RIETI Discussion Paper Series 24-E-059

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RIETI Discussion Paper Series 24-E-059
May 2024

Size of Major Currency Zones and Their Determinants [*]

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Abstract

The US dollar has long been the most dominant international currency used for international trade, investment, financial settlements, foreign exchange market trading, foreign reserve holding, and exchange rate anchoring. This paper develops a new method to estimate the size of major currency zones, i.e., those for the US dollar (USD), euro (EUR), Japanese yen (JPY), British pound sterling (GBP), and Chinese yuan (RMB), and identify their determinants. The paper employs the simple Frankel-Wei (1994) and Kawai-Pontines (2016) estimation models to identify major anchor currencies and the degree of exchange rate stability (ERS) for each economy. The paper uses the estimated currency weights to construct the size of major currency zones globally and regionally over time and econometrically identify the determinants of these currency weights. In this analysis, the paper considers the degree of ERS, defined by the Root Mean Squared Error (RMSE) of the estimation model, which allows for the possibility that a part of each economy or region or part of the world is under a floating exchange rate regime. This method avoids overestimating the size of a particular major currency zone such as the RMB zone, when economies do not rigidly stabilize their currencies to such a major currency, and thus presents a better picture that is more consistent with the current state of the international monetary system.

The paper yields several interesting results. First, the global economic share of the USD zone, still the largest in the world, has declined over time due to the emergence of the EUR zone and the recent rapid rise of the RMB zone. The size of the EUR zone is larger than that of the RMB zone if the degree of ERS is taken into account. Additionally, the share of the world economy under floating exchange rates has expanded in size over time. Second, the USD zone is the largest in the Middle East & Central Asia, followed by emerging & developing Asian and Sub-Saharan African economies, while the EUR zone is dominant in emerging & developing economies in Europe. The USD zone share has been declining rapidly in Latin America & the Caribbean. The size of the RMB zone has been increasing in most regions. Third, the USD weight is positively affected by the share of trade with the United States and the US dollar shares in export invoicing and cross-border bank liabilities. Similarly, the EUR weight is positively affected by economies' shares of trade with the Euro Area as well as the euro shares in export invoicing, inward FDI stock, and cross-border bank liabilities. The RMB weight is not significantly affected by economies' shares of trade with, or inward FDI stock or borrowing from China. The paper provides some policy implications.

Keywords: Dollar dominance; globalization; financial spillover

JEL Classification Nos. G3, F3, F6, F41

[*] This paper was conceived when Ito was visiting the RIETI as a visiting fellow. The draft of this paper was presented at the RIETI DP seminar for the paper. The authors would like to thank participants of the seminar for their helpful comments.

1. Introduction

Many researchers have recently discussed again why the U.S. dollar (USD) is or remains the dominant international currency. The debate arises partly because US monetary policy changes have been the source of disturbances for many emerging economies that rely on US dollar funding particularly since the global financial crisis and also the United States appears to be "weaponizing" its currency by imposing financial sanctions on the dollar-denominated financial assets held by Iran, Russia, and others. Gita Gopinath, First Deputy Managing Director of the International Monetary Fund (IMF), warned that excessive weaponization in the form of financial sanctions could gradually weaken the dollar's position as the dominant international currency.[1] Even US Treasury Secretary Janet Yellen argues that excessive dollar weaponization could hurt the hegemony of the dollar.

Many experts, including those at the US Treasury Department, argue that the dollar's position as the dominant international currency will remain intact because the dollar dominance is backed by a set of favorable conditions: the United States' strong economic performance; sound macroeconomic policies and institutions; open, deep, and liquid financial markets; institutional transparency; commitment to a free-floating currency; and strong and predictable legal systems.[2] Needless to say, largest size of the US economy, the Federal Reserve System's strong support for the international role of the dollar, and network externalities and inertia also help to sustain dollar dominance.

Table 1 summarizes the use of major currencies for international purposes in 2022-23 as compared with those in around 2000. In 2022-23, 88% of the world's foreign exchange market transactions are conducted with the US dollar, 59% of official foreign exchange reserves are held in the US dollar, 48% of international trade settlements are done in the dollar, and 47-48% of outstanding international financial assets are denominated in the US dollar. These shares of US dollar use and holdings are much larger than the US share in global GDP (26% in 2023). Clearly, even if China and Russia decided to rely solely on their own currencies, the RMB and the ruble, the markets for these currencies are far smaller than those for the US dollar or euro. The RMB was recognized as a reserve currency in 2016 after its inclusion in the IMF's Special Drawing Rights (SDR) basket. Having accounted for 1% of global foreign exchange reserves in 2016, the share of the RMB rose to 2% in 2023, a level comparable to the Canadian and

[1] https://www.ft.com/content/3e0760d4-8127-41db-9546-e62b6f8f5773
[2] US Treasury Department, *Macroeconomic and Foreign Exchange Policies of Major Trading Partners* (December 2021), pp. 18-19. https://home.treasury.gov/system/files/206/December-2021-FXR-FINAL.pdf

Australian dollars. Realistically speaking, it is difficult for most economies to shift their reliance on the dollar to the RMB or ruble.

Table 1: International use of major currencies (%) for 2022-23 compared with around 2000

Currency	Foreign exchange market turnover		Foreign exchange reserves		International settlements		Cross-border bank liabilities		International debt securities issued		GDP	
	Apr. 2001	Apr. 2022	Dec. 2000	Sep. 2023	Dec. 2012	Dec. 2023	Dec. 2000	Jun. 2023	Dec. 2000	Sep. 2023	2000	2023
US dollar	89.9	88.4	71.1	59.2	33.3	47.5	54.9	47.8	45.6	47.2	30.1	25.8
Euro	37.9	30.5	18.3	19.6	39.8	22.4	24.4	31.7	29.7	38.9	18.4	14.8
Japanese yen	23.5	16.7	6.1	5.5	2.5	3.8	9.2	3.8	9.3	1.1	14.6	4.1
UK pound	3.0	12.9	2.8	4.8	8.7	6.9	5.3	4.8	8.9	7.7	4.9	3.2
Chinese RMB	0.0	7.0	0.0	2.4	0.6	4.1	--	--	0.0	0.7	3.5	16.9
Canadian dollar	4.5	6.2	--	2.5	2.1	2.5	--	--	0.9	0.5	2.2	2.0
Australian dollar	4.3	6.4	--	2.0	2.0	1.6	--	--	0.6	0.9	1.2	1.6
Swiss franc	6.0	5.2	0.3	0.2	1.9	1.0	2.4	1.2	2.5	0.7	0.8	0.9

Note: Data for foreign exchange market turnover sum up to 200% as two currencies appear for market transactions. Data for GDP in 2023 is the IMF's estimate.
Source: Compiled by authors from data obtained from BIS, IMF, and SWIFT.

Given the global dominance of the US dollar, the natural question arises as to what determines the use of international currencies? While some studies investigate the determinants of the major currencies for trade invoicing, international debt securities issued, and foreign exchange reserve holding, this paper focuses on the formation of major currency zones and the determinants of anchor currencies, i.e., the major reference currencies against which monetary authorities attempt to stabilize or manage their exchange rates. Investigations of anchor currencies is important because the choice of an anchor currency can affect monetary policy environments due to spillover effects from the anchor currency country. For example, since March 2022, the US Federal Reserve System has raised its policy interest rate to rein in 40-year high inflation. Such a policy has strengthened the value of the dollar and weakened many other currencies. A weaker currency means higher debt burdens for economies indebted in the US dollar. Thus, the degree of exposure to spillovers depends on how tightly the economy manages its exchange rate against a major currency. In other words, the choice of an exchange rate regime affects the monetary policy framework of the home economy.

This paper attempts to identify what major currency zone each economy belongs to, construct the size of major currency zones globally and by region, and examine the determinants of the weights on major currencies in various economies' informal currency baskets for the period 1961-2021. It is assumed that the USD, EUR (DEM until 1998), GBP, and JPN were major reserve currencies until 1998, while the RMB began to play a possible major currency role in 1999.

The paper is organized as follows. Section 2 briefly explains the Frankel-Wei (1994) and Kawai-Pontines (2016) estimation methods to identify the weights on major currencies in each economy's formal or informal currency basket and the degree of exchange rate stability (ERS) and maps the evolution of exchange rate regimes for different economies over time. Section 3 computes the size of major currency zones globally and regionally, and over time and compares the size of the USD zone with those for other major currencies, particularly the EUR and RMB. Section 4 investigates the determinants of the estimated weights of the major currencies, including those adjusted for ERS, and discusses policy implications of the findings for USD dominance and further RMB internationalization. Section 5 concludes the paper.

2. Evolution of the Exchange Rate Regime for Each Economy

An exchange rate regime for each economy is typically characterized by the degree of exchange rate stability or flexibility and the choice of anchor currencies for exchange rate management. Using this information, this section discusses the evolution of exchange rate regimes for all economies in the world, where data are available, by identifying the degree of exchange rate stability (or flexibility) and major anchor currencies over the last half century.

2.1 Estimation of the weights on anchor currencies and the degree of exchange rate stability

One of the most powerful ways to identify an economy's anchor currencies and exchange rate stability (or flexibility) is to run the Frankel-Wei and/or Kawai-Ponines regression. The Frankel and Wei (1994) method allows the estimation of the weights on the traditional major anchor currencies, i.e., the US dollar (USD), euro (EUR or DEM [deutschemark] before the introduction of the euro in 1999), British pound sterling (GBP), and Japanese yen (JPY) without considering the role played by the Chinese yuan or renminbi (RMB) as a major international currency. The Kawai and Pontines (2016) method allows the estimation the weight of the RMB, in addition to those of traditional major currencies. The degree of exchange rate stability (or flexibility) is obtained by observing how tightly or loosely the Frankel-Wei or Kawai-Pontines regression explains an economy's exchange rate movements by those of major anchor currencies.

In this paper, the Frankel-Wei method is employed for the period when the RMB was not considered as a major anchor currency, while the Kawai-Pontines method is used for the period when the RMB is judged to play a role as an anchor currency. The reason is that the movement of the RMB is closely associated with the movement of the US dollar, and the usual Frankel-Wei method involves severe multicollinearity problem if the RMB is included on the

right-hand side of the Frankel-Wei regression.[3] The Kawai-Pontines method addresses the multicollinearity problem and yields superior and more stable and robust estimates on US dollar and RMB weights in an economy's implicit currency basket than the traditional Frankel–Wei method. The Kawai-Pontines method is applied for the period after 1999 as the paper treats the RMB as one of the major currencies from then. Appendix I provides detailed explanations of the Kawai–Pontines method.

The degree of exchange rate stability (or flexibility) is obtained by observing how tightly an economy's exchange rate follows the exchange rate movements of major anchor currencies. Economies under a fixed exchange rate regime are expected to achieve a high level of exchange rate stability against an anchor currency (or a basket of anchor currencies), while those under a freely flexible exchange rate regime are expected to show a low level of exchange rate stability. To measure the tightness or looseness of the relationship between an economy's exchange rates against the basket of major currencies, the root mean square error (RMSE) of the Frankel-Wei and/or Kawai-Pontines regression equation is used.[4] Given that the Frankel-Wei and/or Kawai-Pontines regressions are for each period (with 36-month windows), the RMSEs obtained are time-varying, so is the RMSE.[5] The annual average of the time-varying RMSE is used to measure the level of exchange rate stability (ERS).[6]

A smaller value for RMSE means a higher explanatory power for the regression and, thus, a higher degree of ERS, while a larger value for RMSE means a lower explanatory power of the regression and, thus, a lower degree of ERS (or a higher degree of exchange rate flexibility). More specifically, exchange rate regimes can be identified as a fixed rate regime if RMSE < 0.01, a managed exchange rate regime if $0.01 \leqq$ RMSE < 0.02, a flexible exchange rate regime if $0.02 \leqq$ RMSE < 0.03, and a highly flexible (or pure floating) exchange rate regime if RMSE $\geqq$ 0.03.[7]

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[3] There is no question that in recent years the RMB has become a major anchor currency in the sense of influencing the movements of a number of economies' exchange rates together with other major currencies. However, the RMB used to be pegged to the US dollar and is still tied to dollar movements to some extent, which means that the RMB's exchange rate movements are highly correlated with those of the dollar, which is the source of a serious multicollinearity problem.

[4] The RMSE has been proposed by Bleaney and Tian (2020) as a measure of exchange rate stability (or flexibility).

[5] To measure the degree of exchange rate stability, Kawai and Akiyama (1998) chose the standard error of Frankel-Wei regressions and Ito and Kawai (2012, 2014) used the adjusted R^2 instead.

[6] Because of the unique distribution of RMSE, which is skewed to the left with fat tail on the right-hand side, the RMSE values are winsorized at and above the 90th percentile.

[7] Bleaney and Tian (2020) use 0.02 as the threshold value of RMSE to make a distinction between low volatility and high volatility. This paper uses the same principle and further classifies the low volatility part into fixed and managed regimes and the high volatility part to flexible and highly flexible rate regimes.

The Frankel-Wei and Kawai-Pontines regression results for all sample economies and all sample years are reported separately in excel format that is available. The results include the estimated coefficients on the USD, EUR, GBP, JPY and RMB, standard errors, p-values, the root mean squared error (RMSE) of the regression, and the ERS index. The ERS index is constructed by normalizing the RMSE so that its maximum value is 1 (complete currency pegging) and the minimum value is zero (complete currency floating).[8] Each regression is based on monthly observations with a 36-month window.

2.2 Estimation results for selected economies

As examples, Table 2 summarizes regression results for the BRICS economies (Brazil, Russia, India, China, and South Africa) for selected years during 1961-2021. It reports not only the estimated coefficients on anchor currencies but also the values of the RMSE, the exchange rate stability (ERS) index, and the exchange rate regime from ERS perspectives.

