
An Innovative Approach for Dam-based Currency Exchange Rate Reform

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Abstract

Recent discourse on the Renminbi (RMB) exchange rate regime has largely centered on the magnitude and desirability of RMB appreciation. However, a growing body of scholarship has begun to shift attention toward more fundamental questions concerning the underlying currency regime. In this context, this research paper advocates for a reform-oriented approach with the structural composition of reserve “Dam” assets, emphasizing adjustments to the reserve structure as a critical component of exchange rate policy. The stability of the RMB exchange rate is underpinned by several key macroeconomic factors, including substantial foreign exchange reserves, persistent current account surpluses, sustained economic growth, and prevailing market expectations. To critically assess the structural challenges of China’s currency system, it is essential to first deconstruct its foundational elements. Specifically, this study examines: (1) the determinants of the spot exchange rate, (2) the composition and allocation of China’s foreign exchange reserves, and (3) the operational dynamics of the contemporary international monetary system. A central analytical question concerns the nature and composition of foreign exchange reserves what they represent in both accounting and functional terms, and how their structure influences exchange rate stability and policy autonomy. This research paper provides a detailed discussion of these issues. Furthermore, this study advances a policy proposal grounded in the concept of a “Dam-Based Currency Exchange Reserve” framework, aligning it with a broader reform of the exchange rate mechanism. This innovative approach seeks to enhance systemic resilience, improve reserve allocation efficiency, and contribute to a more stable and sustainable currency regime.

Keywords: Exchange Rate Reform, Dam-Based Currency, Dam-Based Currency Exchange Rate Reform, Dam-Based Currency Exchange Reserves.

Introduction:

The reform of China's currency exchange rate system marks a major shift in its monetary policy. Our new approach aims to introduce greater flexibility and market influence into the exchange rate mechanism. By making the currency's value more responsive to market forces, China aims to improve its economic stability and global competitiveness. The reform involves moving away from a fixed or tightly controlled exchange rate to a more flexible system that can better absorb external shocks and support economic growth. Additionally, this change is part of China's broader efforts to internationalize its currency and integrate more fully into the global financial system. The move also seeks to improve transparency and reduce speculative pressures on the yuan. Overall, this reform demonstrates China's commitment to modernization and increased openness in its economic policies. Our proposed suggestion is expected to have lasting effects on both domestic and international markets, fostering a more resilient and efficient financial environment by implementing the Big Dam infrastructure as part of currency reserves to build up public confidence.

Foreign exchange reserves constitute a nation's officially recognized holdings of foreign currencies. These reserves encompass foreign currency deposits, sovereign securities, and government bonds, representing various forms of international financial assets. Foreign exchange deposits primarily originate from three principal sources. The first source is foreign direct investment and indirect investment, including allocations in highly liquid assets such as equities, fixed income securities, and domestic currencies, as well as assets like infrastructure, machinery, factories, and real estate (in less liquid form). The second source derives from the trade balance surplus, specifically when exports exceed imports, denoted as X-M (exports minus imports). The third source is predominantly generated from interest income accrued on these foreign asset holdings.

Literature Review

Research [1][2][3][4] on exchange rate reform highlights a shift from fixed or purely market-determined regimes toward hybrid approaches that better manage volatility and structural imbalances. Studies [5][6][7] on real exchange rate policy emphasize the importance of maintaining a stable but competitive rate to foster diversification, export growth, and resilience to external shocks [7][9]. Recent work [8][10] links exchange rate management with broader macro-prudential and development goals, arguing that rules-based frameworks can mitigate boom–bust capital flows and reduce crisis risk. Within this literature, proposals by C.P. Lie (2025) for infrastructure-linked [11] project-based risk-sharing mechanisms show how specific asset classes (such as large dams) can be used to intermediate foreign exchange risk between global investors, governments, and users. These mechanisms typically combine long-term local-currency revenue streams, contingent guarantees, and indexed tariffs to smooth the impact of exchange rate swings on balance sheets. Building on this strand, our innovative “dam-based” exchange rate reform can be seen as extending such project-level hedging into a systematic architecture that ties currency management to real, productive assets.

