

# The Dynamics of External Adjustment: An Overlook at Indian External Sector

Dhruva Teja Nandipati

Sarla Anil Modi School of Economics,  
Narsee Monjee, Institute of Management Studies, Bengaluru, Karnataka, India  
E-mail: [ndhruvateja@gmail.com](mailto:ndhruvateja@gmail.com)

Received: 12 November 2020; Revised: 19 November 2020;  
Accepted: 15 December 2020; Publication: 1 January 2021

**Abstract:** *There is an ongoing debate about the role of exchange rates in facilitating external adjustment. This paper explores how certain aspects of international trade, namely dominant currency pricing and international integration through global value chains, shape the working of exchange rates to induce external adjustment. The analysis suggests that the widespread use of the US dollar in trade pricing alters the short-term response of trade flows to exchange rate movements, with export volumes responding timidly to an exchange rate depreciation, while most of the adjustment takes place through import volumes. A more balanced adjustment process, through both export and import volumes, reemerges over the medium term. Meanwhile, greater integration into global value chains reduces the exchange rate elasticity of gross trade volumes, both in the short and medium term, but the associated increase in gross trade flows largely offsets this effect in most cases. Overall, the results suggest that while these features of international trade affect the composition and timing of the external adjustment process, for most countries, there remain benefits of exchange rate flexibility, especially in the medium term. With more muted effects of exchange rates on trade flows in the short term, complementary policies may be needed in some cases to support exchange rate flexibility and facilitate external rebalancing. This paper tries to study the recent external trends in Indian external sector giving a detailed information of the dynamics of external adjustment with respect to the global scenario.*

**Key Words:** *External Sector, External Adjustment, Currency of Trade Invoicing, Global Value Chains.*

**JEL:** *F30, F31, F32*

## INTRODUCTION

The notion that exchange rates play a key role in external adjustment has been at the core of modern conventional wisdom.

Since the flake out of the Bretton Woods system, the economic analysis has been shepherd by the Mundell-Fleming framework, whereby the movements in the exchange rate causethe relative prices to change, affecting the supply and demand of the tradable goods, thus inducing

adjustment of import and export volumes. Through expenditure-switching policy effects, wherein export and import volumes react to changes in the relative prices of tradable goods and non-tradable goods, the exchange rate provides a key adjustment mechanism for external rebalancing.

There is an ongoing debate, however, about whether increased complexities of international trade and finance have affected how exchange rates operate. Particular attention has been given to two features of international trade:

- The dominant role of certain currencies in the invoicing of trade, which challenges the Mundell-Fleming paradigm, at least in the short term, as the response of domestic prices of internationally traded goods and trade volumes to exchange rate movements depend on the currency in which trade is invoiced. Movements of the exchange rate have different effects if prices are set and sticky in the currency of the producer, as assumed in the Mundell-Fleming framework, or in other currencies.
- The growing importance of global value chains, whereby countries' cross-border transactions increasingly entail importing intermediate goods, adding some value, and reexporting them. Greater foreign-value-added content may also entail lower sensitivity of gross trade flows to exchange rate movements in part because trade prices and marginal costs move in tandem. Integration into international supply chains also means that upstream and downstream third-party exchange rate movements can affect a country's gross trade flows.

This paper sheds light on the empirical importance of the mechanisms whereby invoicing of trade in a dominant currency and integration into global value chains affect the external adjustment process. The relevance of these features, and how they shape the adjustment process, is assessed by studying the response of trade prices and quantities to exchange rate movements, encompassing bilateral manufacturing trade among 37 advanced and emerging market economies. The analysis uses newly constructed data on bilateral prices and quantities and novel measures of value-chain-related exchange rate shocks. Because these features relate to nominal and real rigidities that may play different roles at different time horizons, special attention is given to their importance in the short versus medium term. Some caveats are worth highlighting.

While this work sheds light on the relevance of these specific features in shaping manufacturing trade elasticities, other relevant aspects and country-specific factors, like the role of services trade and balance sheet

vulnerabilities, are not considered. In addition, the analysis takes as given the invoicing of trade and global value chain integration, recognizing that these two features are dependent on each other, as well as on other country-specific factors.

## **RECENT EXTERNAL DEVELOPMENTS**

Global current account surpluses and deficits narrowed marginally in 2018, with some reconfiguration largely reflecting higher energy prices and continued external rebalancing in China. Overall, global current account balances (the absolute sum of surpluses and deficits) inched down last year to about 3 percent of global GDP. Larger current account surpluses in oil-exporting economies in 2018 were largely matched by a sharp narrowing in China's current account surplus (from 1.4 percent to 0.4 percent of GDP), with more minor reductions in current account surpluses in some advanced (euro area, Japan) and developing economies, mainly on account of higher oil prices. In the United States, despite the sizable fiscal impulse, the current account deficit was broadly unchanged at 2.3 percent of GDP in 2018, due to a smaller investment response than expected and lower oil imports. Meanwhile, in more vulnerable emerging market and developing economies (Argentina, Turkey), current account deficits narrowed as financial conditions tightened, portfolio capital inflows slowed sharply, and currencies weakened.

Currency movements were generally supportive of the observed current account changes in 2018, although the implications of recent currency volatility, largely responding to shifting cyclical conditions and trade tensions, remain uncertain.

During 2018 currency movements were generally supportive of a minor narrowing of imbalances. The euro and renminbi appreciated slightly against the US dollar, translating into moderate average annual appreciations in real effective terms (ranging between 1½ percent and 3 percent), with the yen remaining generally unchanged. Movements were larger in key emerging market and developing economies' currencies, which came under pressure in the second half of 2018 from a combination of higher US interest rates and increased trade tensions, supporting a reduction in their deficits. There was considerable heterogeneity among this group, however, largely reflecting cross-country differences in external vulnerabilities and associated policy responses. For example, while the real effective exchange rate (REER) for Argentina and Turkey weakened on average by about 20 and 15 percent, respectively, these changes were more contained in other emerging market and developing economies (Brazil,

India, Indonesia, Russia), ranging between 3 percent and 10 percent on average, although with significant intra-year volatility.

During the first half of 2019 currency movements were volatile and generally less supportive of a further narrowing of imbalances. After weakening in early 2019 following the Federal Reserve's decision to pause the pace of monetary policy normalization, the US dollar has strengthened again in recent months in response to rising trade tensions and risk aversion.

Estimates through the end of May suggest that the real appreciation of the US dollar and yen (about 3 percent relative to the average for 2018 in both cases) has been accompanied by a weakening of the euro (2½ percent) and currencies of other advanced economies (Australia, Canada, Korea, Sweden), reflecting softer domestic demand and below-target inflation. Meanwhile, emerging market and developing economies currencies and capital flows remain volatile. After rebounding in the first quarter of 2019, many emerging market and developing economies have experienced capital outflows and exchange rate depreciations since May on trade-related uncertainties, especially those with weaker fundamentals and more directly exposed to trade with China and the United States.

Meanwhile, intensified trade tensions are weighing on global trade and investment, without materially affecting imbalances thus far. Over the course of 2018 the United States raised tariffs on imported aluminum and steel and on a subset (worth \$250 billion) of Chinese imports. In May 2019 the United States raised tariffs on the portion of the same subset of Chinese imports, with threats of further protectionist measures weighing on financial markets. Canada, China, the European Union, and Mexico all responded by raising tariffs on US exports. Evidence from the first round of bilateral US-China tariff increases suggests that these actions had only a small impact on the overall US trade balance and imports for 2018 because of trade diversion effects through third countries. That said, these trade actions and related uncertainties have already led to a sharp slowdown in global trade and industrial production and are weighing on investment and business sentiment, especially in sectors integrated into global supply chains. IMF staff simulations suggest that the recently announced and envisaged tariffs could reduce global GDP by an additional 0.3 percent in 2020. That said, the overall impact of trade tensions on growth will depend on the associated confidence effects and offsetting policy responses. The impact of the trade dispute between the United States and China would be felt not only in countries directly involved, but also in other countries through cross-border investment and global supply chains, given their fairly inflexible nature. In particular, it would lead to sizable shifts in manufacturing capacity away

from China and the United States, and toward Mexico, Canada, and east Asia, as well as sizable job losses in certain sectors, particularly in China and the United States.

