LANKA	0.908556	0.05539	-0.023988	0.043568	0.061276	0.028661	0.054805	0.031603	0.008403	0.052423	0.751494	1.765365	
SUDAN (THE)	0.356918	0.023109	0.126873	0.018177	0.092305	0.011957	-0.010046	0.013185	2.77E-01	2.19E-02	0.905175	2.269418	
SURINAM	0.579639	0.283275	-0.086914	0.222817	-0.161092	0.146							

Appendix II: Regression results for all sample countries (methodology: Kawai and Pontines, 2016)

Country Name	USD		EUR		GBP		JPY		CNY		Adj R	D/W	IMF's AREAER classification
	Coeff	Stdev	Coeff	Stdev	Coeff	Stdev	Coeff	Stdev	Coeff	Stdev			
ANDORA	0.0045	0.001892	0.9962	0.002404	0.000994	0.001579	-0.004675	0.001744	0.002965	0.001502	0.998553	2.97995	Euroized
UNITED ARAB EMIRATES	1.000069	0.000137	0.00028	0.000174	-0.000124	0.000114	-0.000134	0.000126	-9.21E-05	0.000109	0.999995	2.310038	
AFGHANISTAN	0.91245	0.08292	0.08574	0.105344	-0.007123	0.069199	-0.003306	0.076426	0.012237	0.065807	0.331542	1.597899	Managed Floating
ALBANIA	0.251802	0.031296	0.87072	0.039759	-0.076575	0.026117	-0.044942	0.028845	-0.001003	0.024837	0.729489	2.385864	Inflation Targeting
ARMENIA	1.053986	0.02559	-0.02396	0.03251	0.001235	0.021355	-0.048766	0.023586	0.017504	0.020308	0.85064	1.746004	
CURACAO	1.052062	0.039193	0.00456	0.049791	-0.071482	0.032707	-0.008145	0.036123	0.023004	0.031104	0.715366	2.203305	
ANGOLA	0.923211	0.077772	0.12558	0.098803	-0.09182	0.064903	0.015472	0.071681	0.027562	0.061721	0.36863	1.855283	
ARGENTINA	0.932453	0.089865	0.17070	0.114167	-0.0329	0.074995	-0.138276	8.28E-02	0.068022	0.071318	0.276204	1.597067	
SHILLING	0.004545	0.001892	0.99621	0.002404	0.000973	0.001579	-0.004699	0.001744	0.00297	0.001501	0.998553	0.998553	Euro
AUSTRALIA	0.075816	0.029162	0.10321	3.70E-02	0.166692	0.024337	-0.119839	0.026878	0.774123	0.023144	0.125967	1.840851	
ARUBA	1	1.16E-15	0.00000	1.47E-15	4.15E-16	9.67E-16	-3.18E-16	1.07E-15	1.31E-16	9.20E-16	1	2.632382	Dollar Peg
AZERBAIJAN	1.02	1.25E-02	0.00569	1.59E-02	7.99E-04	1.05E-02	-0.017044	0.011555	-0.009459	0.00995	0.960335	2.859358	
BOSNIA AND HERZEGOVINA	0.797995	0.037070	0.08799	4.71E-02	0.10109	0.030936	0.011301	0.034167	0.001624	0.02994	0.692914	2.11987	
BARBADOS	1.026801	0.028949	0.03903	0.036777	-0.000456	0.024159	-5.32E-02	0.026682	-0.012175	0.022942	0.818627	2.920489	Dollar Peg
BANGLADESH	1.004612	0.008976	-0.00546	0.011404	-2.79E-03	0.007491	-0.008292	0.008273	0.011934	0.007124	0.97858	2.652346	
BELGIUM	0.004507	0.001892	0.99621	0.00240	0.000992	0.001579	-0.00467	0.001744	0.002964	0.001502	0.998553	2.979395	Euro
BULGARIA	0.023248	0.008228	0.97255	0.010454	0.005916	0.006897	0.010079	7.58E-03	-0.011789	0.00563	0.973944	2.929874	
BAHRAIN	0.999018	0.001461	0.00060	0.001856	-0.001246	1.22E-03	-0.000261	0.001347	0.001887	0.00116	0.999427	1.701313	Dollar Peg
BURUNDI	0.994184	0.028944	0.01290	3.68E-02	0.005642	0.024155	-0.023918	0.026677	0.011198	0.022971	0.811927	2.857724	