Discussion:

The discussion initially centered on the characteristics and functions of foreign exchange reserves. The subsequent section elaborates on the mechanisms driving currency, specifically how these movements impact a nation's exchange rate dynamics. Following an analysis of the processes involved in the accumulation of foreign exchange reserves, this research paper will then examine the underlying determinants of reserve fluctuations and propose an innovative Dam-Based Currency Exchange Rate Reform.

Since the causes of exchange rate volatility are multifaceted and intricate, yet they fundamentally hinge on informational factors: market participants' expectations, the country's overall macroeconomic fundamentals, and the monetary and fiscal policy signals conveyed by the central bank. These variables collectively influence capital flows, thereby contributing to fluctuations in exchange rates, as well as, currency reserves.

This research paper advocates establishing an effective monetary credibility system so that developing countries, such as China, do not need to rely heavily on the monetary reserve systems of developed nations, primarily based on the US dollar and the euro. Instead, they can leverage their own significant national assets, such as natural resources, airports, bridges, and dams, by simply securitizing these assets. This would enable them to adjust their reserve ratios, reduce dependence on the US dollar and the euro, and strengthen the international credibility of their currencies.

Many economists believe that developing countries can more easily build market credibility for their currencies by simply opening their own money and capital markets. However, historical development often leads to the opposite conclusion. For example, after the Asian financial turmoil, many Asian countries and regions, such as Indonesia, over-opened their capital markets and excessively expanded the flow of hot money without effective controls. This caused hedge funds to impact the local markets, and Asian countries suffered greatly. Following the financial turmoil, Malaysia adopted foreign exchange controls, while the Asian market took a reverse approach to deal with its aftermath. It shows that relying solely on open market operations and opening up the financial and monetary systems is not an effective way to build credibility, nor is it a good way to solve internal problems.

This is because, based on past experience, when developing countries are not yet advanced in both economic development and institutional reform, they often need to gather large amounts of foreign exchange reserves from powerful countries, namely developed nations, as a strong backing and method for maintaining free convertibility in the international currency market. Furthermore, reports published by the World Bank [9] indicate that many developing countries have accumulated substantial dollar and euro reserves. These amounts far exceed the needs for actual international trade settlements and transactions. Simply put, if a country's foreign reserves are meant for transactions and settlements, then why do they need such large reserves as backing for their currency or country? In short, it is because of the need to establish a currency's credibility, by holding the currency of a powerful country to build trust and borrowing power.

It can be said that developing countries rely on their currency reserves and the reputation of other nations to support their own currencies. However, if this economic development model is followed, the outcome will be similar to Japan's. The previous monetary system, marked by a weak dollar, suffers from a lack of currency credibility. Although Japan's economy was the second-largest worldwide by nominal GDP before, its international credibility and investor confidence lagged behind that of the British pound, the euro from Germany and France, and the U.S. dollar. This difference in currency trustworthiness stems from factors like Japan's fiscal policy, monetary stability, and geopolitical issues that affect investor trust and currency valuation.

However, Japan's past and current reserve requirements have been disproportionate to its economic strength. This is because Japan's economic growth has depended on an export-focused monetary system pegged to the US dollar, which has prevented it from establishing its own monetary identity or characteristics. For example, Australian and New Zealand dollars are regarded as resource currencies, while the Canadian dollar is a commodity currency. Therefore, it is essential to build the intrinsic value and credibility of one's own currency, and this cannot be achieved simply by holding reserves of a powerful nation's currency.

