A Primer on the Exchange Rate

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1. Backdrop

Developments in the exchange rate of the Indian Rupee (INR) against the US Dollar dominated the headlines and policy actions throughout calendar year 2022. In today's globalized markets, the exchange rate is a critical pillar for a country's economy that influences its international trade, financial flows, forex reserves and overall economic policy of the government and the central bank.

On this backdrop, this note outlines how exchange rates are determined, impact of exchange rate movements on the economy, evolution of the exchange rate policy in India, factors necessitating central bank interventions, indices to measure the relative value of the domestic currency against its trading partners and the recent trends in the global exchange rates and the INR in particular.

2. How are Exchange Rates Determined?

In simple words, an exchange rate is the price of one currency expressed in terms of another currency or a group of currencies. This price can be set by market forces or by official agencies such as the national government or the central bank. The primary categories of exchange rates are:

- **Floating Exchange Rate:** The market forces of supply and demand for a currency in the absence of any regulatory intervention determine its value in relation to other currencies under a floating rate regime. The world's major currencies - US Dollar, Euro, Japanese Yen and the Pound Sterling are fully convertible currencies where macro-economic developments drive the exchange rates. Exchange rates for most currencies across the globe are quoted against these currencies as these are also the most traded in the global currency market
- **Fixed Exchange Rate:** Fixed exchange rates tie the value of one currency to another country's currency or to a commodity like gold. Countries avoid fixed exchange rates because of the inherent rigidity in adjusting to changing economic conditions and shocks.

