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DEPARTMENT OF ECONOMICS

De-dollarization Efforts in BRICS Nations

SIMRAN KAKAR
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Reviewed and approved* by the following:

Stephen Yeaple
Professor of Economics
Thesis Supervisor

Nima Haghpanah
Associate Professor of Economics
Honors Adviser

Bee Yan Roberts
Professor of Economics and Asian Studies
Faculty Reader

* Electronic approvals are on file.

ABSTRACT

This undergraduate thesis examines the de-dollarization efforts in BRICS nations, emphasizing the geopolitical and economic impacts of reducing reliance on the US Dollar in favor of local currencies, particularly the Chinese Renminbi (RMB). It discusses the historical dominance of the US Dollar and its role as the leading international currency. The research highlights the BRICS alliance's initiatives to foster economic cooperation and reduce dependency on Western financial systems, especially the US Dollar.

The thesis specifically examines the influence of China's Belt and Road Initiative (BRI) on the demand for the RMB, using an event study model to analyze data from 48 countries over 15 years. The study aims to quantify the shift in RMB demand following BRI participation, addressing the broader BRICS objective of de-dollarization. The findings suggest that the observed increase in RMB usage does not reflect economic or political inclinations that can be directly attributed to BRI membership. This analysis contributes to understanding the dynamics of currency internationalization amongst the ongoing debate of de-dollarization in emerging economies.

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Chapter 1

Introduction

The BRICS alliance, established in 2009, represents a significant coalition in the current global political and economic landscape. Comprising Brazil, Russia, India, China, and South Africa, this alliance accounts for approximately 40% of the global population. Its collective economic output has, in recent years, surpassed that of the Group of Seven (G7), highlighting its growing influence and importance in global economics. Having provided a 52% growth in the global GDP, the BRICS nations have come together to form an economic bloc that serves as a counterpart to long withstanding Western-domination (BRICS, 2013).

The alliance's formation was motivated by the desire to foster greater economic cooperation, development, and mutual benefit among emerging economies and developing nations. Since its establishment, BRICS has undertaken various initiatives aimed at enhancing trade and investment flows among its members, thereby reducing their dependency on Western financial systems and markets, and ultimately the US Dollar (USD).

A notable development in the BRICS alliance's agenda has been the discussion of de-dollarization to reduce reliance on the US Dollar in international trade, finance, and reserves. This includes countries shifting their foreign exchange reserves away from the USD, using alternative currencies in trade, and establishing local currency swap agreements to conduct trade without USD conversions (Kokenyne et al, 2010).

Moreover, the interest shown by oil-Moguls such as Saudi Arabia and the United Arab Emirates in trading oil with currencies other than the US Dollar underscores a growing trend of

de-dollarization in the international landscape. These countries' recent involvement with the BRICS alliance further exemplifies the expanding influence and appeal of the BRICS framework as an alternative economic and financial decision.

The most direct way for BRICS to reduce their dependence on the US Dollar is to increase the use of their own national currencies in local cross-border transactions. This thesis aims to analyze the geopolitical effects on the demand for BRICS currencies in their pursuit to globalize their national currencies by specifically looking at the effect of the Belt and Road Initiative on the demand for the Chinese Renminbi (RMB). The chapters preceding the economic model will provide background information on the role of the US Dollar, explaining the relevance of de-dollarization, and justify China and the RMB as the focus of the thesis.

Chapter 2

The US Dollar

Money serves three primary roles: it acts as a medium of exchange, a unit of account, and a store of value. An international currency adheres to these principles by settling international payments, standardizing pricing mechanisms, and maintaining liquid assets for cross-border transactions. The US Dollar demonstrates these characteristics, establishing itself as the leading international currency. Its widespread acceptance and trust have enabled it to dominate global financial transactions through international trade and investment (Krugman, 1984). The US Dollar has earned its status as a safe haven through its following roles in the global economy:

Vehicle Currency

Used as a medium of exchange by financial institutions and central banks, the US Dollar serves as a prominent vehicle currency in the global economy. It acts as an intermediate currency, reducing the need for multiple currency transactions and conversions. The widespread adoption of the US Dollar since the end of World War II is credited to its reliability and stability. As one of the strongest economies in the world, the US economy is steady with low inflation rates and minimal financial crises, making the USD a reliable store of value that international traders and investors can trust. Additionally, the US financial markets are one of the most liquid markets in the world; available financial instruments, frequent Forex trading, and the high demand for the US Dollar make it an attractive choice for trade and investment. Apart from economic factors, the US' strengthened geopolitical influence has made many countries align their monetary policies and foreign exchange practices with the US, solidifying the role of the US dollar in global finance.

