RMB Internationalization through Solar Energy Technology Exports

by

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Abstract

China's push to internationalize the Renminbi (RMB) has coincided with its rise as a global leader in green energy. This thesis evaluates whether China's leadership in solar cell exports has significantly advanced RMB internationalization. The original hypothesis posited that China could use its near monopoly in solar cell manufacturing, with over 80% of the global supply chain, as economic statecraft to compel trade partners to settle in RMB, thereby boosting the currency's international use.[1] I employ a mixed-methods approach: quantitative analysis of China's solar export values (2015-2021) versus the share of China's goods trade settled in RMB, and a firm-level case study of Jinko Solar's international revenue data, a major Chinese solar exporter listed on the New York Stock Exchange, again against China's goods trade RMB settlement percentage along with qualitative reasoning.

Contrary to my hypothesis, the findings show no significant positive correlation between solar export growth and an increase in RMB usage in trade. While solar cell exports continued to grow, particularly in 2019, RMB settlement data did not reflect the same trend, and in fact showed a negative correlation (-0.22) as RMB usage peaked in 2015 before nearly halving by 2017 and slowly rising since.[2] For the Jinko Solar case study, the correlation test was also negative (-0.13) as overseas revenue from solar exports steadily increased, but the percentage of goods settled in RMB was still the left heavy U-curve.[3]

[1] "Executive summary – Solar PV Global Supply Chains – Analysis - IEA," IEA, n.d., https://www.iea.org/reports/solar-pv-global-supply-chains/executive-summary.
[2] Kominowski, Sam, "RMB Internationalization Test.xlsx," Unpublished, 2025, https://docs.google.com/spreadsheets/d/15p9tbsF24tQVQuD0BbIFZszdZ1gBQSJj/edit?usp=sharing&ouid=115606060421789582253&rtpof=true&sd=true
[3] Kominowski, Sam, "RMB Internationalization Test.xlsx,"

These unexpected results suggest that currency credibility and financial infrastructure, rather than trade volume alone, are crucial for successful RMB Internationalization. This thesis looks first at my hypothesis, the data collection methods, and the findings. Then it moves into takeaways for broader RMB internationalization, discussing how currency controls and trust in the currency's stability constrain RMB uptake. Policy implications, including enhancing RMB convertibility and offering trade partners greater incentives or assurances to use RMB, could be possible pathways to internationalization for China. This research contributes to understanding the limits of trade-based currency internationalization. It underscores that without robust credibility, trustworthy institutions, and favorable currency policy, even a dominant export sector may not substantially internationalize a currency.

Chapter 1: Introduction

When Russia invaded Ukraine in 2022, China watched as Western sanctions, including a ban from the interbank messaging system SWIFT, essentially cut Russia off from the US Dollar system. This further confirmed something that China's financial planners have known for a long time and has sought to rectify since the 2008 financial crisis: USD hegemony is a liability for China. In 2009, China first started to seek RMB internationalization. This coincided with a time of rapid export growth from 1.497 trillion in 2008 to 3.554 trillion in 2021 as well as a time that China was becoming increasingly interested, for economic, geopolitical, and environmental reasons, in developing green energy technology.[4] [5] Today, China's share in every stage of solar photovoltaic manufacturing, from polysilicon to solar cells to solar modules, exceeds 80%.[6] This

[4] "China Exports 1960-2025 | MacroTrends," March 31, 2025, https://www.macrotrends.net/global-metrics/countries/chn/china/exports#.
[5] "How China Became the World's Leader on Renewable Energy," Yale E360, n.d., https://e360.yale.edu/features/china-renewable-energy.
[6] "Executive Summary – Solar PV Global Supply Chains – Analysis - IEA."

green energy leadership, which has been written into China's Five-Year Plans since 2001, has turned China into the world's indispensable supplier of solar cells, potentially giving it leverage to influence trade settlement practices, advancing its similarly timed goal of RMB internationalization.

This thesis examines whether China has been able to leverage its solar cell export dominance to advance the internationalization of the RMB. The initial hypothesis, based on research of China's RMB internationalization history and China's solar leadership, was that if China produces an irreplaceable product (solar cells) that much of the world needs, or will need for the clean energy transition, it could require or encourage buyers to settle in RMB. This would increase the usage of RMB in global trade, creating a network and promoting the RMB higher on Cohen's currency pyramid to possibly rival the USD at the top.[78]

There is precedent, though not on the same scale, of countries using control over vital energy resources as leverage in international trade and currency settlement. Russia used natural gas as its irreplaceable energy source to pressure the EU into propping up the Ruble temporarily in 2022 after the invasion of Ukraine. Just as Russia could demand payment for its energy in Rubles, China could demand payment in RMB for solar cells, pushing RMB internationalization.

With this logic in mind, the first sections of this paper will set up the background for RMB internationalization, China's solar leadership, and the precedent for energy to be used as currency leverage.

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[7] Benjamin J. Cohen, "The Future of Global Currency: The Euro Versus the Dollar," Choice Reviews Online 49, no. 02 (October 1, 2011): 49–0979, https://doi.org/10.5860/choice.49-0979.
[8] "Currency & Power," IMF, August 16, 2016, https://www.imf.org/en/Blogs/Articles/2016/08/16/currency-power.

Chapter 2: RMB Internationalization History

RMB internationalization, defined as the widespread use of RMB in cross-border trade, investment, and as reserve holdings, has been present since 2009. During the Great Financial Crisis (GFC) trust in the international monetary system, dominated by the USD and Euro, weakened as calls for reforming the IMS intensified. The focus shifted to China, whose currency position had been underweight compared to its size in the world economy.

On July 1st, 2009, China announced the first step into RMB internationalization with a RMB Settlement Pilot Project. This opened 5 Chinese cities (Shanghai, Guangzhou, Shenzhen, Dongguan, and Zhuhai) to do business with external regions (Hong Kong, Macau, ASEAN countries) using RMB.[9] This was China's first measure to turning the RMB into a global trade currency.