Table 2: Frankel-Wei and Kawai-Pontines estimation results for BRICS economies

Country	Year	USD		EUR		GBP		JPY		RMB		RMSE	ERS	FX regime
Brazil	1970	0.430		0.167		-1.396	**	1.799				0.0097	0.6831	Fixed
	1980	1.005	***	-0.123		0.030		0.088				0.0164	0.4632	Managed
	1990	1.161	**	-1.373		-0.615		1.827	**			0.0306	0.0000	Highly flexible
	2000	1.110		-0.370		0.161		-0.217		0.316		0.0306	0.0000	Highly flexible
	2010	0.429		-0.041		0.479	*	-0.249		0.383	*	0.0306	0.0000	Highly flexible
	2020	-0.224		0.558		0.234		-0.197		0.629	**	0.0306	0.0000	Highly flexible
	2021	-0.173		0.504		0.014		-0.036		0.690	**	0.0306	0.0000	Highly flexible
China	1961	1.000	***	0.000		0.000		0.000		--		0.0000	1.0000	Fixed
	1970	1.000	***	0.000		0.000		0.000		--		0.0000	1.0000	Fixed
	1980	0.504	***	0.400	**	0.114		-0.019		--		0.0092	0.6993	Fixed
	1990	0.990	***	-0.158		-0.029		0.196		--		0.0172	0.4384	Managed
	2000	0.999	***	0.001		-0.001		0.001		--		0.0001	0.9959	Fixed
	2010	0.927	***	0.026		0.021		0.027		--		0.0049	0.8400	Fixed
	2020	0.566	***	-0.037		0.347	**	0.123		--		0.0131	0.5278	Managed
	2021	0.764	***	0.089		0.256	**	-0.108		--		0.0105	0.6563	Managed
India	1961	0.120		0.015		0.868	***	-0.003				0.0008	0.9750	Fixed
	1970	0.090		0.009		0.839	***	0.062				0.0018	0.9420	Fixed
	1980	0.369	***	0.047		0.580	***	0.004				0.0118	0.6129	Managed
	1990	0.824	***	0.062		0.325	***	-0.211	***			0.0077	0.7473	Fixed
	2000	0.779	***	-0.076		0.151	*	0.073	*	0.073		0.0087	0.7147	Fixed
	2010	0.508	***	0.312	**	0.188		-0.001		-0.008		0.0213	0.3037	Flexible
	2020	0.708	***	0.053		-0.120		-0.050		0.409	***	0.0158	0.4847	Managed
	2021	0.891	***	-0.062		-0.020		-0.095		0.286	**	0.0134	0.5615	Managed
Russia	2000	1.991	**	-0.412		-0.487		0.120		-0.212		0.0306	0.0000	Highly flexible
	2010	0.422	**	0.445	**	-0.341		-0.049		0.523	***	0.0269	0.1192	Flexible
	2020	0.579		-0.673		0.465		-0.087		0.718	***	0.0306	0.0000	Highly flexible
	2021	0.624		-0.743		0.285		-0.110		0.944	***	0.0306	0.0000	Highly flexible
South Africa	1961	0.075		0.001		0.933	***	-0.009				0.0007	0.9782	Fixed
	1970	0.272	***	0.006		0.777	***	-0.055				0.0005	0.9826	Fixed
	1980	0.948	***	-0.017		0.056		0.013				0.0073	0.7620	Fixed
	1990	0.285	**	0.524	**	0.064		0.127				0.0217	0.2910	Flexible
	2000	0.501	*	0.240		-0.328		0.125		0.462	***	0.0278	0.0898	Flexible
	2010	0.678	**	0.929	**	0.097		-0.699	***	-0.005		0.0306	0.0000	Highly flexible
	2020	-0.256		0.015		0.010		0.037		1.194	***	0.0306	0.0000	Highly flexible
	2021	-0.078		-0.004		0.136		-0.033		0.979	***	0.0293	0.0418	Flexible

[8] See Appendix I for detailed explanations.

ERS = exchange rate stability; EUR = Euro; GBP = British pound; JPN = Japanese yen; RMB = Chinese renminbi; RMSE = root mean squared error; USD = U.S. dollar.
Note: The Frankel-Wei and Kawai-Pontines methods are applied to 1961-1990 and 2000-2021, respectively. EUR refers to DEM (Deutschemark) in 1961-1990. A single asterisk (*), two asterisks (**), and three asterisks (***) indicate that the coefficients are statistically significant at the 10%, 5%, and 1% levels, respectively.
Source: Compiled by authors from their estimations.

Results reveal several interesting points. First, exchange rate arrangements are different across economies and over time. Either a single currency or a basket of currencies is identified as an anchor for exchange rate pegging or managing purposes. Even under flexible or highly flexible exchange rate regimes, anchor currencies are often identified although the degree of anchoring in these cases is loose. Second, the general trend is a shift from fixed exchange rate regimes in early decades, such as 1961-80, to managed, flexible, or highly flexible rate regimes in recent decades. Indeed, all the BRICS economies, other than China, are under flexible or highly flexible exchange rate regimes in recent years. Third, the USD is the most popular currency used as anchor, followed by the EUR (or DEM before 2000) and then by the GBP, while the use of the JPY has been limited. Fourth, the RMB has been under either fixed or managed exchange rate regimes with the USD as the major anchor currency and is not yet under a flexible exchange rate regime even in the most recent years. Nonetheless, it has emerged rapidly as exchange rate anchor for many economies, including BRICS economies, since 2000, often in the context of flexible and highly flexible rate regimes.

2.3 Mapping the evolution of the exchange rate regime by economy

Figure 1 provides snapshots on the evolution of exchange rate regimes over the past 50 years by focusing on anchor currencies and the degrees of exchange rate stability (or flexibility) for individual economies in the world.[9] Each economy in the world map is colored based on the anchor currency with the statistically significant, highest estimated weight among the major currencies. The U.S. dollar is shown in blue, the euro in green, the British pound in orange, the Japanese yen in yellow, and the Chinese RMB in red. For example, in the 1975 world map, a number of economies (including Canada, Colombia, Indonesia, Mexico, Nigeria, and Thailand) are colored in dark blue because the estimated US dollar weight is the highest and the level of the RMSE is small (or the ERS index is large).

In the map, each color is tinted according to the level of the RMSE, which is categorized into three ranges of goodness of fit. An economy with a small RMSE (or a high degree of ERS) is represented in a dark color, while an economy with a large RMSE (or a low degree of ERS) is shown in a light color. More concretely, when the RMSE of the estimation for a certain

[9] The annual data series is created from the estimation results (i.e., the estimated coefficients on major anchor currencies and the estimated RMSE as a measure of goodness of fit) obtained from the 36-month rolling regressions as of December of each year.

economy in a particular year is less than 0.01, the economy is considered as having a high level of goodness of fit, i.e., a high degree of ERS, and thereby be painted with the darkest color.[10] The RMSE greater than 0.02 would be categorized as a low-level goodness of fit, i.e., a low degree of ERS (or a high degree of exchange rate flexibility) and painted with the lightest color. The range in-between ($0.01 < \text{RMSE} \leqq 0.02$) is the middle level. Accordingly, economies like Brazil, China, and Egypt are colored in lighter blue, while economies like Australia, Indonesia, and South Africa are colored in the lightest blue.

Painting each economy with a different color density increases the nuance of the analysis. Many researchers who have implemented the Frankel-Wei or Kawai-Pontines method have not incorporated information measured by the goodness of fit. In other words, their approaches do not clarify whether the regression results have sufficiently high explanatory power or not. For example, Ito (2017), Tovar and Nor (2018), Ilzetzki, Reinhart, and Rogoff (2019), Ito and McCauley (2019), and others apply the Frankel-Wei and/or Kawai-Pontines method to illustrate the development of the "RMB zone." However, they do not pay attention to the implications of the explanatory power of the estimating equation, measured by such statistics as the RMSE.

Figure 1 reveals several interesting observations. First of all, the USD has been the most dominant anchor currency in the last five decades. In the aftermath of the collapse of the Bretton Woods system in 1973, major advanced economies have shifted to flexible exchange rate regimes, but many emerging & developing economies, except for some that pegged their exchange rates to former colonial powers' currencies, decided to continue to stabilize their exchange rates against the USD. In the early 1990s, many of the former Soviet Union republics began to adopt the USD as their anchor currency.

Second, the EUR (or DEM in the early years) solidified its hold in Western Europe and spread eastward in the 1990s and 2000s. Economies in western and central Africa which had pegged their currencies to the French franc began to choose the EUR as their exchange rate anchor. However, outside the Euro Area, its vicinity, and western and central Africa, one does not observe the dominant presence of the EUR. Their sphere of influence is not comparable to that of the USD. This is consistent with what is suggested by other measures of the use of major currencies, such as the shares in trade invoicing, and international debt issuance, and central banks' foreign exchange reserves. Roughly speaking, in these different financial assets,

[10] The major currency countries and region themselves, i.e., the United States, Euro Area, the United Kingdom, Japan, and China (which is treated as a non-major currency economy until 1998 and is assumed to play a major currency role from 1999), are also painted in the darkest colors, i.e., blue, green, orange, yellow, and red, respectively.

the share of the USD is around 50 – 60% while that of the euro is around 20%.

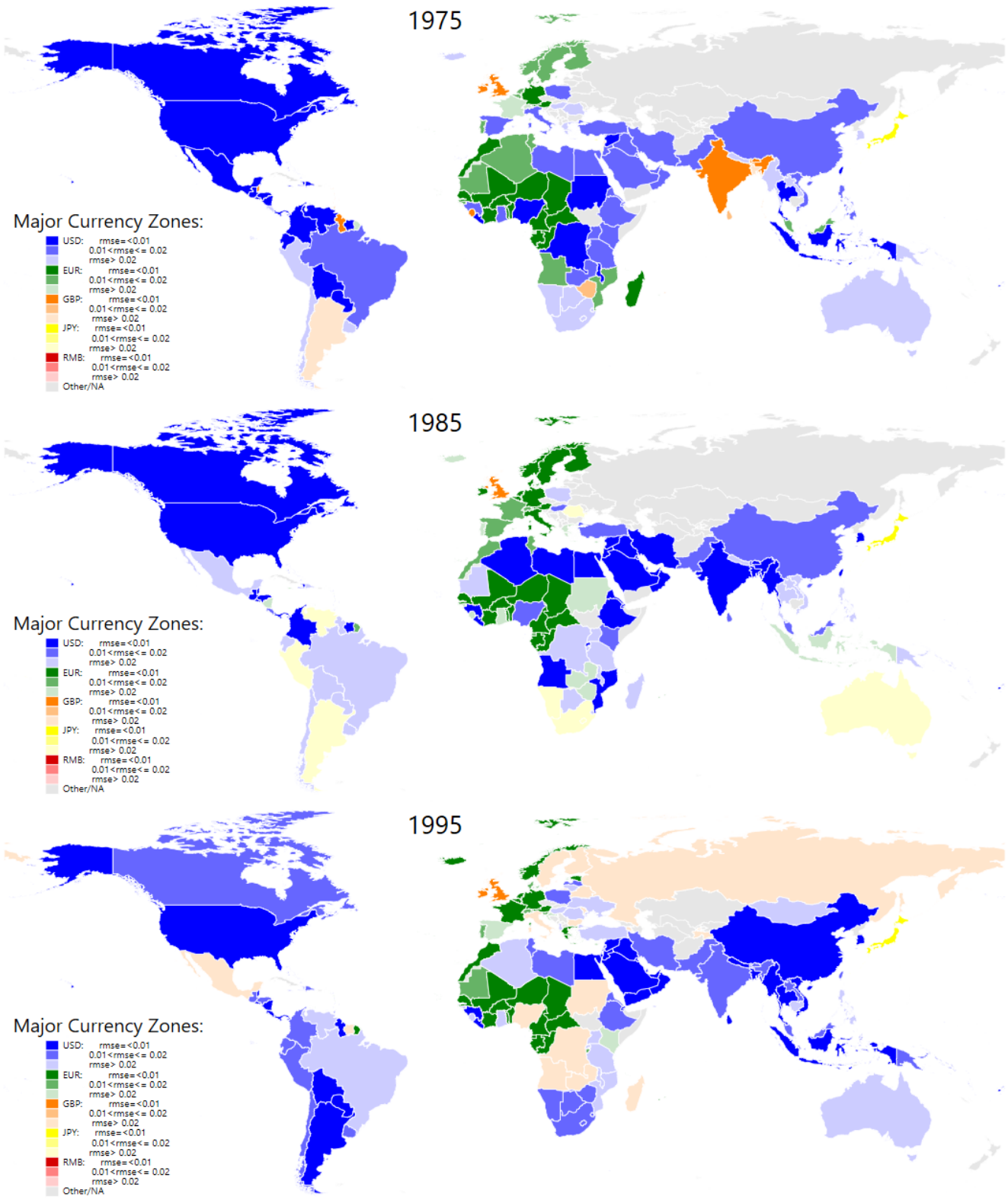
Third, the number of economies that use the U.K. pound and/or the Japanese yen as anchor currency have been limited in the last five decades. By the mid-1970s, the number of economies that stabilize exchange rates against mainly the U.K. pound has diminished (Schenk [2010], Schenk and Singleton [2015]). As of 1975, only Guyana, India, Ireland and Sierra Leone appeared to assign the highest weight to the U.K. pound among major currencies. As of 2021, there is virtually no economy that does the same thing.