Invoicing Currency

Invoicing currency refers to the currency in which the prices of goods and services are quoted, and transactions are settled between businesses and countries involved in cross-border trade. The US Dollar is used as an invoicing currency due to the network externalities, meaning that sellers quote prices in USD in response to buyers' anticipating to transact in USD. Consequently, businesses and traders find it simpler to negotiate contracts in terms of the US Dollar. The widespread use of the USD allows businesses to hedge currency risks more effectively. Businesses can use financial instruments denominated in the US Dollar to protect themselves from fluctuating exchange rates as they deal with multiple currencies. Since most businesses opt for dealing in only the USD, there is a sense of standardization in international trade contracts, making it easier for businesses to operate globally.

Reserve Currency

A reserve currency is a currency that is held in significant quantities by central banks and financial institutions as a part of their foreign exchange reserves. These reserves provide a sense of reassurance to the country's economy in case the native currency devalues. The US Dollar prominently used as a reserve currency due to its stability, acceptance, and trust in its future value. The aftermath of World War II was significant in making the US Dollar the most held reserve currency: at the Bretton Woods Conference, the major economies of the world agreed to develop a fixed exchange rate system dependent on the US Dollar. Consequently, the US backed the dollar value with gold, giving other countries confidence in its value. Despite the abandonment of this system in the 1970s, the dollar remained as the primary reserve currency even today due to the continued stability of the US economy.

This rise of the US Dollar to prominence in international trade was significantly influenced by the events of the First World War. During this period, the United States emerged as a crucial creditor, channeling substantial capital, and credit to the Allies, which resulted in the accumulation of liquid USD assets by foreign institutions. This capital outflow also led to the accumulation of dollar reserves by foreign central banks, which, amidst the instability of the gold standard, opted to retain their dollar holdings rather than convert their currencies into gold. The United States, having sustained minimal infrastructural damage during the war, maintained a dominant position in global geopolitics.

The increasing importance of the USD jeopardized the Pound Sterling's (GBP) status as the global currency, especially as Great Britain's political influence waned. By 1919, with Britain's foreign reserves depleted, the GBP was allowed to fluctuate according to the gold standard (Karlstroem, 1967). All major nations, except the US, pegged their currencies to the GBP, now unstable in value. During the 1920s, the USD stood out as the only currency still convertible into gold at a fixed rate. However, Britain's attempt in 1925 to reattach the GBP to gold, aiming for parity with the USD, led to an overvaluation of the pound, making British imports cheaper and exports less competitive internationally. The onset of the Great Depression in 1929 led to a widespread abandonment of the gold standard, spearheaded by Great Britain (Blinder, 1996).

The Second World War was a turning point, shaping the contemporary international financial systems and the predominance of the US Dollar. The war compelled Britain to liquidate assets and deplete its gold reserves to offset wartime expenditures. The United States, on the other hand, compensated its losses through sustained foreign investments, maintaining a gold reserve triple the size of its foreign-owned liquid dollar assets. The post-war era saw European

nations, eager to recover and rebuild their economies, significantly increasing their demand for private US capital and liquid dollar assets, leading to a national dollar shortage in the 1950s. By 1958, with foreign-owned dollar assets reaching 14.6 million, the US dollar became indispensable in international trade, transactions, and reserve holdings (Devereux, 2013).

In the aftermath of post-war conflicts, nations became acutely conscious of the risks associated with currency fluctuations and economic instability. To safeguard their finances, central banks began accumulating reserves in the Foreign Exchange market, comprising bonds, treasury bills, and currencies. These assets serve as a financial barrier against potential devaluation or insolvency of their currencies. Conventionally, central banks prefer to hold reserves in highly demanded, stable currencies that are uncorrelated with their own. In the 21st century, besides the USD, the most held currencies include the European Euro (EUR), the Chinese Renminbi (RMB), the Japanese Yen (JPY), the Pound Sterling (GBP), Australian Dollars (AUD), and Canadian Dollars (CAD).