### **CURRENCY OF TRADE INVOICING**

The currency of trade invoicing has bearing on the external adjustment process. With stickiness in nominal prices, the currency of invoicing plays a key role in determining the degree of exchange rate pass-through (that is, how exchange rate changes translate into changes of prices in domestic currency) and the associated response of trade volumes. Trade flows between two countries will respond to changes in their bilateral exchange rate if transactions between them are priced in the currency of either trading partner. If trade is priced in third-country currencies, however, movements of exchange rates vis-à-vis those third-country currencies become relevant, and possibly more important than bilateral exchange rates. Therefore, how exchange rates facilitate external adjustment much depends on the price setting mechanism of internationally traded goods:

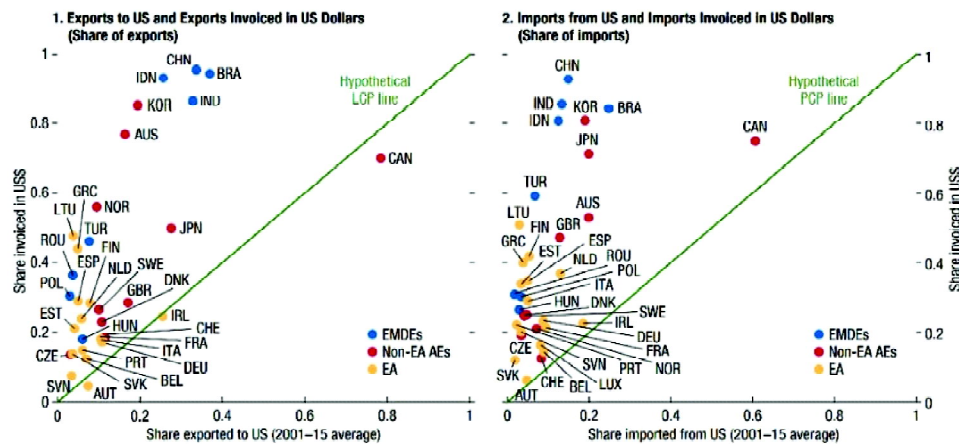
- When prices are set in the currency of the producer—as the Mundell-Fleming framework assumes—exchange rate depreciation entails an increase in country a’s import prices, measured in domestic currency, inducing lower import demand. The depreciation also entails a fall in the prices faced by its trading partners in their respective domestic currencies, inducing higher demand for country a’s exports. Overall, there is a balanced response, involving import and export volumes, to the exchange rate.
- When prices are set in a third country’s (“dominant”) currency, country a’s depreciation entails a similar increase in import prices in domestic currency and thus lower import demand. However, local currency prices faced by trading partners are unchanged as their exchange rates vis-à-vis the dominant do not change. Thus, trading partners’ demand for country a’s exports and, correspondingly, country a’s export volumes do not respond to the currency depreciation. The result is an unbalanced response in trade volumes.

Major currencies, and the US dollar in particular, play a dominant role in pricing of international trade. For most countries, the share of exports and imports invoiced in US dollars is significantly greater than the corresponding share of exports to and imports from the United States, respectively. This indicates that the US dollar plays a dominant role in trade

invoicing—that is, it is used in the pricing of trade between country pairs that do not include the United States (Figure 1).

This pattern is particularly marked in emerging market and developing economies, although it is also visible in key advanced economies (for example, Australia, Japan, Korea). The euro is also used significantly in international trade, although its role is considerably narrower than that of the US dollar. Similarly, partial data indicate that invoicing in other major currencies (for example, British pounds, yen, swiss francs, and renminbi) is significant only in cross-border transactions involving the economies that issue those currencies.

Figure 1: Trade with United States and US Dollar Invoicing



Source: IMF External Sector Report, July 2019.

This pattern is particularly marked in emerging market and developing economies, although it is also visible in key advanced economies (for example, Australia, Japan, Korea). The euro is also used significantly in international trade, although its role is considerably narrower than that of the US dollar. Similarly, partial data indicate that invoicing in other major currencies (for example, British pounds, yen, swiss francs, and renminbi) is significant only in cross-border transactions involving the economies that issue those currencies.

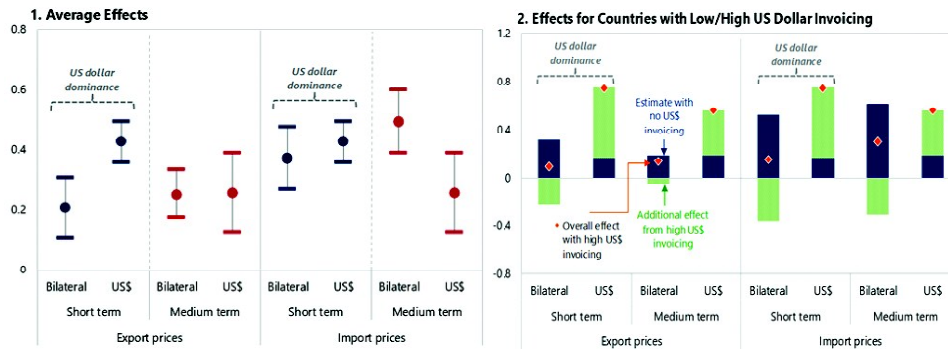
The empirical relevance of invoicing currencies and their implications for external adjustment are explored in an econometric specification that models bilateral trade flows. Building on Gopinath (2015) and Boz, Gopinath, and Plagborg-Møller (2018), the role of the US dollar in trade pricing is studied in a panel setting that models prices and quantities of

bilateral manufacturing trade among 37 advanced and emerging market economies during 1990–14. The framework is extended to disentangle price and quantity responses to bilateral and US dollar exchange rates, from both the exporter's and importer's perspective, which allows for computation of the trade balance response.<sup>9</sup> A depreciation vis-à-vis the US dollar implies that the currencies of both the country of interest and its trading partners depreciate vis-à-vis the US dollar (the exchange rate between the country of interest and non-US trading partners remains unchanged). A bilateral depreciation implies a movement vis-à-vis a trading partner only (the exchange rates between the country of interest and other trading partners remain unchanged). The case of a country's depreciation vis-à-vis all (US dollar and other) currencies is analyzed separately below. Contemporaneous and lagged effects (up to three years) are explored to shed light on short- and medium-term dynamics. The empirical evidence on exchange rate pass-through confirms the importance of the US dollar, especially in the short term.

In the short term (same year as the shock), the exchange rate vis-à-vis the US dollar is a statistically and economically important driver of trade prices in domestic currency (that is, exchange rate pass-through) even after controlling for the bilateral exchange rate (Figure 2, panel 1). This reflects the fact that the US dollar is used for trade pricing in a significant number of bilateral transactions that do not involve the United States. Moreover, the average effect of the US dollar exchange rate is higher than that of the bilateral exchange rate for trade prices expressed in both the exporter's and importer's currency, suggesting also that the US dollar is used more than the individual currencies of the respective trading partners (that is, it plays a dominant role). Specifically, while a 1 percent change in the bilateral exchange rate leads to only a 0.2 percent change in trade prices in the exporter's currency, on average, a 1 percent variation in the exchange rate vis-à-vis the US dollar is associated with a 0.45 percent change in those prices. Results from an importer perspective are also consistent with a dominant role of the US dollar. Moreover, results on the dominance of the US dollar are starker in unweighted regressions, which give equal weights to large and small economies and, thus, represent more closely the prevailing patterns in the latter group, where US dollar invoicing is more pervasive.

In the medium term (three years after the shock), when US dollar prices are more flexible, the relative importance of the exchange rate vis-à-vis the US dollar diminishes, whereas the bilateral exchange rate plays a relatively greater role in affecting trade prices in domestic currency. For example, the average US dollar pass-through to export prices falls from 0.45 in the short term (same year) to 0.25 in the medium term (three-year horizon), whereas

Figure 2: Exchange Rate Pass-Through from Bilateral and US Dollar Exchange Rates



Source: IMF External Sector Report, 2019.

the pass-through from the bilateral exchange rate rises slightly from 0.2 to 0.25. The reduced importance of the US dollar exchange rate over the medium term is also visible from an importer's perspective.

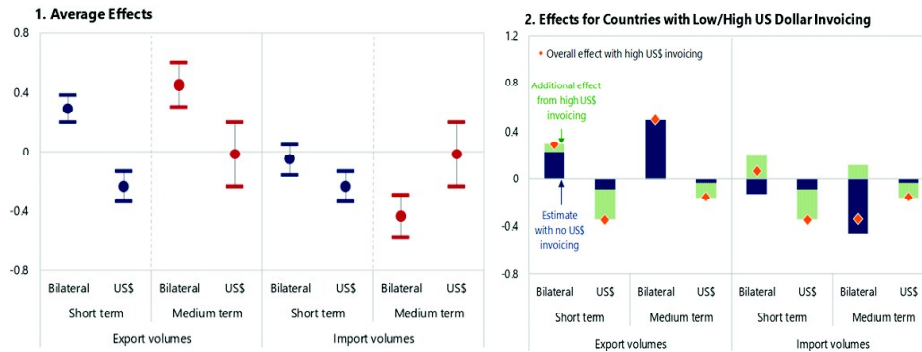
Direct evidence examining the link between exchange rate pass-through and the observed degree of trade invoiced in US dollars for a subset of countries corroborates the dominance of the US dollar in the short term (Figure 2, panel 2). For example, in countries with high US dollar invoicing, pass-through from bilateral exchange rates to export-currency prices averages 0.1 compared with 0.7 from the US dollar exchange rate. The order of magnitude of these estimates changes to 0.3 and 0.2, respectively, for countries with low US dollar invoicing. Over the medium term, the effects of US dollar invoicing are visible, but less pronounced.

The dominant role of the US dollar affects the response of export and import volumes to exchange rate movements (Figure 3). For countries other than the United States:

- In the short term, bilateral export volumes respond positively to a bilateral exchange rate depreciation (that is, an appreciation of the trading partners' currency alone). However, bilateral exports respond negatively to a depreciation only vis-à-vis the US dollar (that is, when trading partners also depreciate vis-à-vis the US dollar), as the latter implies that the (non-US) trading partner faces higher trade prices in domestic currency and, thus, lowers its demand for imports. This result is also consistent with studies linking shifts in global trade volumes to global shift in the US dollar vis-à-vis all currencies. Import volumes, in contrast, respond



**Figure 3: Estimated Trade Volume Elasticities to Bilateral and US Dollar Exchange Rates**



Source: IMF External Sector Report, 2019

limitedly to a bilateral depreciation (that is, an appreciation of the trading partner alone), as import prices remain largely unchanged, while more pronouncedly to a depreciation vis-à-vis the US dollar, as the latter entails an increase in import prices in the importer’s currency.

