Is There Really a RMB Bloc in Asia?

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Outline

- Introduction: Context of the paper
- Do Asia's exchange rate policies track RMB movements?
- A New Method
- Conclusion

1. Introduction: Context of the paper

Dimensions of an International Currency

	Official Sector	Private Sector
Store of value	International reserves	Cross-border deposits; Cross-border securities
Medium of exchange	Vehicle currency for intervention	Invoicing trade and financial transactions
Unit of Account	Anchor for pegging or use in currency baskets of local currency	Denominating trade and financial transactions

Source: Kenen (1983) and Chinn and Frankel (2005).

Rising importance of China in the global economy and Asia

Global Share of Exports (%)



- Rising share of China's export in the global market
- Competitiveness concerns – fear of being outcompeted by the PRC – need to track the RMB closely

Note: EU exports are net of intra-EU exports *Source*: IMF, Direction of Trade Statistics

Rising shares of imports from the PRC in the US and the EU

US Share of Imports from Partners (%) EU Share of Imports from Partners (%)



Note: Asian NIEs and ASEAN include Singapore. EU imports are net of intra-EU imports *Source*: IMF, Direction of Trade Statistics

Rising importance of the PRC as a market





- Rising share of China's imports in the global market
- Market

 attractiveness –
 opportunity for
 economic growth
 need to track
 the RMB closely

Note: EU imports are net of intra-EU imports *Source*: IMF, Direction of Trade Statistics

Rising share of China's domestic demand in global domestic demand



Note: Percent of world domestic demand; Data for 2012-2017 are constructed from IMF, WEO database, assuming the same DD/GDP ratio as in 2000-2011 for each economy.
 Source: IMF, IFS for the US, Japan and the PRC for 1990-2011; World Bank, WDI, for the EU for 1990-2011; IMF, WEO database for the period 2012-17.

The rising share of trade with China for Asian economies (%)

	Exp	oorts to	the PF	RC	Imports from the PRC			
	1990	2000	2010	2013	1990	2000	2010	2013
Australia	2.5	5.7	25.1	36.1	2.7	7.8	18.7	19.5
Bangladesh	1.5	0.2	1.2	1.7	3.4	7.4	16.8	21.9
Brunei Darussalam	0.1	1.8	7.0	0.8	2.7	1.2	12.9	22.1
Cambodia	0.4	2.1	1.2	3.7	5.9	7.9	24.2	22.0
Hong Kong, China	24.7	34.5	52.7	54.8	36.7	43.0	45.5	47.8
India	0.1	1.8	7.9	4.7	0.1	2.9	11.8	11.0
Indonesia	3.2	4.5	9.9	12.4	3.0	6.0	15.1	16.0
Japan	2.1	6.3	19.4	18.1	5.1	14.5	22.1	21.7
Korea	0.0	10.7	25.1	26.1	0.0	8.0	16.8	16.1
Lao PDR	9.1	1.5	23.3	25.1	10.7	5.5	14.7	26.1
Malaysia	2.1	3.1	12.5	14.1	1.9	3.9	12.6	17.0
Mongolia	11.4	49.8	81.6	90.0	21.5	17.8	41.7	37.8
Myanmar	8.1	5.7	13.5	24.5	20.6	18.0	38.5	40.0
New Zealand	1.0	3.0	11.2	20.8	1.2	6.2	16.0	17.5
Pakistan	1.2	2.7	7.4	11.0	4.6	5.0	17.4	22.5
Philippines	0.8	1.7	11.1	12.2	1.4	2.3	8.4	13.0
Singapore	1.5	3.9	10.4	11.8	3.4	5.3	10.8	11.7
Taipei,China	3.1	15.1	34.3	38.3	0.6	3.9	12.6	15.6
Thailand	1.2	4.1	11.1	11.9	3.3	5.5	13.2	15.0
Viet Nam	0.3	10.6	10.5	11.8	0.2	9.0	24.0	32.0

Policy of promoting RMB internationalization

 Rise of RMB denominated international transactions – need to maintain a stable trading environment by achieving a low volatility vis-à-vis against the RMB



Source: IMF (2012).