The Launch of the Chinese clearing house CIPS in October 2015 to rival the U.S.' CHIPS was seen as a crucial step in creating financial institutions to allow for RMB internationalization. Since the start of opening up the RMB to being used in cross-border trading, there had been a need for an RMB payment clearing system. CIPS provides a real-time gross settlement system, allowing direct clearing between onshore and offshore banks without needing intermediary correspondent banks.[10] The signing of a memorandum of understanding with SWIFT allowed CIPS to communicate with more banks outside of China enabling broader global integration of CIPS into international banking.[11] CIPS became the "expressway" for RMB internationalization,

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[9] Barry Eichengreen and Masahiro Kawai, "ADBI Working Paper Series," *Asian Development Bank Institute* (Asian Development Bank Institute, January 2014), accessed April 28, 2025, https://www.adb.org/sites/default/files/publication/156309/adbi-wp454.pdf.
[10] "Introduction," n.d., https://www.cips.com.cn/en/about_us/about_cips/introduction/index.html.
[11] "Swift offers secure financial messaging services to CIPS | Swift," Swift, March 25, 2016, https://www.swift.com/news-events/press-releases/swift-offers-secure-financial-messaging-services-cips.

integrating with new technologies, including mobile payment and biometrics.[12] CIPS was and still is foundational infrastructure for RMB internationalization, which makes large-scale RMB trade settlement technically feasible. While it solved operational barriers, the limited use of RMB in global settlement shows that credibility and incentives, not infrastructure alone, are all bottlenecks.

The inclusion of the RMB in the IMF's Special Drawing Rights (SDR) basket in 2015 marked the next major step in its internationalization, significantly boosting the currency's global credibility by recognizing it as one of the world's most important trade and reserve currencies. The reasoning behind this change was the "substantial increase in the international use and trading of the RMB" and that "the Renminbi can now be considered in fact, widely used to make payments for international transactions."[13] The statements reflected meaningful progress in the RMB's international growth, including rapid increases in cross-border settlement volumes, rising offshore RMB deposits, and the expansion of bilateral currency swap agreements with over 30 central banks. RMB was included at almost 11%, mainly reducing the Euro's share from the previous update in 2010 and making it the 3rd highest currency in the SDR basket.[14] [15] The inclusion marked a global vote of confidence in the RMB's status, triggering a surge in demand, especially from central banks and financial institutions.[16] According to IMF COFER data, RMB holdings rose from 1.08% of global reserves in 2016 to a peak of 2.8% in 2021, before settling at

[12] "CIPS ACCELERATES THE INTERNATIONALISATION OF THE RMB," SWIFT (MI Forum, September 2016), accessed April 28, 2025, https://www.swift.com/sites/default/files/documents/swift_news_mi_cips_accelerates_internationalisation_rmb.pdf.
[13] "IMF -- International Monetary Annual Report 2016," September 26, 2016, https://www.imf.org/external/pubs/ft/ar/2016/eng/sdr.htm.
[14] Hongcai Xu, Global implications of the Inclusion of the RMB into the SDR, China Center for International Economic Exchanges (China Center for International Economic Exchanges, 2016), https://www.cciee.org.cn/UserFile/20151216435.pdf.
[15] "IMF -- International Monetary Annual Report 2016."
[16] Xu, Global Implications of the Inclusion of the RMB into the SDR.

2.18% in 2024.[17] This helped China deepen financial integration with the world by reinforcing the currency's credibility and expanding its role in international finance.

Chapter 3: China's Solar Leadership

Prior to the GFC and China's pursuit of RMB internationalization, China had another issue: the environment. After decades of exponential economic growth based largely on becoming the world's factory, China had just claimed the less-than-desirable crown of the world's largest greenhouse gas emitter by volume, surpassing the U.S. in 2006.[18] At the time, over 80% of China's energy supply came from coal, the most carbon-intensive fossil fuel, exacerbating both domestic pollution and global climate concerns.[19] [20] Recognizing the geopolitical vulnerability of energy dependence and the long-term economic opportunities in green technology, the government began to recalibrate its strategy.

Starting with the 10th Five-Year Plan (2001–2005) and accelerating in every plan since, China embedded sustainability through green energy technology development into national economic planning.[21] Renewable energy technologies, especially solar, were designated as strategic industries for development, tied to both industrial upgrading and energy security. While early policy did not explicitly tie solar technology development to RMB internationalization, it set the groundwork for a soon-to-be global energy dependency on China.

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[17] "Data Explorer," n.d., https://data.imf.org/en/Data-Explorer?datasetUrn=IMF.STA:COFER(7.0.0).
[18] "How China Became the World's Leader on Renewable Energy."
[19] Ember, "China | Energy Trends | Ember," April 9, 2025, https://ember-energy.org/countries-and-regions/china/.
[20] "Fossil Fuels and Climate Change: The Facts," ClientEarth, April 3, 2025, https://www.clientearth.org/latest/news/fossil-fuels-and-climate-change-the-facts/.
[21] Thomas Howell et al., "China's Promotion of the Renewable Electric Power Equipment Industry: Hydro, Wind, Solar, Biomass" (Dewey & LeBoeuf LLP, March 2010), accessed April 28, 2025, https://www.nftc.org/archive/Press%20Release/2010/China%20Renewable%20Energy.pdf.

In the time since China put these key goals in its legislation, China has made multiple strategic initiatives to back them up. Notably, the Belt and Road Initiative (BRI), launched in 2013, and CIPS, as mentioned in the previous chapter, launched in 2015, enabled the export of China's solar cells. It was stated in the People's Bank of China's (PBOC) 2017 RMB internationalization report that through coordination with "'the Belt and Road', the use of the RMB among the nations along 'the Belt and Road' will expand steadily."[22] As of 2023, approximately 54% of Belt and Road Initiative (BRI) projects are in clean or alternative energy sectors, strongly suggesting that China sees green energy as a key driver of RMB internationalization, especially if the BRI is a primary channel for promoting the RMB.[23] Having the infrastructure of CIPS further allowed China to receive payment for these solar exports in RMB if that was part of the settlement terms.

Moving forward to the current day, solar power is still ingrained in China's current 14th Five-Year Plan. With stated targets of non-fossil energy reaching 20% by 2025 and carbon neutrality by 2060, China plans to "vigorously increase the scale in… photovoltaic power generation."[24] China has arguably succeeded in its goal in regard to solar, as China now controls 80% of the global manufacturing capacity.[25] While official documents do not explicitly link this dominance in solar technology to RMB internationalization, the strategic implications are evident. Control over a critical component of the global energy transition strengthens China's economic positioning and could indirectly serve broader monetary goals. This raises the question

[22] "RMB Internationalization Reports," n.d., http://www.pbc.gov.cn/en/3688241/3688636/3828468/index.html.
[23] Fang, Qiang, and Xiaobing Li, eds. China under Xi Jinping: A New Assessment. Leiden University Press, 2024. http://www.jstor.org/stable/jj.15136086.
[24] "中华人民共和国国民经济和社会发展第十四个五年规划和2035年远景目标纲要_滚动新闻_中国政府网," n.d., https://perma.cc/73AK-BUW2.
[25] "Executive Summary – Solar PV Global Supply Chains – Analysis - IEA."

of whether such dominance in a vital resource sector could be leveraged for currency power, something for which there is precedent.