Since 2000, the US Dollar constituted over half of the global currency reserves, attributing to its liquidity and convertibility. However, in the second quarter of 2023, this share hit a notable decline, reaching an all-time low of 58.52%. This decline is hypothesized to stem from the diminishing strength of the US Dollar as other currencies have become more readily adopted in the global economy. Since the introduction of the Euro in 1999, the US Dollar's share in international reserves has decreased by 17 percentage points, from 71% to 59%. Figure 1 illustrates this decline, with a noticeable drop starting in early 2022. The share of the USD, compared to other foreign currencies, shows that, aside from the EUR, which constitutes nearly 40% fewer shares than the USD, no other currency is held in significant demand, as shown in Figure 2.
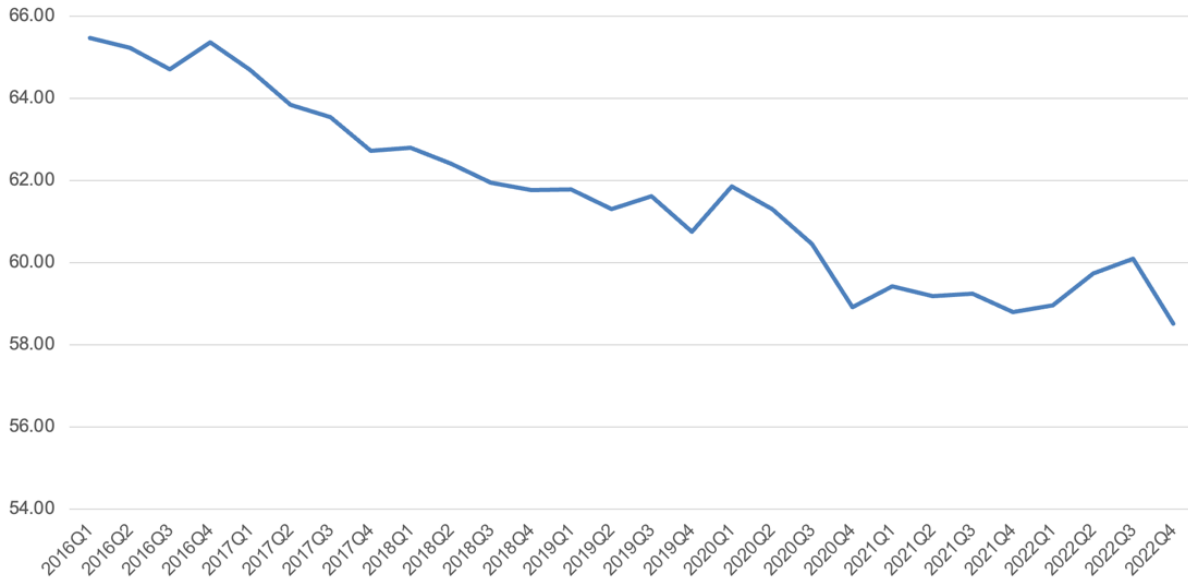
Figure 1: Share of US Dollars in the Official Foreign Exchange Reserves
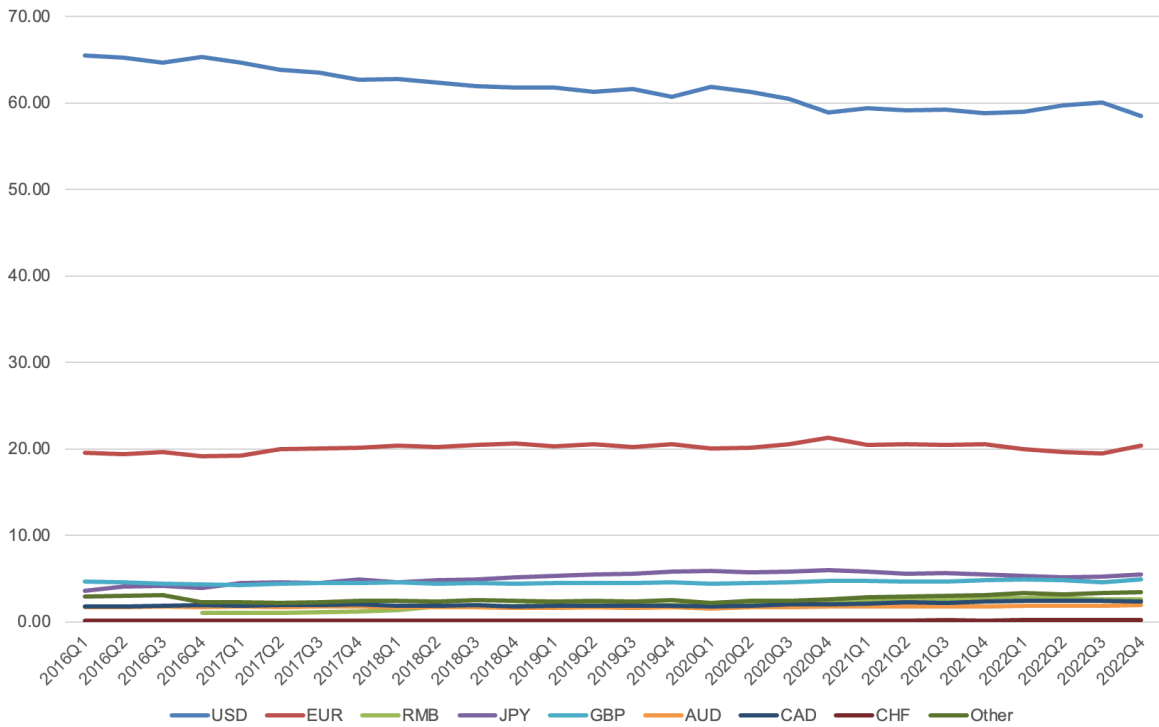
Figure 2: Currency Composition of Official Foreign Exchange Reserves