The Japanese yen does not have its own sphere of influence either. In 1985 when the Japanese economy was in its heyday, close to thirty economies (including Iran, Myanmar, Romania, Samoa, Singapore and Sweden) stabilized their currencies at least partially against the Japanese yen. Especially in Romania, Samoa, and Singapore, the yen had the highest weights as anchor among the major currencies. Since then the anchor currency role of the yen has declined, and about 20 economies and 7 economies used the yen as a partial anchor in 2020 and 2021, respectively. One interesting point is that, in Thailand in 2021, the estimated weight of the yen (0.410) barely exceeded that of the RMB (0.406) and the economy is classified as belonging to the JPY zone. With the value of the RMSE at 0.016, the Thai baht was under a managed exchange rate regime and Thailand is colored with the second darkest yellow. However, the estimated weights on the yen and RMB are very close to each other and it may be fair to say that Thailand belongs to the JPY and RMB zones to about the same extent.

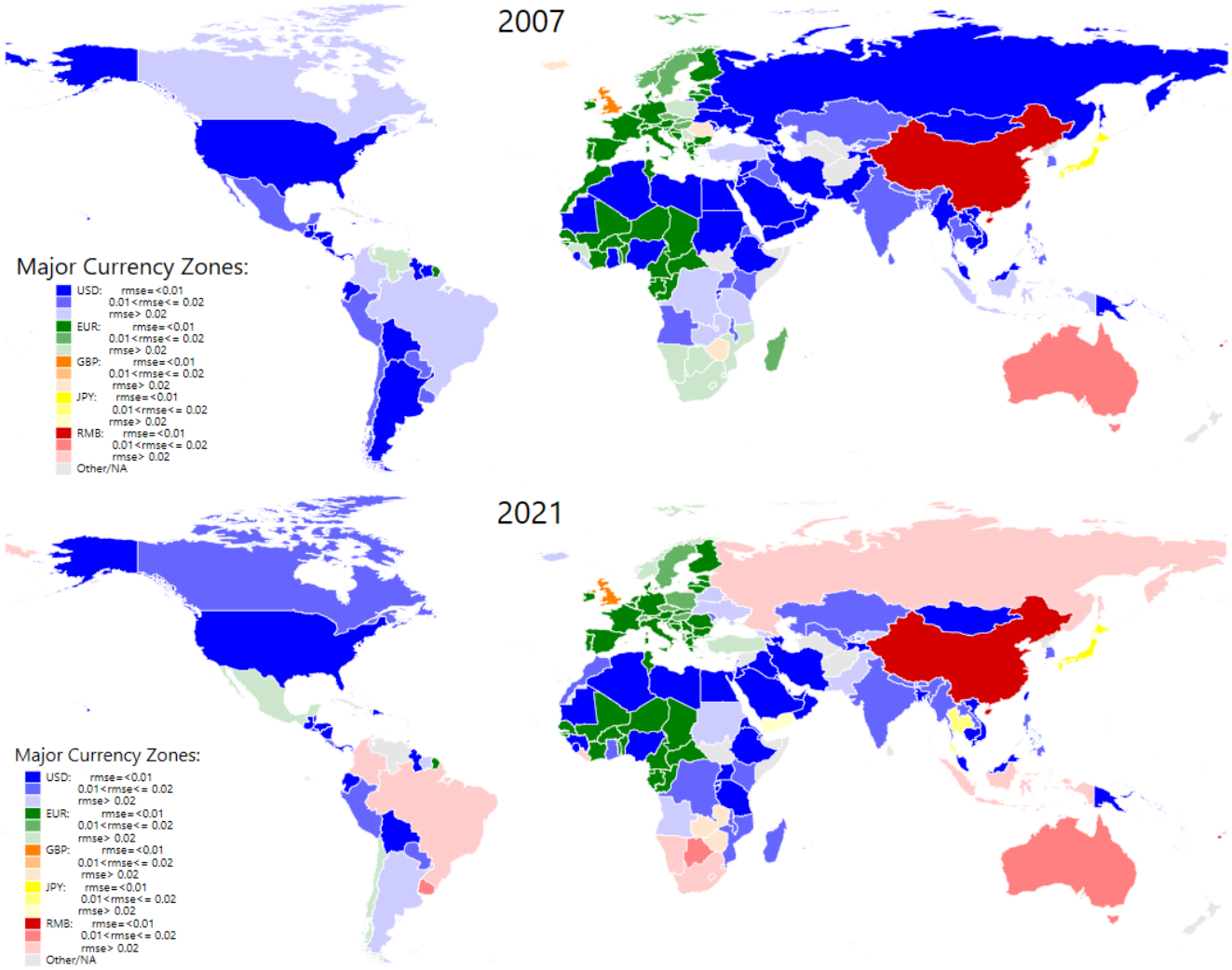
Fourth, although China is treated as a major currency country from 1999, the maps show only a few economies that belong to the RMB zone. Recently, many researchers identify several economies as belonging to the RMB zone. However, most of such economies loosely stabilize their exchange rates against the RMB as indicated by the weak explanatory power of the estimation, i.e., the high values of the RMSE. As of 2021, several economies (including Australia, Botswana, Brazil, Colombia, Indonesia, Russia, and Uruguay) are identified as assigning the highest weights to the RMB as anchor among the major currencies. However, the RMSEs of these economies are high so that their currencies are judged to be not closely tied to the RMB. If the goodness of fit were not considered, such highly flexible exchange rate economies as Brazil and Russia might be categorized as RMB-zone economies.

Figure 1: Evolution of the Major Currency Zones

1A: Constructed currency zones based on the Frankel-Wei method: 1975, 1985, and 1995



1B: Constructed currency zones based on the Kawai-Pontines method: 2007 and 2021



Source: Compiled by authors from their estimations.

3. Evolving Size of Major Currency Zones for the World and by Region

3.1 Computing the size of major currency zones

This section computes the economic size of currency zones formed by the major currencies (i.e., the USD, EUR, GBP, JPY and RMB), using the weights on anchor currencies and the magnitude of ERS obtained from Frankel-Wei or Kawai-Pontines regressions. The computation procedures adopted here are basically the same as those of Kawai and Akiyama (1998),[11] but a new innovation beyond them is introduced. First, each of the major currency country or region (i.e., the United States, Euro Area, the United Kingdom, Japan, or China)

[11] At the time of the publication of Kawai and Akiyama (1998), however, the RMB was not considered as a major currency and the Kawai-Pontines method was not available.

itself is assumed to be the core of a currency zone of its own. However, China is treated as a non-major currency economy during 1961-1998 and is assumed to play a possible major anchor currency role from 1999. Second, if any other economy rigidly pegs its exchange rate to a particular major currency, its entire economy is classified as belonging to the currency zone formed by this major currency. Third, if an economy stabilizes its exchange rate against a basket of major currencies, its economy is divided according to the estimated currency weights and distributed to the corresponding currency zones. The coefficients which are estimated to be positive and statistically significant, at least at the 10% level, are interpreted as the weights assigned to the corresponding major currencies.[12]

A new innovation adopted here, beyond the Kawai-Akiyama procedures, is that if an economy tightly or loosely stabilizes its exchange rate against a major currency or a currency basket, the degree of exchange rate stability or flexibility is taken into account in calculating the size of currency zones (see later for more detail). Accordingly, if an economy does not stabilize its exchange rate against any major currency or currency basket and is judged to adopt a highly flexible exchange rate regime, its economy is considered not to belong to any currency zone.

Even if an economy assigns a statistically significant positive weight to a single major currency or a basket of major currencies, the regression equation may have a very low degree of ERS (with a very large RMSE) and the economy may be judged as having a highly flexible exchange rate regime. In such a case, the economy may be considered a floating zone without belonging to any currency zone.

3.2 Evolving size of major currency zones: Global analysis

Table 3 reports the estimated size of major currency zones in the world as % shares of world GDP. The world is comprised of 150-172 economies depending on the year. Table 3A shows results when the degree (i.e., “tightness” or “looseness”) of ERS is not taken into account, while Table 3B reports results when such a difference is taken into account. In each table, a particular major currency zone is defined as the sum of the major currency country or area itself and the zone formed by other economies, which is the aggregated value across all non-major currency economies.

[12] Furthermore, if the estimated coefficients are negative, they are simply neglected even when statistically significant. If the sum of positive, statistically significant coefficients exceeds unity, they are proportionally re-scaled downward so that the sum of the new weights becomes unity. If the sum of positive, statistically significant coefficients falls short of unity, their values themselves are used as currency weights and the remaining part is considered as a residual, i.e., not belonging to any currency zone.

Table 3: Size of major currency zones, % shares in world GDP

3A. Not adjusted for exchange rate stability or flexibility (measured by ERS)

	World GDP		USD zone			EUR zone			GBP zone			JPY zone			RMB zone			Residual
Year	USD Bill	%	Total	United States	Other	Total	Euro Area	Other	Total	United Kingdom	Other	Total	Japan	Other	Total	China	Other	
1961	1,252	100.0	71.8	45.0	26.8	7.9	6.8	1.2	14.2	6.2	8.0	4.3	4.3	0.0	--	--	--	1.7
1970	2,740	100.0	68.1	39.2	28.9	8.3	7.9	0.4	9.5	4.8	4.8	7.9	7.8	0.1	--	--	--	6.2
1980	10,790	100.0	51.4	26.5	24.9	26.0	11.4	14.6	8.6	5.2	3.3	12.0	10.2	1.7	--	--	--	2.1
1990	21,589	100.0	45.8	27.6	18.2	27.5	10.5	17.0	8.4	5.1	3.3	15.9	14.5	1.4	--	--	--	2.4
2000	33,002	100.0	44.6	31.1	13.5	22.9	19.0	3.9	5.6	5.0	0.5	15.3	15.1	0.3	6.7	3.7	3.1	4.9
2010	64,860	100.0	37.4	23.2	14.2	26.8	19.4	7.5	7.0	3.8	3.1	9.4	8.9	0.5	13.2	9.4	3.8	6.2
2020	82,989	100.0	38.3	25.2	13.1	21.1	15.7	5.4	4.2	3.3	0.9	6.4	6.1	0.3	25.6	17.7	7.9	4.4
2021	93,356	100.0	37.8	24.6	13.2	20.8	15.5	5.3	4.4	3.4	1.0	5.8	5.3	0.5	27.6	19.0	8.6	3.5

3B. Adjusted for exchange rate stability or flexibility (measured by ERS)

	World GDP		USD zone			EUR zone			GBP zone			JPY zone			RMB zone			Residual
Year	USD Bill	%	Total	United States	Other	Total	Euro Area	Other	Total	United Kingdom	Other	Total	Japan	Other	Total	China	Other	
1961	1,252	100.0	71.8	45.0	26.8	7.9	6.8	1.2	14.2	6.2	8.0	4.3	4.3	0.0	--	--	--	1.7
1970	2,740	100.0	68.1	39.2	28.9	8.3	7.9	0.4	9.5	4.8	4.8	7.9	7.8	0.1	--	--	--	6.2
1980	10,790	100.0	47.6	26.5	21.1	22.9	11.4	11.5	7.8	5.2	2.6	11.6	10.2	1.3	--	--	--	10.1
1990	21,589	100.0	41.0	27.6	13.4	25.8	10.5	15.4	8.2	5.1	3.1	14.8	14.5	0.3	--	--	--	10.3
2000	33,002	100.0	40.1	31.1	9.1	22.2	19.0	3.2	5.5	5.0	0.5	15.3	15.1	0.2	5.3	3.7	1.6	11.7
2010	64,860	100.0	30.5	23.2	7.3	22.4	19.4	3.0	4.5	3.8	0.7	9.1	8.9	0.2	10.1	9.4	0.8	23.3
2020	82,989	100.0	35.4	25.2	10.2	19.0	15.7	3.3	4.0	3.3	0.7	6.3	6.1	0.2	20.4	17.7	2.7	14.9
2021	93,356	100.0	35.5	24.6	10.9	18.9	15.5	3.4	4.1	3.4	0.7	5.6	5.3	0.3	22.3	19.0	3.3	13.6

ERS = exchange rate stability; EUR = Euro; GBP = British pound; JPN = Japanese yen; RMB = Chinese renminbi; USD = U.S. dollar.
Note: Each currency zone includes the major currency country (or area) itself and other economies that assign a positive, statistically significant coefficient at the 10% level to that currency. EUR refers to DEM (Deutschemark) in 1961-1990, and Euro Area refers to Germany in 1961-1970 and Austria, Germany and Netherlands in 1980-1990, the eleven member economies of the Euro Area in 2000, the sixteen members in 2010, and the nineteen members in 2020-2021. China is treated as a non-major currency economy during 1961-1998. Residual is the part that cannot be explained by the identified currency weights and hence can be considered as a floating regime zone.
Source: Compiled by authors from their estimations.

The difference between Tables 3A and 3B lies in the calculation of currency zones formed by other (i.e., non-major currency) economies as well as residuals. In Table 3A, the size of a major currency zone formed by other non-major currency economies is obtained by dividing each economy into the five currency zones and the residual according to the estimated weights on major currencies, regardless of the degree of ERS, and aggregating these values across all non-major currency economies. A residual is that part of the economy not belonging to any currency zone.

In Table 3B, the size of a zone formed by non-major currency economies is obtained by considering the degree of ERS. More specifically, the estimated currency weights themselves are used when the degree of ERS is high (with the value of RMSE less than 0.01); the estimated weights times two thirds (2/3) are used when the degree of rate stability is intermediate (with RMSE between 0.01 and 0.02); the estimated weights times one third (1/3) are used when the degree of rate stability is low (with RMSE between 0.02 and 0.03); and zero weights are used when the degree of ERS is very low (with RMSE greater than 0.3). So, economies that adopt highly flexible rate regimes are considered not to belong to any major currency zone even when they assign positive, statistically significant weights to particular major currencies. This procedure is arbitrary, but is one way to capture the different degrees of ERS in calculating the size of currency zones.