IMF's classification of exchange rate arrangements of East Asian economies, 2000–2013

	Dec 2000	Dec 2001	Dec 2002	Dec 2003	Dec 2004	Apr 2006	Apr 2007	Apr 2008	Apr 2009	Apr 2010	Apr 2011	Apr 2012	Apr 2013
PRC		Other conve	ntional fixed	beg arrangem	nent (USD)		Crawling p	eg (USD)	Stabilized an (US	Stabilized arrangement (USD) Crawl-like arrangement			ment
Japan				Independent	ly floating						Free floating		
Korea				Independent	ly floating				Free floating		Floa	ating	
Hong Kong						С	urrency board	I (USD)					
India				Managed	floating						Floating		
Mongolia	Independer	ntly floating		Managed	floating		Other conve peg arrange	ntional fixed ment (USD)			Floating		
Brunei Darussalam						Currenc	y board (Sing	apore dolla	r)				
Cambodia			l	Managed floa	ting (USD)				Floating Stabilized arrangement (USD)			D)	
Indonesia	Independer	ntly floating			Manageo	d floating			Floating Crawl-like arrangement				
Lao PDR	Managed floating (1) (1) (1) (1) (1) (1)				Managed floating (USD)	Stabilized arrangement (USD) Stabilized arrangement			arrangement				
Malaysia	Other	conventiona	I fixed peg ar	rangement (L	JSD)	Μ	anaged floati	ng	Other managed arrangement				
Myanmar	Other con fixed peg ar (comp	ventional rangement osite)		Mar	naged floati	ng		Managed floating (USD)		Other m	anaged arrar	igement	
Philippines				Independent	ly floating						Floating		
Singapore	Managed floating						Managed floating (composite)	Other managed arrangement (composite)			osite)		
Thailand	Independer	ntly floating			Manageo	d floating					Floating		
Viet Nam	Pegged exc within horizo	hange rate	Ма	naged floatin	g	Other c arr	onventional fi angement (U	xed peg SD)	Stabilized	d arrangemer	nt (USD)	Stabilized arrangement (composite)	Stabilized arrangement (USD)

2. Do Asia's Exchange Rate Policies Track RMB Movements?

Frankel-Wei exchange rate regression (1994)

$$\Delta \log \left(\frac{x}{\text{CHF}}\right) = \beta_1 + \beta_2 \Delta \log \left(\frac{\text{USD}}{\text{CHF}}\right) + \beta_3 \Delta \log \left(\frac{\text{GBP}}{\text{CHF}}\right) + \beta_4 \Delta \log \left(\frac{\text{JPY}}{\text{CHF}}\right) + \beta_5 \Delta \log \left(\frac{\text{EURO}}{\text{CHF}}\right) + \varepsilon$$

Previous findings from the simple Frankel-Wei regression analysis

- Earlier findings for the pre-Asian financial crisis period
 - Strong influence of the US dollar on East Asian currencies during the period 1979-1992 (Frankel-Wei 1994)
 - Later studies also arrive at the same conclusion (Kawai and Akiyama 1998; Ogawa and Ito 2002)
- Findings for the post-Asian financial crisis period
 - The US dollar standard broke down for a short period during the Asian financial crisis, but was quickly re-established thereafter (McKinnon and Schnabl, 2004)
 - The finding corroborated by Benassy-Quere and Coeure (2003)
 - Except for a few US dollar peg economies (PRC and Hong Kong), most East Asian currencies began to exhibit greater exchange rate flexibility with a larger weight on the yen (Kawai 2007)

Frankel-Wei regression with RMB

$$\Delta \log \left(\frac{x}{\text{CHF}}\right) = \beta_1 + \beta_2 \Delta \log \left(\frac{\text{USD}}{\text{CHF}}\right) + \beta_3 \Delta \log \left(\frac{\text{GBP}}{\text{CHF}}\right) + \beta_4 \Delta \log \left(\frac{\text{JPY}}{\text{CHF}}\right) + \beta_5 \Delta \log \left(\frac{\text{EURO}}{\text{CHF}}\right) + \beta_6 \Delta \log \left(\frac{\text{RMB}}{\text{CHF}}\right) + \varepsilon$$

