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# Is the Rupee on the cusp of being accepted as a reserve currency?

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## Introduction

Central banks hold reserve currencies[1] for a variety of reasons, and the choice of which to hold can be based on a several factors. Historically, gold, pound sterling and the dollar were all accepted as satisfactory forex reserve instruments at various points in time for most central banks. In recent years, many central banks have expanded the list of currencies held in their reserves reflecting diversification in trade and a greater internationalisation of the financial system. The list of common forex reserve currencies now includes not only the SDR constituents but also Swiss franc, Korean won, and the Australian and Canadian dollars.

Many central banks are now more cautious or are rethinking their currency allocations based on the additional objective of geopolitical risk avoidance. There has been much discussion around the displacement or replacement of the dollar with a variety of other options. This paper is not about that discussion, but aimed to show that, by almost all metrics, the Indian rupee should be considered a strong candidate to be included as an additional currency and government bond portfolio within most central bank reserve allocations.

There is increased urgency in this discussion. Since 2022, the Reserve Bank of India has allowed the invoicing of trade in rupees and has implemented a facility for trading partners and central banks to hold an onshore vostro account that allows the proceeds to be invested in Indian government bonds. The inclusion of Indian bonds in popular emerging market bond indices in 2024 is also acting as a catalyst and prompts our closer look at the fundamentals of the currency to examine whether it satisfies some of the basic criteria for inclusion in a reserve portfolio. The following sections look at the rupee from a variety of perspectives to assess the qualities of the rupee as compared with some more commonly held currencies.

### Criteria for status as a reserve currency

Many central bank reserve currency allocations are determined by the mix of trading partners. Ito and McCaulay (2008 and 2019) showed countries with more US trade had a higher USD allocation, and trade with EUR economies correlated with a higher EUR allocation. A common target level of reserves is a function of either import cover or short-term external indebtedness. In both cases, the currency of trade or of the liabilities is in part a determinant of the mix.

There are several necessary and preferred conditions for a currency to be considered a reserve currency:

1. The use of a currency for invoicing
2. The presence of considerable imports from the candidate reserve currency country into the reserve-holding country
3. A store of value for the reserve holding country being reflected in a relatively low volatility of the exchange-rate with the candidate reserve currency
4. External indebtedness in the currency of the reserve candidate currency
5. Size of reserves held by the central bank relative to trade levels
6. Investment qualities that satisfy the objectives of the reserve currency, namely safety, liquidity and a reasonable rate of return

[1]There are at least three concepts concerning ‘reserve currencies’ that are often used interchangeably, but are worth clarifying at the outset. The first is the concept of the internationalisation of a currency. The second is the notion of a reserve currency and the third is the possibly of a currency being suitable to be held in some portion in a reserve portfolio.

The ongoing internationalisation of the Chinese renminbi is a case in point showing large current account balances can be sufficient to establish a currency as a reserve currency. The classic paradigm of the sterling and dollar in the past where deep liberal capital markets convinced the global community to use these currencies as reserve currencies. We must not forget that it took a prolonged period of being fixed to gold deposits before the world accepted the fiat face value of dollars as a store of value. As Eichengreen (2022) points out, a currency such as the RMB, where there is lack of simple convertibility, can still function as a reserve currency provided there is a backing of dollars; much as the US dollar was backed up by gold during the Bretton-woods system. India's substantial dollar forex reserves make it a good candidate in this respect.