Chapter 4: Precedent for Energy to be used as Currency Leverage

Russia's ability to control European natural gas supplies demonstrated the power of energy as a political tool. Russia exploited this reliance during the 2022 Ukraine invasion, which triggered sanctions from Europe against Russia in almost all major export categories except natural gas, which could not be sanctioned due to the EU's and especially Germany's reliance on their energy.[26] [27]

Looking into the background of Chinese energy policy, it is clear that China views energy security as a cornerstone of national security. Daniel Yergin's The Prize highlights the critical link between energy security and political independence, emphasizing that "control over a vital source of energy permits states to regain power."[28] This perspective provides a useful lens for understanding China's 1959 discovery of the Daqing Oil Field and its subsequent decision to sever ties with the USSR. While multiple factors contributed to the breakdown of Sino-Soviet relations, the discovery of domestic energy resources likely gave China the confidence to end diplomatic relations with its primary energy supplier at the time.

This example, coupled with China's consistent focus on learning from its history, shows that the country is aware of the power of energy reliance. China not only observes Russia's current use of

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[26] "The European Union-Russia Energy Divorce: State of Play," Bruegel | the Brussels-based Economic Think Tank, April 24, 2025, https://www.bruegel.org/analysis/european-union-russia-energy-divorce-state-play.
[27] Rrustemi, Arlinda, Rob de Wijk, Connor Dunlop, Jovana Perovska, Lirije Palushi, Willem Oosterveld, Matthew Phillips, et al. "Russia." *Geopolitical Influences of External Powers in the Western Balkans*. Hague Centre for Strategic Studies, 2019. http://www.jstor.org/stable/resrep19582.14.
[28] Daniel Yergin, *The Prize : The Epic Quest for Oil, Money & Power*, *Free Press eBooks*, 2008, http://ci.nii.ac.jp/ncid/BA89882821.

energy dependency as geopolitical leverage but also takes lessons from its own historical reliance on foreign powers for energy. In turn, China's energy security policy has evolved alongside its global standing. In 2006, Hu Jintao emphasized global energy cooperation, reflecting China's need for alliances to counter U.S. dominance.[29] By 2024, Xi Jinping shifted the focus to national energy security, signaling China's emergence as a self-reliant superpower challenging the monopolar world order.[30] In addition, China seeks, just as Russia did, to gain the leverage it once gave to the USSR by making the world reliant on China for the new oil: green energy.

Chapter 5: Theoretical Framework

This section seeks to support my hypothesis on a theoretical level, focusing on how a country's economic actions intersect with currency internationalization. Two key frameworks are considered: Benjamin Cohen's Currency Pyramid from his book *The Future of Global Currency: The Euro Versus the Dollar* and the theory of Network Externalities in international currency usage. [31] [32] [33] Additionally, the notion of currency credibility will be emphasized, which is included in most currency theories as a fundamental pillar.

5.1 Cohen's Currency Pyramid

To better describe the way currencies act in global trade and investment, Benjamin Cohen conceptualizes international currencies through a hierarchical "Currency Pyramid," categorizing

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[29] Consulate General of the People's Republic of China in New York. "Hu Jintao's Speech at the G8 Summit." Consulate General of the People's Republic of China in New York, 17 July 2006, https://newyork.china-consulate.gov.cn/eng/xw/200607/t20060717_4685499.htm.
[30] 王晶晶, "Xi Stresses High-quality Development of New Energy, Greater Contributions to Building Clean, Beautiful World," n.d., https://english.www.gov.cn/news/202403/02/content_WS65e14600c6d0868f4e8e47ec.html.
[31] Cohen, "The Future of Global Currency: The Euro Versus the Dollar."
[32] Nienke Oomes, "Network Externalities and Dollarization Hysteresis: The Case of Russia," IMF (IMF, May 2003), accessed April 28, 2025, https://www.imf.org/external/pubs/ft/wp/2003/wp0396.pdf.
[33] Gerard DiPippo and Andrea Leonard Palazzi, "It's All about Networking: The Limits of Renminbi Internationalization," CSIS, October 28, 2024, https://www.csis.org/analysis/its-all-about-networking-limits-renminbi-internationalization.

currencies based on global usage and the three monetary functions being unit of account, medium of exchange, and store of value. The tip of the pyramid is made up of the USD, as he claims the currency has expanded beyond its borders, "vying directly with local [currencies] for both medium-of-exchange and investment purposes."[34] Next comes the (at the time of publication in 2011) newly created Euro and Japanese Yen. Then follow the rest of the currencies as they "[reflect] various degrees of competitive inferiority."[35]

China's ambition for RMB internationalization represents an attempt to climb this pyramid, moving from local to regional, and eventually global, currency status. This gradual ascent can be seen in the RMB internationalization history section of starting as being confined to domestic trade pre-GFC, opening to select cities including Hong Kong, Macau, and regional neighbors ASEAN, and then in 2013 opening broader to Belt and Road Initiative members. Cohen addressed the RMB's potential to rise as an international currency, but dismissed the Yuan as "no threat to the dollar" due to the 3 requirements it did not meet as of writing in 2011:

1. Confidence in the currency's future value, backed by political stability.
2. Exchange convenience and capital certainty based on open and liquid markets.
3. A broad transactional network tied to a large and open economy.[36]

China has taken steps to address 2 out of 3 of these issues. While the government has not allowed the currency to float, its shadow price is essentially its market price, meaning that the government is not keeping it artificially strong or weak (Zeidan Lectures, need to find exact source). This has increased investor confidence in the RMB being able to maintain its value. The solution to the broad transactional network issue is CIPS, and, while not as complete as CHIPS,

[34] Cohen, "The Future of Global Currency: The Euro Versus the Dollar."
[35] Cohen, "The Future of Global Currency: The Euro Versus the Dollar."
[36] Cohen, "The Future of Global Currency: The Euro Versus the Dollar."

it's growing. Exchange convenience is the only issue that China has not budged on. A quote from Cohen, “use of the yuan continues to be inhibited by cumbersome exchange and capital controls,”[37] could be written today and be just as valid. So while there are still barriers to RMB’s internationalization, particularly regarding exchange convenience and capital openness, China’s efforts in expanding its transactional network raise an important question: can dominance in a specific strategic sector to compensate for broader institutional limitations? This is where the solar industry becomes relevant. With China having a quasi monopoly, its exports are not just economically significant, they are indispensable to many countries’ energy transition. In this context, the solar cell industry presents a unique test case: does overwhelming trade leverage in a critical global sector generate enough transactional influence to elevate a currency’s international role, at least partially, despite unresolved convertibility issues?