Tables 3A and 3B provide the same message qualitatively, but there are some quantitative differences. The quantitative difference is that the economic size of major currency areas formed by other economies reported in Table 3B is smaller than that in Table 3A, and that the economic size of the residual reported in Table 3B is larger than that in Table 3A. The reason for this difference is that Table 3B, which calculates the size of major currency zones by adjusting for the degree of ERS, delivers the result that the size of major currency zones becomes smaller than in the case of Table 3A, as the degree of ERS tends to decrease over time. This means that the residual which does not belong to any currency zone, shown in Table 3B, becomes larger than in Table 3A.

By focusing on Table 3B for interpretation of the results, one can observe several points. First, the share of the USD zone was large at around 70% of world GDP in 1961-1970, but has diminished over time by about 35 percentage points since then to 35% in 2020-2021. The reason is that both the shares of the U.S. economy and other USD-zone economies in the world have declined. Second, the global share of the EUR zone (the DEM zone in early years) rose from 1961 to 1990, reaching 26%, as the share of other EUR-zone economies rose, but has gradually

declined to 19% in 2020-2021 because the relative shares of both the Euro Area and other EUR-zone economies have decreased. Third, the share of the GBP zone, which was 14% in 1961, has declined as a trend overtime, reaching 4% in recent years. Fourth, the share of the JPY zone rose until 2000, reaching 15%, mainly because of the expansion of the Japanese economy, but has diminished since then to 6% in 2020-2021 due the continuous shrinkage of the share of the Japanese economy. The share of other JPY-zone economies, which recorded 1% in 1980, has also declined. Fifth, in contrast, the share of the RMB zone has increased persistently over time, reaching more than 20% of the global economy in 2020-21, because of the sustained expansion of the Chinese economy and other RMB-zone economies. The RMB zone is now the second largest economy after the USD zone, followed by the EUR, JPY, and GBP zones. Finally, the share of the residual, i.e., the global economy that does not belong to any major currency zone, increased from 2% in 1961 to 23% in 2010 and has maintained since then the close to 15% level in recent years.

In summary, the economic share of the USD zone has declined noticeably since the breakdown of the Bretton Woods system, because the share of the EUR zone (the DEM zone until 1999) expanded until around 1990 (and then began to decrease), the share of the yen zone expanded until around 2000 (and then contracted), and the share of the RMB zone has increased in recent years. The RMB now complements the anchor currency role played by the USD, EUR, GBP, and JPY. Nonetheless, the USD zone remains the most dominant currency zone, accounting for 11% of non-major currency economies' GDP, well above the shares of the EUR and RMB zones (both 3%). In addition, the global economic share of a zone that does not belong to any major currency zone and adopts a free floating regime expanded rapidly until 2010, has since declined slightly, but has remained high at 14% in recent years.

3.3 Evolving size of major currency zones: Analysis by region

This subsection compares and examines the size of major currency zones for advanced economies and emerging market & developing economies, as well as for various regions of the latter economies. Table 4 summarizes the results with and without adjusting for the degree of ERS. Information in this table differs from that in Table 3, as the table does not include major currency economies or region (i.e., the U.S., Euro Area, the U.K., Japan, and China).[13] In other

[13] As in Table 3, China is treated as a non-major currency economy during 1961-1998 and is assumed to play a major anchor currency role from 1999.

words, the major currency zones in this table refer only to those formed by non-major currency economies.

Table 4: Size of the major currency zones by income or region, % shares in GDP

4A. All non-major currency economies, including China during 1961-1990

	GDP	Not adjusted for exchange rate stability/flexibility							Adjusted for exchange rate stability/flexibility						
Year	USD Bill	Total	USD	EUR	GBP	JPY	RMB	Res.	Total	USD	EUR	GBP	JPY	RMB	Res.
1961	473	100.0	71.1	3.0	21.3	0.1	--	4.5	100.0	71.1	3.0	21.3	0.1	--	4.5
1970	1,108	100.0	71.6	1.1	11.8	0.3	--	15.2	100.0	71.6	1.1	11.8	0.3	--	15.2
1980	5,035	100.0	53.4	31.3	7.1	3.7	--	4.5	100.0	45.2	24.7	5.6	2.8	--	21.6
1990	9,143	100.0	43.0	40.2	7.9	3.3	--	5.6	100.0	31.5	36.3	7.3	0.6	--	24.3
2000	8,633	100.0	51.6	14.9	2.1	1.1	11.7	18.6	100.0	34.7	12.1	1.7	0.8	6.1	44.5
2010	22,913	100.0	40.1	21.1	8.9	1.4	10.9	17.5	100.0	20.7	8.6	1.9	0.6	2.2	66.0
2020	26,583	100.0	41.0	16.9	2.9	1.0	24.6	13.6	100.0	31.8	10.4	2.1	0.7	8.5	46.5
2021	30,008	100.0	41.1	16.3	3.2	1.7	26.8	10.9	100.0	33.9	10.5	2.2	1.1	10.2	42.2

4B. Advanced economies, excluding the US, the UK, Euro Area, and Japan

	GDP	Not adjusted for exchange rate stability/flexibility							Adjusted for exchange rate stability/flexibility						
Year	USD Bill	Total	USD	EUR	GBP	JPY	RMB	Res.	Total	USD	EUR	GBP	JPY	RMB	Res.
1961	276	100.0	71.6	5.2	18.6	0.0	--	4.6	100.0	71.6	5.2	18.6	0.0	--	4.6
1970	625	100.0	75.8	0.5	8.2	0.0	--	15.5	100.0	75.8	0.5	8.2	0.0	--	15.5
1980	2,648	100.0	28.3	52.0	7.7	6.1	--	6.0	100.0	22.3	39.6	6.5	4.6	--	27.0
1990	5,619	100.0	25.7	59.7	10.6	0.1	--	3.9	100.0	18.1	55.0	9.7	0.1	--	17.1
2000	3,060	100.0	38.5	28.5	2.9	0.7	18.8	10.6	100.0	27.2	24.7	2.0	0.7	12.4	33.1
2010	6,068	100.0	23.5	34.1	18.3	2.5	8.7	12.8	100.0	8.5	15.9	2.4	0.8	3.1	69.2
2020	7,020	100.0	30.4	24.6	8.5	3.8	22.5	10.3	100.0	25.4	16.6	5.9	2.6	15.3	34.3
2021	8,184	100.0	28.1	20.3	8.1	3.0	27.9	12.6	100.0	23.8	15.1	5.6	2.0	18.4	35.1

4C. Emerging market and developing economies, including China during 1961-1990

	GDP	Not adjusted for exchange rate stability/flexibility							Adjusted for exchange rate stability/flexibility						
Year	USD Bill	Total	USD	EUR	GBP	JPY	RMB	Res.	Total	USD	EUR	GBP	JPY	RMB	Res.
1961	196	100.0	70.4	0.0	25.0	0.3	--	4.3	100.0	70.4	0.0	25.0	0.3	--	4.3
1970	483	100.0	66.2	1.8	16.5	0.6	--	15.0	100.0	66.2	1.8	16.5	0.6	--	15.0
1980	2,386	100.0	81.2	8.4	6.5	1.0	--	2.8	100.0	70.6	8.3	4.6	0.9	--	15.7
1990	3,525	100.0	70.6	9.2	3.6	8.3	--	8.4	100.0	53.0	6.5	3.5	1.4	--	35.6
2000	5,573	100.0	58.7	7.5	1.6	1.3	7.9	23.0	100.0	38.9	5.2	1.6	0.9	2.6	50.8
2010	16,845	100.0	46.1	16.4	5.5	1.1	11.7	19.2	100.0	25.1	6.0	1.7	0.6	1.8	64.8
2020	19,563	100.0	44.8	14.2	0.8	0.0	25.4	14.8	100.0	34.1	8.2	0.7	0.0	6.0	51.0
2021	21,824	100.0	46.0	14.8	1.4	1.2	26.4	10.2	100.0	37.7	8.7	0.9	0.7	7.1	44.8

4Da. Emerging and developing Asia, including China during 1961-1990

	GDP	Not adjusted for exchange rate stability/flexibility							Adjusted for exchange rate stability/flexibility						
Year	USD Bill	Total	USD	EUR	GBP	JPY	RMB	Res.	Total	USD	EUR	GBP	JPY	RMB	Res.
1961	105	100.0	61.3	0.0	33.3	0.5	--	4.9	100.0	61.3	0.0	33.3	0.5	--	4.9
1970	188	100.0	54.8	0.4	29.7	0.0	--	15.1	100.0	54.8	0.4	29.7	0.0	--	15.1
1980	580	100.0	56.0	15.1	22.1	0.9	--	5.8	100.0	51.8	15.0	15.0	0.9	--	17.3
1990	1,032	100.0	86.8	1.1	9.3	1.2	--	1.7	100.0	73.1	0.4	9.2	1.1	--	16.1
2000	1,071	100.0	48.6	0.2	6.6	3.4	3.0	38.2	100.0	40.0	0.2	6.6	3.3	0.5	49.5

2010	3,672	100.0	46.5	16.2	0.5	2.2	10.6	23.9	100.0	23.4	6.1	0.4	1.5	1.4	67.2
2020	5,945	100.0	59.9	0.5	0.0	0.1	31.6	7.8	100.0	42.6	0.5	0.0	0.1	18.6	38.2
2021	6,565	100.0	58.5	0.3	0.1	3.2	32.5	5.5	100.0	44.4	0.3	0.1	2.1	17.7	35.5

4Db. Emerging and developing Europe

	GDP	Not adjusted for exchange rate stability/flexibility							Adjusted for exchange rate stability/flexibility						
Year	USD Bill	Total	USD	EUR	GBP	JPY	RMB	Res.	Total	USD	EUR	GBP	JPY	RMB	Res.
1961	8	100.0	100.0	0.0	0.0	0.0	--	0.0	100.0	100.0	0.0	0.0	0.0	--	0.0
1970	17	100.0	100.0	0.0	0.0	0.0	--	0.0	100.0	100.0	0.0	0.0	0.0	--	0.0
1980	195	100.0	100.0	0.0	0.0	0.0	--	0.0	100.0	60.7	0.0	0.0	0.0	--	39.3
1990	311	100.0	72.1	19.8	0.0	0.0	--	8.2	100.0	34.0	13.2	0.0	0.0	--	52.9
2000	885	100.0	56.5	31.1	0.0	0.0	9.4	3.0	100.0	13.8	17.8	0.0	0.0	2.7	65.7
2010	3,477	100.0	29.6	36.6	7.2	0.4	16.9	9.4	100.0	4.8	10.4	0.0	0.1	5.7	79.0
2020	3,669	100.0	4.7	32.1	1.1	0.0	40.2	21.9	100.0	0.6	25.5	0.7	0.0	0.0	73.1
2021	4,279	100.0	4.5	31.2	1.2	0.0	41.4	21.7	100.0	1.7	24.9	0.8	0.0	0.8	71.9

4Dc. Latin America and the Caribbean

	GDP	Not adjusted for exchange rate stability/flexibility							Adjusted for exchange rate stability/flexibility						
Year	USD Bill	Total	USD	EUR	GBP	JPY	RMB	Res.	Total	USD	EUR	GBP	JPY	RMB	Res.
1961	39	100.0	94.7	0.0	3.9	0.0	--	1.4	100.0	94.7	0.0	3.9	0.0	--	1.4
1970	163	100.0	72.3	0.0	1.6	0.0	--	26.1	100.0	72.3	0.0	1.6	0.0	--	26.1
1980	745	100.0	98.1	0.2	0.0	1.4	--	0.3	100.0	81.6	0.2	0.0	1.0	--	17.3
1990	1,043	100.0	58.9	0.0	0.6	23.6	--	17.0	100.0	37.4	0.0	0.4	0.5	--	61.7
2000	2,189	100.0	57.9	0.0	0.0	0.2	10.5	31.4	100.0	37.9	0.0	0.0	0.0	3.9	58.2
2010	5,172	100.0	31.9	2.5	11.7	0.0	16.5	37.3	100.0	13.9	0.1	4.5	0.0	0.1	81.5
2020	4,289	100.0	17.4	29.8	0.0	0.0	26.9	25.9	100.0	14.8	8.5	0.0	0.0	0.3	76.4
2021	4,963	100.0	25.0	32.1	0.0	0.4	27.5	15.0	100.0	17.2	10.7	0.0	0.3	3.4	68.3

4Dd. Middle East and Central Asia

	GDP	Not adjusted for exchange rate stability/flexibility							Adjusted for exchange rate stability/flexibility						
Year	USD Bill	Total	USD	EUR	GBP	JPY	RMB	Res.	Total	USD	EUR	GBP	JPY	RMB	Res.
1961	17	100.0	67.6	0.0	20.3	0.0	--	12.0	100.0	67.6	0.0	20.3	0.0	--	12.0
1970	57	100.0	85.8	0.5	7.6	5.3	--	0.8	100.0	85.8	0.5	7.6	5.3	--	0.8
1980	590	100.0	84.7	9.5	1.3	0.8	--	3.7	100.0	84.6	9.5	1.3	0.8	--	3.9
1990	807	100.0	76.8	14.6	2.6	4.0	--	2.1	100.0	69.9	12.2	2.6	3.7	--	11.7
2000	1,035	100.0	82.4	8.1	1.9	3.0	1.6	3.0	100.0	70.4	7.6	1.8	1.4	0.5	18.2
2010	3,210	100.0	83.0	10.1	1.5	2.5	0.5	2.5	100.0	71.4	8.2	1.1	1.1	0.4	18.0
2020	4,042	100.0	83.2	1.9	3.0	0.1	1.6	10.1	100.0	65.7	1.4	2.8	0.1	1.1	28.9
2021	4,672	100.0	90.0	1.2	5.2	0.6	1.0	2.0	100.0	85.0	1.0	3.4	0.1	0.7	9.8