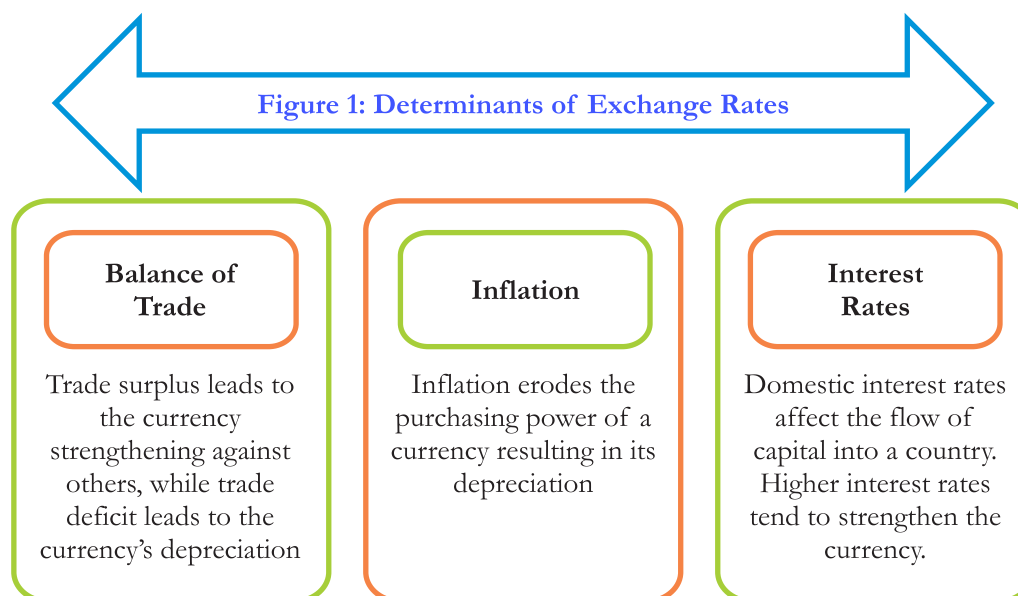

Figure 1: Determinants of Exchange Rates

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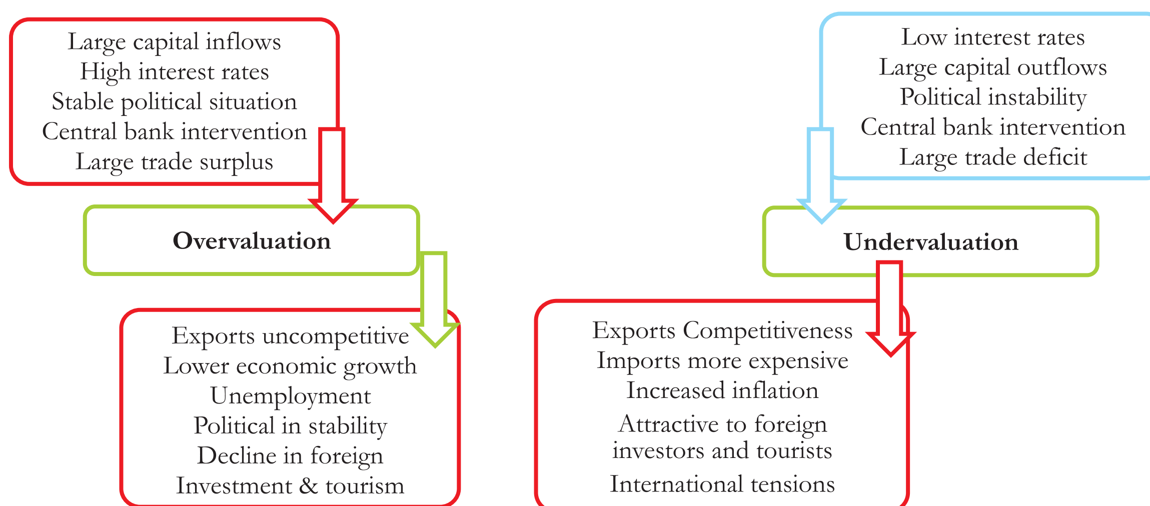
- **Pegged Exchange Rate:** A pegged exchange rate is determined by policy actions. Generally, the government through its central bank determines the rate of the domestic currency against one of the major world currencies. The central bank actively resorts to currency purchase and sale operations to maintain its targeted exchange rate. Such exchange rate regimes have generally been found to be unsustainable in the long run as was seen during the Asian Currency Crisis of 1997.
- **Managed Float:** A managed or dirty floating exchange rate system allows the central bank to intervene in the currency market to influence the direction of the currency's floating exchange rate. India has adopted this policy where the exchange rate of the INR is determined by market forces and the Reserve Bank of India (RBI) intervenes only to maintain orderly market conditions by containing excessive volatility without targeting any pre-determined level or band for the exchange rate.

2.1. Disequilibrium in the Exchange Rate

In the parlance of exchange rates, disequilibrium arises when the exchange rate of a currency vis-à-vis another currency or a basket of currencies, is higher or lower than its true value resulting in overvaluation or undervaluation. Overvaluation implies that a currency is more expensive than it should be relative to other currencies. On the other hand, an undervalued currency is cheaper than it should be relative to other currencies based on economic fundamentals.

Figure 2: Impact of Exchange Rate



A Case of Overvaluation:

Japan's huge trade surplus during the 1980s created upward pressure on the JPY that made Japanese exports more expensive leading to a decline in demand for Japanese goods and services and eventually culminated in a period of economic stagnation known as the "Lost Decade" in the 1990s. This necessitated actions from the Japanese government and the Bank of Japan to devalue the yen to support economic growth.

A Case of Undervaluation:

The People's Bank of China (PBOC) has frequently intervened in the currency market to depress the value of the yuan making Chinese exports more competitive and less expensive which has significantly contributed to the rapid growth of the Chinese economy over the past three decades. The US Treasury Department formally designated China a currency manipulator in August 2019.

Generally triggered by artificial adjustments in the demand and supply of a currency by central bank interventions, either of these states is undesirable in the long term as they result in distortions in the domestic economy. Central banks often intervene in the currency market to support the domestic economy by making exports more

competitive, control inflation or manage capital flows. However, currency manipulation that confers unfair competitive advantages often triggers retaliatory tariffs and other negative actions from trading partners.

2.1.1. Devaluation vs Revaluation

Occasionally countries resort to official changes in the exchange rate of the domestic currency against another currency, basket of currencies or a commodity like gold. Devaluation of a currency refers to the official downward adjustment in the value of the domestic currency, whereas revaluation is an upward adjustment. These are implemented by the central banks on behalf of the government. Devaluation measures are often sudden changes triggered by large trade imbalances and/or hard economic conditions. The INR has been devalued thrice in 1949, in 1966 and a two-step devaluation in 1991. Each event was followed by years of massive economic reform that have resulted in the resilience of the Indian economy which is now the fastest growing major economy in the world an also of the INR which has been one of the most stable currencies in the world in recent years with orderly movements guided by the RBI.

Similarly, revaluation exercises are also sudden actions of currency appreciation that have large scale economic impact on via import prices and retail level consumer expenditure and investment patterns. The most recent major revaluation exercises with widespread impact on the global currency markets were undertaken by the Swiss National Bank (SNB). The SNB first pegged the Swiss franc (CHF) to the Euro on September 6, 2011 to address a sharp appreciation of the CHF that had made Swiss exports and tourism costly. However, while this addressed speculation in the CHF and deflationary risks imminent at that point of time, it eventually led to a persistent depreciation in the CHF as it was now pegged to the Euro which depreciated against other currencies because of the European Central Bank's massive quantitative easing program. This prompted the SNB to unexpectedly abandon the minimum exchange rate on January 15, 2015 triggering a 20% overnight appreciation in the CHF that sent shockwaves through the global currency markets as the CHF was a popular safe haven reserve currency.