The practical question is whether the current international monetary development model, in which developing countries consistently export to build large foreign exchange reserves, primarily in the US dollar and the euro for powerful nations, is sustainable. These powerful nations, however, often find themselves spending more than they earn, yet they can print vast amounts of money (at no cost) to buy large quantities of daily necessities and manufactured goods, such as clothing, toys, and electronic devices. Therefore, is it worthwhile for developing countries to sacrifice their labor and resources in a desperate effort to accumulate substantial foreign exchange reserves? Consequently, discussing and examining China's future currency development model requires first understanding the current global monetary system, which is dominated by the US dollar.

The current state of the US dollar's position as a comparative currency indicates:

Because of its widespread acceptance in the global market, the US dollar has become the primary benchmark currency in the foreign exchange market. From the perspective of international reserve research and exchange rate theory policy, we cannot overlook the roles of the PPP theory and the J-curve. The PPP theory is also the mainstream concept in cash exchange rate theory. Research on international reserves, including exchange rate management strategies like floating, free float, and fixed exchange rates, aims to ensure that reserves serve mainly for international settlement and monetary (social) stability, while balancing exchange rates and trade surpluses or deficits. Compared to wealthy nations, developing countries like South Korea prefer to hold wealth in cash reserves rather than in natural resources.

Based on the current development models of China and other developing countries, such as Indonesia and Russia, some economists have argued that excessive foreign exchange reserves are unnecessary. They contend that reserves are not required in large amounts; enough reserves for international trade settlements suffice. This view is supported by a series of arguments raised at the 7th G20 Finance Ministers and Central Bank Governors Meeting in 2006. A joint statement issued after the meeting by the G20 identified four major threats to stable global economic growth:

- 1) Global energy issues, like high oil prices, have driven up global production costs.
- 2) The rise of trade protectionism across different countries
- 3) Free trade imbalances and trade distortions
- 4) China's monetary and exchange rate policies are in focus. The US Treasury Secretary and Central Bank Governor urged China to accelerate the reform of the RMB exchange rate and to establish a Chicago-style futures market as soon as possible. These issues are currently drawing the most attention in the market.

As China's foreign exchange reserves continue to grow and its trade surpluses with the United States and other countries reach record highs, it is important to understand the reasons behind the calls for changes to China's exchange rate and trade policies. Analyzing China's regulated and managed foreign exchange strategies, especially its basket currency policy, explains why it hasn't quickly liberalized its foreign exchange market. The main reason is that China wants to avoid creating an external channel that could influence the RMB and the domestic financial system, and to prevent excessive speculation by investors. In fact, the Chinese government is clearly concerned about the rapid increase in its foreign exchange reserves.

The large accumulation of international capital in China may not necessarily be beneficial. The problem is that these rapidly and heavily accumulated funds lack effective outlets. As a result, funds flow turbulently in certain areas of the country, similar to how an unstable air pressure moves through a person's body. While China is desperately trying to acquire foreign exchange from other countries worldwide, it also lacks efficient channels for investors from various nations to earn RMB, causing the trade balance imbalance to persist.

In fact, the four force currency theory [4] offers practical solutions to address trade tensions between countries and the RMB exchange rate issue, helping the global economy maintain steady growth. All nations have their own interests and conflicts, but they are not intimidated by China's rise and power. Instead, they aim to balance their interests. How can it be used to maximize their benefits? China, as the new global manufacturing hub, has gradually overtaken Japan's position as the world's factory. It is in China's best interest to become a shared solution to high unemployment and slow economic growth across nations. This situation resembles when the G7 jointly pressured the yen to appreciate after the 1986 Italian meeting. The Japanese government eventually agreed and signed the Plaza Accord, causing the yen to rise sharply from 250 to 1 US dollar to 85 to 1 US dollar in 1996. Japan's exports weakened, and high production costs contributed to a two-decade economic recession.

The Japanese government hoped that a significant rise in the yen's value would encourage many Japanese companies to invest in the United States, such as by establishing factories and acquiring local real estate projects. For example, several Japanese companies in New York happened to be owned by the same entity. This was part of the Japanese government's strategy to balance its interests, increase its previously accumulated profits through yen appreciation, and help the yen go global. Moreover, a large inflow of speculative capital into Japan created numerous asset and financial bubbles, indirectly leading to a bubble economy. When these bubbles burst and people's assets shrank, it became clear that the bubble economy caused by the high value of yen was the fatal blow to Japan's economic recession.