4De. Sub-Saharan Africa

	GDP	Not adjusted for exchange rate stability/flexibility							Adjusted for exchange rate stability/flexibility						
Year	USD Bill	Total	USD	EUR	GBP	JPY	RMB	Res.	Total	USD	EUR	GBP	JPY	RMB	Res.
1961	27	100.0	64.2	0.0	33.4	0.0	--	2.3	100.0	64.2	0.0	33.4	0.0	--	2.3
1970	57	100.0	56.4	13.2	29.1	0.0	--	1.3	100.0	56.4	13.2	29.1	0.0	--	1.3
1980	277	100.0	68.0	20.3	7.2	1.1	--	3.4	100.0	58.0	19.3	5.1	1.1	--	16.5
1990	332	100.0	40.5	40.1	0.7	0.8	--	17.9	100.0	16.8	25.7	0.7	0.7	--	56.1
2000	392	100.0	33.6	14.0	0.1	0.8	19.5	31.9	100.0	14.3	13.0	0.1	0.5	6.4	65.8
2010	1,314	100.0	54.4	34.3	0.3	0.4	8.8	1.8	100.0	15.0	11.9	0.1	0.3	2.9	69.8
2020	1,618	100.0	56.5	13.1	0.1	0.0	23.8	6.5	100.0	50.7	13.1	0.1	0.0	1.0	35.2

2021	1,344	100.0	41.2	17.8	0.3	0.0	33.1	7.6	100.0	31.0	17.8	0.2	0.0	11.5	39.5

EUR = Euro; GBP = British pound; JPY = Japanese yen; Res. = residual: RMB = Chinese renminbi; USD = U.S. dollar.
Note: Each currency zone here includes only part of those economies that assign a positive, statistically significant coefficient at the 10% level to that currency. EUR refers to DEM (Deutschemark) in 1961-1990. Euro Area refers to Germany in 1961-1970, Austria, Germany and Netherlands in 1980-1990, the eleven member economies of the Euro Area in 2000, the sixteen members in 2010, and the nineteen members in 2020-2021. China is treated as a non-major currency economy during 1961-1990 and a major currency country. As a result GDP in the table (shown in 3A-3C and 3Da) includes China's GDP during 1961-1990 but not during 2000-2021. Residual is the part that cannot be explained by the identified currency weights and hence can be considered as a floating regime zone.
Source: Compiled by authors from their estimations.

Table 4A reports results for all non-major currency economies, excluding the U.S., Euro Area, the U.K., and Japan for the entire period as well as China after 2000. It shows that the size of the USD zone used to be dominant in 1961-1970, accounting for more than 70% of these economies, but has declined overtime to 38% (without adjusting for ERS) or 36% (with such adjustment) in recent years. This share is still the largest, followed by those of the RMB and EUR zones. An interesting observation is that the recent RMB-zone share is high at 28% without adjusting for ERS, while it is smaller at 22% with such adjustment. This suggests that economies that select the RMB as exchange rate anchor do not necessarily pursue high degrees of ERS.

Another interesting observation is that the residual is much larger with ERS adjustment than without. For example, the share of the residual used to be only 5% in 1961, began to rise over time to 18% (without adjustment for ERS) or 66% (with adjustment) in 2010 and has since declined to 11% (without adjustment) or 42% (with adjustment) in the most recent year. In other words, the share of the economy adopting freely floating exchange rates, measured as the residual, increased from the time of the collapse of the Bretton Woods system until the global financial crisis, and although it declined somewhat thereafter, it still maintains a high share. The global share of the residual economy being more than 40% in recent years when adjusted for ERS may be surprisingly high.

These basic observations carry over to the remainder of Table 4, but there are also differences in results across economy groups classified by income and region. The following discussion focuses on the case where the degree of ERS is adjusted for comparative analysis.

Comparison of results for advanced economies (reported in Table 4B) with those for emerging & developing economies (reported in Table 4C) reveals some interesting differences. First, during the period 1961-1970, the share of the USD zone in advanced economies was larger than that of emerging & developing economies, but since 1980, the share of the USD zone in emerging & developing economies has been larger. Second, the shares of the EUR and RMB zones are

generally larger in advanced economies than in emerging & developing economies. Third, the share of the residual is generally larger in emerging & developing economies than in advanced economies, with some exceptions. This suggests that emerging & developing economies tend to adopt higher degrees of exchange rate flexibility than advanced economies. However, at the time of the global financial crisis of 2010, advanced economies also preferred greater exchange rate flexibility, as indicated by the high share of the residual in regional GDP.

In the emerging & developing world, some clear differences across regions can be observed. In emerging & developing Asia, the share of the USD zone has been persistently high, reaching a peak of 73% in 1990. Although the share of the USD zone has decreased since then, it still maintains a relatively high level of 44% in 2021. The share of the RMB zone is the highest in Asia among all regions, recording 18% in 2021. In emerging and developing Europe, the share of the USD zone was very high (61% to 100%) in 1961-1980, but fell sharply after 1990, and was replaced by the share of the EUR zone, which has become the largest currency area in the region, accounting for 25% (with the residual accounting for 72%) in 2021. In Latin America and the Caribbean, the share of the USD zone was also very high at over 70% in 1961-1980, but has declined since 1990, reaching 17% in 2021. In the region, the EUR-zone share has gradually increased, recording 11% in recent years. In the Middle East and Central Asia, the share of the USD zone has remained consistently very high, recording 85% in 2021. In Sub-Saharan Africa, the share of the USD zone was high at around 60% in 1961-1980, and although it has declined since then, it has been relatively high, registering 31% in recent years. In the early years, the share of the GBP zone was also relatively large, but since 1990 it has declined sharply and been replaced by the share of the EUR zone, which reached 18% in recent years. The RMB zone is also increasing its presence, with a 12% share in 2021.

The size of the residual is the largest in emerging & developing Europe as well as LAC while it is the smallest in Middle East and Central Asia. This suggests that emerging & developing economies in Europe and LAC adopt relatively high degrees of exchange rate flexibility, while economies in the Middle East and Central Asia adopt relatively high degrees of ERS. The degrees of exchange rate stability/flexibility in Sub-Saharan Africa and emerging & developing Asia are in-between those of the above two groups.

To summarize, the global share of the USD zone is trending downward following the emergence of the euro and the recent rapid rise of the RMB. Nevertheless, the USD zone remains the world's largest currency zone, particularly since 1980, in emerging & developing regions such as the

Middle East and Central Asia and emerging & developing Asia. The share of the EUR zone is large among advanced economies, and it was indeed larger than the share of the USD zone during the period 1980-2010 but was surpasses by the USD zone in 2020-2021. Among the emerging & developing regions, Europe has the largest EUR zone. The share of the EMB zone is also large among advanced economies, and in 2021, it became the second largest currency zone among these economies. Among the emerging & developing regions, Asia has the largest RMB zone and in 2020-2021 it became the second largest currency zone in the region after the US dollar zone. In Sub-Saharan Africa, the importance of the RMB zone is also rising. The residual part of the world economy, which does not belong to any major currency zone and is judged to adopt floating exchange rate regime, has been expanding mainly in emerging & developing regions, especially in Europe and Latin America and the Caribbean.

4. Determinants of the Estimated Major Currency Weights

This section investigates the determinants of the estimated major currency weights. One of the hypotheses of the paper is that the major currency weight is determined not only by economies' structural characteristics but also by their trade, investment, and financial linkages with the major currency countries or region (i.e., the United States, the Euro Area, the United Kingdom, Japan, and China). Here, economies' structural characteristics include: the relative income level, the share of commodity exports in total exports, trade openness, financial openness, and the degree of financial market development as well as several dummy variables, such as former British colony, former non-British European colony, financial center, and OPEC_Plus dummies. Economies' trade, investment, and financial linkages are measured by the shares of major currency countries in trade, inward FDI stock, cross-border bank liabilities, and external debt stock.

Another hypothesis of the paper is that the major currency weight is determined by the shares of the major currencies in economies' export invoicing, cross-border bank liabilities, international debt securities issued, and external debt stock in addition to their structural characteristics.

4.1 Estimation model and theoretical predictions

This section investigates the determinants of the major currency weights in a formal or informal currency basket for each sample economy. To do so, the following equation is estimated:

$$y_{i,t}^{c} = \alpha^{c} + X_{i,t}' \mathrm{B}^{c} + Z_{i,t}^{c\prime} \Gamma^{c} + D_{i}' \Phi^{c} + u_{t}^{c} + v_{i,t}^{c}$$

The left-hand side variable, $y_{i,t}^{c}$, is the estimated weight on major currency *c* in the currency basket of economy *i* in year *t*, where *c* is the US dollar, euro, and renminbi (RMB). The regression is conducted for each major currency, and the issuers of these major currencies are not included in *i*. The vector $X_{i,t}$ represents the characteristics of economy *i* that possibly affect the major currency weight $y_{i,t}^{c}$, including the following:

- relative income to the United States (obtained from Penn World Table), with the predicted negative impact on the major currency weight as a higher income economy relies less on any major currency, including the US dollar.
- the share of commodity exports in total exports (constructed from data on exports of food, metal, and fuel, obtained from the World Bank's World Development Indicators database), with the expected positive impact on the USD weight as commodity exporting economies tend to earn US dollars and thus have incentives to stabilize their currencies to the US dollar but with the expected negative or ambiguous impact on the euro or RMB weight
- financial development index (obtained from IMF),[14] with the predicted negative impact on the major currency weight as an economy which has larger, more liquid, and deeper financial markets can diversify more risk using a variety of financial instruments and thus tends to rely less on major currencies, particularly the US dollar
- financial openness, defined as the average of the ratios of external assets plus liabilities to GDP and trade (obtained from Ito and Kawai, 2023), with the predicted negative impact on the major currency weight due to reasons similar to the above
- trade openness, defined as the ratio of exports plus imports to GDP (World Bank's World Development Indicators database), with the predicted negative impact on the major currency weight as an open economy in terms of international trade tends to diversify trading partners and thus is not likely to focus on stabilizing its currency to one or two major currencies.

The vector $Z_{i,t}^{c}$ represents variables that connect economy *i* with the issuer country of major currency *c*, such as bilateral trade, investment, and lending. More specifically these variables include:

- Major currency country share of trade (exports plus imports, obtained from IMF Direction of Trade Statistics), i.e., the share of trade with the major currency country in total trade, with the predicted positive impact on the major currency weight as an economy which trades more

[14] It is available at https://data.imf.org/?sk=F8032E80-B36C-43B1-AC26-493C5B1CD33B&sId=1480712464593 .

with a major currency country has greater incentives to stabilize its currency against the major currency

- Major currency country shares of inward FDI stock (obtained from UNCTAD and IMF *Coordinated Direct Investment Survey*), cross-border bank liabilities (obtained from BIS), and external debt stock (public and publicly guaranteed [PPG], obtained from World Bank *International Debt Statistics*), i.e., the shares of inward FDI stock, cross-border bank liabilities, and external debt stock (PPG) provided by a major currency country in total inward FDI stock, cross-border bank liabilities, and external debt stock, with the predicted positive impact on the major currency weight as an economy which receives more investment and lending from a major currency country tends to prefer to have a stable exchange rate against the major currency

Alternatively, currency denomination variables that connect economy *i* with major currency *c* can also be considered for inclusion in this vector, $Z_{i,t}^{c}$. When data are available for economy *i* on the share of its exports invoiced or settled in major currency *c*, such a variable may be used for regression analysis. Similarly, data on the shares of inward financial investment denominated in a major currency can also be used. This alternative specification includes the following variables:

- Major currency share in export invoicing (obtained from Boz, et.al. 2020), i.e., the share of exports invoiced or settled in a major currency, with the expected positive impact on the major currency weight as an economy whose trade is invoiced/settled more in a major currency tends to have greater incentives to stabilize its currency against the major currency
- Major currency shares in cross-border bank liabilities (obtained from BIS), international debt securities (obtained from BIS), and external debt stock, PPG (public and publicly guaranteed, obtained from World Bank *International Debt Statistics*), i.e., the shares of cross-border bank liabilities, international debt securities issued,[15] and external debt stock, PPG denominated in a major currency in total cross-border bank liabilities, international debt securities issued, and external debt stock, PPG, with the predicted positive impact on the major currency weight as an economy which receives more financial investment from abroad denominated more in a major currency tends to wish to stabilize the exchange rate against the major currency

[15] On international debt securities issued, currency composition data are available but not bilateral volume data. In addition, some currency composition data for inward FDI stock are available, but as of this writing, the estimation to test the currency denomination is yet to come.

The estimation equation also includes dummy variables, D_i , to better characterize the sample economies, such as dummies for a former British colony, a former European colony,[16] a financial city state (as defined in Lane and Milesi-Ferretti 2017), and a member of OPEC-Plus.[17]

To capture the effects of global shocks, yearly dummies are included in the estimation model. The sample includes 124 economies (including both advanced and emerging & developing economies) from the period 1992 through 2019. For estimation, observations are sampled every three years. To mitigate potential endogeneity problems, all explanatory variables except for dummy variables are lagged by one year. Regional dummies are also included to capture regional orientation for certain exchange rate arrangements.