- In the medium term, as prices in the currency of invoicing adjust, both export and import volumes display greater sensitivity to bilateral exchange rate movements, while the effect of the US dollar exchange rate becomes economically and statistically insignificant.
- Direct evidence of the influence of US dollar invoicing on trade volume elasticities corroborates the results on the dominant role of the US dollar in the short term (Figure 3, panel 2).

Overall, the composition of the external adjustment process is influenced by the dominance of the US dollar, in the near term. The empirical evidence indicates that the response of the trade balance to a depreciation of a country’s currency vis-à-vis all others is limited in the near term, mostly reflecting subdued responses from trade volumes, especially exports. US dollar invoicing contributes to the latter, altering the export/import and price/quantity composition of the adjustment process. Specifically, US dollar invoicing is associated with:

Unbalanced volume responses. While import volumes fall in response to the depreciation, irrespective of the extent of US dollar invoicing, export volumes react less with greater US dollar invoicing. As discussed above, the latter reflects that local currency prices faced by trading partners are unchanged—as their exchange rates vis-à-vis the US dollar do not vary—and so are their demand for imports.

Greater (and more symmetric) price responses. Prices in the exporter's and importer's currency react similarly under high US dollar invoicing, in comparison with a more asymmetric response under low US dollar invoicing (the latter being consistent with producer currency pricing).

Taking these results on prices and quantities together, in the short term, US dollar invoicing alters the price/quantity composition of external adjustment, with higher US dollar invoicing levels leading to less adjustment through export quantities and more adjustment through prices (and, thus, markups). Over the medium term, the influence of the dominant currency is more muted. Consistent with greater price flexibility at longer horizons, the evidence points to less influence of US dollar invoicing over the medium term, with more symmetric export and import volume responses and greater asymmetry between export and import prices. That is, the conventional expenditure-switching mechanism through both exports and imports reemerges in the medium term.

## **GLOBAL VALUE CHAINS**

This section explores how integration into international supply chains can influence the workings of exchange rates.

A country's degree of integration into global value chains affects how gross trade flows respond to different exchange rates. Greater integration into value chains entails a larger extent of trade in intermediate goods that are reexported (after adding some domestic value). This has two direct implications.

Exchange rates beyond those of the immediate trading partners become relevant, as currency shifts of upstream suppliers (backward integration) and downstream buyers (forward integration) affect the whole supply chain.

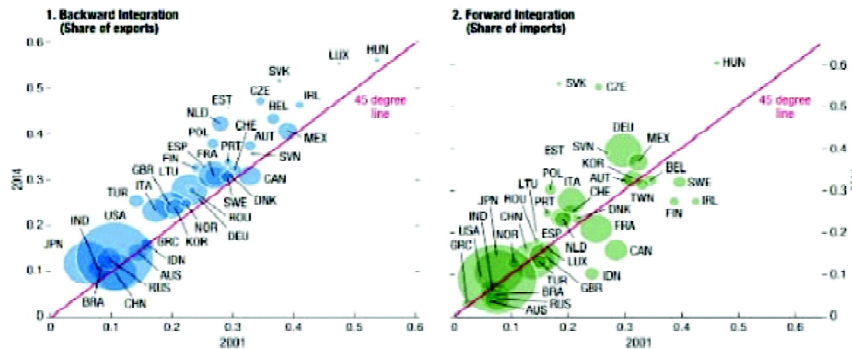
Shifts in the value of a country's currency may have more muted effects on its gross trade flows. A depreciation of a country's currency, for example, would have more muted effects on its exports volumes as the latter include imported intermediate goods (backward participation) and, thus, the depreciation would raise export prices (in local currency) but also production costs. In addition, demand for intermediate goods from foreign downstream buyers (forward integration) may respond less to the exchange rate depreciation if demand for intermediate goods is inelastic due to adjustment costs in production.

Most economies have become increasingly integrated into global value chains, although differences across countries are large. This process of integration started before the sample period considered in the analysis (see,

for example, Johnson and Noguera 2014, 2017; and Duval and others 2014, 2016) and continued through the 2000s, although at a slower pace, leading to sizable differences across countries (Figure 4). While a considerable share of today’s global trade remains non-value-chain-related, the degree of integration through value chains is significant in some cases, especially in small economies where, for example, the import content of exports (backward integration) can reach one-third to one-half. This is the case, for example, in economies such as Belgium, the Czech Republic, Hungary, and the Slovak Republic, which are heavily integrated into European value chains. In contrast, for large systemic economies (for example, China, Japan, United States) traditional trade still dominates.

The influence of global value chain integration on the external adjustment process can be explored by extending the empirical framework used to study the role of dominant currencies. Specifically, the framework is modified to study how traditional trade elasticities are affected by the impact of third-country exchange rates on both marginal costs (backward integration) and the demand for intermediate inputs (forward integration). Data on domestic and imported intermediate inputs from the 2016 World Input-Output Database, available for 2001–14, are matched with the bilateral trade data to measure the importance of global value chain linkages among country-pairs, decomposing corresponding prices and quantities. The extended framework takes into account the role of dominant currency invoicing in intermediate goods trade by building measures of global value chain integration with bilateral and US dollar exchange rates. While integration into global value chains is one of the determinants of US dollar invoicing, the framework allows for these effects to operate independently.

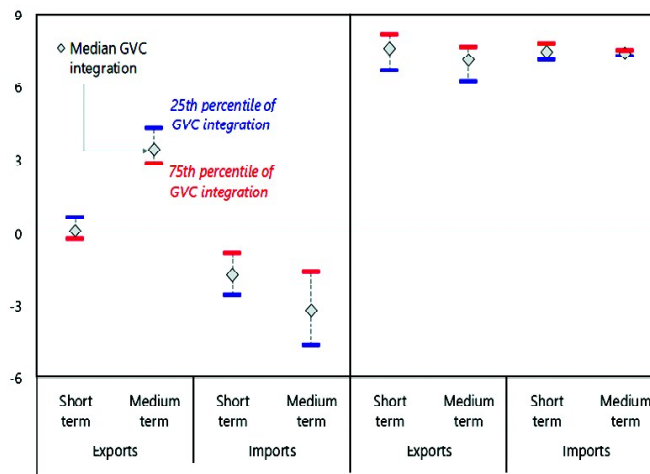
Figure 4: Integration into Global Value Chains, 2001–14 (Manufacturing, trade-weighted average across trading partners)



Source: World Input – Output Database, IMF

Greater global value chain integration dampens gross trade volume elasticities. Consistent with the theory and previous country-specific studies, results indicate that, for a given degree of trade openness (that is, exports-or imports-to-GDP ratio), greater global value chain integration dampens the exchange rate elasticity of gross trade volumes, lowering the response of both exports and imports through backward and forward linkages (Figure 5). This dampening effect is not only relevant in the short term but also in the medium term, pointing to, among other things, persistent rigidities in production due to international value chain integration. For example, while the medium-term exchange rate elasticity of export volumes for a country with a low degree of integration into global value chains (25th percentile of the distribution, both backward and forward) is about 0.45, this elasticity drops to 0.3 for a country in the 75th percentile. Similarly, import volume elasticities are considerably different between the two cases, at  $-0.5$  and  $-0.25$  for countries with a low and high degree of integration, respectively. Meanwhile, greater global value chain integration leads to somewhat higher exchange rate pass-through to both export and import prices reflecting, respectively, the greater sensitivity of marginal costs and input demand to exchange rate changes, although the effects are small in general. The results indicate that the dominant role of the US dollar is partly related to exporters' use of imported intermediate goods (that is, linked to global-value-chain trade) but also goes beyond, as the patterns of exchange rate pass-through and effects on volumes remain significant even after including global value chain measures in the framework.

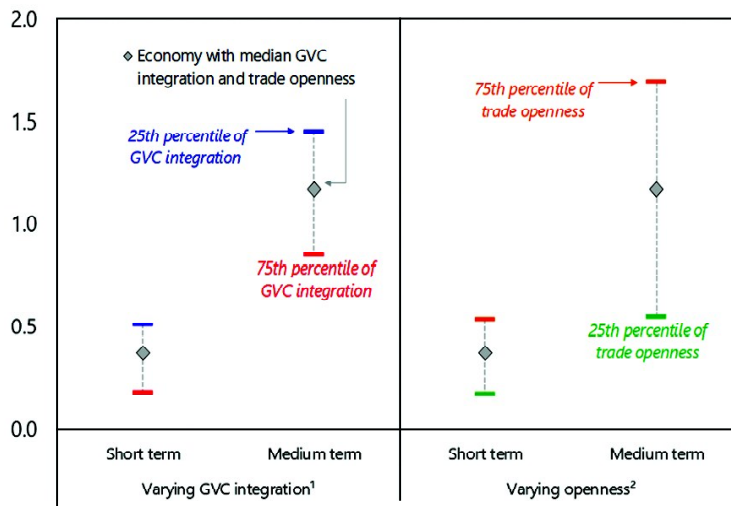
Figure 5: Trade Flow Responses and Global Value Chain Integration



Source: IMF Statistics

The sensitivity of the trade balance to exchange rates falls with greater global value chain integration. Combining the estimated impact on prices and quantities, the results indicate that, for a given level of trade openness, greater global value chain participation entails a more muted response of the trade balance to the exchange rate both in the short and medium term (Figure 6). Conversely, for a given level of global value chain integration, greater trade openness increases the overall responsiveness of the trade balance in terms of percentage points of GDP.