 Difficulty with this regression: High correlation between the changes in the USD/CHF rate and changes in the RMB/CHF rate due to the RMB peg to the US dollar

Jan. 2000 - June 2005 Jan. 2009 - May 2010

	USD/CHF	RMB/CHF		USD/CHF	RMB/CHF
USD/CHF	1.000		USD/CHF	1.000	
RMB/CHF	0.624	1.000	RMB/CHF	0.620	1.000

Consequence of multicollinearity: Examples





THAILAND



SINGAPORE



Literature: 3 ways of addressing the multicollinearity problem

- Using the US dollar as the numeraire currency: Ho-Ma-McCauley (2005) who also used the NDF rate rather than the spot rate for RMB
- Choosing periods of the RMB's relative flexibility: Henning (2012) and Subramanian-Kessler (2013)
- Removing the US dollar component from the RMB movements: Balasubramaniam, Patnaik, and Shah (2011) and Fratzscher and Mehl (2011)

Ho-Ma-McCauley (2005) approach

 Express all the exchange rates in terms of the USD, and place the RMB/USD rate on the r.h.s. of the regression equation

$$\Delta \log \left(\frac{x}{\text{USD}}\right) = \beta_1 + \beta_2 \Delta \log \left(\frac{\text{EURO}}{\text{USD}}\right) + \beta_3 \Delta \log \left(\frac{\text{JPY}}{\text{USD}}\right) + \beta_4 \Delta \log \left(\frac{\text{GBP}}{\text{USD}}\right) + \beta_5 \Delta \log \left(\frac{\text{RMB}}{\text{USD}}\right) + \varepsilon$$

- In this way, the authors claims that the multicollinearity problem can be removed in principle
- The USD coefficient is implicitly obtained as:

1 -
$$\beta_2$$
 - β_3 - β_4 - β_5

Ho-Ma-McCauley (2005) estimation results

	_	Нс	o–Ma–M	cCaul	ey Own Estimates				
		200	03			2004			
	Euro	Yen	RMB NDF	USD	Euro	Yen	RMB NDF	USD	
Korean won	0.04	0.33***	0.17*	0.46	0.12***	0.32***	0.30***	0.26	
NT dollar	0.03**	0.09***	0.12***	0.76	0.00	0.20***	0.28***	0.52	
Indonesian rupiah	0.09**	0.15***	0.12	0.64	0.12***	0.28***	0.30***	0.30	
Philippine peso	0.01	0.09**	0.02	0.88	0.02	0.08***	0.00	0.90	
Singapore dollar	0.08***	0.21***	0.15***	0.56	0.11***	0.22***	0.11*	0.56	
Thai baht	0.04*	0.24***	0.14**	0.58	0.08***	0.22***	0.13**	0.57	

Note: The values for USD are added by the authors. Source: Ho, Ma, and McCauley (2005).

Rolling regression results using the Ho-Ma-McCauley approach



Henning (2012) and Subramanian-Kessler (2013) approach

- These authors estimated the Frankel–Wei regression with the RMB movements included on the right-hand side by choosing the sample period when the RMB was more flexible against the US dollar (post-July 2005 period, excluding the period of re-peg to the US dollar)
- Henning: Malaysia, Thailand, Singapore and the Philippines have formed a loose but effective 'RMB bloc' with China, and ... Korea has participated tentatively since the global financial crisis.
- Subramanian-Kessler: The RMB has now become the dominant reference currency in East Asia, eclipsing the dollar and the euro. There is now a de facto renminbi currency bloc in East Asia