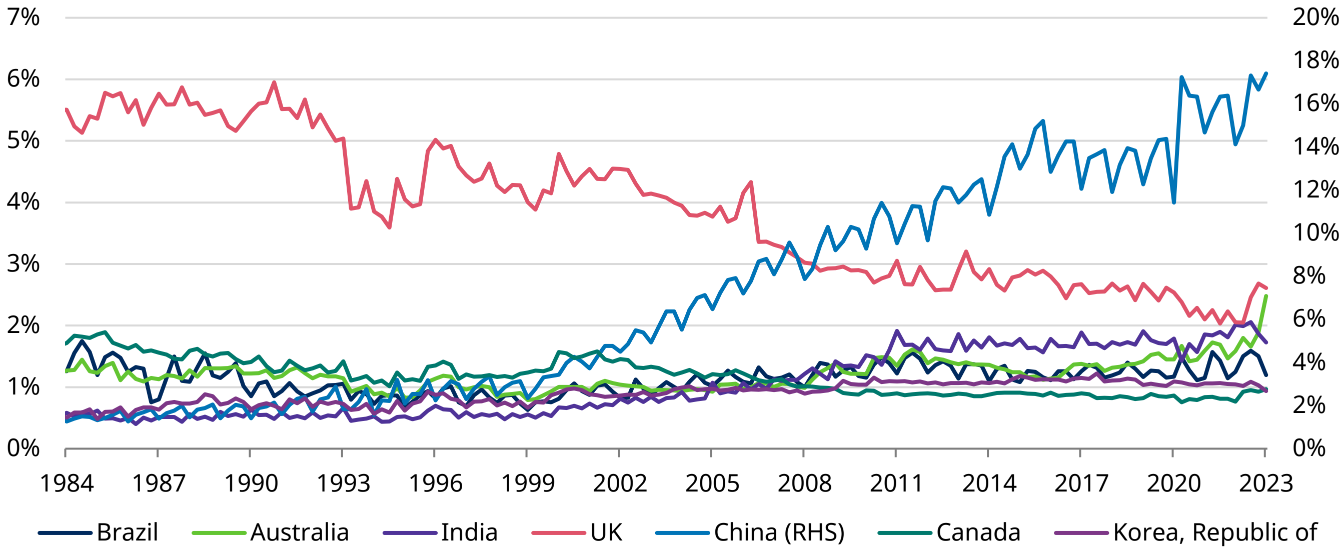
We will look at the rupee through several lenses commonly used to consider a currency and its role in a reserve portfolio:

1. Trade and worldwide imports from India
2. Currency turnover
3. Currency volatility and size of reserves
4. Correlation of the rupee compared to other reserve asset currencies
5. The return characteristics of INR government bonds
6. Suitability of the currency in a minimum variance portfolio

### Trade and worldwide imports from India

One of the primary motivations for holding reserves is to cover demands from trade and particularly imports. Ito and McCauley (2019) show that the currency allocation of reserves roughly reflects the degree to which the reserve holding country imports from the reserve currency issuing country. China is the well-known case in point constituting roughly 18% of global imports while only representing roughly 2% of global FX reserves. The currency of invoicing and settling of that trade is important. Eichengreen et al (2022) shows that the amount of trade invoiced in CNY and the global reserve allocations to CNY are roughly consistent with USD and EUR allocations. Perhaps more importantly, other currencies which are commonly held in reserve portfolios, namely AUD, CAD, KRW and GBP are at similar percentages of global imports compared to India. While a large portion of the India trade is invoiced in currencies other than INR, the 2022 policy change by the RBI, to allow invoicing and settlement in INR and vostro facilities for using those proceeds for either trade or purchasing government bonds, means that the possibility of investing proceeds of trade into INR government bonds is now an option. We discuss the issue of currency trade and facilities in the last section.