**Figure 6: Impact of GVC and Trade Openness on Trade Balance Response to Exchange Rate**

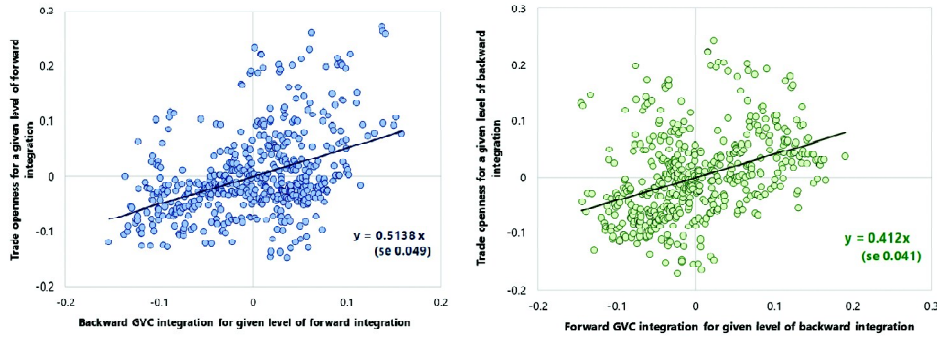


Source: IMF External Sector Report, July 2019.

Greater integration into global value chains is associated with higher trade openness. While disentangling the share of trade that is created by participating in global value chains is empirically challenging, greater integration into value chains is generally associated with larger trade flows, as moving toward the use of imported intermediate inputs frees domestic factors of production, which can be used to produce and export other goods and services. Such positive relationship between global value chain integration and trade openness is strong in the data (Figure 7).

Taking into account the degree of both global value chain integration and trade openness, trade balance elasticities appear to be different across countries but broadly stable over time. The distribution of medium-term trade balance elasticities resulting from the analysis displays significant variance, indicating considerable heterogeneity across countries although,

**Figure 7: Partial Correlation Between Trade Openness and Backward/ Forward GVC Integration**



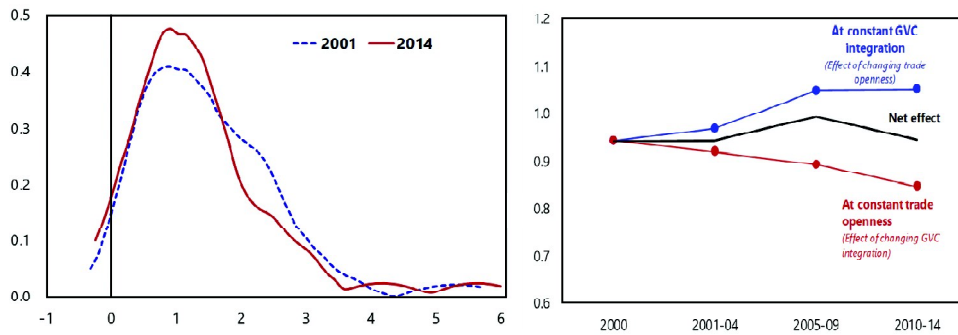
Source: IMF External Report, 2019

for most cases, estimated responses are economically meaningful (Figure 8, panel 1). For the average country (in terms of global value chain integration and trade openness), a 10 percent depreciation is estimated to lead to an increase in the trade balance of about 1 percentage point of GDP.<sup>17</sup> Moreover, such estimates do not appear to have changed much since early 2001, mainly as the effect of increasing global value chain integration has been largely offset by the accompanying increase in trade openness (Figure 8, panel 2).

**INDIA’S EXTERNAL SECTOR: AN OVERLOOK**

The international environment is clouded with very challenging conditions. Global growth is slowing down and central banks across the world are bracing up to counter it by easing monetary policy; but there is no recession

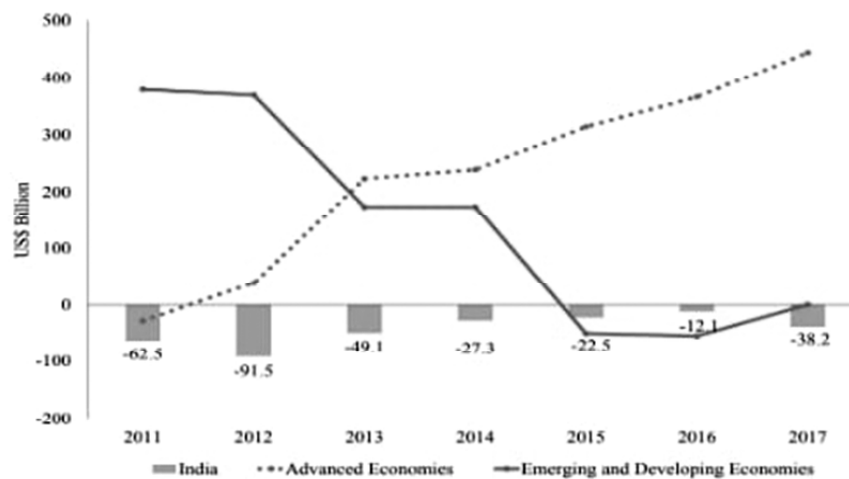
**Figure 8: Trade Balance Response: Distribution and Variation over Time, 2000-14**



Source: IMF External Report, 2019.

as yet. Trade wars have pushed world trade into contraction and threaten to morph into tech and currency wars, with no evidence of any significant gains accruing to anyone. Meanwhile, global commodity prices have weakened, with collateral benefits to net commodity importers and terms of trade losses for commodity exporters. The developments emanating from drone strikes on Saudi oil facilities are, however, still playing out. Sporadic flights to safety are driving capital flows out of emerging markets into advanced economy assets; but the universe of negative yielding bonds is growing disconcertingly large, posing a potential threat to financial stability.

Figure 9: International Comparison of Current Account Balance

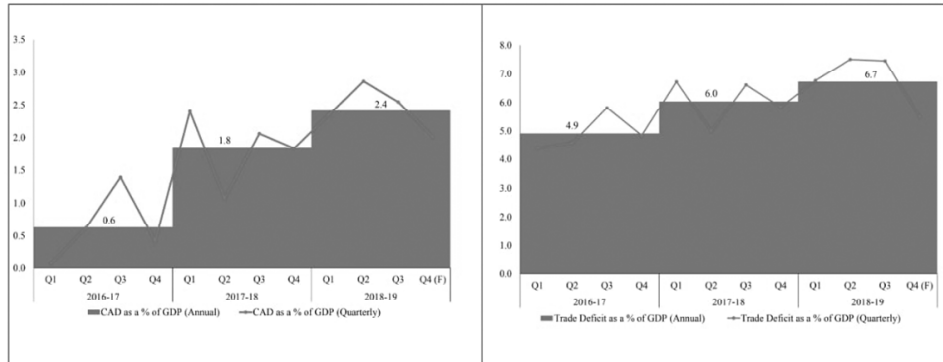


Source: Economic Survey 2018-19, Ministry of Finance, Government of India

In this hostile environment, India's external sector has exhibited resilience and viability. The current account deficit has averaged 1.4 per cent of GDP over the last 5 years and remains comfortably financed in spite of global spillovers imparting risk-on-risk-off volatility to portfolio flows. The level of foreign exchange reserves was at US\$ 429 billion on September 13, 2019, sufficient to cover close to 10 months of imports or 21 months of debt of residual maturity up to 1 year. The Indian economy remains a preferred habitat for foreign direct investment (FDI) and is among the top 10 destinations for greenfield projects (Source: FDI Report, Financial Times, 2018). Net foreign direct investment at US\$ 18.3 billion in April-July 2019 was higher than US\$ 11.4 billion in the corresponding period of 2018-19.

Significant progress has been made in external debt management since the external payment difficulties encountered in 1990 which triggered wide-

**Figure 10: Current Account and Trade Account Deficit: as a percentage of GDP**



Source: Economic Survey 2018-19, Ministry of Finance, Government of India

ranging structural adjustments and reforms. The level of external debt at 19.7 per cent of GDP and the debt service ratio (principal repayments and interest payments as a ratio of current earnings) at 6.4 per cent of GDP are among the lowest in emerging market peers. This places India among the least externally indebted countries of the world, by the World Bank's classification. In terms of a broader measure of external liabilities – the net international investment position (NIIP) which includes both debt and equity liabilities, net of foreign assets – India's exposure declined to 15.9 per cent of GDP at end-March 2019 from a peak level of 18.3 per cent at end-March 2015. Foreign exchange reserves covered 76 per cent of external debt and 94.6 per cent of the NIIP at end-March 2019, up from 68.2 per cent and 89.3 per cent, respectively, at end-March 2014. Short-term debt by residual maturity declined to 57 per cent of foreign exchange reserves at end-March 2019 from a peak level of 59 per cent at end-March 2013. Short-term debt by original maturity constitutes barely 20 per cent of total external debt.

These healthy developments are underpinned by the innate strength of India's underlying fundamentals. The degree of openness of the economy, measured by the ratio of exports and imports of goods and services to GDP, has risen from 20 per cent in the first half of the 1990s to 44 per cent in the latest five-year period from 2014-19. The share of India's merchandise exports in world exports has gone up from 0.5 per cent in 1990 to 1.7 per cent in 2018.