BERMUDA	1.000000	0.000000	0.00000	3.09E-17	-1.00E-16	2.03E-17	-3.18E-16	2.24E-17	-2.61E-17	1.93E-17	1	2.025996	
BRUNEI DARUSSALAM	0.713076	0.020310	0.06552	2.58E-02	1.01E-01	1.70E-02	-0.020587	0.01872	0.141447	0.016119	0.848112	2.273214	
BOLIVIA	1.001270	0.012670	0.01090	1.61E-02	-0.003784	0.010574	-0.003961	0.011678	-0.004425	0.010055	0.958998	2.721454	
BRAZIL	0.437041	0.102502	0.12723	0.130221	0.04365	0.08554	-0.205697	0.094474	0.597777	0.081347	0.046079	2.249189	Inflation Targeting
THE BAHAMAS	1.000327	0.002977	-0.00434	0.003783	-0.000701	0.002485	0.003211	0.002744	0.0015	0.002363	0.997631	3.049033	
BHUTAN	0.895613	0.032551	0.03266	0.041354	0.088995	0.027165	-0.090639	3.00E-02	0.073373	0.025833	0.733008	2.048659	
BOTSWANA	1.341586	0.052058	-0.23653	0.066136	-0.08206	4.34E-02	0.175581	0.047981	-0.198575	0.041514	0.70321	2.447316	
BELARUS	0.911308	0.050386	0.11846	6.40E-02	0.057307	0.042049	-0.246449	0.04644	0.159379	0.039987	0.496376	1.718999	
BELIZE	1.000000	0.000000	0.00000	3.09E-17	-1.00E-16	2.03E-17	-3.18E-16	2.24E-17	-2.61E-17	1.93E-17	1	2.025996	Euro Peg
CANADA	0.607456	0.032728	0.13665	4.16E-02	1.69E-01	2.73E-02	-0.268954	0.030165	0.356146	0.025974	0.537896	2.033074	
THE DEM REP OF CONGO	0.952146	0.029832	0.01039	3.79E-02	0.009798	0.024895	-0.00591	0.027495	0.033575	0.023675	0.793589	2.005775	
LIECHTENSTEIN	0.037338	0.022483	0.73702	0.028563	-0.002408	0.018763	0.239366	0.020722	-0.011319	0.017843	0.841577	2.091199	
CHILE	0.737673	0.072399	0.17233	0.091977	0.061855	0.060419	-0.439187	0.066729	0.467329	0.057457	0.189887	1.906157	Inflation Targeting
COLOMBIA	0.848877	0.070982	0.04856	0.090178	0.142773	0.059237	-0.456799	0.065423	0.416584	0.056333	0.231268	1.788745	Inflation Targeting
COSTA RICA	1.024366	0.030480	0.02236	0.038723	-0.004511	0.025436	-0.017835	0.028093	-0.02438	0.02419	0.807228	2.180458	Inflation Targeting
CUBA	1.069167	1.182313	0.20428	1.502042	0.042034	0.986672	-0.182532	1.089715	-0.132951	0.938306	-0.002056	2.002846	
CABO VERDE	0.280857	0.038226	0.63693	0.048563	-0.002221	0.0319	0.08259	0.035232	0.001845	0.030337	0.636751	2.529989	Euro Peg
CZECH REPUBLIC	-0.127212	0.033327	0.93666	0.04234	0.156715	0.027813	-0.121502	0.030717	0.15534	0.026449	0.596048	2.233467	
GERMANY	0.004410	0.001899	0.99653	0.002413	0.000671	0.001585	-0.004616	0.00175	0.003002	0.001507	0.998542	2.990616	Euro
DJIBOUTI	1.002587	0.004528	0.00585	0.005753	-0.003682	0.003779	-0.004988	0.004174	0.000238	0.003594	0.994541	2.911051	Dollar Currency Board
DENMARK	-0.004209	0.001772	0.99827	0.002251	-0.000944	0.001479	0.004002	1.63E-03	0.002886	0.001406	0.998735	2.445855	Dollar Currency Board
DOMINICAN REPUBLIC	1.002192	0.044639	0.04188	0.05671	-0.011725	3.73E-02	0.025195	0.041143	-0.057544	0.035426	0.67087	2.787549	
ALGERIA	0.728920	0.013296	0.28674	1.69E-02	0.00994	0.011096	-0.033936	0.012254	0.008336	0.010552	0.944164	2.057718	Basket to range of countries