Subramanian-Kessler (2013) estimation results

	Subrar	Subramanian–Kessler Own Estimates								
	US	dollar	RMB							
	(1)	(2)	(3)	(4)						
	Jul 2005– Aug 2008	Jul 2010– Jul 2013	Jul 2005– Aug 2008	Jul 2010– Jul 2013						
Korean won	0.261	-0.359**	0.580***	1.196***						
NT dollar	0.359***	0.281***	0.519***	0.639***						
Indonesian rupiah	0.621***	0.473***	0.162	0.503***						
Malaysian ringgit	0.214**	-0.188	0.653***	1.056***						
Philippine peso	0.696***	0.076	0.163	0.821***						
Singapore dollar	0.343***	0.039	0.300***	0.495***						
Thai baht	0.522**	0.181*	0.29	0.692***						

Source: Subramanian and Kessler (2013)

Rolling regression results using the Subramanian-Kessler approach





NT DOLLAR



Balasubramaniam-Patnaik-Shah (2011) approach

- The third strategy is to remove the US dollar component from the RMB movements, and then estimate the Frankel-Wei exchange rate regression
- Run the first-stage regression:

$$\Delta \log\left(\frac{\text{RMB}}{\text{CHF}}\right) = \theta_1 + \theta * \Delta \log\left(\frac{\text{USD}}{\text{CHF}}\right) + \varepsilon$$

- Then use the residuals from this regression as a proxy for the log changes in RMB/CHF and use it to estimate the Frankel-Wei regression model
- The estimated coefficient on the USD/CHF and the proxy for RMB/CHF are often larger than unity

Balasubramaniam–Patnaik–Shah (2011) estimation results

		Balasubramaniam–Patnaik–Shah Estimates					
Currency		US dollar	RMB				
Start date	End date	(1)	(2)				
Malaysian ring	ggit	1.23***	1.13***				
14 Oct 2005	11 Jun 2007						
NT dollar		1.03***	0.45***				
14 Oct 2005	11 Feb 2011						
Vietnamese do	ong	0.82***	1.39***				
16 Oct 2009	11 Feb 2011						

Source: Balasubramaniam, Patnaik and Shah (2011).

Rolling regressions using B-P-S method (1)



Rolling regressions using B-P-S method (2)



Rolling regressions using B-P-S method (3)



3. New Method

- We propose a method building on the Balasubramaniam-Patnaik-Shah (2011) approach
- We first remove the US dollar (and other major currencies') components from the RMB movements by running the following Frankel-Wei equation for RMB:

$$\Delta \log\left(\frac{\text{RMB}}{\text{NZD}}\right) = \phi_0 + \phi_1 \Delta \log\left(\frac{\text{USD}}{\text{NZD}}\right) + \phi_2 \Delta \log\left(\frac{\text{EURO}}{\text{NZD}}\right) + \phi_3 \Delta \log\left(\frac{\text{JPY}}{\text{NZD}}\right) + \phi_4 \Delta \log\left(\frac{\text{GBP}}{\text{NZD}}\right) + \omega_3 \Delta \log\left(\frac{\text{SD}}{\text{SD}}\right) + \omega$$

 Then construct the Frankel-Wei regression model for currency x:

$$\Delta \log \left(\frac{x}{NZD}\right) = \gamma_0 + \gamma_1 \Delta \log \left(\frac{USD}{NZD}\right) + \gamma_2 \Delta \log \left(\frac{EURO}{NZD}\right) + \gamma_3 \Delta \log \left(\frac{JPY}{NZD}\right) + \gamma_4 \Delta \log \left(\frac{GBP}{NZD}\right) + \gamma_5 \widehat{\omega} + v,$$

• Finally, subtract the residual from each term above, and then run the regression under $\gamma_5 = 1 - \gamma_1 - \gamma_2 - \gamma_3 - \gamma_4$

Estimated currency basket for Asian currencies (Jan. 2000 -June 2005)

Source: Kawai and Pontines (2014).