China is currently facing a dilemma: first, it doesn't want to follow Japan's example; second, it appears helpless in balancing the interests of different countries; and third, it is somewhat concerned about the rapid growth of its foreign exchange reserves. An excessively fast increase in reserves, without proper channels to manage capital flows, can harm the domestic economy. A large build-up of speculative capital in China could easily trigger a bubble economy and overly rapid economic growth. However, if domestic growth slows too much, unemployment could rise significantly, threatening social stability. So, what should China do?

Suggestion:

In recent years, the accelerated privatization and marketization of state-owned enterprises have led to massive layoffs and unemployment, causing significant potential losses and waste in the labor market. We cannot follow Japan's example and make major adjustments to the RMB, nor can we allow large amounts of speculative capital to flood into the domestic economy, which could trigger an economic bubble. The solution is to establish China's own energy-specific asset notes, similar to World Bank infrastructure bonds. Since the market for treasury bonds and yields is not yet mature, foreign capital can be raised through global energy asset notes based on projects like the Yangtze River Dam improvement and the Yellow River Dam construction. This approach allows for quick offsetting of excess foreign exchange reserves, preventing surplus funds from remaining unused or being diverted into speculation.

After completing this dam, it will provide a stable hydropower supply and income, aiding developing countries, especially China, in expanding renewable energy while reducing their reliance on international crude oil. The steady income from hydropower functions as the return rate on these bonds, which have interest rates similar to those of bonds. Additionally, the eventual listing of the Yangtze Three Gorges and Yellow River dam power assets will resemble convertible bonds, encouraging more international investor interest. Our proposal effectively addresses two issues at once. Furthermore, this research paper suggests that by opening their own monetary and capital markets, developing countries can more practically improve and reform these markets through market mechanisms, thereby building credibility for their currencies.

Since, establishing strategic oil reserves now would be like adding fuel to the fire by pursuing high oil prices; exploring and extracting new oil now would take at least 10 years, roughly the same as the construction time. So, our Dam-based proposal advantages are: 1) Listing large amounts of electricity globally would help balance the interests of various countries in China and attract international capital, creating a win-win situation by increasing employment and economic development in China while benefiting them; 2) Investing Dam Infrastructure in large-scale construction would prevent economic growth from becoming a bubble and effectively absorb the surplus labor force of laid-off workers, allowing surplus capital and laid-off workers to be offset simultaneously, thereby increasing social stability. 3) Compared to issuing treasury bonds, energy construction bonds can serve as a test for large-scale issuance of state-owned bonds in China. Although China does issue state-owned bonds, the market is still immature, heavily speculative, and lacks clear funding pathways. In fact, solving China's energy crisis also helps address the world's energy issues. The global market mainly worries about China's and India's increasing dependence on oil due to rapid industrialization, which has driven up energy

prices. Therefore, if China effectively expands hydropower in the near future to cut oil demand, it could break the irrational expectations of international oil prices held by speculators, allowing energy prices to stabilize at reasonable levels. This approach is much better than boosting global energy purchases to build oil reserves now. It would also help solve China's longstanding flooding problems and balance international interests. This is a win-win strategy that effectively tackles China's six major current challenges.

1) Addressing high oil prices. 2) China's dam construction and the introduction of new machinery from Europe and the US to reduce trade imbalances. 3) Attracting international capital to balance interests. 4) Offsetting China's rapid reserve growth and decreasing international reactions to exchange rate policies. 5) Boosting employment. 6) Reducing flooding to support agricultural development. Just as Yu the Great once managed floods in ancient times to bring peace, today's water resources in China may positively impact the world.