EQUADOR	1.000000	0.000000	0.00000	1.51E-15	-9.03E-16	9.89E-16	0	1.09E-15	5.24E-16	9.41E-16	1	2.617922	Dollarized
ESTONIA	0.004539	0.001894	0.99614	2.41E-03	0.001009	1.58E-03	-0.004674	0.001746	0.002984	0.001503	0.99855	2.980334	Euro
EGYPT	1.026333	0.012478	0.00223	1.59E-02	-0.001522	0.010413	-0.015582	0.011501	-0.01146	0.009903	0.961015	1.712535	
ERITREA	1.000000	0.000000	0.00000	1.58E-15	-8.59E-16	1.04E-15	9.53E-16	1.15E-15	5.76E-17	9.89E-16	1	2.599044	
SPAIN	0.004500	0.001892	0.99622	2.40E-03	9.94E-04	1.58E-03	-0.004675	0.001744	0.002965	0.001502	0.998553	2.97995	Euro
ETHIOPIA	1.015173	0.049107	0.01284	6.24E-02	-0.081367	0.040982	0.030854	4.53E-02	0.022504	0.038973	0.613627	2.738266	
FINLAND	0.004571	0.001896	0.99615	0.002408	0.001098	0.001998	0.004766	0.001747	0.002943	0.001504	0.998547	2.976744	Euro
FUJI	1.373968	0.032066	-0.01481	4.07E-02	-0.068845	0.02676	-0.003184	0.029554	-0.287128	0.025448	0.86567	2.69844	
FALKLAND ISLANDS	2.000000	0.000000	0.00000	2.62E-15	-1	1.72E-15	-1.27E-15	1.90E-15	-7.27E-16	1.64E-15	1	2.580861	
FRENCH	0.004492	0.001886	0.99614	2.40E-03	1.09E-03	1.57E-03	-0.004623	1.74E-03	0.0029	0.001497	0.998563	2.983104	Euro
GEORGIA	0.881737	0.057262	-0.01215	7.27E-02	0.113901	4.78E-02	0.05792	0.052777	-0.041408	0.045444	0.519878	1.469083	Inflation Targeting
GHANA	0.982296	0.048301	-0.05674	6.14E-02	-0.004508	0.040309	0.079564	0.044518	-0.00061	0.038333	0.620473	2.424638	
GIBRALTAR	2.000000	0.000000	0.00000	2.62E-15	-1	1.72E-15	-1.27E-15	1.90E-15	-9.49E-16	1.64E-15	1	2.581763	
GAMBIA	1.002045	0.029003	-0.01964	3.68E-02	-3.25E-02	2.42E-02	1.86E-02	2.67E-02	0.031489	0.023017	0.813288	2.500862	
GUINEA	0.976666	0.035586	0.07739	4.52E-02	3.04E-02	2.97E-02	-0.042874	0.032799	-0.041543	0.028242	0.747719	2.804727	Dollar Stabilized Arrangement
GREECE	0.004502	0.001892	0.99622	2.40E-03	0.000993	0.001579	-0.004672	0.001744	0.002961	0.001502	0.998553	2.979862	Euro
GUATEMALA	0.980591	0.013937	-0.02283	0.017706	0.022971	0.011631	0.018356	0.012846	0.000916	0.011061	0.94976	2.019121	
GUYANA	0.954823	0.043866	0.05513	0.055728	-0.022009	0.036607	-0.054561	0.04043	0.066618	0.034813	0.628296	2.89339	
HONG KONG	0.990776	0.003862	0.00402	0.004907	0.002275	0.003223	-0.004411	0.00356	0.007343	0.003065	0.995944	1.88267	Dollar Currency Board
HONDURAS	0.985382	0.019546	0.02871	0.024832	-0.013551	0.016312	-0.01157	0.018015	0.011028	0.015512	0.905004	2.99895	Dollar Crawling Peg
CROATIA	0.000620	0.010015	0.98948	0.012723	0.0052	0.008358	-0.015903	0.00923	0.020603	0.007948	0.95949	2.128865	Euro Peg
HAITI	1.156732	0.126938	0.09296	0.161265	0.073938	0.105933	-0.187909	0.116996	-0.135715	0.10074	0.215249	2.369927	
HUNGARY	-0.267803	0.037665	1.14183	0.04785	0.124303	0.031432	-0.084358	0.034715	0.08603	0.029892	0.595401	1.85471	