3. How are Exchange Rates Quoted in the Currency Markets?

In the forex market where currencies are traded, the prices are quoted in terms of units of currencies in pairs i.e. the currencies being exchanged. The first currency appearing in a price quote in the forex market is called the base currency while the second currency is called the quote currency. The three ways of quoting exchange rates in the market are:

- **Direct Quote:** It indicates the amount of domestic currency needed to buy one unit of the foreign currency - most commonly the US Dollar (USD). The foreign currency is the base currency, while the domestic currency is the counter currency or quote currency.

  Direct Quote = Domestic Currency / Foreign Currency

- **Indirect Quote:** It indicates the price of one unit of the domestic currency in terms of the foreign currency.

  Indirect Quote = Foreign Currency / Domestic Currency

- **Cross Rates:** Exchange rates are generally quoted with the USD as one of the currencies in the pair. Cross rates indicate the price of one currency in terms of a currency other than the USD. In such cases usually the USD is used to establish the values of the pair being exchanged. Here two transactions are actually involved. The trader first trades one currency for its equivalent in USD. The USD is then exchanged for the second currency.

Cross Currency Quote = (Currency 1 / USD) * (USD / Currency 2)

The market convention in India is to give direct quotes that have the USD as the base currency and the INR as the counter currency i.e. USD/INR. All other currencies are quoted as cross rates.

4. Evolution of the Foreign Exchange Rate in India

Since March 1, 1993 the Indian rupee (INR) has officially been a market-determined exchange rate. The exchange rate is determined by the market forces of demand for and supply of foreign exchange with occasional interventions by the RBI.

RBI uses various tools to manage the exchange rate, such as:

- Maintaining a large stock of foreign exchange reserves;
- Using monetary policy tools, such as interest rates, to influence the supply and demand of Indian rupees; and
- Capital controls and relaxations to manage the inflow and outflow of foreign exchange.

RBI intervenes in the currency market in the currency market to address excessive volatility that can have adverse effects on trade and capital markets.

Figure 3: Evolution of the INR Exchange Rate

RBI's consistent interventions since the outbreak of the Ukraine conflict in February 2022 have been to address sharp movements in the INR and to ensure an orderly evolution in the exchange rate.

5. Exchange Rate Indices

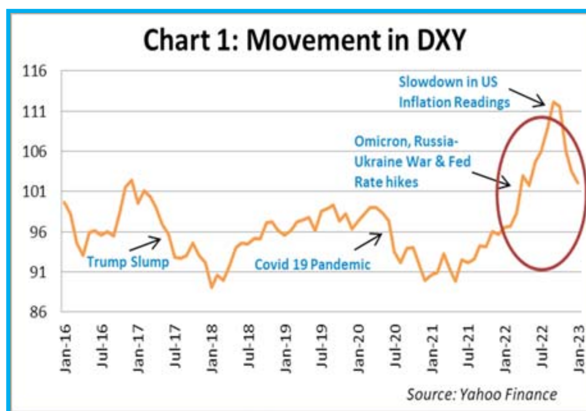
Market exchange rates are either spot rates i.e. the current rate at which one currency can be exchanged for another currency or forward rates where the currencies are exchanged on a pre-determined future date. On the other hand, a currency's real exchange value indicating its actual purchasing power is based on fundamental economic forces of demand and supply for the currency.

Exchange rate indices are used to measure the performance of a country's currency against a basket of other currencies - mostly its trading partners. Also referred to as "Effective Exchange Rates (EER)" these rates are not bilateral exchange rates but indices that indicate the international competitiveness of a country's goods and

services in terms of purchasing power parity. EER help policymakers in assessing the effectiveness of their monetary and fiscal policies while businesses and investors use them to evaluate the risks and opportunities associated with currency fluctuations. The commonly tracked exchange rate indices are:

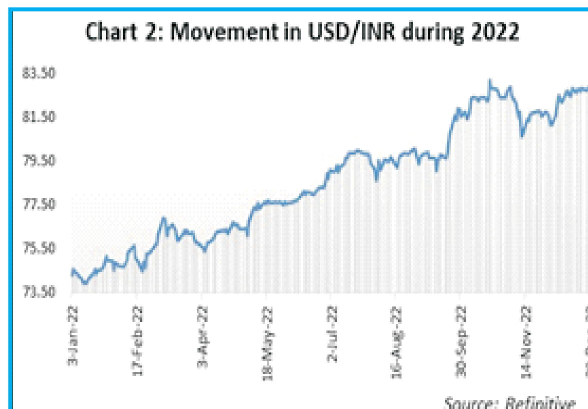
- **NEER (Nominal Effective Exchange Rate):** The NEER is calculated by taking the weighted average of bilateral exchange rates between the domestic currency and the currencies of its major trading partners. NEER can be used to determine whether a currency is overvalued or undervalued relative to its trading partners.
- **REER (Real Effective Exchange Rate):** REER is similar to NEER, but it also takes into account inflation differentials between trading partners. As defined by the IMF, REER is a measure of the value of a currency against a weighted average of several foreign currencies) divided by a price deflator or index of costs. An increase in REER indicates loss in trade competitiveness as exports become more expensive and imports become cheaper. REER is generally lower than the NEER and considered to be a more accurate measure of a country's international competitiveness as it reflects changes in relative prices between countries.
- **BIS REER (Bank for International Settlements Real Effective Exchange Rate):** The BIS REER index is used to assess whether a country's currency is overvalued or undervalued relative to its trading partners providing a more accurate picture of a country's exchange rate competitiveness. It basically measures the value of a country's currency relative to a basket of other currencies weighted by their importance in the country's trade. The BIS REER index is adjusted for inflation and is calculated based on a multilateral exchange rate model which is a more comprehensive measure than a bilateral exchange rate which only measures the value of a currency relative to one other currency. If a country's BIS REER index is above 100, it suggests that the country's currency is overvalued, while a BIS REER index below 100 suggests that the currency is undervalued.

6. Recent Trends in Global Exchange Rates



Trends in the global currency markets are generally measured by tracking the changes in the US Dollar Index (DXY) due to its central role in global trade and finance. DXY is a measure of the value of the US dollar (USD) relative to a basket of six major world currencies, including the Euro, Japanese Yen, British Pound, Canadian Dollar, Swedish Krona and Swiss Franc. Calendar year 2022, was one of the most volatile years for the global currency markets in recent years because of the dual effects of geopolitical shocks and the central bank action against inflation. The USD strengthened against nearly every other major currency to levels not seen in decades, as the US Federal Reserve aggressively hiked interest rates in a bid to combat inflation that was also breaching multi-decadal highs. Heightened uncertainty triggered a flight to safety of US assets further strengthening the USD. The USD started retreating in the last quarter of 2022 as weakening economic parameters increased bets for brakes on the rate hike cycle in the US.

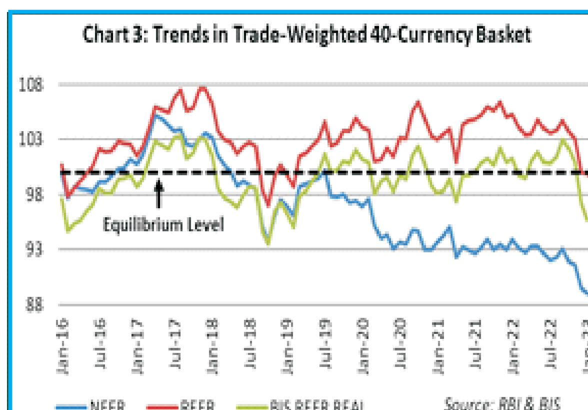
7. 2022 - A Volatile Year for the INR



While global geopolitical developments and the pandemic have had a significant impact on the INR in recent times, calendar 2022 was extremely volatile and the INR depreciated more than 10% despite India being one of the fastest-growing nations in the world with a stable domestic macro environment. Since 1992, there had been five instances when the rupee depreciated more than 10% (Year: 1992 (-10.90%), 1995 (-10.80%), 2008 (-19.20%), 2011 (-15.80%) and 2013 (-11%). Overall, INR depreciated 7.80% against the USD in FY23. A range of factors influenced the INR's performance including:

- Aggressive monetary policy tightening by the US Federal Reserve triggered a multi-decadal rally in the USD, which in turn resulted in massive capital outflows across the globe and EMEs like India in particular, weakening the INR.
- The outbreak of the Russia-Ukraine war in February 2022 disrupted global supply chains, fuelling inflation and inflationary expectations across the world. Rapid rise in commodity prices, especially oil, resulted in a spike in imported inflation for net importers like India worsening the trade deficit and weakening the INR.
- Consistent exit of foreign portfolio investors (FPIs) from the Indian capital markets since the beginning of 2022 further weakened the INR.
- RBI's interventions provided the primary support to the INR during 2022 ensuring a gradual depreciation in the exchange rate. RBI intervened in all segments of the currency market and also implemented special measures in July 2022 to smoothen volatility. RBI actions were evident in the drawdown from the foreign exchange reserves as well as the rate movements in the forwards segment.