The consistency of the USD's value, despite its decreasing share, suggests a gradual shift by central banks away from the US Dollar. While the USD continues to dominate the foreign exchange reserves, this transition may indicate the rise of alternative international currencies in the long run.

Chapter 3

China and the Renminbi

In the realm of global finance, the strengthening of the Chinese Renminbi (RMB) is particularly noteworthy. According to the Bank for International Settlements (BIS, 2022), the RMB ascended from the 35th most actively traded currency in 2007 to the 8th in 2022, indicating a substantial increase in its usage in international trade. On the other hand, other BRICS currencies experienced only marginal improvements in their rankings during the same period: the Indian Rupee (INR) improved from 20th to 16th, the Russian Ruble (RUB) oscillated around the 17th position, the Brazilian Real (BRL) ascended from 21st to 20th, and the South African Rand (SAR) exhibited fluctuations around the 33rd position.

Table 1: Share of Currencies in Over-the-Counter Foreign Exchange Turnover

Currency		2007	2010	2013	2016	2019	2022
Intl. Currencies	USD	88	85.6	84.9	87	87.6	88.3
	EUR	37.4	37	39	33.4	31.4	32.3
	JPY	20.8	17.2	19	23	21.6	16.8
	GBP	16.5	14.9	12.9	11.8	12.8	12.8
BRICS Currencies	RMB	0.1	0.5	0.9	2.2	4	6.25
	INR	0.3	0.7	0.9	1	1.1	1.7
	RUB	0.6	0.7	0.9	1.6	1.1	1.1
	BLR	0.3	0.4	0.7	1.1	1	1.1
	SAR	0	0.1	0.1	0.1	0.3	0.2

From this data, the cumulative percentage change on a year-on-year basis for international currencies and BRICS currencies is represented graphically in Figure 3 and Figure 4 respectively.

Figure 3: Year-on-Year Cumulative Percentage Change of International Currencies
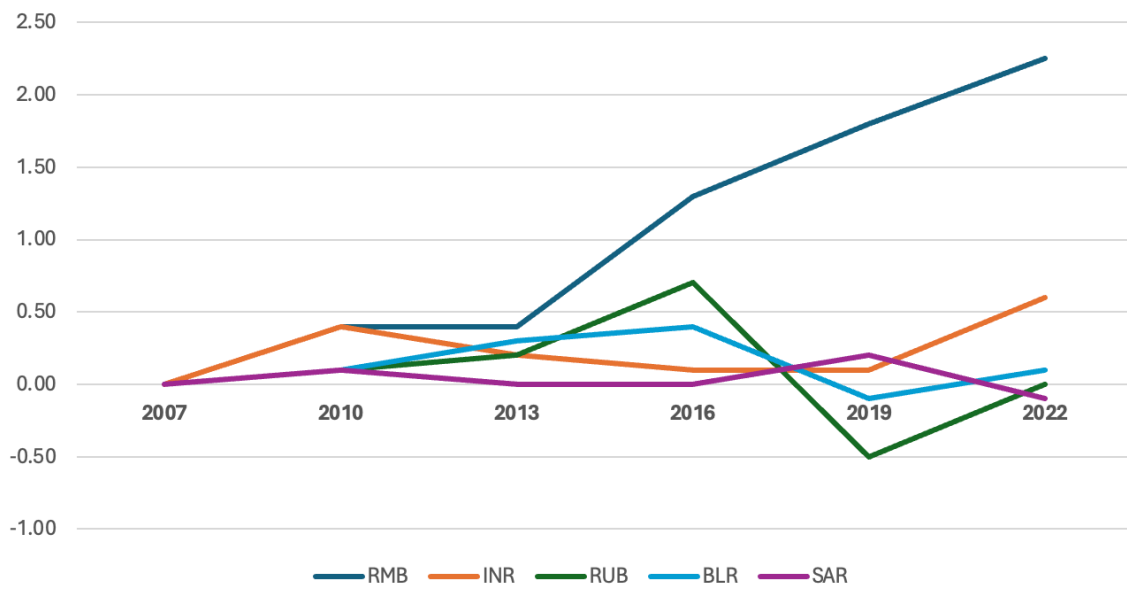
Figure 4: Year-on-Year Cumulative Percentage Change of BRICS Currencies