	US dollar	Euro	Yen	Pound sterling	RMB	R ²
	0.999***	0.000	0.000	-0.000		0 000
	[0.000]	[0.000]	[0.000]	[0.000]		0.999
Korean won	0.638***	-0.022	0.270***	0.065**	0.048***	0 768
	[0.030]	[0.021]	[0.021]	[0.025]	[0.017]	0.700
	0.810***	0.031**	0.094***	0.045***	0.016*	0 021
	[0.017]	[0.014]	[0.011]	[0.012]	[0.010]	0.924
Hong Kong	0.988***	0.000	0.004***	0.004***	0.001	0 008
dollar	[0.002]	[0.000]	[0.001]	[0.001]	[0.001]	0.990
Singapore	0.611***	0.082***	0.219***	0.036***	0.049***	0 011
dollar	[0.017]	[0.011]	[0.012]	[0.013]	[0.009]	0.911
Cambodian	0.992***	0.011	-0.022	0.036	-0.017	0 807
riel	[0.015]	[0.015]	[0.017]	[0.026]	[0.017]	0.097
Indonesian	0.779***	-0.101	0.180***	0.028	0.113***	0 / 11
rupiah	[0.052]	[0.049]	[0.041]	[0.050]	[0.035]	0.411
Laotian kin	0.996***	-0.029	-0.003	0.038	-0.000	0.821
	[0.016]	[0.041]	[0.019]	[0.033]	[0.016]	0.021
Malaysian	0.999***	0.000	0.000	-0.000	0.000	0 000
ringgit	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	0.999
Indian runoo	0.915***	0.007	0.024***	0.028***	0.023***	0.056
mulan rupee	[0.016]	[0.008]	[0.008]	[0.010]	[0.006]	0.950
Mongolian	1.026***	0.063	-0.025	-0.104	0.039	0 606
togrog	[0.033]	[0.065]	[0.021]	[0.079]	[0.033]	0.090
Philippine	0.878***	0.012	0.144***	-0.055	0.019	0 723
peso	[0.024]	[0.018]	[0.039]	[0.039]	[0.013]	0.723
Thai haht	0.652***	0.033*	0.231***	0.020	0.061***	0.847
	[0.023]	[0.018]	[0.018]	[0.022]	[0.015]	0.047
Vietnamese	1.000***	-0.003	0.001	0.003	-0.002	0 006
dong	[0.002]	[0.002]	[0.001]	[0.003]	[0.001]	0.990

Estimated currency basket for Asian currencies (July 2005 -July 2008)

Source: Kawai and Pontines (2014).

	US dollar	Euro	Yen	Pound sterling	RMB	R ²	
	0.934***	0.044***	0.028***	-0.017		0 070	
	[0.009]	[0.013]	[0.007]	[0.013]		0.979	
Korean won	0.686***	0.140**	-0.036	0.096	0.112***	0 730	
Noreall woll	[0.055]	[0.067]	[0.055]	[0.070]	[0.023]	0.750	
NT dollar	0.737***	0.076**	0.079***	0.042	0.064***	0 008	
NT UOIIai	[0.027]	[0.032]	[0.020]	[0.031]	[0.014]	0.900	
Hong Kong	0.980***	0.007	0.010***	0.001	0.000	0 008	
dollar	[0.002]	[0.005]	[0.002]	[0.004]	[0.001]	0.330	
Singapore	0.562***	0.196***	0.078***	0.049*	0.113***	0.025	
dollar	[0.022]	[0.024]	[0.019]	[0.025]	[0.013]	0.925	
Cambodian	0.964***	0.037	-0.015	0.005	0.007	0 822	
riel	[0.035]	[0.080]	[0.027]	[0.065]	[0.020]	0.022	
Indonesian	0.664***	0.087*	0.008	0.127**	0.113***	0.631	
rupiah	[0.081]	[0.048]	[0.042]	[0.059]	[0.024]	0.031	
l actian kin	1.032***	-0.073*	0.004	0.008	0.027	0 0 20	
	[0.023]	[0.043]	[0.015]	[0.026]	[0.021]	0.920	
Malaysian	0.752***	0.068	0.021	0.042	0.114***	0.870	
ringgit	[0.029]	[0.042]	[0.025]	[0.042]	[0.018]	0.079	
Indian runoo	0.804***	0.058*	-0.023	0.080**	0.079***	0.966	
mulan rupee	[0.030]	[0.034]	[0.023]	[0.036]	[0.021]	0.000	
Mongolian	1.028***	-0.011	-0.018	0.012	-0.010	0 883	
togrog	[0.035]	[0.021]	[0.012]	[0.031]	[0.014]	0.005	
Philippine	0.801***	0.044	-0.021	0.059	0.115***	0 770	
peso	[0.041]	[0.046]	[0.034]	[0.045]	[0.022]	0.779	
Thai babt	0.681***	0.038	0.140***	0.057*	0.082***	0.815	
	[0.035]	[0.041]	[0.025]	[0.032]	[0.023]	0.015	
Vietnamese	1.014***	0.006	-0.005	-0.013*	-0.002	0 080	
dong	[0.010]	[0.009]	[0.009]	[0.007]	[0.004]	0.900	