8. Recent Trends in India's NEER and REER



While the headline movements in the daily spot USD/INR exchange rates are widely reported about, the monthly EER of the Rupee released by RBI (with a lag of one month), are closely watched by economists, currency traders and policymakers as these indicate the relative strength or weakness in the INR relative to India's trading partners. With both being trade-weighted indicators, higher weightage is assigned to countries with larger share in trading. RBI regularly reviews the NEER/REER basket of the Rupee. The broad basket of Rupee NEER/ REER indices was expanded to 40 currencies and rebased to 2015-16 in January 2021. India's NEER and REER indices fluctuate largely due to changes in capital flows, current account deficit and movements in the global currency market along with government policies and

market sentiment. The trajectories of India's NEER and REER indices have diverged since January 2019. With the uptrend in global inflation since 2021, India's inflation differentials with trading partners narrowed. While the Fed rate hikes and Ukraine war weighed on the Rupee, the depreciation in INR against the dollar was relatively lesser than other currencies due to RBI's interventions. As a result, the currency remained overvalued in real terms i.e. above a value of 100 until November 2022. This trend is also reflected in the BIS REER for India, which also shows a significant depreciation starting December 2022.

9. Benefits of Currency Competitiveness

A low exchange rate makes a country's exports more competitive in international markets, as foreign buyers can purchase goods and services from the country at a lower cost. This can increase demand for the country's exports and help to boost economic growth. A low exchange rate can also make it more expensive for foreign competitors to sell their products in the domestic market, supports domestic industries. A competitive currency can make a country's assets, such as real estate and stocks, more affordable for foreign investors. This can encourage foreign investment in the country. It can also make a country more attractive to foreign visitors and support job creation in the tourism sector.

Enhancing the competiveness of the domestic currency requires a judicious mix of policy actions from the central bank as well as the Government. Some measures that can be adopted for the INR are enlisted in Figure 4.

Figure 4: Measures for Improving Competitiveness of Rupee

Boosting Exports	Attracting Foreign Investment	Improving Infrastructure	Improving Macros
• Incentives to Exporters • Focus on Quality • Reducing Costs	• Favorable Business Environment • Simplifying Investment Procedures • Tax Incentives	• Reduce Costs • Boost Export Competitiveness • Attract Investment	• Stable Inflation • Manageable Fiscal Deficit

RBI's recent measures to support the INR include expanding sources of forex funding to mitigate exchange rate volatility along with encouraging the nascent interest of the global trading community in the INR. Invoicing, payment and settlement of foreign trade in the INR will not only lower the demand for USD and help the exchange rate, but will also help in aiding the internationalisation of the INR as more and more countries join the framework. Going ahead, these policy measures can significantly boost the competiveness of the Rupee bringing along its associated favourable economic benefits.

10. The Way Ahead

Global spillovers are having an increasing impact on the INR as the Indian economy and financial markets become more integrated with international markets for goods and capital. At the same time, the pandemic and the geopolitical ramifications of the Ukraine conflict on global supply chains and financial markets have reemphasized the importance of having robust domestic systems in place. With this backdrop, to

further boost the competitiveness of both Indian exports and the Indian Rupee, the Union Government launched the Foreign Trade Policy (FTP) 2023 from April 1, 2023. The Government is also encouraging the use of the INR in cross-border trade, aided by the new payment settlement framework introduced by RBI in July 2022. In the April 2023 Monetary Policy Committee meeting, the RBI announced that banks with International Financial Services Centre (IFSC) Banking Units (IBUs) to offer INR Non-deliverable foreign exchange derivative contracts (NDDCs) to resident users in the onshore market, with a view to develop the onshore INR market as, NDDCs provide residents with the flexibility to efficiently design their hedging programmes. India's resilient macroeconomic stability, easing inflationary pressures and improving external sector parameters coupled with the relative strength of the domestic banking system that has been able to smoothly adjust to the rapid interest rate hiking cycle of FY23, are conducive to attracting foreign investment that can add to the strength of the INR in the near future.