INDONESIA	0.767658	0.043396	0.16004	0.055132	0.136926	0.036215	-0.098309	0.039998	0.033684	0.03444	0.592038	1.841021	Inflation Targeting
IRELAND	1.995174	0.001917	-0.99648	0.002435	-0.000709	0.0016	0.004829	0.001767	-0.002813	0.001521	0.998553	2.987567	Euro
ISRAEL	0.761787	0.041883	0.11874	0.05321	0.041885	0.034953	-0.110496	0.038603	0.188086	0.033239	0.556499	1.89187	Euro
BHUTAN	0.888390	0.032225	0.02487	0.04094	0.061552	0.026893	-0.083574	0.029702	0.074162	0.025575	0.73564	2.050242	
IRAQ	1.056915	0.076091	0.06623	0.096668	-0.108925	0.0635	0.007361	0.070132	-0.021581	0.060387	0.417857	2.009925	Dollar Peg
IRAN	0.984831	0.063213	-0.04385	0.080307	0.005602								

	USD	EUR	GBP	JPY	CNY								
JORDAN	1.000000	0.000000	0.00000	1.37E-15	-4.34E-17	8.97E-16	-9.53E-16	9.91E-16	1.14E-17	8.54E-16	1	2.45371	Dollar Peg
KENYA	0.923204	0.019650	0.04239	2.50E-02	-3.87E-03	1.64E-02	0.033359	0.018111	0.004915	0.015595	0.902039	1.80669	
KYRGYZSTAN	1.035199	0.082883	0.17833	1.05E-01	-0.134972	0.069168	-0.053836	0.076391	-0.024717	0.065777	0.37167	2.556083	
CAMBODIA	1.023755	0.021245	-0.1302	0.026993	-0.026976	0.01773	0.003525	0.019582	0.012716	0.016861	0.893388	2.581607	Dollar Crawl-Like Arrangement
COMOROS	0.290450	0.024357	0.78300	0.030944	0.014858	0.020326	-0.095856	0.022449	0.007551	0.01933	0.803256	2.674354	
SOUTH KOREA	0.821908	0.046187	0.08789	0.058677	0.100562	3.85E-02	-0.083068	0.04257	0.072705	0.036655	0.561467	2.427945	
KUWAIT	0.981185	0.006278	0.00220	7.98E-03	0.010138	0.005239	0.004072	0.005786	0.002406	0.004982	0.98935	2.184617	
CAYMAN ISLANDS	1.000000	0.000000	0.00000	1.38E-15	-7.45E-16	9.04E-16	-3.18E-16	9.98E-16	1.10E-15	8.60E-16	1	2.523949	
KAZAKHSTAN	0.889130	0.043901	-0.02341	5.58E-02	1.12E-01	3.66E-02	-0.070222	0.040463	0.023352	0.034841	0.59369	1.881768	
LAOS	0.996857	0.020391	-0.01218	2.59E-02	0.001209	0.017017	-0.0056	0.018794	0.019711	0.016183	0.896995	2.492654	
LEBANON	0.897017	0.031849	0.04605	0.040462	0.007799	0.026579	0.030894	0.029354	0.018236	0.025276	0.770393	2.896667	Dollar Stabilized Arrangement
SRI LANKA	0.915537	0.034208	-0.02356	0.043458	0.061652	0.028547	0.054507	0.031528	-0.008139	0.027148	0.751805	1.765339	
LIBERIA	0.745972	0.267520	0.29922	0.339865	-0.030822	2.23253	-0.015042	0.246569	0.00067	0.212309	0.037367	2.02028	
LESOTHO	0.295072	0.080272	0.19417	0.10198	0.105841	0.06699	-0.361734	0.073986	0.766652	0.063706	0.040576	1.978452	Dollar Crawl-Like Arrangement
LITHUANIA	0.004290	0.001900	0.99668	0.002413	0.000977	0.001585	-0.004627	0.001751	0.002678	0.001508	0.998542	2.982593	Euro
LUXEMBOURG	0.004507	0.001892	0.99621	0.002404	0.000992	0.001579	-0.00467	0.001744	0.002964	0.001502	0.998553	2.979395	Euro
LATVIA	0.004503	0.001890	0.99633	0.002401	0.000987	0.001577	-0.004723	0.001742	0.002916	0.0015	0.998556	2.975409	Euro
LIBYA	1.454445	0.446487	0.10085	0.56723	0.216242	0.372606	-0.208387	0.411519	-0.563145	0.354341	0.033251	2.010126	