5.2 Network Externalities

Money, as a tool that is used in lieu of hard, valuable assets, gains more value as more people use it. Money is not inherently worth anything unless everyone agrees that it is worth something. The dollar, post WWII, being the world reserve currency, has an immense network of people trading, saving, and investing in it. This, coupled with the U.S. government being considered essentially “risk-free,” makes the U.S. dollar desirable and therefore valuable. Nienke Oomes from the International Monetary Fund quotes Martin Uribe, who states, “If the economy is not dollarized (i.e., if agents are not used to receiving foreign currency in exchange for goods) it is more costly for the consumer to carry out transactions in the foreign currency. Conversely, in an environment in which everybody is used to dealing in dollars, it is easier for the consumer to use dollars as a

[37] Cohen, “The Future of Global Currency: The Euro Versus the Dollar.”

means of exchange."[38] In other words, due to how many people use the USD, no one, whether they are a resident of the U.S. or not, worries about the ability to use it to purchase other goods and services, so there is no risk premium required to pay for a good or service with the USD.[39]

This is not the case for the RMB. While China settled 23% of its trade in 2023 in RMB, according to the People's Bank of China, this is almost exclusively transactions that include at least one Chinese entity.[40] Unlike the USD, there is essentially no trade happening between two third-party countries that is settled in RMB. As the Center for Strategic & International Studies claims, "China's currency will not be truly internationalized until it is readily accepted by, say, Brazil to trade with South Africa."[41] China is realistic about this issue, and is not seeking to immediately shortcut the third-party transactions issue.

Instead, its focus is on attempting to shift the network of its own trade with other countries from the USD to the RMB. As 13.45% of global exports, compared to the U.S.' 8.98%, it has the capacity to construct a substantial transactional network centered on itself.[42] If China builds a trade network centered on itself, it positions the RMB for future third-party internationalization. Other countries may come to see RMB transactions as a safe option between each other, knowing that the currency can always be used to purchase goods from the world's largest exporter due to China's RMB network centered on itself. The question, then, is whether China can build a reliable RMB-based trade network by leveraging its export dominance, particularly in sectors where it holds a near-monopoly, such as solar cells?

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[38] Oomes, "Network Externalities and Dollarization Hysteresis: The Case of Russia."
[39] DiPippo and Palazzi, "It's All about Networking: The Limits of Renminbi Internationalization."
[40]DiPippo and Palazzi, "It's All about Networking: The Limits of Renminbi Internationalization."
[41] DiPippo and Palazzi, "It's All about Networking: The Limits of Renminbi Internationalization."
[42] Jacque Schrag, "Is China the World's Top Trader? | ChinaPower Project," ChinaPower Project, August 25, 2020, https://chinapower.csis.org/trade-partner/.

Chapter 6: Methodology

To test the hypothesis that solar panel exports have contributed significantly to RMB internationalization, I designed an empirical study with two complementary components: a time series analysis using national data, and a company-level case study using firm data. Both quantitative analyses are supported by qualitative context from policy documents.

Data Sources:

7.1 Solar Panel Export Data[43]

I obtained official statistics on China's solar panel exports from the General Administration of Customs of China. Specifically, data on export values (denominated in RMB) and quantities were collected for the time period 2014-2021. To find the data, I used the Harmonized System commodity codes using 6-bit (854140) instead of 8-bit (85414020) to collect all solar cell data versus more specific types of solar cells. The reason I only included up to 2021 is that starting in 2022, the code descriptor changed, and the data was cut significantly. I decided that this must have been a change in classification of exports, meaning the data was not compatible with data from previous years. To ensure consistency, I compiled a continuous series up to 2021 using the old classifications. The values were measured in RMB, which directly relates to my analysis of currency usage.

7.2 RMB Trade Settlement Data[44]

The key metric for RMB internationalization via trade is the percentage of China's cross-border goods trade settled in RMB each year. This metric is reported in the PBoC's yearly *RMB*

[43] "Home - GACC," n.d., http://english.customs.gov.cn/.
[44] "RMB Internationalization Reports."

Internationalization Reports. I extracted these percentages for each year from 2014 to 2021 from PBoC reports. While it would have been ideal to find direct data on solar goods trade settled in RMB, that data was not publicly available, per a phone call with the customs department.

7.3 *Jinko Solar International Revenue Data*[45]

I examined the financial statements and yearly reports of Jinko Solar, one of China's largest solar panel manufacturers and exporters, which is publicly listed on the New York Stock Exchange. Critically, I found disclosures of the proportion of Jinko's revenue coming from overseas markets. I used that percentage to calculate the total amount of revenue, from their total revenue listed on their balance sheet, to find their international revenue. I then collected the data from the years to match my RMB trade settlement data.

7.4 SWIFT RMB Tracker Document Centre - Methods Limitation[46]

In addition to PBOC data, SWIFT also publishes regular reports in their RMB document tracker page. This data shows statistics such as RMB's share as a global payment's currency. However SWIFT's data aggregates a broader range of financial transactions, instead of just goods trade. I selected the PBOC's cross-border goods trade settlement data because it is specifically goods, which is as close as I could find to solar cells, and I only found the SWIFT data after completing the study. However, SWIFT may offer more comprehensive and independently verifiable data compared to official national statistics from China which could be subject to bias. Future research might consider integrating both SWIFT and PBOC data for a more robust study.

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[45] "Annual Reports | JinkoSolar," JinkoSolar, April 25, 2024, https://ir.jinkosolar.com/financials/annual-reports.
[46] "RMB Tracker document centre | Swift," Swift, n.d., https://www.swift.com/products/renminbi-tracker/document-centre.

Chapter 8: Findings and Analysis

8.1 Statistical Analysis Results[47]

The first test I ran was a correlation analysis test on Excel of solar panel export data versus goods trade RMB settlement data. If the correlation was positive, it would mean that my data supported my hypothesis that as solar exports were pushing RMB internationalization forward as solar exports increased, so did the settlement of goods in RMB. However, the correlation came back at -0.2196, meaning that solar exports and cross-border RMB settlement for goods trade had a slightly negative, or opposite, correlation. This did not support my hypothesis.

The second test I ran was another correlation analysis test on Excel, but this time using Jinko Solar's international revenue data against the same goods trade RMB settlement data. Again, if the correlation coefficient was positive, that would mean that as Jinko exported more solar cells, usage of RMB to settle goods trade increased, implying that solar exports contributed to RMB internationalization. However, again, the correlation was negative at -0.128. This went against my hypothesis, suggesting that Jinko Solar exports did not have any relationship with RMB internationalization.