Estimated currency basket for Asian currencies (June 2010 - July 2013)

Source: Kawai and Pontines (2014).

	US dollar	Euro	Yen	Pound sterling	RMB	R ²
PRC RMB	0.941***	0.034***	0.006	0.001		0 981
	[0.009]	[0.008]	[0.006]	[0.011]		0.001
Korean won	0.620***	0.062*	-0.048	0.045	0.319***	0 538
	[0.044]	[0.034]	[0.032]	[0.049]	[0.029]	0.000
NT dollar	0.832***	0.060***	-0.006	-0.008	0.122***	0.004
NT dona	[0.021]	[0.017]	[0.014]	[0.024]	[0.016]	0.304
Hong Kong	0.983***	0.001	-0.003*	0.002	0.016***	0 008
dollar	[0.003]	[0.002]	[0.002]	[0.003]	[0.002]	0.330
Singapore	0.461***	0.158***	0.034**	0.097***	0.248***	0.821
dollar	[0.027]	[0.026]	[0.017]	[0.029]	[0.022]	0.021
Cambodian	0.977***	-0.011	-0.004	0.032*	0.005	0.887
riel	[0.019]	[0.024]	[0.011]	[0.019]	[0.012]	0.007
Indonesian	0.826***	0.054*	-0.021	0.043	0.096***	0 720
rupiah	[0.033]	[0.029]	[0.022]	[0.038]	[0.024]	0.720
l aotian kin	0.920***	0.106**	-0.031	-0.000	0.004***	0 820
	[0.039]	[0.041]	[0.026]	[0.047]	[0.017]	0.029
Malaysian	0.702***	0.094***	-0.065***	0.033	0.234***	0 73/
ringgit	[0.036]	[0.026]	[0.023]	[0.036]	[0.020]	0.754
	0.599***	0.144***	-0.064**	0.032	0.288***	0 577
mulan rupee	[0.042]	[0.031]	[0.029]	[0.045]	[0.026]	0.577
Mongolian	1.010***	0.003	0.007	-0.041	0.018	0 803
togrog	[0.029]	[0.030]	[0.018]	[0.040]	[0.024]	0.005
Philippine	0.754***	0.090***	-0.052**	0.047	0.159***	0 806
peso	[0.036]	[0.025]	[0.021]	[0.035]	[0.018]	0.000
Thai babt	0.696***	0.106***	0.030*	0.040*	0.125***	0 872
	[0.027]	[0.019]	[0.018]	[0.023]	[0.015]	0.072
Vietnamese	0.981***	0.014	0.015	-0.026	0.014*	0 80/
dong	[0.029]	[0.012]	[0.020]	[0.015]	[0.014]	0.034

Rolling regression using new method (1)



Rolling regression using new method (2)



Rolling regression using new method (3)



Robustness check

- We have performed various robustness checks and have found that our results are quite robust
- These robustness checks include: Monte Carlo simulation, structural break tests, inclusion of exchange market pressure variables on the RHS of the estimating equation, inclusion of global risk and other factors on the RHS

4. Conclusion

- Some recent studies claim that a renminbi (RMB) bloc has emerged in East Asia.
- A simple new model is developed to estimate an economy's implicit currency basket, including the RMB
- The RMB weight has risen in East Asia's currency baskets at the expense of the yen
- However, the RMB has not eclipsed the US dollar as the most dominant anchor currency
- These conclusions are robust to alternative specifications of the model

Thank you For more information:

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