4.2 Estimation results and discussions

Tables 5 and 6 report the regression results for the estimated USD and EUR weights, respectively. As has been discussed, the analysis considers five types of the estimated currency weight, i.e., (i) the original estimated weight (including statistically insignificant ones), (ii) statistically significantly estimated weight (including negative ones), (iii) statistically significantly estimated, positive weight, (iv) significantly estimated weight adjusted for the degree of exchange rate stability (ERS), and (v) significantly estimated positive weight adjusted for ERS. Here, only the results using (v) are reported. When other types of the currency weights are used, the estimation results are qualitatively similar.

The tables indicate that most estimates are consistent with theoretical predictions. Economies with more developed or more open financial markets are less likely to stabilize their currencies against the US dollar or euro. However, there is no evidence that commodity exporters tend to stabilize their currencies against the US dollar, and OPEC_Plus economies are less likely to link their currencies with the US dollar, both of which are somewhat puzzling.

Estimation results for the USD weight

In Table 5A, the estimation uses the shares of the United States as a partner for trade, inward FDI

[16] A “former European colony” refers to the former colonies of Belgium, France, Germany, Portugal, and Spain.

[17] OPEC_Plus refers to the 12 OPEC members (Algeria, Congo, Rep. of the, Equatorial Guinea, Gabon, Iran, Iraq, Kuwait, Libya, Nigeria, Saudi Arabia, Venezuela, United Arab Emirates) plus 11 non-OPEC petroleum producing economies (Azerbaijan, Bahrain, Brazil, Brunei Darussalam, Kazakhstan, Malaysia, Mexico, Oman, Russia, Sudan, and South Sudan).

stock, bank liabilities, and external debt stock, PPG as explanatory variables in addition to economies' characteristics variables. Although the USD weight is positively affected by the US share of trade (except the last specification), it is not significantly and positively affected by the US share as a source of inward FDI stock, cross-border bank liabilities, or external debt stock. Despite theoretical predictions, the impact of the United States as a source of economies' inward investment and external borrowing on the USD weight is limited.

In contrast, Table 5B shows that economies which invoice larger proportions of their exports in the US dollar tend to have higher USD weights, suggesting that monetary authorities intervene in the foreign exchange market to reduce exchange rate risks. In specification (B2), the USD share in export invoicing is instrumented with the US share of trade due to possible simultaneity problems. The magnitude of the estimated coefficient on the USD share in export invoicing becomes large while other estimates remain intact in terms of both statistical significance and magnitude. The significantly positive coefficient on the USD share in export invoicing is found in all specifications except (B3), where this share may be correlated with the USD share in cross-border bank liabilities. The USD share in bank liabilities has significantly positive impact on the USD weight. However, such a link is not found in the USD share in international debt securities or external debt stock.

Comparing Table 5B with Table 5A, it is observed that using the USD shares in export invoicing and bank liabilities improves the explanatory power of estimations, suggesting that it is the currency of domination that matters, not so much of the United States as a partner of trade or cross-border bank borrowing. This suggests that even if the global shares of US trade and cross-border bank loans are trending downward, that does not necessarily imply the importance of the US dollar as anchor currency declines.

Table 5: Estimation results for the USD weight adjusted for ERS

5A: Use of the US share of trade and inward investment/borrowing as explanatory variables

Left-hand side variable	USD weight	USD weight	USD weight	USD weight	USD weight	USD weight
Explanatory variables	(A1)	(A2)	(A3)	(A4)	(A5)	(A6)
Relative income	0.168	-0.454	-0.337	-0.494	0.209	-0.866
	(0.268)	(0.516)	(0.510)	(0.641)	(0.270)	(0.267)**
Share of commodity exports	0.181	0.021	-0.049	0.075	0.196	1.175
	(0.131)	(0.259)	(0.291)	(0.311)	(0.231)	(0.533)*
Financial development	-0.728	-0.404	-0.513	-0.759	-0.666	2.053
	(0.247)***	(0.346)	(0.431)	(0.365)**	(0.340)*	(0.669)**
Trade openness	0.002	0.053	0.026	0.209	0.056	-0.133
	(0.080)	(0.130)	(0.136)	(0.169)	(0.103)	(0.181)
Former British colony	-0.060	-0.256	-0.199	0.259	-0.172	0.684
	(0.074)	(0.146)*	(0.166)	(0.345)	(0.147)	(0.316)*
Former European colony	-0.006	-0.181	-0.087	0.027	0.305	-0.858
	(0.098)	(0.229)	(0.238)	(0.155)	(0.260)	(0.429)
Financial city state	0.378	0.574	0.217			
	(0.142)***	(0.282)**	(0.264)			
OPEC_Plus	0.038	0.312	0.257	0.021	0.012	-0.768
	(0.110)	(0.173)*	(0.184)	(0.246)	(0.153)	(0.338)*
Financial openness	-0.335	-0.327	-0.308	-0.062	-0.193	-0.154
	(0.136)**	(0.190)*	(0.225)	(0.580)	(0.173)	(0.273)
US share of trade	0.945	2.814		0.593	1.168	-9.091
	(0.281)***	(0.745)***		(0.606)	(0.265)***	(4.516)
US share of inward FDI stock		-1.417	0.358			0.932
		(0.612)**	(0.373)			(1.002)
US share of cross-border bank liabilities					0.462	0.095
					(0.596)	(0.794)
US share of external debt stock, PPG				-0.611		
				(1.469)		
Number of observations	130	59	59	63	68	22
Adjusted R^2	0.33	0.26	0.13	0.28	0.63	0.88
Number of economies	51	30	30	24	21	12
Sample period	1992-19	2010-19	2010-19	1992-19	1992-19	2010-19

ERS = exchange rate stability, OPEC = Organization for Petroleum Exporting Economies, PPG = public and publicly guaranteed, USD = United States dollar

Note: * p<0.1; ** p<0.05; *** p<0.01. The USD weight used on the left-hand side is the statistically significant, positive USD weight (with outliers removed) multiplied by the ERS index. Annual fixed effects as well as regional dummies are included, but not reported to conserve space. To mitigate endogeneity, all explanatory variables except the dummy variables are lagged by one year. For estimation, observations are sampled every three years.

Source: Compiled by authors using their estimation results.

5B: Use of the USD share in exports and inward investment/borrowing as explanatory variables

Left-hand side variable	USD weight	USD weight (2SLS)	USD weight	USD weight	USD weight	USD weight
Explanatory variables	(B1)	(B2)	(B3)	(B4)	(B5)	(B6)
Relative income	0.355	0.516	0.366	0.423	0.384	0.039
	(0.233)	(0.214)**	(0.210)*	(0.238)*	(0.224)*	(0.572)
Share of commodity exports	0.058	-0.053	0.109	0.130	0.151	-0.082
	(0.122)	(0.141)	(0.109)	(0.132)	(0.129)	(0.175)
Financial development	-0.742	-0.867	-0.695	-0.664	-0.649	-0.588
	(0.211)***	(0.196)***	(0.206)***	(0.241)***	(0.229)***	(0.300)*
Trade openness	0.107	0.123	0.138	0.143	0.155	0.294
	(0.077)	(0.086)	(0.077)*	(0.080)*	(0.082)*	(0.108)***
Former British colony	0.203	0.271	0.254	0.241	0.273	0.225
	(0.082)**	(0.123)**	(0.073)***	(0.089)***	(0.082)***	(0.101)**
Former European colony	0.143	0.225	0.155	0.264	0.228	0.161
	(0.094)	(0.127)*	(0.073)**	(0.121)**	(0.109)**	(0.109)
Financial city state	0.657	0.679	0.565	0.699	0.651	0.444
	(0.114)***	(0.103)***	(0.099)***	(0.139)***	(0.121)***	(0.263)*
OPEC_Plus	-0.174	-0.227	-0.223	-0.242	-0.261	0.014
	(0.119)	(0.145)	(0.117)*	(0.117)**	(0.120)**	(0.169)
Financial openness	-0.326	-0.339	-0.441	-0.401	-0.477	-0.332
	(0.142)**	(0.126)***	(0.132)***	(0.157)**	(0.152)***	(0.294)
USD share in export invoicing	0.617	0.898	0.248	0.678	0.406	0.495
	(0.127)***	(0.324)***	(0.161)	(0.153)***	(0.187)**	(0.127)***
USD share in cross-border bank liabilities			0.619		0.547	
			(0.181)***		(0.189)***	
USD share in international debt securities				0.126	-0.022	
				(0.132)	(0.134)	
USD share in external debt stock, PPG						0.134
						(0.214)
Number of observations	130	130	130	119	119	81
Adjusted R^2	0.42	0.36	0.48	0.43	0.47	0.34
Number of economies	51	51	51	46	46	32
Sample period	1992-19	1992-19	1992-19	1992-19	1992-19	1992-19

2SLS = two-stage least squares, ERS = exchange rate stability, OPEC = Organization for Petroleum Exporting Economies, PPG = public and publicly guaranteed, USD = United States dollar

Note: * p<0.1; ** p<0.05; *** p<0.01. The USD weight used on the left-hand side is the statistically significant, positive USD weight (with outliers removed) multiplied by the ERS index. Annual fixed effects as well as regional dummies are included, but not reported to conserve space. To mitigate endogeneity, all explanatory variables except the dummy variables are lagged by one year. In specification (B2), the USD share in export invoicing is instrumented with the US share of trade. For estimation, observations are sampled every three years.

Source: Compiled by authors using their estimation results.

Estimation results for the EUR weight

Table 6 is parallel to Table 5 except that the estimation is now conducted for the EUR weight in various economies' currency baskets. As in the case of USD weight estimations, Table 6A uses the Euro Area shares of trade, inward FDI stock, and external borrowing and Table 6B uses the EUR shares in export invoicing and inward investment and borrowing as explanatory variables to estimate the EUR weight.

Unlike the case of the USD weight, relative income is negatively correlated with the EUR weight, and the share of commodity exports is positively correlated with the EUR weight. These results are somewhat puzzling, although the impact of the latter is not necessarily statistically significant. Economies with more developed financial markets or greater openness to international trade tend to stabilize their home currencies against the EUR. Financial openness tends to have negative impact on the EUR weight, although its impact is not statistically significant in Table 5B.

In Table 6A, the Euro Area share of trade has statistically significant, positive impact on the EUR weight across different specifications, and this trade effect for the euro is much more robust than that for the US dollar. However, the Euro Area shares of inward FDI stock, cross-border bank liabilities, and external debt stock, PPG do not have significant effects on the EUR weight. These findings support the view that the euro is rather a regional currency based on various economies' trade ties with the Euro Area member economies.

Table 6B also confirms that the EUR share in export invoicing has statistically significant positive impact on the EUR weight. In addition, the EUR shares in cross-border bank liabilities, international debt securities, and external debt stock, PPG positively contribute to the EUR weight. The impact of these variables is stronger the case for the estimations of the USD weight.

Table 6: Estimation results for the EUR weight adjusted for ERS

6A: Use of the Euro Area share of trade and inward investment/borrowing as explanatory variables

Left-hand side variable **Explanatory variables**	**EUR weight** (A1)	**EUR weight** (A2)	**EUR weight** (A3)	**EUR weight** (A4)	**EUR weight** (A5)	**EUR weight** (A6)
Relative income	-0.593 (0.210)***	-0.644 (0.434)	-0.105 (0.481)	-1.915 (0.644)***	-0.610 (0.208)***	-0.611 (0.445)
Share of commodity exports	0.112 (0.210)	0.594 (0.436)	0.144 (0.427)	-0.439 (0.176)**	0.116 (0.210)	0.598 (0.359)
Financial development	0.317 (0.257)	0.354 (0.442)	0.260 (0.503)	2.032 (0.304)***	0.371 (0.267)	0.277 (0.474)
Trade openness	0.213 (0.114)*	0.334 (0.204)	0.190 (0.201)	0.345 (0.145)**	0.207 (0.115)*	0.342 (0.206)
Former British colony	0.190 (0.086)**	0.294 (0.219)	0.330 (0.221)	-0.740 (0.209)***	0.200 (0.087)**	0.263 (0.214)
Former European colony	0.217 (0.157)	0.614 (0.442)	0.996 (0.459)**	-0.230 (0.116)*	0.246 (0.162)	0.549 (0.365)
Financial city state	-0.071 (0.128)	-0.025 (0.220)	-0.309 (0.219)		-0.078 (0.128)	
OPEC_Plus	-0.422 (0.192)**	-0.539 (0.233)**	-0.604 (0.247)**		-0.442 (0.199)**	-0.514 (0.244)**
Financial openness	-0.141 (0.155)	-0.533 (0.240)**	-0.333 (0.282)	-1.148 (0.269)***	-0.169 (0.164)	-0.519 (0.254)**

Euro Area share of trade	0.773 (0.316)**	1.408 (0.409)***		2.040 (0.335)***	0.824 (0.319)**	1.414 (0.403)***
Euro Area share of inward FDI stock		0.149 (0.219)	0.364 (0.305)			0.111 (0.223)
Euro Area share of cross-border bank liabilities					-0.085 (0.128)	0.076 (0.200)
Euro Area share of external debt stock, PPG				-0.144 (0.167)		
Number of observations	139	68	68	52	139	68
Adjusted R^2	0.34	0.35	0.27	0.68	0.34	0.36
Number of economies	45	31	31	22	45	31
Sample period	1992-19	2010-19	2010-19	1998-19	1992-19	2010-19

ERS = exchange rate stability, EUR = euro, OPEC = Organization for Petroleum Exporting Economies, PPG = public and publicly guaranteed

Note: * $p<0.1$; ** $p<0.05$; *** $p<0.01$. The EUR weight used on the left-hand side is the statistically significant, positive EUR weight (with outliers removed) multiplied by the ERS index. Annual fixed effects as well as regional dummies are included, but not reported to conserve space. To mitigate endogeneity, all explanatory variables except the dummy variables are lagged by one year. For estimation, observations are sampled every three years.