Taken together, these two tests suggest that the data does not support my hypothesis that solar cell exports contribute to RMB internationalization. While the argument holds qualitatively, as outlined in previous sections, the empirical evidence shows no meaningful positive relationship, and even a possible negative one, between solar exports and the use of RMB in international goods trade settlement.

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[47] Kominowski, Sam, "RMB Internationalization Test.xlsx,"

8.2 Limitations

I believe there were three main limitations to my research: Data quality, solar cell exports might have been the wrong item to focus on, and a fundamental misunderstanding of China's current RMB internationalization goals.

Firstly, I had poor RMB settlement data. My data was from the PBC, an official government source, but it had 2 issues. The primary issue was that my data was for all goods exported from China. While RMB settlement data for all goods exported was too broad to determine a correlation, data from the settlement of the solar sector alone could have revealed whether China was achieving sector-specific RMB internationalization. While leadership in a critical sector may not lead to full RMB internationalization, but it could enable targeted or "compartmentalized" currency internationalization, particularly in politically or strategically aligned markets. Therefore, I believe that sector-specific RMB settlement data would have made my study more rigorous, however, this data was not publicly available.

Secondly, and probably most importantly, I believe that I fundamentally misjudged China's RMB internationalization goals. The premise of my argument is that China is trying to shortcut RMB internationalization by pushing trade to be settled in RMB. However, this implies that China is seeking to make RMB an international currency as quickly as possible. I no longer believe that China is actively pursuing full RMB internationalization in the short term. While if China could immediately make the RMB the global currency, it would, China knows that is not possible. As the government often emphasizes, its strategy is long-term. While China is laying the groundwork for future internationalization, its continued use of strict capital controls, a major barrier to currency internationalization, suggests that the current priority is not global RMB

adoption, but rather domestic economic growth and building the structural foundations for broader currency use when the economy and financial system are deemed ready.

8.3 Reasoning

My hypothesis anticipated a positive correlation between China's solar cell exports and greater RMB usage in trade. However, empirical data showed no significant correlation, which led me to research why this may be. I came to the conclusion that multiple structural and policy factors likely are impeding RMB Internationalization which supersede China's export strength. The three key reasons I determined rose above the rest were entrenched trade invoicing inertia favoring the USD, persistent RMB credibility and convertibility concerns, and sector specific limitations of the solar industry's financial market.

8.3.1 Network Externalities Part 2

In my theoretical framework section above, I evaluate China's potential opportunities that come from currencies gaining their value from being widely used. Essentially, my argument was that based on China's large export network, China can push the use of RMB through its exports deemed essential or that it controls the majority of, such as solar cells, therefore fast tracking RMB into being a widely used currency. However, after looking at the data, it is evident China is not using solar cells to fast track RMB usage. I believe this is partially due to the U.S.' long-standing network dominance, which I undervalued in my original assessment, especially for third party transactions.

Global trade exhibits strong inertia in settlement currencies. The USD's share of 2024 global payments per FED data is 47% even though the U.S. only accounts for 11.3% of global trade.[4849] For comparison, according to the FED, the RMB accounted for 4.3% of global trade in 2023, a significant jump from 2.1% in 2022, but still well below China's 12.4% of global trade.[50] [51] This outsized use of the dollar compared to the undersized use of the RMB reflects the network externalities effect and "incumbent advantage" that the RMB must overcome. The USD's dominance creates a self-reinforcing network. Widespread USD use reduces transaction costs, deepens liquidity, and incentivizes more parties to invoice in USD, further solidifying its role.[52] China's solar cell exports, and all other trade, however large they might be, work in the global trade system which is denominated in USD, with banks, finances, and supply chains all based on USD.[53] China would need to expend serious political and financial capital to convince traders to use RMB instead of USD, which, as I said in the limitations section, isn't their highest priority right now. Even if China leveraged its control over 12.4% of global trade, truly internationalizing the RMB would require third-party countries to adopt it as well. A shift that, based on my research into solar cell trade and RMB internationalization, seems nearly impossible without major overhauls to the global trade system and RMB management. Overall, the USD's network effect will significantly impede any shift to the RMB, partially explaining why rising solar exports did not translate into correlated RMB trade settlement increases.

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[48] Bastian Von Beschwitz, "Internationalization of the Chinese Renminbi: Progress and Outlook," August 30, 2024, https://www.federalreserve.gov/econres/notes/feds-notes/internationalization-of-the-chinese-renminbi-progress-and-outlook-20240830.html.
[49] Katharina Buchholz, "U.S. Dollar Defends Role as Global Currency," Statista Daily Data, January 22, 2025, https://www.statista.com/chart/30838/share-us-us-dollar-in-global-economy-global-financial-transactions/.
[50] Von Beschwitz, "Internationalization of the Chinese Renminbi: Progress and Outlook."
[51] Jacque Schrag, "Is China the World's Top Trader? | ChinaPower Project," ChinaPower Project, August 25, 2020, https://chinapower.csis.org/trade-partner/.
[52] "Expanding Local Currency Transactions in ASEAN+3 Cross-Border Payments," AMRO - Policy Position Paper (PPP/23-02), December 2023, accessed April 28, 2025, https://amro-asia.org/wp-content/uploads/2024/06/AMRO-Policy-Position-Paper_Expanding-LCT-in-ASEAN3-Cross-Border-Payments-v2_Dec-2023.pdf.
[53] "Expanding Local Currency Transactions in ASEAN+3 Cross-Border Payments."

8.3.2 RMB Credibility and Convertibility Challenges

As I mentioned in the theoretic framework section, in Cohen's currency pyramid, he notes that "the use of the yuan continues to be inhibited by cumbersome exchange and capital controls."[54] I then posed the question: can China's dominance in a critical export overcome this issue? The answer is no.