While the growth of BRICS currencies was not as rapid, they experienced a steady improvement compared to the leading international currencies. Moreover, the share of leading currencies has generally declined in this timeframe whereas the share of BRICS nations has steadily increased. On comparing the cumulative percentage change of BRICS nations, it is evident that the RMB had the most significant and consistent increase in foreign exchange turnover.

Given this context, this thesis will primarily concentrate on the Chinese Renminbi. The increasing engagement of the RMB in global foreign exchange markets not only illustrates China's expanding economic influence but also reflects the broader objective of BRICS to diminish reliance on dominant international currencies, paving the way for a more diversified global economy.

The Belt and Road Initiative

The Belt and Road Initiative (BRI), established in September 2013 by Chinese President Xi Jinping, represents a strategic endeavor by China to foster economic development across Asia, Europe, and Africa. Accounting for 64% of the global population and 30% of the world's GDP through 151 partner nations, this initiative aims to stimulate economic progress and connectivity among these regions and their emerging economies (Huang, 2016).

The primary motivation of the BRI is the ambition to bolster China's global economic influence and introduce the BRICS narrative to the Western-dominated economic landscape. Beyond infrastructural development, the BRI is a comprehensive framework encompassing global connectivity, trade liberalization, economic integration, and cultural exchanges. Through

BRI expansion, China will foster not only align economic developmental strategies but also strengthen trade relationships with participating nations.

This thesis aims to analyze whether joining the Belt and Road Initiative affects a country's demand for Chinese Renminbi. Through this analysis, the thesis seeks to understand how geopolitical trade efforts such as the Belt and Road Initiative can help actualize the BRICS goal of de-dollarization in the long run.

Chapter 4

Methodology

An event study model is an econometric tool used to estimate the dynamic effects of a treatment over time. These effects are then represented graphically, such that the x-axis represents the event time, and the y-axis represents the treatment effect for each time period relative to a baseline comparison period (0). The event time 0 is referred to as the treatment, or an event or study that otherwise would have happened, and the takeaway from this study is the change in the post-treatment window. An ideal event study is one where the line before the event is trendless – a trend suggests that the change in the post-treatment window was expected or bound to happen, and the treatment had no effect on the outcome variable (Miller, 2023).

This thesis aims to estimate the shifts in relative demand for the Chinese Renminbi as a global currency from participating in the Belt and Road Initiative. This thesis will utilize the event study model, analyzing 48 countries across a span of 15 years. The event or treatment in question is joining the Belt and Road Initiative and the time variable consists of three-year intervals ranging from 2007 to 2022. This event study is hybrid in nature, meaning that there is a control group and a treatment group and the countries in the treatment group have joined the event at a varying event date. The estimating equation is as follows:

$$Y_{i,t} = \left(\sum_{j \in \{-m,n\}} \gamma_j \cdot D_{i,t-j} \right) + \alpha_i + \delta_i + \beta_1 \cdot X1_{i,t} + \beta_2 \cdot X2_{i,t} + \varepsilon_{i,t}$$

On the left-hand side, the outcome variable $Y_{it} = \frac{T_{i,RMB}}{T_{i,world}}$ denotes the total share of transactions conducted by country$_i$ in RMB in the given year. This data is calculated from the

BIS Triennial Survey: OTC foreign exchange turnover by country and counterpart sector. On the right-hand side, the equation can be broken down into 3 parts: the event study terms, the panel fixed effect, and the control variables.

Event Study Terms: $\left(\sum_{j\in\{-m,n\}} \gamma_j \cdot D_{i,t-j} \right)$

Variable $D_{i,t-j}$ is an indicator variable for event time j, meaning that the event took place j periods before the event's calendar time t. The coefficient term γ_j measures the dynamic effects of the treatment as these effects manifest over time since the event has occurred. γ_j is the main coefficient of interest as it estimates the treatment's impact j periods after participating in the event. In this model the event window is fixed to $j \in \{-3,3\}$, which means that the period of interest is from 3 periods post-treatment to 3 periods pre-treatment. Due to limited pre-treatment data, $\gamma_{-1} = 0$ so that the data is normalized to one period before treatment. This thesis aims to analyze the γ_j coefficients during the post-treatment window, where $j \in (0,3\}$.