**Chart 1: Global imports from listed country**

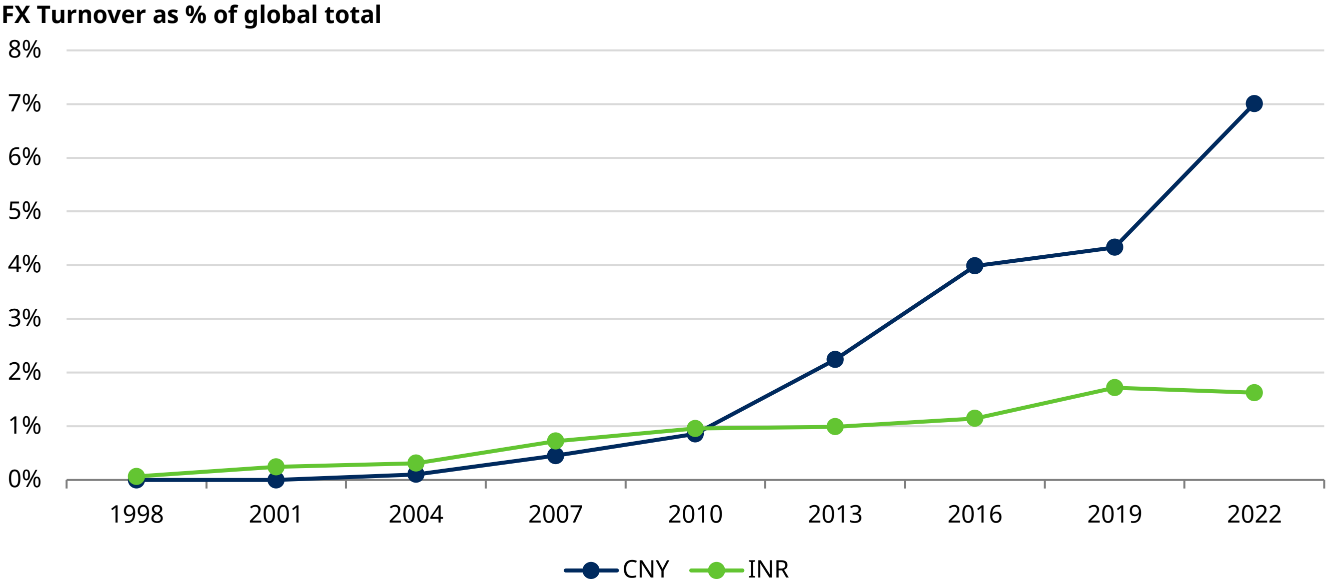



Source: International Monetary Fund, data as at 31 March 2023. Note all country data except China are with respect to the left hand scale.

## Currency turnover

The traditional measure of suitability is the depth of the forex market for a reserve currency. For this information, we turn to the BIS's triennial forex survey for comprehensive data on turnover. While the most recent survey was conducted in the midst of the Covid pandemic, the latest numbers are nevertheless encouraging. Rupee turnover in 2022 was just below 2%, which is a level consistent with where CNY was when reserve managers began to seriously consider whether or not to hold CNY assets as part of their reserve portfolio.

**Chart 2: INR forex turnover in the spot markets: 1998–2022**

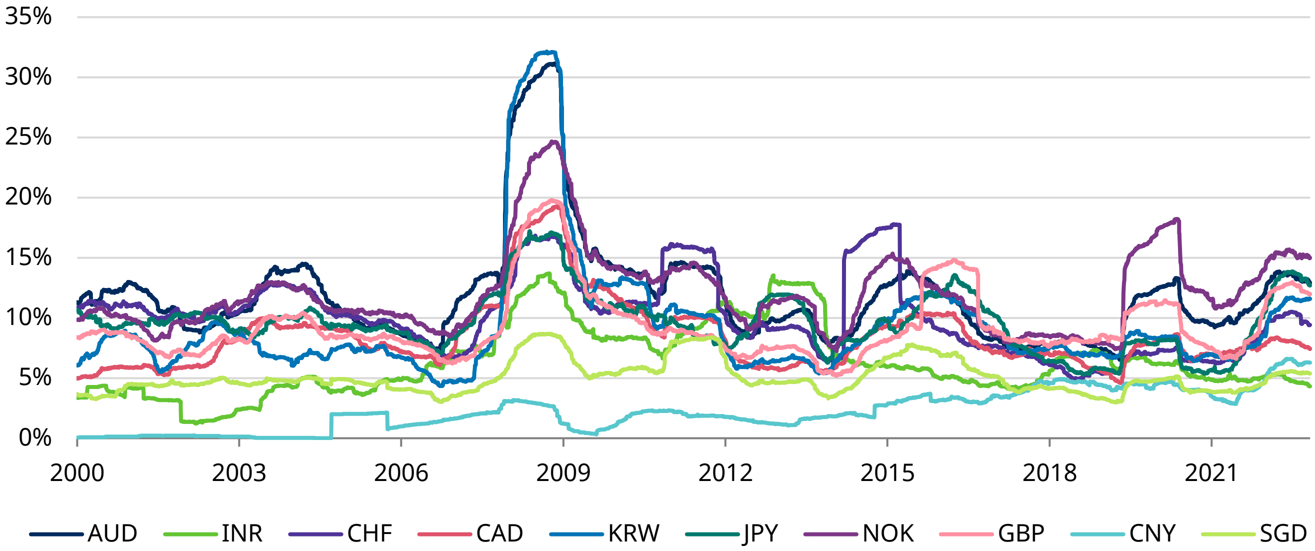



Source: Bank for International Settlements, Triennial Foreign Exchange Survey, 2022.