Unlike the USD, which floats freely, the RMB is tightly controlled. The PBoC sets the RMB fixing rate against the USD, and only allows the daily exchange rate to fluctuate +/- 2%.[55] A FED graph from 2024 shows how the RMB fixing spot has been kept more stable since RMB depreciation pressure started in August 2023.[56]

According to an AMRO research study, "any liberalization [of the RMB is] expected to only be gradual" further supporting the hypothesis that RMB internationalization, while desirable, is not a top priority for China.[57] Such controls and intervention can shake international trust as markets worry they won't be able to convert their RMB revenue as needed or that the true value of the RMB is being hidden by the daily fixing rate. The FED cites these concerns as limiting "the renminbi's more widespread use and the attractiveness of renminbi assets."[58] A quote from the AMRO study sums up the issue neatly by stating "Existing limits on inbound capital flows restrict foreign investors from holding greater amounts of Chinese assets, while limits on outbound investments by Chinese residents disincentivize foreign governments from holding renminbi assets as foreign exchange reserves."[59] Traders are then more hesitant to settle or accept

[54] Cohen, "The Future of Global Currency: The Euro Versus the Dollar."
[55] Von Beschwitz, "Internationalization of the Chinese Renminbi: Progress and Outlook," August 30, 2024.
[56] Von Beschwitz, "Internationalization of the Chinese Renminbi: Progress and Outlook," August 30, 2024.
[57] "Expanding Local Currency Transactions in ASEAN+3 Cross-Border Payments."
[58] Von Beschwitz, "Internationalization of the Chinese Renminbi: Progress and Outlook," August 30, 2024.
[59] "Expanding Local Currency Transactions in ASEAN+3 Cross-Border Payments."

RMB as payment as they prefer stable, highly liquid currencies that can be freely converted and traded such as the USD. This connects with the network externalities theory as capital controls make a currency less liquid, or less readily usable. Therefore, by logic, the transaction costs will be higher and fewer market participants will choose to use the RMB, creating less of a network, leading to higher transaction costs, and the cycle continues.

In conclusion, the high level entrenched network externalities and market participants favoring the U.S. dollar due to its liquidity and credibility explain why my hypothesis was not supported by the data, and more broadly why RMB has struggled to become an internationalized currency. The USD's position in international trade, reinforced by liquidity, trust, and universal acceptability, means that any emerging currency faces formidable challenges from currency inertia. At the same time, China's capital controls, exchange peg, and cautious liberalization restrict the RMB's appeal as a settlement currency for both direct trading partners and especially third party transactions. Even as China attempts to gradually build a trade network centered around the RMB, it remains clear that export dominance alone cannot substitute for the benefits that the USD brings as the global currency.

8.3.3 Structural Limitations Due to Lack of RMB Derivatives

It's worth noting that another reason solar cells might not have been a good choice for RMB internationalization is their only recent ascension to commodity status. After completing my research, I learned that polysilicon derivatives, the material used to make solar cells and many other high-tech devices such as semiconductors, were only just approved in December 2024 by the China Securities Regulatory Commission (CRSC) in Guangzhou.[60] Unlike oil and gold which

[60] 杨宇, "China's Securities Regulator OKs Registration of Polysilicon Futures, Options," n.d., https://english.www.gov.cn/news/202412/13/content_WS675c3849c6d0868f4e8edf01.html.

were listed in 2018 and 2019 respectively, polysilicon only recently got added.[61] These standardized contracts could have more easily been RMB-denominated. In international finance, commodity sectors, which are the base for all production, have historically strengthened currencies like the USD. The "petrodollar" system, which is simply USD used to pay for oil, gives the USD immense power as every country in the world needs to buy or sell oil.[62] Oil derivatives based on the USD add to both the network effect, as countries always know that they can spend USD to buy oil, as well as the credibility, as you can buy a hard, useful commodity with the USD. By contrast, polysilicon has only recently been added to the RMB derivatives market, and USD- or EUR-denominated derivatives remain far more widely traded. This opens up a possible future research topic: how China might use commodity pricing, especially in sectors like rare earth elements where it controls a majority share, to push RMB internationalization. However, I predict that this effort will face the same underlying challenge: RMB internationalization cannot be shortcut, even with the leverage China currently holds.

Chapter 9: Conclusion - Implications

9.1 Policy Implications for China

China must recognize (or recognizes) that trade volume alone is not sufficient to internationalize the RMB and align its other currency policy based on their ultimate goal, whatever that might be. Proactive ecosystem building and strategic market reform are required to advance RMB internationalization, which cannot happen overnight, meaning if a global currency is China's goal, it needs to start building the infrastructure now. However, the speed and the amount of

[61] "The RMB Bloc and Global Currency Markets," Asset Management, November 1, 2022, https://www.ubs.com/hk/en/assetmanagement/insights/thematic-viewpoints/apac-and-emerging/articles/rmb-bloc.html.
[62] Bracarense, Natália, and Irène Berthonnet. "From Petrodollar to Energy-Yuan: Currency Internationalization in the Light of Original Institutional Economics." Journal of economic issues 58, no. 1 (2024): 112–135.

political capital that China should spend on these initiatives depends on China's internal timeframe for RMB internationalization, which, despite their reports claiming it's a goal, is not truly public information.

9.1.1 Expansion and Deepening of RMB infrastructure

China must expand CIPS to compete as a major international clearing house. CIPS can be compared to the U.S.' clearing house CHIPS, but not on scale. CHIPS boasts almost 10 times the number of participants as CIPS.[63] While CHIPS is much older than CIPS, to catch up and reduce transaction costs and make RMB settlement more efficient and attractive, China must keep building its settlement infrastructure, namely expanding CIPS.

9.1.2 Promotion of RMB-Denominated Commodity Markets

To build trust in the RMB and to bring some sort of hard value to the RMB, China must create RMB denominated commodity markets that are as widely and efficiently traded as USD ones. Extend the petrodollar strategy to the RMB, adding a useful commodity to essentially back the RMB. By making the RMB a default currency for a highly sought after resource that China controls, such as rare earth elements, China can add a material, useful backing to the RMB. While not ideal to tie the value directly to the commodity as commodity prices fluctuate, ensuring the RMB can always be used to easily buy rare commodities will give traders confidence that any RMB they are paid in can be easily used to acquire a useful raw material.

9.1.3 Gradual Relaxation of Capital Controls

[63] Barry Eichengreen, "Sanctions, SWIFT, and China's Cross-Border Interbank Payments System," September 25, 2024, https://www.csis.org/analysis/sanctions-swift-and-chinas-cross-border-interbank-payments-system.

This is possibly the hardest, yet most important, aspect if China wants to internationalize the RMB. It's also the area that China needs to decide the most on how important this goal is as compared to the country's other economic goals. It's clear, based on my research and many other before, that China will need to loosen capital controls in order to increase investor confidence and reduce transaction costs if they ever want to have an internationalized RMB. However, this would mean giving up another side of the impossible currency trinity of free capital flows, fixed exchange rate and sovereign monetary policy. When China tried to have all three corners of the trinity, it faced a speculative attack and PBOC was forced to step in and stabilize the RMB.[64] This proved to China and the world that no country, no matter how powerful the economy, could have all three aspects of the trilema. China, of course, will never give up their sovereign monetary policy, meaning it must allow the RMB to float freely. This could be harmful to other aspects of its economy, such as exports, which it recently re-added to its two sessions work report as an important aspect to its economic growth. This highlights the choice China needs to make between having a global currency and its domestic economic goals. There is always a trade-off, and China needs to make the decision on how best to balance its multiple contradictory goals.