MOROCCO	0.424582	0.017341	0.61502	0.022031	-0.023919	0.014472	-0.021173	0.015983	0.005489	0.013762	0.897364	1.783686	
MOLDOVA	0.940334	0.031031	0.02810	0.039423	-0.010268	0.025896	-0.006626	0.028601	0.048459	0.024627	0.776656	1.436257	
MADAGASCAR	0.933428	0.067790	-0.05767	0.086123	0.036018	0.056573	-0.007934	0.062481	0.096158	0.0538	0.399022	2.470561	
NORTH MACEDONIA	0.221335	0.022023	0.82376	0.027978	-0.003972	0.018378	-0.048124	0.020298	0.006998	0.017478	0.834466	2.75679	
MYANMAR	0.920259	0.071736	-0.00860	0.091136	0.023521	0.059866	-0.101237	0.066118	0.094261	0.056931	0.376277	2.158502	
MONGOLIA	0.970904	0.021473	0.07864	0.02728	-0.006302	0.01792	-0.017096	0.019791	-0.026144	0.017041	0.890659	2.466828	
MACAO	0.983234	0.005475	0.00602	0.006956	-0.000245	0.004569	0.00633	0.005046	0.004661	0.004345	0.991907	2.731517	
MAURITANIA	0.957410	0.026506	0.03031	0.033673	-0.006988	0.02212	0.025915	0.02443	-0.006648	0.021035	0.840141	2.512615	
MAURITIUS	0.856366	0.057608	0.10878	0.073187	0.044562	0.048076	0.018487	0.053096	-0.028192	0.045719	0.508975	2.712389	
MALDIVES	0.987707	0.030444	0.00219	0.038676	-0.026895	0.025406	-0.005033	0.028059	0.04203	0.024161	0.792082	2.604497	Dollar Stabilized Arrangement
MALAWI	1.031473	0.027015	-0.00160	0.03432	-0.038178	0.022545	-0.003796	0.024899	0.0121	0.021439	0.839272	2.599339	
MEXICO	0.402630	0.074785	0.06816	0.095009	0.282266	0.06241	-0.30803	0.068928	0.554975	0.059351	0.097126	1.916276	
MALAYSIA	0.861553	0.025261	0.05517	0.032092	0.001262	0.001582	-0.004396	0.001747	0.002799	0.001505	0.998547	2.982293	
MOZAMBIQUE	0.938308	0.057643	0.01958	0.073231	-0.013045	0.048105	0.024776	0.053128	0.030376	0.045747	0.510334	1.987125	
NAMIBIA	0.295072	0.080272	0.19417	0.10198	0.105841	0.06699	-0.361734	0.073986	0.766652	0.063706	0.040576	1.978452	
NIGERIA	0.959976	0.065562	0.07745	0.083292	-0.076432	0.054713	0.000495	0.060427	0.038516	0.052031	0.45144	2.605498	
NICARAGUA	1.041245	0.038058	0.04166	0.04835	-0.017948	0.031761	-0.026072	0.035078	-0.038889	0.030204	0.73478	2.880831	Dollar Crawling Peg
THE NETHERLANDS	0.004236	0.001896	0.99610	0.002409	0.001262	0.001582	-0.004396	0.001747	0.002799	0.001505	0.998547	2.982293	
Norway	-0.049296	0.053608	0.61765	0.068105	0.250188	0.044737	-0.491466	0.049409	0.672923	0.042544	0.180488	2.034267	
NEPAL	0.974114	0.032114	-0.00656	0.040799	0.013156	0.0268	-0.019771	2.96E-02	0.039055	0.025486	0.768911	2.016622	
OMAN	1.001415	0.002771	0.00473	3.52E-03	-0.00372	0.002313	-0.003925	0.002554	0.001496	0.002199	0.997944	2.582968	Dollar Peg
PANAMA	1.000000	0.000000	0.00000	3.09E-17	-1.00E-16	2.03E-17	-3.18E-16	2.24E-17	-2.61E-17	1.93E-17	1	2.025966	Dollarized
PERU	0.945008	0.045263	-0.04537	5.75E-02	0.07612	3.78E-02	-0.132218	0.041718	0.166862	0.035922	0.563	1.896175	
PAPUA NEW GUINEA	1.015766	0.038023	0.08333	4.83E-02	0.050056	0.031731	-0.091023	0.035045	-0.058124	0.030176	0.726937	2.668106	