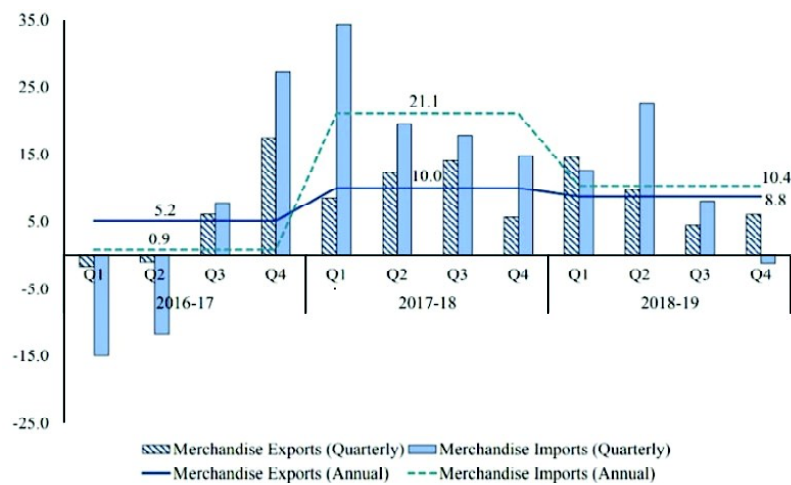
In line with the expanding share of services in domestic output, India's services exports have grown rapidly over the past two decades. In fact, India's services exports have shown a higher degree of resilience to global



shocks than merchandise exports. At US\$ 81.9 billion, net services exports financed 45 per cent of India’s trade deficit in 2018-19. In the area of traded services, India remains a world leader in software exports and information technology (IT) enabled services, accounting for around 12 per cent of world software exports. India’s IT sector, which earned US\$ 78 billion through net exports in 2018-19, is leapfrogging into new technologies including artificial intelligence, machine learning and robotics. The Indian diaspora is among the largest in the world and reflecting this, India currently receives the highest amount inward remittances in the world from Indians working abroad. Alongside, accretions to non-resident deposits have provided stable and reliable support to the balance of payments over the years. Financial openness, measured by the ratio of gross capital inflows and outflows to GDP, has increased three-fold from 15 per cent in the first half of the 1990s to 45 per cent during 2014-19.

Notwithstanding these achievements, there are several areas of concern as well which occupy center-stage in the conduct of external sector management. First, merchandise exports have lost momentum under the weight of the slump in world trade. In spite of export volume growth averaging 4.2 per cent during 2013-18 (UNCTAD, 2019), India’s export growth in US dollar terms has weakened – as in a host of emerging and advanced economies - to 2.2 per cent over the same period, as falling unit value realizations have taken their toll. The slowdown in global demand has affected our exports of petroleum products as well – they constitute 14 per cent of total merchandise exports. Second, the deceleration in domestic

Figure 11: Growth Rate of Merchandise Exports and Imports (Per Cent)



Source: Economic Survey 2018-19, Ministry of Finance, Government of India

demand has pulled imports, especially non-oil non-gold imports, into contraction and this has reduced the inflow of intermediates, capital goods and technology that is vital for modernizing our infrastructure and industry. Third, portfolio flows, which on average account for about 23 per cent of external financing in a normal year, have turned highly volatile, with net outflows of US\$ 0.6 billion in 2018-19. During 2019-20 so far (up to September 13, 2019), portfolio equity outflows were of the order of US\$ 1.4 billion but lower than US\$ 2.9 billion in the corresponding period a year ago. Net inflows into the debt market of US\$ 4.1 billion have, however, provided relief. Moreover, these portfolio capital movements have turned out to be conduits of global spillovers, impacting domestic equity, debt and forex markets, and asset prices.

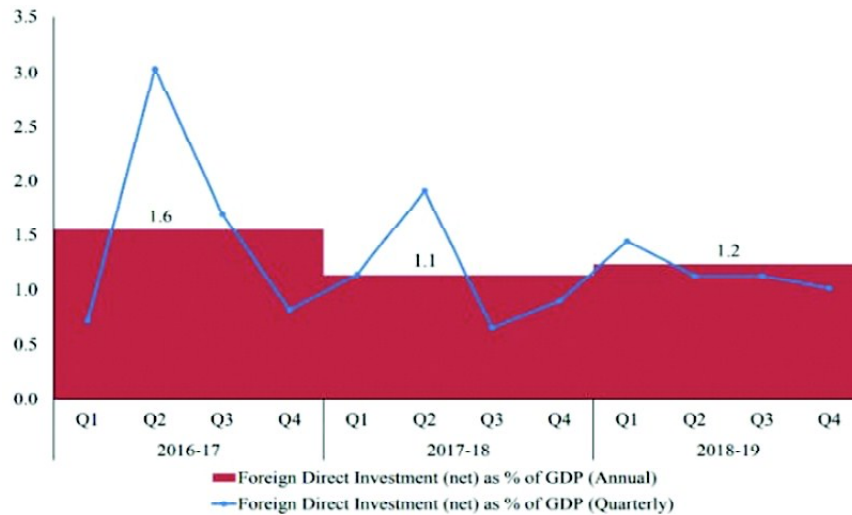
Against this backdrop, Reserve Bank of India and the Government of India took several initiatives to fortify India's external position and improve the capacity of the economy to deal with the headwinds that confront us in these testing times.

Exports hold the key to a sustainable balance of payments position. In the final analysis, liabilities in the form of debt and even equities cannot entirely substitute for foreign exchange earnings from exports of goods and services that create import purchasing power and liability servicing capacity. Over the years, the policy endeavour has been to secure a wide diversification in India's export profile in terms of both products and destinations. In particular, product diversification has enabled India to broaden its export basket relative to BRICS peers and reduce its vulnerability to trade shocks. Apart from diversification, India is now exporting sunrise products like electronics, chemicals and drugs and pharmaceuticals for which demand is expanding at the global level. In the smart phone segment of electronic goods, India has transformed itself from being a net importer to an exporter with the impetus from the phased manufacturing program.

With regard to capital flows, India has adopted an approach marked by progressive liberalization but calibrated to the realities of the domestic situation, including the evolution of financial markets. A diverse range of instruments for managing exchange rate risk for an expanding investor base has come into play. India's hierarchical policy approach – preferring equity flows over debt flows, and preferring FDI flows over portfolio flows within equity flows and long-term debt flows over short-term flows within total debt flows – has influenced the composition of capital flows.

Turning to equity flows, FDI policy has been progressively liberalized across various sectors in recent years to make India an attractive investment destination. Sectors that have been opened up in recent years include

Figure 12: Foreign Direct Investment as a percent of GDP

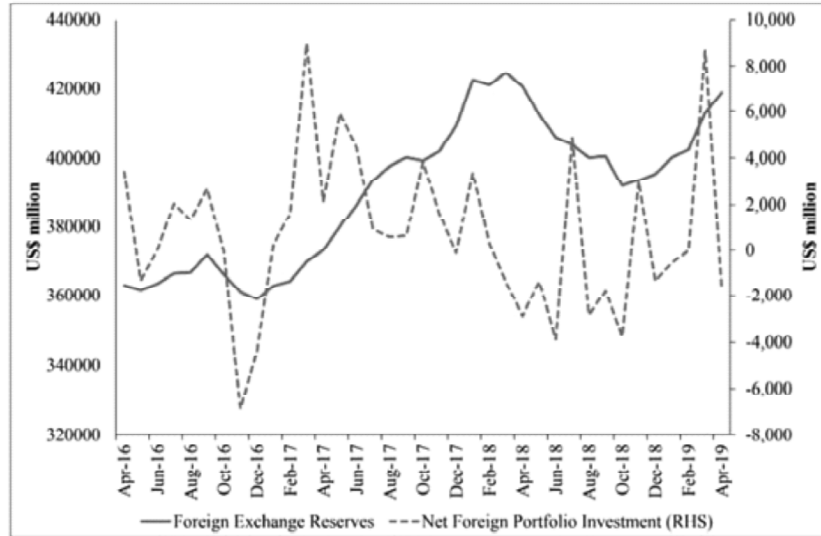


Source: Economic Survey 2018-19, Ministry of Finance, Government of India

defence, construction development, trading, pharmaceuticals, power exchanges, insurance, pensions, financial services, asset reconstruction, broadcasting and civil aviation. 100 per cent FDI has also been allowed in insurance intermediaries. In August 2019, FDI norms in single-brand retail trade have been further liberalized. FDI up to 100 per cent has been permitted under the automatic route in contract manufacturing and coal mining.

With regard to foreign portfolio investment (FPI), several measures have been undertaken to create an investor-friendly regime and to put in place a more predictable policy environment. FPI limits are now being revised on a half yearly basis under the medium-term framework. FPI has been allowed in municipal bonds within the limits set for State Development Loans (SDLs). Greater operational flexibility has been granted to FPIs under a Voluntary Retention Route (VRR) which facilitates investment in G-secs, SDLs, treasury bills and corporate bonds while allowing investors to dynamically manage their currency and interest rate risks. The initial response to the VRR scheme has been encouraging. The Union Budget 2019-20 proposed to ease KYC norms for FPIs and also merge the NRI portfolio route with the FPI route for seamless investment in stock markets. Outward direct and portfolio investment have also been progressively liberalized to give Indian entities a global scan and presence.