9.2 Current Trade War Implications

9.2.1 Impact of U.S. Tariffs and Possible USD weaponization

The new tariffs being applied to Chinese goods from the U.S. increases costs for Chinese exporters. If the current tariff regime of 145% holds, this means most Chinese exports to the U.S. become unviable, which might lead to total decoupling from the U.S. market. The U.S. has also

[64] Sjs, "The Future of the Chinese Yuan | GJIA," Georgetown Journal of International Affairs, April 21, 2024, https://gjia.georgetown.edu/2024/04/18/de-dollarization-the-belt-and-road-initiative-and-the-future-of-the-chinese-yuan/.

been said to have been trying to work with third party countries to limit China's trading ability in return for the U.S. lowering tariffs against said third country. This threatens China's integration into the USD-centric supply chain, and leads to concerns that the U.S. could weaponize the dollar as a tool in the trade war, as it has done in other negotiations such as Russia in 2022. If China fears their exports and role as a global export powerhouse is under threat due to the U.S.' possible weaponization of the dollar, this might change China's goal priority order, raising RMB internationalization in order to safeguard China's economy. Even if the U.S. doesn't weaponize the dollar against China now, the current trade war has surely been a wake-up call to China that it cannot forever rely on an unfriendly United States currency if it ever wants to match or overtake the U.S. as the global economic or military superpower. Controlling the global reserve and trade currency is too powerful of a tool, which China has known, but the recent trade war has shown China just how crucial it can be.

9.2.2 Impact on USD credibility and China's strategic response

To say the least, Trump's second trade war has shaken the confidence of the world economic system in the U.S. As the U.S. stock market plunged after the announcement, bond yields rose, showing the flight to quality was no longer going towards US Treasury bonds.[65] This was so concerning that it's speculated it was one of the main reasons trump reversed course and paused the tariffs. China, in comparison, has looked stable in a time of turbulence. Many have stated that China should capitalize on this situation by essentially doing nothing and looking like the rational actor, furthering its *credibility*, a crucial piece of the global currency puzzle. Political moves that were thought of as unthinkable just two months ago, such as China and the EU

[65] Caroline Valetkevitch, "US bond yields rise, dollar down as turbulent week comes to an end," Reuters, April 11, 2025, https://www.reuters.com/markets/global-markets-wrapup-1pix-2025-04-11/.

becoming closer, are now happening. This turmoil could be the incentive countries need to adopt the RMB as a diversifying tactic and reduce dollar dependence. However, geopolitical risk perception such as the fear of secondary sanctions by the U.S. may be simultaneously deterring governments from adopting the RMB widely. The USD still has the most powerful network, as it remains resilient due to the inertia explained above. While the recent trade war and perceived irrationality from the U.S. have created fertile ground for an RMB internationalization push, it remains far from becoming a reality. Only time will tell whether the U.S. continues actions that drive countries to consider alternatives to the dollar, and how much political and economic capital China is willing to invest to truly internationalize the RMB.

9.3 Further Study

9.3.1 Geopolitical Analysis of currency blocs

I would like to explore the influence of geopolitical alignments (BRI, BRICS, NATO, NAFTA, etc.) on RMB internationalization and currency choice in general. For example, a study could quantify if countries with closer strategic ties to China exhibit higher RMB usage in trade than others. Conversely, does limited access to USD force countries (Iran, Russia, North Korea, etc.) to seek out other currencies, and are third party countries willing to trade with them based on the RMB. This would contribute to the literature on how political factors and alliances create currency spheres of influence, complementing the economic determinants.

9.3.2 Firm-level Currency Choice Analysis

Investigating micro-level decision-making by Chinese exporters and their foreign buyers regarding invoicing currency would allow me to better understand the transaction costs and

benefits surrounding RMB settlement. Firm surveys or interviews accompanied by case studies could explain the practical, real life hurdles or incentives that lead firms to stick with the USD or switch to the RMB. This would deepen understanding of corporate practices and risk management affecting currency internationalization. The biggest foreseen issue would be this data would be very challenging to acquire, as I learned that specific settlement data by companies and economies as a whole is widely not publicly available.

Bibliography

1. JinkoSolar. “Annual Reports | JinkoSolar,” April 25, 2024. https://ir.jinkosolar.com/financials/annual-reports.
2. Bracarense, Natália, and Irène Berthonnet. “From Petrodollar to Energy-Yuan: Currency Internationalization in the Light of Original Institutional Economics.” Journal of economic issues 58, no. 1 (2024): 112–135.
3. Buchholz, Katharina. “U.S. Dollar Defends Role as Global Currency.” *Statista Daily Data*, January 22, 2025. https://www.statista.com/chart/30838/share-us-us-dollar-in-global-economy-global-financial-transactions/.
4. Chen, James. “Petrodollars: Definition, History, Uses.” Investopedia, July 17, 2024. https://www.investopedia.com/terms/p/petrodollars.asp.
5. “China Exports 1960-2025 | MacroTrends,” March 31, 2025. https://www.macrotrends.net/global-metrics/countries/chn/china/exports#.
6. “CIPS ACCELERATES THE INTERNATIONALISATION OF THE RMB.” *SWIFT*. MI Forum, September 2016. Accessed April 28, 2025. https://www.swift.com/sites/default/files/documents/swift_news_mi_cips_accelerates_internationalisation_rmb.pdf.
7. Cohen, Benjamin J. “The Future of Global Currency: The Euro Versus the Dollar.” *Choice Reviews Online* 49, no. 02 (October 1, 2011): 49–0979. https://doi.org/10.5860/choice.49-0979.
8. Consulate General of the People's Republic of China in New York. “Hu Jintao’s Speech at the G8 Summit.” Consulate General of the People's Republic of China in New York, 17

July 2006, https://newyork.china-consulate.gov.cn/eng/xw/200607/t20060717_4685499.htm