PHILIPPINES	0.951719	0.027301	0.01210	0.034684	0.051719	0.022784	-0.033776	0.025163	0.012777	0.021667	0.820964	1.093768	
PAKISTAN	0.997165	0.044265	0.03770	0.056235	-0.059514	0.03694	0.009226	0.040798	0.015424	0.035129	0.656466	1.846152	
POLAND	-0.184564	0.031927	1.04798	0.040561	0.095549	0.026644	-0.094761	0.029427	0.135793	0.025338	0.64281	2.048576	
PORTUGUESE	0.004506	0.001891	0.99625	0.002403	0.000967	0.001578	-0.00471	0.001743	0.002988	0.001501	0.998554	2.978446	Euro
PARAGUAY	1.040000	0.036908	-0.02109	0.046889	-0.014765	0.0308	0.021882	0.034017	0.017734	0.029291	0.733293	1.891383	
QATAR	1.000000	0.000550	-0.00083	0.000698	-1.36E-05	0.000459	0.000308	0.000507	0.00053	0.000436	0.999919	2.483084	Dollar Peg
ROMANIA	-0.004303	0.010094	0.97051	0.012824	0.010966	0.008424	-0.00064	0.009304	0.023472	0.008011	0.958502	1.92864	
SERBIA	0.071359	0.013043	0.94690	0.016571	-0.001301	0.010885	-0.007568	0.012022	-0.009386	0.010351	0.936752	2.666154	
RUSSIAN FEDERATION	0.604564	0.069313	0.01817	0.088057	0.136818	0.057843	-0.294756	0.063884	0.535201	0.055008	0.14779	2.075422	
RUWANDA	0.807899	0.056548	-0.02289	0.07184	-0.07985	0.047991	0.175289	0.052119	0.119552	0.044878	0.491469	2.831478	
SAUDI ARABIA	1.003553	0.002131	-0.00786	0.002707	0.00624	0.001778	-0.004775	0.001964	0.00284	0.001691	0.998779	2.438296	Dollar Peg
SOLOMON ISLANDS	1.019826	0.073998	-0.02321	0.094009	0.079044	0.061753	0.019431	0.068202	-0.09509	0.058726	0.431188	2.745298	
SEYHELLES	0.860973	0.204789	-0.05524	0.260169	-0.129761	0.170902	0.195858	0.18875	0.128169	0.162524	0.069028	2.606239	
SUDAN	-0.731120	1.521522	-0.79070	1.932983	0.121752	1.269752	1.306862	1.402358	1.093203	1.20751	-0.003963	2.001239	
SWEDEN	-0.042820	0.033659	0.78248	0.042761	0.093199	2.81E-02	-0.167668	0.031023	0.334813	0.026712	0.479271	2.30735	
SINGAPORE	0.587381	0.015679	0.14110	1.99E-02	0.104708	0.013085	-0.019888	0.014451	0.186704	0.012443	0.885684	2.25048	
SAINT HELENA	2.000000	0.000000	0.00000	2.62E-15	-1	1.72E-15	-1.27E-15	1.90E-15	-7.27E-16	1.64E-15	1	2.580861	
SLOVENIA	0.004499	0.001892	0.99622	0.002403	0.000967	0.001578	-0.00471	0.001743	0.002988	0.001501	0.998554	2.978446	Euro
SIERRA LEONE	1.030655	0.039968	-0.00040	0.05702	-0.046194	0.032271	-0.012144	0.003746	0.028086	0.03164	0.701156	2.260753	
SOMALIA	1.007545	0.007260	-0.01579	0.009223	0.001296	0.006059	-0.002403	6.69E-03	0.009353	0.005762	0.985974	2.915511	
SURINAME	0.763727	0.175018	-0.07555	0.222347	-0.151185	1.46E-01	0.16118	1.61E-01	0.301832	0.138897	0.067399	1.894552	
SAO TOME AND PRINCIPE	0.606943	0.055683	0.32397	0.07072	0.051508	0.049252	0.051324	-0.031673	0.044193	0.48993	0.262586		
EL SALVADOR	1.000000	0.000000	0.00000	1.44E-15	-1.15E-16	9.45E-16	-1.59E-15	1.04E-15	-1.91E-16	8.98E-16	1	2.576911	Dollarized