Furthermore, proposing to use renewable energy bonds or contracts as a way to offset the growth of foreign exchange reserves is a practical approach to long-term currency exchange rate reform in China. The current reserve portfolio is often composed of foreign currencies and bonds, and rarely includes real infrastructure. As the paper analyzes, foreign reserves are based on foreign stocks, bonds, and currencies. It is to use foreign symbols such as the US dollar as a noticeable for supporting local currency. For example, a country's well-known brand name is used to support its currency. The main goal is to build confidence among outsiders and within the country in the currency system. This research paper believes that a reserve portfolio centered on substantial Dam-based infrastructure can strengthen citizens' confidence & help establish a strong currency brand.

It is more cost-effective than constantly buying foreign exchange reserves like U.S. dollars because real infrastructure can create jobs and boost social welfare. All that is needed is to convert some of the national reserves, such as turning 20% into infrastructure projects like hydropower, after which the government can issue dam energy bonds and securities bill. Given that China's foreign reserves are over 3 trillion U.S. dollars, this approach is affordable. For instance, investing US\$200 billion, or 1.6 trillion yuan, in building a hydroelectric power station on the Yellow River dam could generate numerous jobs and supply one-tenth of China's energy, which can be met with renewable hydropower energy. The above is the dam reserve portfolio proposed by this article as a new method for RMB internationalization.

In fact, the main purpose of establishing the monetary system is to facilitate transactions, reduce transaction costs, and serve as a strong medium of exchange. From the collapse of the gold standard in the past to the free-floating exchange rate system used by most countries today, each has its own advantages and disadvantages. The primary reason for its fundamental failure is not that it was poorly designed, but that the system itself had a serious flaw, namely, that the ability to produce gold and the limited amount of gold could not support the demand for unlimited economic growth. And, more importantly, Triffin's problem.

While the economy and currency can theoretically grow without limit, the production of gold and Earth's gold reserves capacity are finite. When multiple countries achieve 10% economic growth, their gold production and reserves won't increase proportionally, leading to a natural rise

in gold prices. If a country or a group of countries consistently uses gold as a reserve currency and doesn't see its currency appreciate, they will eventually need to physically acquire gold to sterilize the currency. Conversely, if a country must appreciate its currency and reduce gold redemptions, its exports are likely to fall, since currency appreciation typically causes exports to decrease.

Some people may ask why not turn the Golden Gate Bridge into a famous landmark with U.S. dollar, currency interest and make it the main asset of the U.S. dollar? The main reason is that the United States has established widespread credibility. During the gold-standard era and under the Bretton Woods System, the U.S. dollar's parity with gold was intended to bolster the dollar's credibility. But now, the U.S. dollar has gained significant internationally recognized credibility. Even now, some people call the U.S. dollar the most beautiful gold, so whether gold is used as a reserve seems not to matter.

In Conclusion:

Currency plays a crucial role in the economic system. Each country should determine the strength or stability of its currency to manage its external financial situation effectively. The reform of the exchange rate formation mechanism is closely linked to broader economic reforms across various sectors. This research paper proposes that currency exchange rate reform should focus on establishing an energy-based reserve, modeled after a dam, and on creating a natural resources-based currency reserve portfolio to build the currency's credibility (brand). It also emphasizes reducing reliance on external foreign exchange reserves like US dollars and Euros. These Dam-based-Reserved securities could feature well-known landmarks, such as the Three Heroes Water Dam, hydropower facilities, or the Yellow River dam, which is proposed here. The Yellow River dam, based on reusable water energy, aims to generate jobs and utilize reserves more effectively, in-turn investing within these Dam-based facilities will certainly generate further investment return, and the security issue in the dam-based facilities will certainly becoming a part of the country's reserves, fostering a diversified reserve portfolio and enhancing currency credibility. Ultimately, this paper advocates developing countries should build up their own country infrastructure-based currency reserves and improve their monetary capital markets. Improving and reforming these markets through infrastructure-based currency-reserve market mechanisms is a feasible way to boost confidence in their currencies. It is hoped this research paper will contribute to society and the mankind.

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