Source: Compiled by authors using their estimation results.

6B: Use of the EUR share in exports and inward investment/borrowing as explanatory variables

Left-hand side variable	**EUR weight**	**EUR weight (2SLS)**	**EUR weight**	**EUR weight**	**EUR weight**	**EUR weight**
Explanatory variables	(B1)	(B2)	(B3)	(B4)	(B5)	(B6)
Relative income	-0.553 (0.209)***	-0.477 (0.216)**	-0.460 (0.215)**	-0.946 (0.227)***	-0.755 (0.247)***	1.893 (0.873)**
Share of commodity exports	0.219 (0.194)	0.319 (0.177)*	0.093 (0.191)	0.543 (0.229)**	0.381 (0.224)*	-0.769 (0.360)**
Financial development	0.395 (0.244)	0.312 (0.237)	0.475 (0.233)**	0.723 (0.302)**	0.864 (0.278)***	1.509 (0.227)***
Trade openness	0.184 (0.110)*	0.242 (0.101)**	0.156 (0.098)	0.393 (0.104)***	0.343 (0.090)***	-0.864 (0.308)***
Former British colony	0.227 (0.074)***	0.169 (0.070)**	0.173 (0.076)**	0.259 (0.118)**	0.240 (0.108)**	-0.332 (0.292)
Former European colony	0.214 (0.137)	0.105 (0.149)	0.138 (0.139)	-0.201 (0.157)	-0.161 (0.143)	0.565 (0.216)**
Financial city state	-0.045 (0.121)	-0.011 (0.119)	-0.031 (0.115)	-0.121 (0.159)	-0.102 (0.150)	-1.640 (0.405)***
OPEC_Plus	-0.302 (0.205)	-0.100 (0.154)	-0.191 (0.200)	-0.609 (0.240)**	-0.508 (0.221)**	-0.969 (0.307)***
Financial openness	-0.169 (0.157)	-0.158 (0.139)	-0.145 (0.150)	-0.275 (0.181)	-0.265 (0.166)	0.589 (0.486)
EUR share in export invoicing	0.538 (0.180)***	0.780 (0.223)***	0.196 (0.201)	-0.006 (0.205)	-0.329 (0.197)*	0.287 (0.332)
EUR share in cross-border bank liabilities			0.627 (0.176)***		0.671 (0.167)***	
EUR share in international debt securities				0.256 (0.121)**	0.184 (0.115)	
EUR share in external debt stock, PPG						0.673 (0.251)**
Number of observations	139	139	139	120	120	49
Adjusted R^2	0.36	0.30	0.42	0.41	0.49	0.85
Number of economies	45	45	45	35	35	21

Sample period	1992-19	1992-19	1992-19	1992-19	1992-19	2001-19

2SLS = two-stage least squares, ERS = exchange rate stability, EUR = euro, OPEC = Organization for Petroleum Exporting Economies, PPG = public and publicly guaranteed
Note: * $p<0.1$; ** $p<0.05$; *** $p<0.01$. The EUR weight used on the right-hand side is the statistically significant, positive EUR weight (with outliers removed) multiplied by the ERS index. Annual fixed effects as well as regional dummies are included, but not reported to conserve space. To mitigate endogeneity, all explanatory variables except the dummy variables are lagged by one year. In specification (B2), the EUR share in export invoicing is instrumented with the Euro Area share of trade. For estimation, observations are sampled every three years.
Source: Compiled by authors using their estimation results.

Estimation results for the RMB weight

Table 7 reports the estimation results for the RMB weight adjusted for ERS. Unlike the case of estimations for the USD or EUR weight, the table uses only the share of trade with China and the shares of inward FDI stock and external debt stock, PPG from China as explanatory variables to estimate the RMB weight. RMB shares in export invoicing or in inward FDI investment and external debt stock are not used as explanatory variables due to the lack of sufficient data.

The table suggests that there are not many statistically significant determinants of the RMB weight. In particular, the rising share of China in economies' trade, inward FDI stock, or external debt stock does not lead to high values of the RMB weight in their implicit currency basket. This suggests that it is not an easy task for China to challenge US dollar dominance through expansion of trade, investment and loans under the Belt and Road Initiative.

Table 7: Estimation results for the RMB weight adjusted for ERS

Left-hand side variable Explanatory variables	RMB weight (1)	RMB weight (2)	RMB weight (3)
Relative income	0.021 (0.024)	0.187 (0.103)*	0.216 (0.132)
Share of commodity exports	-0.037 (0.025)	-0.017 (0.084)	-0.041 (0.034)
Financial development	0.020 (0.037)	-0.078 (0.110)	-0.005 (0.074)
Trade openness	-0.014 (0.013)	-0.041 (0.054)	-0.036 (0.025)
Former British colony	0.060 (0.022)***	-0.028 (0.059)	0.121 (0.037)***
Former European colony	-0.011 (0.016)	0.017 (0.061)	-0.001 (0.023)
Financial city state	-0.045 (0.020)**		
OPEC_Plus	-0.010 (0.020)	0.016 (0.038)	0.060 (0.050)
Financial openness	-0.023 (0.027)	-0.033 (0.056)	-0.086 (0.069)
Chinese share of trade	-0.013 (0.121)	0.019 (0.525)	-0.052 (0.161)
Chinese share of inward		-0.430	

FDI stock		(0.338)	
Chinese share of external debt stock, PPG			0.143 (0.145)
Number of observations	206	56	87
Adjusted R^2	0.38	0.32	0.55
Number of economies	80	26	40
Sample period	2001-2019	2001-2019	2001-2019

ERS = exchange rate stability, OPEC = Organization for Petroleum Exporting Economies, PPG = public and publicly guaranteed, RMB = renminbi
Note: * p<0.1; ** p<0.05; *** p<0.01. The adjusted RMB weight is the statistically significant, positive RMB weight (with outliers removed) multiplied by the ERS index. Annual fixed effects as well as regional dummies are included, but not reported to conserve space. To mitigate endogeneity, all explanatory variables except the dummy variables are lagged by one year. For estimation, observations are sampled every three years.
Source: Compiled by authors using their estimation results.

4.3 Policy implications

This section has considered two hypotheses on the determinants of the major currency weights. The first is that they are determined by economies' trade, investment, and financial linkages with the major currency countries or region (i.e., the United States, the Euro Area, the United Kingdom, Japan, and China) in addition to their structural characteristics but also. The second is that they are determined by the shares of major currencies in economies' export invoicing, cross-border bank liabilities, international debt securities issued, and external debt stock in addition to their structural characteristics. It turns out that the major currency weights are better explained by the shares of the major currencies used for economies' export invoicing, cross-border bank liabilities, international debt securities, and external debt stock than by the shares of major currency countries or region in economies' trade, inward FDI stock, cross-border bank liabilities, external debt stock.

These results suggest that the USD has a strong advantage in maintaining its dominance as the USD shares are high in many economies' export invoicing or settlement, cross-border bank liabilities, international debt securities, and external debt stock. The challenge for the RMB is to promote the global use of RMB in trade invoicing and cross-border financial transactions. This, however, is likely limited unless China opens its financial markets, liberalizes the use of the RMB globally, and substantially improves rule of law and institutions.

One point that the above results suggest is that a third hypothesis may be considered, that is, the major currency weights are determined by economies' linkages with the currency zones formed by major currencies, not just the major currency countries or region. To test this hypothesis, the current authors are now constructing variables that represent each economy's trade, investment,

and financial linkages with the major currency zones formed by the USD, EUR, GBP, JPY, and CNY. Each economy's trade, investment, and financial linkages with a major currency zone are constructed by summing up the size of all of its partners' currency zones formed by this major currency. The authors plan to test this hypothesis as soon as these variables are constructed.

5. Conclusion

The paper has addressed three issues. First, it has examined various economies' exchange rate arrangements over the last 50 years, by providing a new measure for the degree of exchange rate stability or flexibility as well as identifying anchor currencies. The degree of exchange rate stability or flexibility has been measured by the root mean square error (RMSE) of the Frankel-Wei and/or Kawai-Pontines regression equations. Second, it has calculated the size of major currency zones in the world and in each region of the world. The GDP size of major currency areas has been calculated from the estimated weights of anchor currencies for each economy as well as the degree of exchange rate stability (ERS). One of the innovations of this paper is that the weights of anchor currencies are adjusted according to the value of ERS when calculating the size of major currency zones. Third, it has identified the determinants of the estimated major currency weights. Here again, the estimated weights are adjusted for ERS to account for the tightness or looseness of economies' exchange rate management.

This analysis of exchange rate arrangements has demonstrated that, globally, the relative economic shares of the USD and GBP zones were large in the 1960s and 1970s, but both have declined since the 1980s, with the emergence of the EUR zone (initially the DEM zone) and the JPY zone and the recent rapid rise of the RMB zone. However, the JPY and EUR zones have been shrinking since the 2000s and 2020, respectively. As a result, the size of the RMB zone has risen in recent years, supplementing the roles played by the USD, EUR, GBP and JPY. Nevertheless, the USD remains the most dominant anchor currency for non-major currency economies, and the USD zone remains the largest currency zone in the world. The residual portion of the world economy that is not part of any major currency zone, i.e., the portion that is judged to be under floating exchange rate regimes, has been growing in size as a trend.

There are considerable differences among emerging & developing regions in the world with respect to the degree of exchange rate stability or flexibility and the size of major currency zones. These regions have increased their exchange rate flexibility over time, and in recent years they have made their exchange rates more flexible to a higher level than advanced economies. In

particular, emerging & developing Europe and Latin America have highly flexible exchange rate arrangements, while the Middle East and Central Asia have very stable exchange rate regimes. The size of the USD zone is very large in the Middle East and Central Asia at 85% of regional GDP, 44% in Asia, 31% in Sub-Saharan Africa, and 17% in Latin America. The size of the EUR zone is the largest in Europe at 25% of the region's GDP, and relatively large in Sub-Saharan Africa at 18% and Latin America at 11%. The size of the RMB zone is 18% of the region's GDP in Asia and 12% in Sub-Sahara Africa.

On the determinants of the major currency weights, one of the hypotheses of the paper is that these weights are affected not only by economies' structural characteristics but also by their trade, investment, and financial linkages with the major reserve currency countries or region (i.e., the United States, the Euro Area, the United Kingdom, Japan, and China). Economies' trade, investment, and financial linkages are measured by the shares of the major currency countries in trade, inward FDI stock, cross-border bank liabilities, and external debt stock. Another hypothesis of the paper is that the major currency weights are determined by the shares of major currencies in economies' export invoicing, cross-border bank liabilities, international debt securities issued, and external debt stock in addition to their structural characteristics.

It turns out that the major currency weights are better explained by the shares of the major currencies used for export invoicing, cross-border bank liabilities, international debt securities, and external debt stock than by the shares of major currency countries in economies' trade, inward FDI stock, cross-border bank liabilities, and external debt stock. These results suggest that the US dollar has a strong advantage in maintaining its dominance as the dollar shares are high in many economies' export invoicing or settlement, cross-border bank liabilities, international debt securities, and external debt stock. The challenge for the Euro Area is to expand the use of the euro globally, particularly in trade invoicing or settlement, direct investment, and financial transactions. The creation of a large integrated euro financial market, particularly for bonds, would be an important direction. The challenge for China is to promote the global use of the RMB in trade invoicing and cross-border financial transactions. This, however, is likely limited unless China opens its financial markets, liberalizes the use of the RMB globally, and substantially improves rule of law and domestic institutions.

Appendix I: Identifying Anchor Currencies and the Degree of Exchange Rate Stability

Identification of anchor currencies by using the Frankel-Wei and Kawai-Pontines methods

To construct an index that measures the degree of exchange rate stability (ERS), the methodology first introduced by Haldane and Hall (1991) and popularized by Frankel and Wei (1994) is employed.[18] Frankel and Wei (1994) investigated the extent of influence of major currencies on the exchange rate of economy *j* using the following estimation model:

$$\Delta ln\left(\frac{x}{NZD}\right)_{jt} = \beta_{0it} + \beta_{1jt}\Delta ln\left(\frac{USD}{NZD}\right)_t + \beta_{2jt}\Delta ln\left(\frac{EUR}{NZD}\right)_t + \beta_{3jt}\Delta ln\left(\frac{GBP}{NZD}\right)_t + \beta_{4jt}\Delta ln\left(\frac{JPY}{NZD}\right)_t + u_{jt} \quad (1)$$

where $\Delta ln\left(\frac{x}{NZD}\right)_t$ and $\Delta ln\left(\frac{k}{NZD}\right)_t$ are the rates of change in the exchange rates of currency *x* and major currency *k* (= USD, EUR, GBP, and JPY) against the New Zealand dollar, the numéraire currency.[19] The currencies included in the right-hand side of the estimation equation, such as the US dollar, the euro (or the Deutsche mark before 1999), the British pound, and the yen, can be thought of comprising an implicit basket of major currencies in the mind of monetary authorities. Therefore, $\hat{\beta}_{kjt}$, the estimated coefficient on the rate of change in the exchange rate of major currency *k* against the numéraire, represents the weight of currency *k* in the implicit basket. If currency *i* is pegged to a major currency or a basket of major currencies, it must be either $\hat{\beta}_{kjt} = 1$ or $\sum_{k=1}^{K'} \hat{\beta}_{kjt} = 1$ for the *K' (< K)* currencies included in the implicit basket. Also, in such a case, the goodness of fit of the above estimation model must be high.[20]

The basic assumption here is that monetary authorities use an implicit basket of currencies for the purpose of exchange rate stabilization or management, and that the extent of response to the change in the value of the entire basket would vary across economies and over time. The major currencies included in the estimation equation are often held by monetary authorities as foreign exchange reserves. In the years before the introduction of the euro in 1999, the Deutsche mark is included in place of the euro. For the former French or Belgian colony economies, the French

[18] Haldane and Hall (1991) applied their technique to sterling over a period that included both Bank of England management and relatively free floating, while FW (1996) sought to discover weights in an informal currency basket. See also Kawai and Akiyama (1998, 2000), Bénassy-Quéré et al (2006), Kawai and Pontines (2016), Tovar and Nor (2018), Ito and McCauley (2019), and Ito and Kawai (2021).