**Figure 13: Monthly Movement in Net Foreign Portfolio Investment and Foreign Exchange Reserves**



Source: Economic Survey 2018-19, Ministry of Finance, Government of India

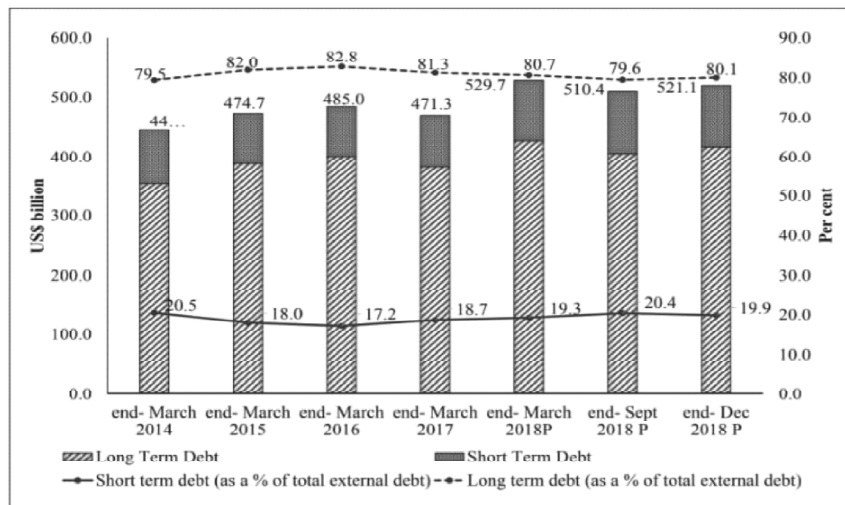
External borrowing norms have also been simplified under two tracks: foreign currency denominated ECBs; and rupee denominated ECBs. The list of eligible borrowers has been expanded to include all entities eligible to receive FDI, registered entities engaged in microfinance activities, registered societies/trusts/cooperatives and non-government organisations. A rule-based dynamic limit for outstanding stock of ECBs at 6.5 per cent of GDP is in place. Rupee denominated bonds or Masala bonds under the ECB route offer an opportunity to domestic firms to borrow from international markets without the need for hedging exchange rate risk. ECBs up to US\$ 750 million or equivalent per financial year are permitted under the automatic route. Recently, end-use restrictions relating to external commercial borrowings have also been relaxed for specific eligible borrowers for their working capital requirements, general corporate purposes and repayment of rupee loans. The mandatory hedging requirement had earlier been reduced from 100 per cent to 70 per cent for ECBs with minimum average maturity period between 3 and 5 years in the infrastructure space. Net disbursement of ECBs rose to US\$ 7.7 billion in April-July 2019, as against net repayments of US\$ 0.8 billion in the corresponding period of 2018-19.

Before concluding, it is only fair to say a few words about the exchange rate of the rupee. Over the last couple of years, the exchange rate has seen

large two-way movements with considerable volatility imparted mainly by global spillovers. During 2019-20 so far, the rupee has traded in a narrow range, with modest appreciation in Q1 giving way to some depreciation in August and the first half of September, accentuated by drone attacks on Saudi oil facilities on September 14, 2019. In its External Sector Report of July 2019, the International Monetary Fund (IMF) has employed a suite of models to assess the alignment of currencies with their fundamentals. For the rupee, the IMF estimates the REER gap to be zero, implying that the currency is fairly valued and broadly in line with fundamentals. India’s exchange rate regime is flexible and market-driven, with the exchange rate being determined by the forces of demand and supply. The RBI has no target or band for the level of the exchange rate. Interventions are intended to manage undue volatility. This is reflected in the two-sided interventions conducted during the past two years – net purchases in 2017-18, followed by net sales in 2018-19. In fact, it is in recognition of this flexibility that the US Department of the Treasury has removed India from its watch list relating to currency manipulation.

Overall, the outlook for India’s external sector is one of cautious optimism, albeit with some downside risks accentuated at this juncture. Among them, deepening of the global slowdown and escalation of trade and geopolitical tensions appear to be the most significant. Volatile international crude prices also continue to pose potential risks to the viability of the current account balance through trade and remittances channels. Yet,

Figure 14: India’s Outstanding External Debt



Source: Economic Survey 2018-19, Ministry of Finance, Government of India

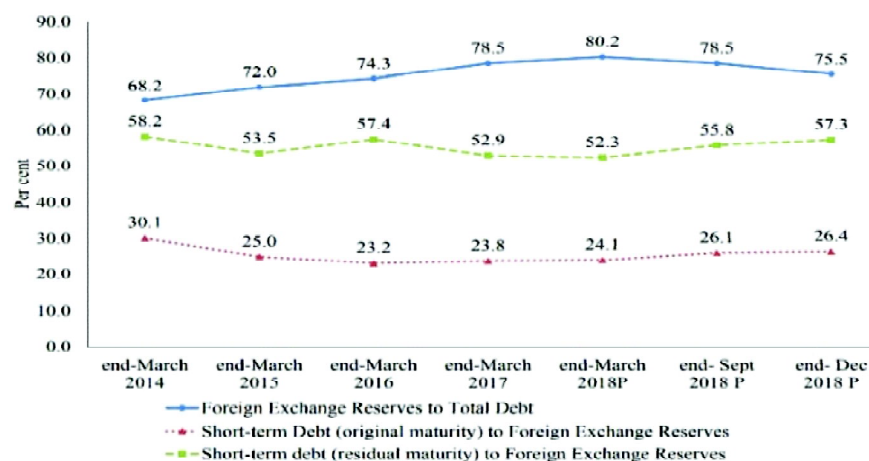
there are underlying strengths that can be built upon to buffer the external sector from these risks. The search for new export markets and new niches must go on so as to reap the benefits of changing dynamics of global value chains. Indian IT companies need to accelerate market diversification and invest in new skills and technologies to hone their comparative advantage. Remittances and non-resident deposits are likely to remain shock-absorbers over the medium term and need to be assiduously cultivated, including by ease of remitting/depositing and reducing transaction costs.

Ultimately, the strength of the external sector derives from domestic macro-fundamentals. Investors and markets need to be credibly assured of our ability to maintain macroeconomic and financial stability through continued focus on these areas. At the same time, we need to persevere with structural reforms in various sectors of the economy to unlock productivity and competitiveness gains. The overarching objective should be to keep the current account deficit within sustainable limits and financed by a prudent mix of debt and equity flows. The global environment is challenging, but it offers opportunities as well. By the IMF's assessment, India will account for a sixth of global growth in 2020. Trade wars are presenting new business relocation avenues that seem to be favorable to India from the point of view of the economies of scale and scope. Indian entrepreneurship, the rupee and our people are progressively but inexorably internationalizing. Since 2018, India's working age population has grown larger than the dependent population, and this demographic advantage is expected to last till 2055.

The external sector position in 2018 was broadly in line with the level implied by fundamentals and desirable policies. India's lower per capita income, favorable growth prospects, demographic trends, and development needs justify running CA deficits. External vulnerabilities remain, as highlighted by bouts of turbulence in 2018. India's economic risks stem from volatility in global financial conditions and an oil price surge, as well as a retreat from cross-border integration. Progress has been made on FDI liberalization, whereas portfolio flows remain controlled. India's trade barriers remain significant.

Whereas the external position is broadly in line with fundamentals, measures to rein in fiscal deficits should be accompanied by efforts to enhance credit provision through faster cleanup of bank and corporate balance sheets and strengthening the governance of public banks. Improving the business climate, easing domestic supply bottlenecks, and liberalizing trade and investment will be important to help attract FDI, improve the CA financing mix, and contain external vulnerabilities. Gradual

Figure 15: Foreign Exchange Reserves and Debt



Source: Economic Survey 2018-19, Ministry of Finance, Government of India

liberalization of portfolio flows should be considered, while monitoring risks of portfolio flows' reversals. Exchange rate flexibility should remain the main shock absorber, with intervention limited to addressing disorderly market conditions.

*Foreign Asset and Liability Position and Trajectory:* As of end-2018, India's NIIP improved to -15.9 percent of GDP, from -17.3 percent of GDP at end-2017. Gross foreign assets and liabilities were 22.2 and 38.1 percent of GDP, respectively. The bulk of assets are in the form of official reserves and FDI, whereas liabilities include mostly other investments (39 percent), FDI (37 percent), portfolio equity (13 percent), and debt (10 percent). External debt amounted to some 20 percent of GDP, of which about half was denominated in US dollars and another 36 percent in Indian rupees. Long-term external debt accounted for about 80 percent of the total. Short-term external debt on a residual maturity basis stood at 43 percent of total external debt and 55.8 percent of FX reserves. With CA deficits projected to continue in the medium term, the NIIP-to-GDP ratio is expected to weaken marginally. The mode rate level of foreign liabilities reflects India's gradual approach to capital account liberalization, which has focused mostly on attracting FDI. India's external debt is moderate compared with other emerging market economies, but rollover risks remain elevated in the short term.

*Current Account:* The CA deficit is estimated to have increased to 2.5 percent of GDP in fiscal year 2018/19 from 1.9 percent of GDP in the previous year, due to higher commodity prices and strong domestic demand in the first half of the fiscal year. Robust export growth continued, supported

by partners' strengthening demand and rupee depreciation. Over the medium term, the CA deficit is expected to remain about 2½ percent of GDP. The EBA cyclically adjusted CA deficit stood at 2.5 percent of GDP in fiscal year 2018/19. The EBA CA regression estimates a norm of -3.4 percent of GDP for India in fiscal year 2018/19, with a standard error of 1.4 percent, thus implying an EBA gap of 0.9 percent. In staff's judgment, a CA deficit of about 2½ percent of GDP is financeable over time. Based on India's historical cash flow and capital inflow restrictions, global financial markets cannot be counted on to reliably finance a CA deficit above 3 percent of GDP. FDI flows are not yet sufficient to cover protracted and large CA deficits; portfolio flows are volatile and susceptible to changes in global risk appetite, as demonstrated in the taper tantrum episode and again in fall 2018. Based on the staff-assessed CA norm, the CA is in line with fundamentals and desired policies, with a CA gap range from -1.0 to 1.0 percent of GDP. Positive policy contributions to the CA gap stem from a negative credit gap and a relatively closed capital account, partly offset by a larger-than-desirable domestic fiscal deficit and a large decline in FX reserves.