Panel Fixed Effect: $\alpha_i + \delta_i$

$\alpha_i + \delta_i$ represents the panel fixed effect. α_i represents the fixed effect across country and δ_i represents the fixed effect across time. This two-way fixed effects approach helps isolate the pure treatment effect of the event. In this model, however, these coefficients are not relevant to the research question at hand.

Control Variables: $\beta_1 \cdot X1_{i,t} + \beta_2 \cdot X2_{i,t}$

To control for external factors that could affect $Y_{i,t}$, this model uses $X1_{i,t}$ and $X2_{i,t}$ as control variables. $X1_{i,t} = \frac{X_{i,k}}{X_{i,world}}$, where k represents the country that issues RMB i.e. China. This denotes the share of exports conducted between country$_i$ and China in the given year.

$X2_{i,t} = \frac{1}{N}\Sigma[lnE_{RMB,t} - \overline{lnE_{RMB,t}}]^2$, where $E_{i,RMB}$ denotes the real broad effective exchange rate

of RMB in year$_t$. $X2_{i,t}$ measures the volatility of RMB across the 15-year timespan.

Pre-Trends

A pre-trend in an event study model refers to the pattern of the outcome variable prior to

the treatment or event of interest. Observing the presence of a pre-trend is important because

they can indicate whether the treatment effects are also trending, which might bias the estimated

event study coefficients. The estimated parameters for unit-specific trends aim to capture

trending behavior both before and after the event, and if treatment effects are also trending, it

could affect the accuracy of the estimated event study coefficients (Miller, 2023). Therefore, in

an ideal situation, a researcher aims for an event study free from trends.

The most common forms of pre-trends in an event study are – a zero pre-trend, a stable

pre-trend, and an increasing/decreasing pre-trend. A zero pre-trend occurs when the outcome

variable remains zero throughout the event study. This means that in the pre-treatment window,

the event had no effect on the outcome variable. A stable pre-trend means that the outcome

variable was relatively constant in the pre-treatment window. The presence of a stable pre-trend

means that there were no distinct changes or shocks that influenced the outcome variable before

the event occurred. An increasing/decreasing pre-trend occurs when the outcome variable shows

a consistent upward or downward trend in the pre-treatment window. The presence of this trend

suggests improving or deteriorating conditions related to the outcome variable, which could

influence the interpretation of the event's pure effects.

Parallel Trends Assumption

An underlying assumption of this model is the parallel trends assumption. This entails

that in the absence of the event, the treatment and control groups would have followed parallel

paths over time with respect to the outcome variable. This suggests that any differences between these groups are constant over time, and therefore, any deviation from this parallel trend after the introduction of the treatment can be attributed to the treatment itself.

　　To validate this assumption, the pre-treatment trends in the data must be examined. If the outcome variable follows a similar path for both treated and control groups before the event, this is accredited to the parallel trends assumption. However, if pre-treatment trends are significantly different, this means the assumption is violated, and the control group would have behaved different from the treatment group irrespective of the event.

Chapter 5

Data

Table 2 represents the list of countries used in the data set. Each country has been assigned a numeric value, or country code, from 1 to 48. The treatment group comprises of countries 1 to 24; these countries have joined the Belt and Road Initiative in the corresponding year since its establishment in 2013. Countries 25 to 48 make up the control group, denoted by N/A.

Table 2: List of Countries and Year Joined

Country	Country Code	Year Joined
Bahrain	1	2018
Bulgaria	2	2015
Chile	3	2018
Greece	4	2018
Hungary	5	2015
Indonesia	6	2015
Italy	7	2019
Latvia	8	2016
Lithuania	9	2017
Luxembourg	10	2019
Malaysia	11	2017
New Zealand	12	2017
Peru	13	2019
Philippines	14	2017
Poland	15	2015
Portugal	16	2018
Romania	17	2015
Saudi Arabia	18	2018
Singapore	19	2018
South Africa	20	2015
Thailand	21	2013
Turkey	22	2015
United Arab Emirates	23	2018

Argentina	24	N/A
Australia	25	N/A
Belgium	26	N/A
Brazil	27	N/A
Canada	28	N/A
Colombia	29	N/A
Czechia	30	N/A
Denmark	31	N/A
Finland	32	N/A
France	33	N/A
Germany	34	N/A
Hong Kong	35	N/A
India	36	N/A
Israel	37	N/A
Japan	38	N/A
Korea	39	N/A
Mexico	40	N/A
Netherlands	41	N/A
Norway	42	N/A
Slovakia	43	N/A
Spain	44	N/A
Sweden	45	N/A
Switzerland	46	N/A
United Kingdom	47	N/A
United States	48	N/A

The countries in the treatment group were selected based on one or both of the following factors: first, the country is a developing economy, and second, the country has been open to trading with China in the past. The control group, on the other hand, consists of both developed and developing economies that may or may not be affiliated with China either economically or politically.