## Currency volatility and size of reserves

While deep, liquid, open capital markets are good criteria for reserve currencies, Eichengreen (2022) points out that for an economy such as China, without full convertibility, the establishment of a large reserve portfolio to lend stability to the currency is a critical factor. As of September 2023, China's forex reserves totalled USD 3,160 billion against a GDP size of USD17.73 trillion or 17.8%. In the case of India, which has reserves of USD 599 billion and GDP of USD3.74 trillion, the ratio is only slightly lower at 16%. The result of these large reserve holdings can be a dampening of currency volatility. The most extreme version of this would be in the case of a currency peg where there is a very large dollar holding relative to the domestic currency monetary base. Chart 3 shows, based on historical volatilities, both the RMB and rupee fit the pattern with consistently among the lowest volatilities of a sampling of typical currencies held in reserve baskets.

## Chart 3: Annualised 260-day volatility of USD exchange rate % daily returns



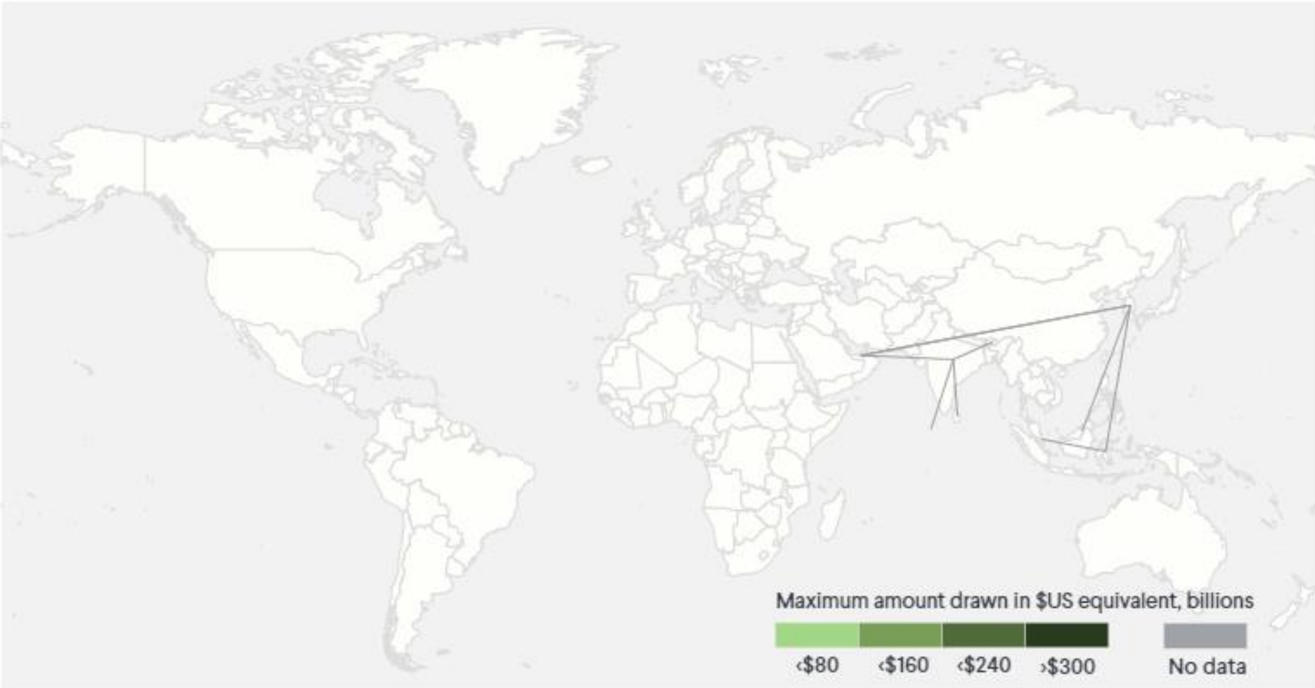

Source: Data from Federal Reserve H.10 release. Exchange rates are noon buying rates in New York. GBP and AUD are adjusted to show as the same unit of measure as the others, namely number of units of foreign currency per USD. Data from August 2000 to September 2023. Author's calculations.

It should be noted again that there is not full and open convertibility with the rupee, much like with CNY. China has supplemented the lack of fully open forex markets with two key facilities. The first is to do with offshore clearing facilities, namely the CNH or offshore renminbi markets particularly in Hong Kong Special Administrative Region, which allows some degree of liquidity for holders of CNY. The other pillar is from the establishment of bilateral central bank swap lines across most large trading partners to facilitate trade and banking-related issues in CNY. Exhibit 1 shows a visualisation of these established links. India is now beginning to follow suit although there are many fewer swap lines at the moment. Exhibit 2 shows some of the swap lines established by the RBI, which are primarily limited to the larger nearby trading partners.