*Real Exchange Rate:* The average REER in 2018 depreciated by about 3.8 percent from its 2017 average. As of May 2019, the rupee had appreciated by about 7.7 percent in real terms compared with the average REER in 2018. The EBA REER Index and REER level models estimate a REER gap of 5.4 and 2.5 percent, respectively, for 2018. Meanwhile, the external stability approach estimates a REER gap of about -2.0 percent. Based on the staff-assessed CA gap, the REER gap is assessed to be in the range of -6 to 6 percent for fiscal year 2018/19.

*Capital and Financial Accounts – Flows and Policy Measures:* The sum of FDI, portfolio, and financial derivative flows on a net basis is estimated at 0.8 percent of GDP in fiscal year 2018/19, down from 2 percent in fiscal year 2017/18. Net FDI inflows remained unchanged at 1.3 percent of GDP in fiscal year 2018/19, despite investor-friendly reform efforts that could have attracted more investment. Bouts of both equity and debt outflows, especially in the spring and fall of 2018, brought net portfolio flows into negative territory (by 0.5 percent of GDP) in fiscal year 2018/19. Yearly capital inflows are relatively small, but, given the modest scale of FDI, flows of portfolio and other investments are critical to finance the CA. As evidenced by the episodes of external pressures, portfolio debt flows have been volatile, and the exchange rate has been sensitive to these flows and changes in global risk aversion. Attracting more stable sources of financing is needed to reduce vulnerabilities.



*FX Intervention and Reserves Level:* The authorities responded to market pressure in fall 2018 with a combination of exchange rate flexibility and FX intervention. Spot foreign exchange sales were US\$26 billion (1 percent of GDP) and net forwards decreased by US\$31.5 billion in 2018. International reserves stood at \$411.9 billion at end-March 2019, down by about \$12.5 billion from March 2018. Reserve coverage currently is about 15.2 percent of GDP and about 6.7 months of prospective imports of goods and services. Reserve levels are adequate for precautionary purposes relative to various criteria. International reserves represent about 155 percent of short-term debt and 149 percent of the IMF's composite metric.

India is presently known as one of the most important players in the global economic landscape. Its trade policies, government reforms and inherent economic strengths have attributed to its standing as one of the most sought-after destinations for foreign investments in the world. Also, technological and infrastructural developments being carried out throughout the country augur well for the trade and economic sector in the years to come.

Boosted by the forthcoming FTP, India's exports are expected reach US\$ 750 billion by 2018-2019, according to Federation of India Export Organization (FIEO). Also, with the Government of India striking important deals with the governments of Japan, Australia and China, the external sector is increasing its contribution to the economic development of the country and growth in the global markets. Moreover, by implementing the FTP 2014-19, by 2020, India's share in world trade is expected to double from the present level of three per cent.

## **POLICY CHALLENGES**

Against a backdrop of escalating trade tensions, greater urgency is needed in tackling persistent excess imbalances. Even though overall imbalances have come down, they still show strong persistence and little rotation between deficit and surplus economies, and the sum of creditor and debtor positions is at record levels. Faced with the risks of escalating trade tensions, stronger commitments to tailored macro structural policies and to further trade liberalization are essential to support a more sustainable rules-based multilateral trading system.

Policies that distort trade should be avoided. Specifically, countries should refrain from using tariffs to target bilateral trade balances, as they are costly for global trade, investment, and growth, and are generally not effective in reducing external imbalances.

Similarly, managed trade agreements are a very costly means to influencing bilateral trade relationships and they introduce distortions to the global trading system without necessarily addressing aggregate saving and investment imbalances. Instead, efforts should be concentrated on reviving liberalization efforts and modernizing the multilateral rules-based trading system to capture the increasing importance of e-commerce and trade in services, strengthen rules in areas such as subsidies and technology transfer, and assure continued enforceability of World Trade Organization (WTO) commitments through a well-functioning WTO dispute settlement system.

With most economies operating near potential, carefully calibrated macroeconomic policies to reduce excess external imbalances remain essential. In general, excess surplus economies should make use of available fiscal space to boost potential growth while reducing over reliance on accommodative monetary policies.

In the euro area, where accommodative monetary conditions remain necessary to support the return of area-wide inflation to its target, fiscal policy in key credit or economies could be used to boost potential growth through infrastructure investments and greater support for innovation (Germany, Netherlands). In Germany, where the current account surplus has been associated with rising top income inequality, further tax relief for low-income households could boost their disposable income and support domestic demand, while property and inheritance tax reform could help reduce excess saving and wealth concentration.

Meanwhile, excess deficit countries should adopt gradual growth-friendly fiscal consolidation while allowing monetary policy to be guided by inflation developments and expectations (United Kingdom, United States). In some cases, macroprudential policies may need to be tightened to help slow excessive credit growth, especially in the real estate sector (Canada).

Structural reforms have a key role to play in addressing persistent external imbalances while boosting potential growth. Boosting potential growth and achieving rebalancing will require policies that incentivize higher levels of private investment, particularly in those countries where demographics are weighing on potential growth and reducing incentives for domestic investment. While, in general, removing structural policy distortions is a desirable policy goal, careful sequencing of structural reforms are needed to achieve sustained global rebalancing in a growth-friendly fashion, particularly since reform payoffs are often gradual and fully materialize only in the medium term.

Excess surplus economies should prioritize reforms that encourage investment by incentivizing research and development spending, ensuring financing for investment in innovative activities (for example, by increasing access to venture capital), and deregulating the service sector (Germany, Korea). Steps should also be taken to discourage excessive saving by expanding the social safety net (Korea, Malaysia, Thailand) and prolonging working lives (Germany). The ongoing gradual realignment of price competitiveness in euro area surplus countries could be supported by policies that incentivize stronger wage growth to facilitate an internal revaluation and rebalancing. Moreover, at the euro area level, efforts to further strengthen banking, fiscal, and capital market integration would help support investment while improving the resilience of the currency union.

Excess deficit economies should focus on reforms that boost saving and competitiveness. Greater efforts are needed to strengthen the skill base of workers (Canada, Indonesia, South Africa, Spain, United Kingdom, United States). In some cases, increasing saving requires safeguarding the sustainability of public pension systems (Spain) and strengthening the depth and inclusion of financial systems (Indonesia, South Africa). Resource-rich economies should accelerate their efforts to diversify export markets and strengthen productivity in non-oil sectors (Canada, Saudi Arabia). Even where external positions are assessed to be broadly in line with fundamentals, policies are necessary to tackle domestic imbalances and avoid a resurgence of external imbalances. Former excess surplus countries (China, Japan) should address domestic imbalances by gradually reducing vulnerabilities from high levels of public debt and/or excessive credit while engaging in reforms that ease entry barriers in certain sectors and strengthen the safety net, where relevant. Former excess deficit countries (Brazil, France, Italy) should both improve their business climate and ease impediments to credit and investment while also increasing saving and competitiveness by strengthening public finances and increasing human capital investment.

There is a growing need to better understand and address high and rising levels of corporate saving in some advanced economies. While the rise in net corporate saving has been a common phenomenon across many advanced economies, predating the global financial crisis, it has been especially noticeable in a group of surplus economies (such as Germany, Korea, Japan, Netherlands) where higher levels of corporate saving was not offset by lower household saving at the aggregate level. Although further analysis is needed, especially at the country level, findings imply that tax and structural policies that encourage domestic demand, and

support higher labor compensation and disposable income of lower-income households, may have a role to play.

Exchange rate flexibility remains key to supporting external adjustment, despite varying effects across countries and over time. Although evolving features of international trade—including dominant currency invoicing and global value chain integration—may alter the mechanisms of external adjustment in the short term, conventional exchange rate channels regarding trade flows remain at play in the medium term. The sluggish short-term export response to the exchange rate points to the need to support exchange rate flexibility with other macroeconomic policies in the near term. Meanwhile, structural policies could boost exchange rate mechanisms.

These include measures to improve export infrastructure, expand access to export credit, and lower regulatory barriers and red tape—all of which tend to be more binding for small and medium-sized enterprises.

Vulnerabilities associated with rising external liability positions need to be addressed. While net foreign currency-denominated external debt has fallen since the early 2000s for emerging market and developing economies as a whole, overall gross external debt and gross external financing needs have increased in most these economies, reaching record highs, both as a share of their own GDP and global GDP. This rapid rise of gross external indebtedness by sovereigns and corporates of emerging market and developing economies, as well as of some advanced economies, warrants careful monitoring, especially of currency and maturity mismatches.

Special attention should be given to (1) reducing foreign-currency-denominated debt through targeted macro prudential policies; (2) encouraging more inward direct investment by ensuring equal treatment of domestic and foreign investors (Argentina, India, Indonesia); (3) deepening financial markets, including aiding the development of foreign exchange hedging instruments (Indonesia); and (4) closely monitoring activities of the less regulated nonbank financial sector. In some cases, foreign exchange intervention might be necessary should disorderly exchange rate movements threaten economic and financial stability.