9. IMF. “Currency & Power,” August 16, 2016. https://www.imf.org/en/Blogs/Articles/2016/08/16/currency-power.
10. “Data Explorer,” n.d. https://data.imf.org/en/Data-Explorer?datasetUrn=IMF.STA:COFER(7.0.0).
11. DiPippo, Gerard, and Andrea Leonard Palazzi. “It’s All about Networking: The Limits of Renminbi Internationalization.” *CSIS*, October 28, 2024. https://www.csis.org/analysis/its-all-about-networking-limits-renminbi-internationalization.
12. Eichengreen, Barry. “Sanctions, SWIFT, and China’s Cross-Border Interbank Payments System,” September 25, 2024. https://www.csis.org/analysis/sanctions-swift-and-chinas-cross-border-interbank-payments-system.
13. Eichengreen, Barry, and Masahiro Kawai. “ADBI Working Paper Series.” *Asian Development Bank Institute*. Asian Development Bank Institute, January 2014. Accessed April 28, 2025. https://www.adb.org/sites/default/files/publication/156309/adbi-wp454.pdf.
14. Ember. “China | Energy Trends | Ember,” April 9, 2025. https://ember-energy.org/countries-and-regions/china/.
15. “The European Union-Russia Energy Divorce: State of Play,” Bruegel | the Brussels-based Economic Think Tank, April 24, 2025, https://www.bruegel.org/analysis/european-union-russia-energy-divorce-state-play

16. Fang, Qiang, and Xiaobing Li, eds. China under Xi Jinping: A New Assessment. Leiden University Press, 2024. http://www.jstor.org/stable/jj.15136086.
17. IEA. “Executive summary – Solar PV Global Supply Chains – Analysis - IEA,” n.d. https://www.iea.org/reports/solar-pv-global-supply-chains/executive-summary.
18. “Expanding Local Currency Transactions in ASEAN+3 Cross-Border Payments.” *AMRO - Policy Position Paper (PPP/23-02)*, December 2023. Accessed April 28, 2025. https://amro-asia.org/wp-content/uploads/2024/06/AMRO-Policy-Position-Paper_Expanding-LCT-in-ASEAN3-Cross-Border-Payments-v2_Dec-2023.pdf.
19. ClientEarth. “Fossil Fuels and Climate Change: The Facts,” April 3, 2025. https://www.clientearth.org/latest/news/fossil-fuels-and-climate-change-the-facts/.
20. “Home - GACC,” n.d. http://english.customs.gov.cn/.
21. Yale E360. “How China Became the World’s Leader on Renewable Energy,” n.d. https://e360.yale.edu/features/china-renewable-energy.
22. Howell, Thomas, William Noellert, Gregory Hume, and Alan Wolff. “China’s Promotion of the Renewable Electric Power Equipment Industry: Hydro, Wind, Solar, Biomass.” Dewey & LeBoeuf LLP, March 2010. Accessed April 28, 2025. https://www.nftc.org/archive/Press%20Release/2010/China%20Renewable%20Energy.pdf.
23. “IMF -- International Monetary Annual Report 2016,” September 26, 2016. https://www.imf.org/external/pubs/ft/ar/2016/eng/sdr.htm.
24. “Introduction,” n.d. https://www.cips.com.cn/en/about_us/about_cips/introduction/index.html.

25. Oomes, Nienke. “Network Externalities and Dollarization Hysteresis: The Case of Russia.” *IMF*. IMF, May 2003. Accessed April 28, 2025. https://www.imf.org/external/pubs/ft/wp/2003/wp0396.pdf.
26. “RMB Internationalization Reports,” n.d. http://www.pbc.gov.cn/en/3688241/3688636/3828468/index.html.
27. Rrustemi, Arlinda, Rob de Wijk, Connor Dunlop, Jovana Perovska, Lirije Palushi, Willem Oosterveld, Matthew Phillips, et al. “Russia.” Geopolitical Influences of External Powers in the Western Balkans. Hague Centre for Strategic Studies, 2019. http://www.jstor.org/stable/resrep19582.14.
28. Swift. “RMB Tracker document centre | Swift,” n.d. https://www.swift.com/products/renminbi-tracker/document-centre.
29. Schrag, Jacque. “Is China the World’s Top Trader? | ChinaPower Project.” ChinaPower Project, August 25, 2020. https://chinapower.csis.org/trade-partner/.
30. ———. “Is China the World’s Top Trader? | ChinaPower Project.” ChinaPower Project, August 25, 2020. https://chinapower.csis.org/trade-partner/.
31. Sjs. “The Future of the Chinese Yuan | GJIA.” Georgetown Journal of International Affairs, April 21, 2024. https://gjia.georgetown.edu/2024/04/18/de-dollarization-the-belt-and-road-initiative-and-the-future-of-the-chinese-yuan/.
32. Swift. “Swift offers secure financial messaging services to CIPS | Swift,” March 25, 2016. https://www.swift.com/news-events/press-releases/swift-offers-secure-financial-messaging-services-cips.

33. Bruegel | the Brussels-based Economic Think Tank. “The European Union-Russia Energy Divorce: State of Play,” April 24, 2025. https://www.bruegel.org/analysis/european-union-russia-energy-divorce-state-play.
34. Asset Management. “The RMB Bloc and Global Currency Markets,” November 1, 2022. https://www.ubs.com/hk/en/assetmanagement/insights/thematic-viewpoints/apac-and-emerging/articles/rmb-bloc.html.
35. Valetkevitch, Caroline. “US bond yields rise, dollar down as turbulent week comes to an end.” *Reuters*, April 11, 2025. https://www.reuters.com/markets/global-markets-wrapup-1pix-2025-04-11/.
36. Von Beschwitz, Bastian. “Internationalization of the Chinese Renminbi: Progress and Outlook,” August 30, 2024. https://www.federalreserve.gov/econres/notes/feds-notes/internationalization-of-the-chinese-renminbi-progress-and-outlook-20240830.html.
37. Xu, Hongcai. *Global implications of the InclusionoftheRMB into the SDR*. *China Center for International Economic Exchanges*. China Center for International Economic Exchanges, 2016. https://www.cciee.org.cn/UserFile/20151216435.pdf.
38. Yergin, Daniel. *The Prize : The Epic Quest for Oil, Money & Power*. *Free Press eBooks*, 2008. http://ci.nii.ac.jp/ncid/BA89882821.
39. “中华人民共和国国民经济和社会发展第十四个五年规划和2035年远景目标纲要_滚动新闻_中国政府网,” n.d. https://perma.cc/73AK-BUW2.
40. 杨宇. “China’s Securities Regulator OKs Registration of Polysilicon Futures, Options,” n.d.

https://english.www.gov.cn/news/202412/13/content_WS675c3849c6d0868f4e8edf01.html.

41. 王晶晶. “Xi Stresses High-quality Development of New Energy, Greater Contributions to Building Clean, Beautiful World,” n.d. https://english.www.gov.cn/news/202403/02/content_WS65e14600c6d0868f4e8e47ec.html.