## Exhibit 1: China Central Bank Swap Lines in place as of 2020


Source: Central Bank Currency Swaps Tracker, Council on Foreign Relations.

**Exhibit 2: Emerging Market Swap lines including India**




Source: Central Bank Currency Swaps Tracker, Council on Foreign Relations.

## Part II: The investment merits of holding INR as a reserve asset

### Correlation of rupee compared to other reserve asset currencies

While volatilities are important for forming expectations concerning a store of value, it also has some merits from a purely investment perspective. In this vein, correlations also play an important role since lower correlations should make currencies somewhat more attractive as part of a basket or reserve currencies. Using our exchange-rate data set from 2000–2023, and detailed in Table 1, we can see that the rupee has one of the lowest pairwise correlation averages of all the candidates. While low correlation is not sufficient merit to invest, as we shall see in the next section, a reasonably high Sharpe ratio paired with a low correlation results in an excellent candidate from an investment perspective alone.

**Table 1: Correlations of percentage change in spot exchange rate versus USD**

| | AUD | INR | CHF | CAD | KRW | JPY | NOK | GBP | CNY | SGD |
|---|---|---|---|---|---|---|---|---|---|---|
| **AUD** | 1.00 | 0.33 | 0.40 | 0.64 | 0.39 | 0.10 | 0.61 | 0.54 | 0.22 | 0.62 |
| **INR** | 0.33 | 1.00 | 0.16 | 0.28 | 0.31 | -0.00 | 0.29 | 0.24 | 0.17 | 0.38 |
| **CHF** | 0.40 | 0.16 | 1.00 | 0.34 | 0.16 | 0.40 | 0.60 | 0.50 | 0.14 | 0.47 |
| **CAD** | 0.64 | 0.28 | 0.34 | 1.00 | 0.32 | 0.05 | 0.55 | 0.46 | 0.17 | 0.52 |
| **KRW** | 0.39 | 0.31 | 0.16 | 0.32 | 1.00 | 0.05 | 0.30 | 0.27 | 0.21 | 0.49 |
| **JPY** | 0.10 | -0.00 | 0.40 | 0.05 | 0.05 | 1.00 | 0.19 | 0.17 | 0.10 | 0.32 |
| **NOK** | 0.61 | 0.29 | 0.60 | 0.55 | 0.30 | 0.19 | 1.00 | 0.60 | 0.25 | 0.59 |
| **GBP** | 0.54 | 0.24 | 0.50 | 0.46 | 0.27 | 0.17 | 0.60 | 1.00 | 0.22 | 0.51 |
| **CNY** | 0.22 | 0.17 | 0.14 | 0.17 | 0.21 | 0.10 | 0.25 | 0.22 | 1.00 | 0.31 |
| **SGD** | 0.62 | 0.38 | 0.47 | 0.52 | 0.49 | 0.32 | 0.59 | 0.51 | 0.31 | 1.00 |
| **AVG** | **0.39** | **0.22** | **0.32** | **0.33** | **0.25** | **0.14** | **0.40** | **0.35** | **0.18** | **0.42** |

Source: Data from Federal Reserve H.10 release. Exchange rates are noon buying rates in New York. GBP and AUD are adjusted to show as the same unit of measure as the others, namely number of units of foreign currency per USD. Data from August 2000 to September 2023.

### The return characteristics of INR Government bonds

While we will make the case that holding rupee government bonds is rewarding from a return perspective, this is often only an afterthought for reserve managers since the primary objective for reserve managers is safety and liquidity. Nevertheless, given the reserve balances of many economies and the sterilization costs of holding those reserves, the potential of a higher-yielding asset that has economic justification is important. In short, the ICE Index representing Indian government bonds (G0IN) has returned a Sharpe ratio of USD returns of 0.43 in unhedged terms and 0.48 hedged since 2001. A comparable set of Sharpe ratios for other government bond indices for currencies that are considered reserve currencies can be seen in Table 2. With the exception of onshore China, the INR market has experienced the highest unhedged Sharpe ratio and among the highest of the hedged Sharpe ratios indicating that the volatility of the INR relative to other markets is slightly less compensated than other candidate reserve currency markets. Also, it could be argued that both the onshore and offshore Renminbi bond market Sharpe ratios should be only cautiously considered since it was very difficult to obtain those onshore returns during a significant portion of the sample period.