Finally, continued efforts are required to strengthen the analysis of global imbalances, including to account for the growth and complexity of cross-border flows and positions. The assessment of external positions will continue to evolve, drawing on the latest advances in the literature and lessons learned in the implementation process. In this regard, a better understanding of the risks from growing stock imbalances and their shifting

composition is of essence. Moreover, data collection efforts need strengthening to account for the rising cross-border activities of multinationals, as the boundaries between residents and nonresidents, and the corresponding attribution of income across countries, have become blurred. These issues are particularly relevant for financial centers (countries with large gross assets and liabilities) and tax havens (whose statistics are disproportionately affected by profit-shifting practices). Rigorous, even handed, and multilaterally consistent analysis of external positions remains key to promote growth-friendly policy actions by both excess surplus and deficit countries to rebalance the global economy.

### **CONCLUSIONS AND POLICY IMPLICATIONS**

The increasing complexity of international trade requires a granular analysis of cross-country linkages and exchange rates to understand the dynamics of external adjustment. As countries price their trade in currencies other than those of immediate trading partners or become more integrated into global value chains, the set of exchange rates that can impact a country's external position becomes more difficult to identify and the composition and dynamics of external adjustment change. Where dominant currency invoicing is pervasive, traditional metrics of effective exchange rates—which focus on currencies of trading partners rather than invoicing currencies—may be less informative to understand short-term adjustment dynamics, although they remain relevant to shed light on medium-term dynamics. Thus, competitiveness metrics that take invoicing currencies into account would complement traditional metrics well. Similarly, with high integration into global value chains, exchange rates vis-à-vis immediate trading partners become less relevant, while other downstream and upstream exchange rates become more relevant. In addition, the traditional view that a country competes with trading partners may not fully reflect value chain complementarities, especially if supply chains are rigid as suggested by the data. Thus, taking into account input linkages would be a valuable refinement to existing effective exchange rates measures, particularly for some small economies that are highly integrated into global value chains. Given that data limitations remain an obstacle in many cases, improved data collection efforts are essential.

Exchange rate flexibility may need to be supported with other policies. The findings suggest that exchange rate changes have muted effects on the trade balance in the short term, including because of the limited response of export volumes. Thus, where external deficits are excessive, achieving meaningful near-term external adjustment may require larger exchange rate

movements—which may have adverse balance sheet effects and feed into inflation—and/or tighter macroeconomic policies. Even in cases with no evident external imbalances, weak near-term buffering effects of exchange rates suggest that other policy tools may be needed to achieve full employment in the event of a negative shock.

Exchange rate mechanisms can be strengthened with structural policies. Price stickiness in dominant currencies partly reflects frictions that limit exporters' responses to exchange rate movements, including capacity constraints. For example, firms may choose to price trade and maintain those prices in US dollars despite exchange rate movements when capacity constraints prevent them from reaping the benefits of expanding sales by lowering US dollar prices. Thus, the benefits of exchange rate flexibility could be bolstered by macroeconomic and structural policies that alleviate such capacity constraints, including through improved access to credit and transportation infrastructure.

Overall, exchange rate flexibility remains key to facilitating external adjustment. While the analysis indicates that the features of international trade studied in this chapter may affect the composition and strength of exchange rate effects in the short term, it also indicates that the conventional exchange rate mechanisms are present in the medium term. Thus, while other temporary policies may be needed to support exchange rate flexibility in the near term, these should not be thought of as substitutes for exchange rate flexibility, which remains a key mechanism to facilitate durable external adjustment.

## **FUTURE CONSIDERATIONS**

Understanding the choice of invoicing currencies and the associated price stickiness, as well as the intrinsic rigidities of global value chains, is key to the design of policy responses. The analysis in this chapter considered currency of invoicing and global value chain participation as exogenous features of international trade. Pricing strategies likely depend on the extent of integration into global value chains, and both these features of international trade reflect multilayered decisions shaped by numerous country features, including expectations about exchange rate policies. A deeper analysis of the factors that shape these decisions is necessary for a fuller view on optimal policy design.

Other country characteristics and fundamentals can have bearing on how exchange rates affect the external adjustment process. Understanding whether this paper's findings on manufacturing trade apply to services trade (such as tourism)—which relies more on non-tradable inputs—is

essential to a fuller picture of the process of external adjustment for some countries. In addition, external balance sheet vulnerabilities mentioned earlier can also play a role in shaping the workings of exchange rates in the adjustment process. Further efforts are necessary to integrate empirically these additional trade and financial features.

## REFERENCES

- Amiti, Mary, Oleg Itskhoki, and Jozef Konings. (2014). "Importers, Exporters, and Exchange Rate Disconnect." *American Economic Review* 104 (7): 1942–978.
- Bayoumi, Tamim, Maximiliano Appendino, Jelle Barkema, and Diego A. Cerdeiro. (2018). "Measuring Competitiveness in a World of Global Value Chains." IMF Working Paper 18/229, International Monetary Fund, Washington, DC.
- Bayoumi, Tamim, Jelle Barkema, and Diego A. Cerdeiro. Forthcoming. "The Inflexible Structure of Global Supply Chains." IMF Working Paper, International Monetary Fund, Washington, DC.
- Bayoumi, Tamim, Mika Saito, and Jarkko Turunen. (2013). "Measuring Competitiveness: Trade in Goods or Tasks?" IMF Working Paper 13/100, International Monetary Fund, Washington, DC.
- Bems, Rudolfs. (2014). "Intermediate Inputs, External Rebalancing, and Relative Price Adjustment." *Journal of International Economics* 94 (2): 248–62.
- Bems, Rudolfs, and Robert C. Johnson. (2017). "Demand for Value Added and Value-Added Exchange Rates." *American Economic Journal: Macroeconomics* 9 (4): 45–90.
- Borin, Alessandro, and Michele Mancini. (2019). "Measuring What Matters in Global Value Chains and Value-Added Trade." Policy Research Working Paper Series 8804, World Bank, Washington, DC.
- Boz, Emine, Eugenio Cerutti, and Evgenia Pugacheva. Forthcoming. "Dissecting the Global Trade Slowdown: A New Database." IMF Working Paper, International Monetary Fund, Washington, DC.
- Boz, Emine, Gita Gopinath, and Mikkel Plagborg-Møller. (2018). "Global Trade and the Dollar." VOX, CEPR Policy Portal, Center for Economic and Policy Research, Washington, DC.
- Casas, Camila, J. Federico Diez, Gita Gopinath, and Pierre-Olivier Gourinchas. (2017). "Dominant Currency Paradigm: A New Model for Small Open Economies." IMF Working Paper 17/264, International Monetary Fund, Washington, DC.
- Cheng, C. Kevin, Sidra Rehman, Dulani Seneviratne, and Shiny Zhang. (2015). "Reaping the Benefits from Global Value Chains." IMF Working Paper 15/204, International Monetary Fund, Washington, DC.
- De Soyres, Francois, Erik Frohm, Vanessa Gunnella, and Elena Pavlova. (2018). "Bought, Sold, and Bought Again: The Impact of Complex Value Chains on Export Elasticities." Policy Research Working Paper 8535, World Bank, Washington, DC.
- Duval, Romain, Kevin Cheng, Kum Hwa Oh, Richa Saraf, and Dulani Seneviratne. (2014). "Trade Integration and Business Cycle Synchronization: A Reappraisal with Focus on Asia." IMF Working Paper 14/52, International Monetary Fund, Washington, DC.

- Duval, Romain, Nan Li, Richa Saraf, and Dulani Seneviratne. (2016). "Value-Added Trade and Business Cycle Synchronization." *Journal of International Economics* 99 (C): 251–62.
- Economic Survey (2018-19). Ministry of Finance, Government of India.
- Goldberg, Pinelopi Koujianou, and Rebecca Hellerstein. (2008). "A Structural Approach to Explaining Incomplete Exchange Rate Pass-Through and Pricing-to-Market." *American Economic Review* 98 (2): 423–29.
- Gopinath, Gita. "The International Price System." (2015). NBER Working Paper 21646, National Bureau of Economic Research, Cambridge, MA.
- Head, Keith, and Thierry Mayer. (2014). "Gravity Equations: Workhorse, Toolkit, and Cookbook." In *Handbook of International Economics* 4:131–95.
- Johnson, Robert C., and Guillermo Noguera. (2014). "Fragmentation in Trade Value Added over Four Decades." NBER Working Paper 19186, National Bureau of Economic Research, Cambridge, MA.
- Leigh, Daniel, Weicheng Lian, Marcos Poplawski-Ribeiro, Rachel Szymanski, Viktor Tsyrennikov, and Hong Yang. (2017). "Exchange Rates and Trade: A Disconnect?" IMF Working Paper 17/58, International Monetary Fund, Washington, DC.
- Pesaran, M. H., Y. Shin and R. P. Smith. (1999). "Pooled Mean Group Estimation of Dynamic Heterogeneous Panels," *Journal of the American Statistical Association* 94 (446): 621–34.
- Organisation for Economic Co-operation and Development (OECD). (2018). "Trade Policy Implications of Global Value Chains." OECD Trade Policy Brief, Paris.
- Timmer, Marcel P., Erik Dietzenbacher, Bart Los, Robert Stehrer, and Gaaitzen J. de Vries. 2015. "An Illustrated User Guide to the World Input–Output Database: The Case of Global Automotive Production." *Review of International Economics* (23): 575–605.