SYRIAN ARAB REPUBLIC	1.000000	0.000000	0.00000	1.39E-15	-								

Country		Source (when it is not from the regression results)
Åland Islands	EUR	Finland's territory
American Samoa	USD	Dollarized
Andorra	EUR	Not a member of EU but signed monetary union agreement
Antarctica	USD	Official currency exists, but the Dollar is de facto national currency
Antigua and Barbuda	USD	East Caribbean Currency
Azerbaijan	USD	Dollar is widely accepted, the exchange rate tied to the dollar
Bahamas	USD	The Bahamian dollar is pegged to the US dollar on a one-to-one basis
Bonaire, Sint Eustatius and Saba	EUR	Dutch territory
Bosnia and Herzegovina	EUR	Bosnia uses the same fixed rate as the German Mark — 1.935583 BAM = 1 Euro
Botswana	USD	d
Bouvet Island	EUR	Official currency is Norwegian Krona
British Indian Ocean Territory	USD	The currency of British Indian Ocean Territory is USD
Burkina Faso	EUR	CFA Franc (which is defined as Dollar bloc in the regression)
Cameroon	EUR	Central African CFA Franc; Tied to the Euro
Cape Verde	EUR	Pegged to the Euro
Central African Republic	EUR	CFA Franc
Christmas Island	RMB	Australian territory
Cocos (Keeling) Islands	RMB	Australian territory
Congo	EUR	Central African CFA Franc; Tied to the Euro
Congo, the Democratic Republic of the	USD	Pegged to the Dollar
Côte d'Ivoire	EUR	CFA Franc
Curaçao	EUR	Dutch territory (Netherlands Antillean Guilder)
Cyprus	EUR	Currency is Euro
Dominica	USD	Eastern Caribbean dollar
Equatorial Guinea	EUR	Central African CFA Franc; Tied to the Euro
Falkland Islands (Malvinas)	GBP	British Overseas Territory
Faroe Islands	EUR	Part of Denmark
French Guiana	EUR	Overseas Department of France
French Polynesia	USD	Israeli New Shekel
French Southern Territories	EUR	French Territory
Gabon	EUR	Central African CFA Franc; Tied to the Euro
Greenland	EUR	Part of Denmark
Grenada	USD	Eastern Caribbean dollar
Guadeloupe	EUR	French overseas region
Guernsey	GBP	English Channel near Franchy Coast
Guinea-Bissau	EUR	CFA Franc
Heard Island and McDonald Islands	RMB	Australian territory
Iran, Islamic Republic of	USD	Fixed to the dollar (actual exchange rate)
Isle of Man	GBP	Self-governing British Crown Dependenc
Jersey	GBP	Self-governing dependency of the United Kingdom
Macedonia, the former Yugoslav Republic of	EUR	Greek geographic region
Mali	EUR	CFA Franc
Malta	EUR	Official currency is Euro
Marshall Islands	USD	Dollarized
Martinique	EUR	French overseas department
Mayotte	EUR	Mayotte is politically part of France and an Outermost Region of the European Union
Micronesia, Federated States of	USD	Dollarized
Monaco	EUR	Monaco made a special agreement with France in 1963 in which French customs laws apply in Monaco and its
Montenegro	EUR	Adopted Euro unilaterally
Montserrat	USD	Eastern Caribbean dollar
New Caledonia	USD	CEP Currency
Niger	EUR	CFA Franc
Norfolk Island	RMB	Australia's external territories
Northern Mariana Islands	USD	Dollarized