**Table 2: Sharpe Ratios for returns of local currency government bond markets 2001–2023**

| Market | Index | USD Unhedged Sharpe Ratio | USD Hedged Sharpe Ratio | Kurtosis |
|---|---|---|---|---|
| **KRW** | G0SK | 0.27 | 0.48 | 7.19 |
| **CAD** | G0C0 | 0.36 | 0.47 | 1.74 |
| **AUD** | G0T0 | 0.40 | 0.23 | 1.31 |
| **CNY** | G0CN | 0.70 | 0.75 | 0.75 |
| **GBP** | G0L0 | 0.18 | 0.24 | 2.12 |
| **CHF** | G0S0 | 0.40 | 0.53 | 1.84 |
| **USD** | G0Q0 | 0.38 | 0.38 | 0.89 |
| **EUR** | ECAS | 0.29 | 0.56 | 1.13 |
| **CNH** | CJHG | -0.02 | -0.47 | 0.88 |
| **INR** | G0IN | 0.43 | 0.48 | 2.44 |

Source: ICE Index Platform. Note Sharpe ratio is 1-month local currency full curve government bond market return less the return on a one-month US T-bill measured in USD either hedged or unhedged as indicated. Data from August 2001–August 2023. Note data for China markets is as of 2005.

The excess kurtosis numbers are important for gaining an understanding about the fat-tails of the returns, which can be problematic in that an investor can incur larger losses more often than would be expected under normal assumptions. This can be particularly prevalent in emerging markets that are subject to currency crises and defaults.

### Currency behaviour of significant trading partners

Our final metric looks at the correlation of the currencies of large trading partners with India in the context of the optimal reserve currency allocation methodology of Ito and McCaulay (2019). One possible objective for a central bank currency allocation strategy is to choose the mix that gives the lowest variance as measured in its domestic currency. We have replicated the Ito and McCaulay methodology to test whether there is a significant allocation to INR using some of India's major trading partner currencies. Using this methodology, we regress the domestic currency exchange-rate vis-à-vis the USD, against the EUR, JPY and INR (since USD, EUR and JPY are the three most actively traded currencies according to BIS (2022).

$$\%\Delta\left(\frac{x}{USD}\right) = B \cdot \%\Delta\left(\frac{EUR}{USD}\right) + C \cdot \%\Delta\left(\frac{JPY}{USD}\right) + D \cdot \%\Delta\left(\frac{INR}{USD}\right)$$

where the USD allocation is calculated as 1-B-C-D.

Using ordinary least squares we can minimise the errors and then solve for the USD allocation to derive the domestic currency minimum variance portfolio weights for FX. The results of these optimal weights for some of India's major trading partners are included below. It should be noted that due to the relatively low volatility of the INR that there is some sharing of explanatory power with the USD allocation and hence the high INR numbers should be taken lightly. Nevertheless, the statistical significance of the INR allocation suggests some allocation to the currency is warranted.

**Table 3: Statistically derived weights for reserve currency allocations for major trading partners with India**

| Currency | USD | EUR | JPY | INR | T-stat for INR |
|---|---|---|---|---|---|
| South Korea | -8% | 29% | 20% | 59% | 9.22 |
| Singapore | 30% | 33% | 12% | 25% | 8.27 |
| Australia | -15% | 58% | 7% | 49% | 5.91 |
| Indonesia | 35% | 17% | 2% | 46% | 7.22 |
| United Kingdom | 4% | 73% | -5% | 28% | 3.89 |

Source: Author's calculations. FX data source: Refinitiv. Coefficients estimated on weekly % changes in exchange rates vis-à-vis USD from January 2015–October 2023. Note: Due to the low volatility of INR with USD, there is some sharing of explanatory power between the two, which can result in lower or even negative USD allocations.

## Summary and conclusions

Central bank reserve managers are warranted to consider investing in Indian Rupee as a small component of their reserves portfolio. As with the gradual inclusion of CNY in reserve portfolios, a small allocation that allows the development of operational capabilities and an understanding of the investment dynamics of the markets can easily be justified by the risk-and return characteristics of the currency.

A continued increase in invoicing in rupee, an appetite to further diversify reserves away from USD, and an RBI intent on furthering this development will make it necessary to actively consider rupee.

While in central banking, it rarely pays to be the first mover, it is the case that many are already considering the addition of INR to reserve portfolios and the operational hurdles are perhaps less than they were for CNY many years ago when it was the new candidate reserve currency.

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