Since data for $Y_{i,t}$ was only available in three-year intervals, the event time also corresponds to those intervals. This means that for the control group, -3 = 2007, -2 = 2010, -1 = 2013, 0 = 2016, 1 = 2019, and 2 = 2022. For the treatment group, the most current three-year

interval after the year they joined is taken as event time 1. For example, if country$_i$ joined in 2014, then event time 1 = 2016. This is graphically shown in Figure 5 below.

## Distribution of Participants by 3-Year Intervals
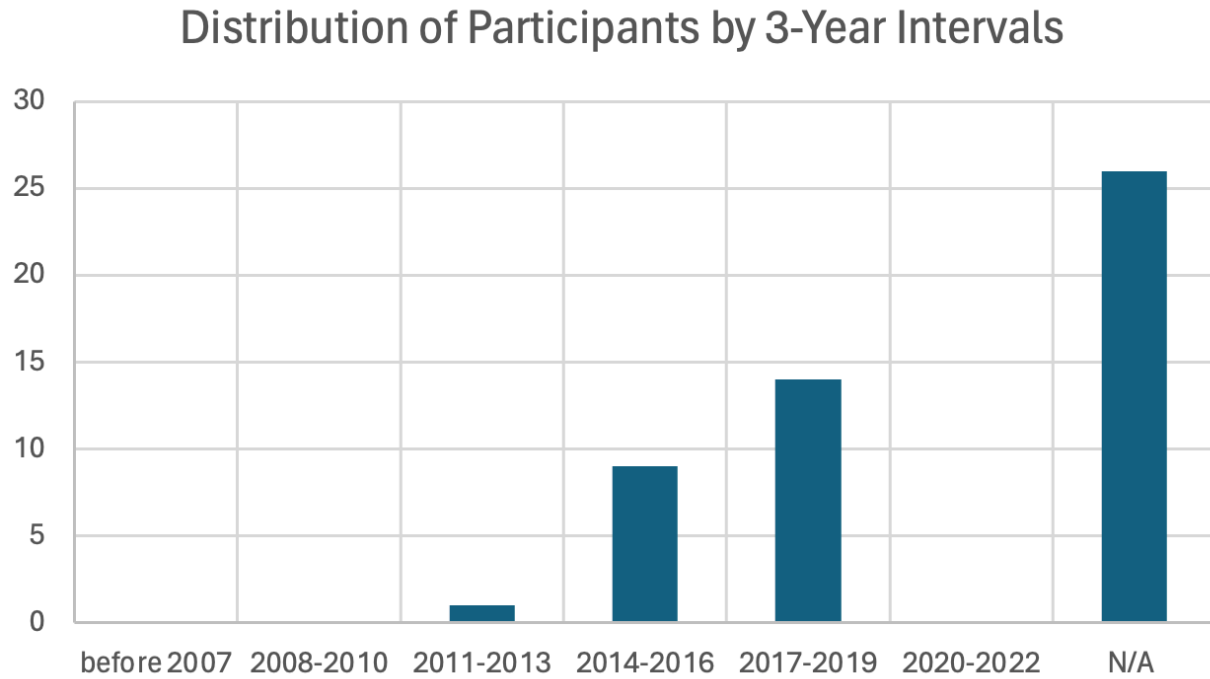
Figure 5: Distribution of Participants by 3-Year Intervals

From this data, event time j can be identified to code the indicator variable $D_{i,t-j}$. This results to six indicator variables: $D_{i,-3}$, $D_{i,-2}$, $D_{i,-1}$, $D_{i,+1}$, $D_{i,+2}$, and $D_{i,+3}$. Table 3 represents the estimated treatment effect for each indicator variable from the OLS regression. These points are then plotted along the event time in Figure 6.