Palau	USD	A presidential republic in free association with the United States
Puerto Rico	USD	Unincorporated U.S. territory
Qatar	USD	CEP Currency
Réunion	EUR	Department of France
Saint Barthélemy	EUR	EUR is official currency of the country
Saint Helena, Ascension and Tristan da Cunha	GBP	British Overseas Territory
Saint Kitts and Nevis	USD	East Caribbean Currency
Saint Lucia	USD	Eastern Caribbean dollar
Saint Pierre and Miquelon	EUR	French territory
Saint Vincent and the Grenadines	USD	East Caribbean Currency
Samoa	USD	CFP Franc
San Marino	EUR	Independent part of Italy
Singapore	USD	CFA Franc
Solomon Islands	USD	Norwegian territory
South Sudan	USD	Fixed to the dollar (actual exchange rate)
Sudan	USD	Fixed to the dollar (actual exchange rate)
Svalbard and Jan Mayen	EUR	British Overseas Territory
Timor-Leste	USD	Dollarized
Togo	EUR	West CFA Franc
Turks and Caicos Islands	USD	A British Overseas Territory southeast of the Bahamas
Tuvalu	RMB	Independent nations within the British Commonwealth and its currency is Australian Dollar
Virgin Islands, U.S.	USD	US Territory
Western Sahara	EUR	Moroccan dirham
Yemen	USD	East Caribbean Currency

Appendix III: RMB Bloc's export partners and export products

	Main Export Partner	Main Export Products
Namibia	China 27%, South Africa 18%, Botswana 8%, Belgium 7% (2019)	copper, diamonds, uranium, thorium, gold, radioactive chemicals, fish
South Africa	China 15%, United Kingdom 8%, Germany 7%, United States 6%, India 6% (2019)	gold, platinum, cars, iron products, coal, manganese, diamonds
South Korea	China 25%, United States 14%, Vietnam 9%, Hong Kong 6%, Japan 5%	integrated circuits, cars and vehicle parts, refined petroleum, ships, office machinery
Chile	China 32%, United States 14%, Japan 9%, South Korea 7%	copper, wood pulp, fish fillets, pitted fruits, wine
Colombia	United States 31%, China 11%, Panama 6%, Ecuador 5% (2019)	crude petroleum, coal, refined petroleum, coffee, gold
Turkey	Germany 9%, United Kingdom 6%, Iraq 5%, Italy 5%, United States 5% (2019)	cars and vehicle parts, refined petroleum, delivery trucks, jewelry, clothing and apparel (2019)
Norway	United Kingdom 18%, Germany 14%, Netherlands 10%, Sweden 9%, France 6%, United States 5% (2019)	crude petroleum, natural gas, fish, refined petroleum, aluminum (2019)
Australia	China 39%, Japan 15%, South Korea 7%, India 5%	iron ore, coal, natural gas, gold, aluminum oxide
Brazil	China 28%, United States 13%	soybeans, crude petroleum, iron, corn, wood pulp products
Eswati and Swaziland	South Africa 94%	soft drink concentrates, sugar, timber, cotton yarn, etc
Lesotho	United States 29%, Belgium 26%, South Africa 25%,	diamonds, clothing and apparel,
Mexico	United States 75% (2019)	cars and vehicle parts, computers, delivery trucks, crude petroleum, insulated wiring

Source: CIA World Factbook