[19] In other studies, other major currencies such as the Swiss franc (CHF) and Special Drawing Rights (SDR) are used as numeraire. Accordingly, this paper has also tried CHF and SDR, but the basic estimation outcomes are intact with minor quantitative differences.

[20] The constraint of $\sum_{k=1}^{K} \hat{\beta}_{kjt} = 1$ is imposed in the estimation. Considering that the estimated betas represent weights in the hypothetical basket, it makes sense to impose such a constraint. However, as is explained later, from 1999 on, the Kawai-Pontines (2016) modification to the original Frankel-Wei method is adopted because the Chinese yuan is also treated as one of the major currencies.

franc and Belgian franc were the target currencies for exchange rate stabilization, respectively, but the Deutsche mark is used instead of the francs.[21]

In this paper, two modifications are made to the Frankel-Wei model. First, the estimation model is applied to each sample currency by using overlapping, rolling windows of 36 months.[22] In other words, $\hat{\beta}_{kjt}$'s, the weights of the major currencies in the implicit basket become time-varying because it is assumed that monetary authorities keep updating their information sets every month.

Second, the Chinese RMB is treated as one of the major currencies for this estimation after 1999. There is no question that the RMB has become a major anchor currency in the sense of influencing the movements of a number of economies' exchange rates together with other major currencies.[23] However, merely including the exchange rate movements of the RMB in equation (1) would be problematic. The RMB used to be pegged to the US dollar and is still tied to dollar movements to some extent, which means that the RMB's exchange rate movements are highly correlated with those of the dollar. This creates a serious multicollinearity problem and would make the estimated β's inaccurate. To overcome this problem, the paper adopts the Kawai and Pontines (2016) method.

The first step of the Kawai-Pontines procedure is to regress the rate of change in the RMB exchange rate on those of the four other major currencies, using 36-month windows, as follows:

$$\Delta ln\left(\frac{RMB}{NZD}\right)_{jt} = \phi_{0jt} + \phi_{1jt}\,\Delta ln\left(\frac{USD}{NZD}\right)_t + \phi_{2jt}\,\Delta ln\left(\frac{EUR}{NZD}\right)_t + \phi_{3jt}\Delta ln\left(\frac{GBP}{NZD}\right)_t + \phi_{4jt}\,\Delta ln\left(\frac{JPY}{NZD}\right)_t + \omega_{jt} \quad (2)$$

The estimation of equation (2) provides the estimated residual, $\hat{\omega}_{jt}$, as:

$$\hat{\omega}_{jt} = \Delta ln\left(\frac{RMB}{NZD}\right)_t - \left[\hat{\phi}_{0jt} + \hat{\phi}_{1jt}\Delta ln\left(\frac{USD}{NZD}\right)_t + \hat{\phi}_{2jt}\Delta ln\left(\frac{EUR}{NZD}\right)_t + \hat{\phi}_{3jt}\Delta ln\left(\frac{GBP}{NZD}\right)_t + \hat{\phi}_{4jt}\Delta ln\left(\frac{JPY}{NZD}\right)_t\right] \quad (3)$$

Thus, the estimated residual, $\hat{\omega}_{jt}$, removes that part of the RMB movement that is affected by the movements of major currencies, particularly those of the USD. Using $\hat{\omega}_{jt}$, the Kawai-Pontines estimation equation that is the counterpart of equation (1) becomes:

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[21] The estimation also includes a dummy variable that takes the value of one if the monthly rate of change in the exchange rate of the sample currency is greater than 10% in absolute terms so as to minimize noise from exchange rate disruptions such as abortion of an exchange rate regime and sudden re/devaluation of the currency. Similarly, the regression includes a dummy variable that takes the value of one in the first month after the introduction of the euro.

[22] As a result, the estimation results for every 3 years would become the same as the results using non-overlapping 3-year panels.

[23] See Kawai and Pontines (2015), Ito (2017), Ito and McCauley (2017), Tovar and Nor (2018), and Ito and Kawai (2021).

$$\Delta ln\left(\frac{x}{NZD}\right)_{jt} = \gamma_{0it} + \gamma_{1jt}\Delta ln\left(\frac{USD}{NZD}\right)_t + \gamma_{2jt}\Delta ln\left(\frac{EUR}{NZD}\right)_t + \gamma_{3jt}\Delta ln\left(\frac{GBP}{NZD}\right)_t + \gamma_{4jt}\Delta ln\left(\frac{JPY}{NZD}\right)_t + \gamma_{5jt}\widehat{\omega}_{jt} + v_{jt} \quad (4)$$

One may consider estimating equation (4), but doing so does not necessarily yield good results, so Kawai and Pontines (2016) propose to estimate the following equation by subtracting $\widehat{\omega}_{jt}$ from both sides of equation (4). This estimation yields results that are more robust, stable and accurate.

$$\Delta ln\left(\frac{x}{NZD}\right)_{jt} - \widehat{\omega}_{jt} = \gamma_{0jt} + \gamma_{1jt}\left[\Delta ln\left(\frac{USD}{NZD}\right)_t - \widehat{\omega}_{jt}\right] + \gamma_{2jt}\left[\Delta ln\left(\frac{EUR}{NZD}\right)_t - \widehat{\omega}_{jt}\right] + \gamma_{3jt}\left[\Delta ln\left(\frac{GBP}{NZD}\right)_t - \widehat{\omega}_{jt}\right] + \gamma_{4jt}\left[\Delta ln\left(\frac{JPY}{NZD}\right)_t - \widehat{\omega}_{jt}\right] + v_{jt} \quad (5)$$

Here, it is assumed that the weights of the major currencies in the currency basket in equation (4) sum up to one, i.e., $\gamma_1 + \gamma_2 + \gamma_3 + \gamma_4 + \gamma_5 = 1$. Hence, from equation (5), the estimate of the RMB weight is obtained as: $\hat{\gamma}_5 = 1 - \hat{\gamma}_1 - \hat{\gamma}_2 - \hat{\gamma}_3 - \hat{\gamma}_4$. The Kawai-Pontines method is applied to the rolling regressions from January of 1999. Before that period, the rolling regressions do not include the RMB, so the constraint becomes: $\gamma_1 + \gamma_2 + \gamma_3 + \gamma_4 = 1$.

Defining the exchange rate stability (ERS) index by using the RMSE

The root mean square error (RMSE) is chosen as a measure of ERS, because the RMSE reflects how tightly monetary authorities stabilize or manage exchange rates against a basket of major currencies. The RMSE has been proposed by Bleaney and Tian (2020) as a measure of ERS or flexibility. Given that the estimates from equation (1) or (4) are time-varying (with 36-month windows), so is the RMSE. The annual average of the time-varying RMSE is used to measure the level of ERS.[24]

A high level for RMSE means that the estimation model does not have a good fit, which suggests that the economy of concern tends to face exchange rate *flexibility.* To make use of RMSE to construct the measure of ERS*,* convert RMSE is converted as follows:

$$ERS_{jt} = \frac{\left(RMSE(p(90)) - RMSE_{jt}\right)}{\max\left(RMSE(p(90)) - RMSE_{jt}\right)} \quad (6)$$

where $RMSE(p(90))$ is the 90th percentile of RMSE. In this way, *ERS* ranges between 0 and 1, and 0 means no exchange rate stability (i.e., the highest degree of exchange rate flexibility), and 1 means rigid exchange rate stability.

[24] Because of the unique distribution of RMSE, which is skewed to the left with fat tail on the right-hand side, the RMSE values are winsorized at and above the 90th percentile.

Appendix II: Country List and Availability of Exchange Rate Stability (ERS) Index Data

	Country name	Country code	AE	EMMIE	LIC	ERS	
1	Albania	914	0	1	0	1995	2021
2	Algeria	612	0	1	0	1970	2021
3	Angola	614	0	1	0	1970	2021
4	Argentina	213	0	1	0	1970	2021
5	Armenia	911	0	1	0	1995	2021
6	Australia	193	1	0	0	1970	2021
7	Austria	122	1	0	0	1970	2021
8	Bahrain	419	0	1	0	1970	2021
9	Bangladesh	513	0	0	1	1974	2021
10	Barbados	316	0	1	0	1970	2021
11	Belarus	913	0	1	0	1995	2021
12	Belgium	124	1	0	0	1970	2021
13	Bolivia	218	0	1	0	1970	2021
14	Botswana	616	0	1	0	1970	2021
15	Brazil	223	0	1	0	1970	2021
16	Bulgaria	918	0	1	0	1970	2021
17	Cote d'Ivoire	662	0	0	1	1970	2021
18	Canada	156	1	0	0	1970	2021
19	Chile	228	0	1	0	1970	2021
20	China	924	0	1	0	1970	2021
21	Colombia	233	0	1	0	1970	2021
22	Congo, Rep.	634	0	0	1	1970	2021
23	Costa Rica	238	0	1	0	1970	2021
24	Croatia	960	0	1	0	1995	2021
25	Cyprus	423	1	0	0	1970	2021
26	Czech Rep.	935	1	0	0	1996	2021
27	Denmark	128	1	0	0	1970	2021
28	Ecuador	248	0	1	0	1970	2021
29	Egypt	469	0	1	0	1970	2021
30	El Salvador	253	0	1	0	1970	2021
31	Estonia	939	1	0	0	1995	2021
32	Finland	172	1	0	0	1970	2021
33	France	132	1	0	0	1970	2021
34	Gabon	646	0	1	0	1970	2021
35	Georgia	915	0	1	0	1998	2021
36	Germany	134	1	0	0	1970	2021
37	Greece	174	1	0	0	1970	2021
38	Guatemala	258	0	1	0	1970	2021
39	Honduras	268	0	0	1	1970	2021
40	Hong Kong	532	1	0	0	1970	2021
41	Hungary	944	0	1	0	1971	2021
42	Iceland	176	1	0	0	1970	2021
43	India	534	0	1	0	1970	2021
44	Indonesia	536	0	1	0	1970	2021
45	Iran	429	0	1	0	1970	2021
46	Ireland	178	1	0	0	1970	2021
47	Israel	436	1	0	0	1970	2021
48	Italy	136	1	0	0	1970	2021
49	Japan	158	1	0	0	1970	2021
50	Jordan	439	0	1	0	1970	2021
51	Kazakhstan	916	0	1	0	1996	2021
52	Kenya	664	0	0	1	1970	2021
53	Korea, Rep.	542	1	0	0	1970	2021

54	Kuwait	443	0	1	0	1970	2021
55	Latvia	941	1	0	0	1995	2021
56	Libya	672	0	1	0	1970	2021
57	Lithuania	946	1	0	0	1995	2021
58	Luxembourg	137	1	0	0	1970	2021
59	Malaysia	548	0	1	0	1970	2021
60	Malta	181	1	0	0	1970	2021
61	Mexico	273	0	1	0	1970	2021
62	Moldova	921	0	0	1	1994	2021
63	Mongolia	948	0	1	0	1993	2021
64	Morocco	686	0	1	0	1970	2021
65	Netherlands	138	1	0	0	1970	2021
66	Nicaragua	278	0	0	1	1970	2021
67	Nigeria	694	0	0	1	1970	2021
68	Norway	142	1	0	0	1970	2021
69	Oman	449	0	1	0	1970	2021
70	Pakistan	564	0	1	0	1970	2021
71	Paraguay	288	0	1	0	1970	2021
72	Peru	293	0	1	0	1970	2021
73	Philippines	566	0	1	0	1970	2021
74	Poland	964	0	1	0	1970	2021
75	Portugal	182	1	0	0	1970	2021
76	Qatar	453	0	1	0	1970	2021
77	Romania	968	0	1	0	1970	2021
78	Russia	922	0	1	0	1995	2021
79	Saudi Arabia	456	0	1	0	1970	2021
80	Senegal	722	0	0	1	1970	2021
81	Serbia, Rep.	942	0	1	0	2003	2021
82	Singapore	576	1	0	0	1970	2021
83	Slovak Rep.	936	1	0	0	1996	2021
84	Slovenia	961	1	0	0	1994	2021
85	Solomon Is.	813	0	0	1	1970	2021
86	South Africa	199	0	1	0	1970	2021
87	Spain	184	1	0	0	1970	2021
88	Sri Lanka	524	0	1	0	1970	2021
89	Sweden	144	1	0	0	1970	2021
90	Switzerland	146	1	0	0	1970	2021
91	Taiwan	528	1	0	0	1970	2021
92	Tajikistan	923	0	0	1	1995	2021
93	Thailand	578	0	1	0	1970	2021
94	Togo	742	0	0	1	1970	2021
95	Tunisia	744	0	1	0	1970	2021
96	Turkey	186	0	1	0	1970	2021
97	Uganda	746	0	0	1	1970	2021
98	Ukraine	926	0	1	0	1995	2021
99	U.K.	112	1	0	0	1970	2021
100	Uruguay	298	0	1	0	1970	2021
101	Venezuela	299	0	1	0	1970	2018
102	Vietnam	582	0	0	1	1970	2021

AE = advanced economy; EMMIE = emerging market and middle income economy; ERS = exchange rate stability; LIC= low income country.

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