Table 3: Regression Coefficients with 95% Confidence Intervals

Event Time	γ_j	Lower CI	Upper CI
-3	-0.0832094	-0.1177411	-0.0486777
-2	-0.0658806	-0.0899046	-0.0418565
-1	-0.0345636	-0.0484639	-0.0206633
1	0.0263583	0.0143455	0.0383711
2	0.0490278	0.029557	0.0684986
3	0.0772774	0.0497672	0.1047876
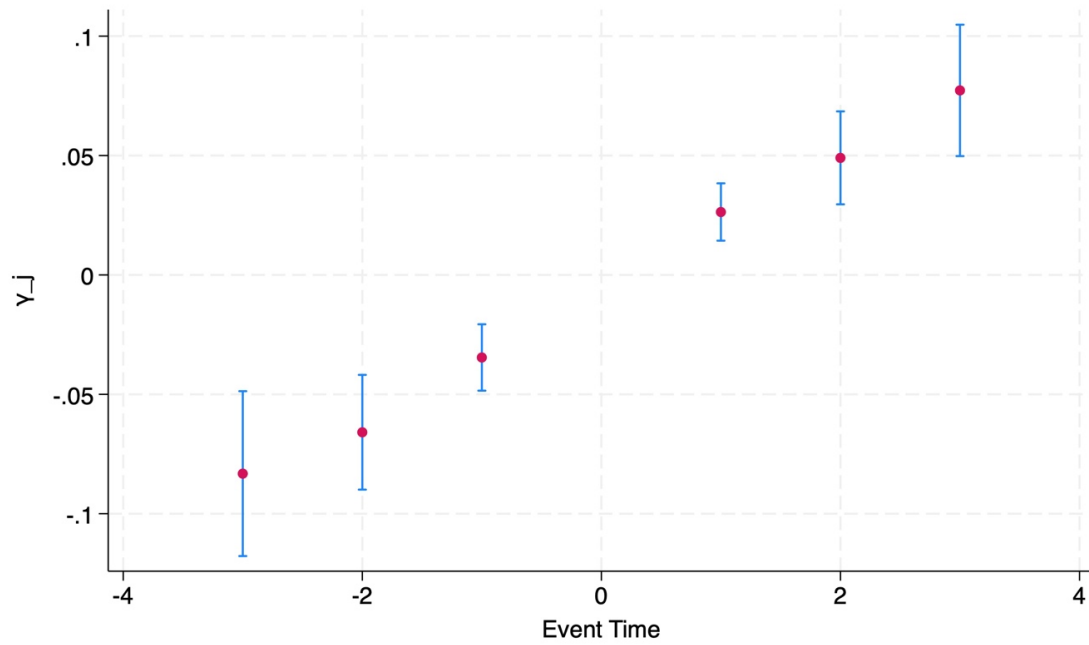
Figure 6: Event Study Graph with 95% Confidence Intervals

Chapter 6

Conclusion

Figure 6 indicates a classic example of an increasing pre-trend in the dataset, illustrating

that the Belt and Road Initiative has not significantly altered the demand for the Chinese

Renminbi among its participating countries. The existence of a trend indicates that the BRI's

impact on RMB adoption is not as significant as perceived. This implies that joining the BRI is

an endogenous factor in a country's decision to conduct trade in the RMB.

The event study's findings reveal that the inclination towards the RMB predated a

country's likeliness to participate in the BRI. This suggests that countries with pre-existing

economic or political motivations favoring the RMB were more likely to participate in the BRI.

Therefore, the decision to join the BRI appears to reflect these countries' preferences for the

RMB, rather than the BRI influencing their choice of currency. From this, it can be concluded

that the BRI was not a direct catalyst for the increased RMB usage discussed in Chapter 3.

Chapter 7

Discussion

The findings of this thesis are significant in the context of the broader discussion on BRICS and de-dollarization. It highlights that while geopolitical and economic strategies like the Belt and Road Initiative can facilitate currency internationalization, the fundamental choice of currency rests within the economic and political preferences of individual nations. The countries that have shown an increased demand for the RMB had predispositions towards it, shaped by their economic interests, political alignments, or bilateral trade agreements.

While the discussion on the internationalization of a BRICS currency is ambitious, it is important to note that the analysis in this study is based on relatively recent data from 2013. The limitation on data highlights the need for continuous monitoring and evaluation as economic developments unfold in the BRICS alliance. Strengthening BRICS currencies to a level where they can compete with the US Dollar's status as a safe haven additionally requires unwavering efforts and commitment from the respective nations. This process is not expected to manifest easily and may take many decades for these economic advancements to actualize among BRICS nations.

Furthermore, achieving the status of a global reserve currency requires not only economic stability but also good faith and a sense of trust in the currency's value and reliability. This entails implementing robust monetary policies, fostering financial transparency, and enhancing regulatory frameworks to instill confidence among international investors and economies. Additionally, another international and diversified currency may emerge in the distant future provided BRICS nations and participating emerging economies are committed to promoting

greater usage of BRICS currencies in international trade and investment transactions and

reducing dependence on the US Dollar.

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