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Indo-China Trade in the Period of Trade Liberalization: A study on the composition, nature and balance of trade[ϒ]

Subhasis Santra[♣]

Joydeb Sasmal[♦]

The nature and composition of bilateral trade between India and China has changed significantly during the last three decades. In 1980's both these countries exported primary and resource based products to each other. With the passage of time China has made a drastic change in the composition of its export to India. At present majority of its exports comprise of sophisticated and technology intensive products. India's exports to China, on the other hand, are still dominated by primary and resource based products. Except some initial years (1991 and 1992), India has suffered from an increasing trade deficit with China every year since the adoption of trade liberalization in 1991. A number of policies have been adopted by both the countries for better performances in their bilateral trade. The time series econometric analysis of this paper reveals that policies adopted by China, such as FDI policy; reduction of tariff rates and change in exchange rate are found to be more effective to determine the trade flows between these two countries than the policies adopted by India during the last three decades of trade liberalization.

Keywords: Trade policies, FDI, Exchange Rate, Trade balance.

JEL Classification: F14, F40

1. Introduction

India and China, the two most prospering countries in Asia, is the centre of attraction in foreign trade arena now-a-days. Historically, the most significant years for these two countries are 1947, the year of India's independence, and 1949, when People's Republic of China was established. Initially, both of them were very

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[♣] Department of Economics with Rural Development, Vidyasagar University, Midnapore (W) 721102, West Bengal, India. E-mail: subhasissantra71@gmail.com

[♦] Department of Economics with Rural Development, Vidyasagar University. E-mail: joydebsasmal@yahoo.co.in

restrictive in their foreign trade policies. Strict restrictions on imports were imposed and at the same time import substitution policies were adopted with an objective to achieve self sufficiency. Eventually, they felt the importance of opening up their economies for the better performances in foreign trade. As a result, China adopted the trade liberalization policy in 1978 and India in 1991, more than a decade later than China. Direct controls on trade were replaced by indirect instruments like tariffs and non-tariff barriers, to regulate the flow of imports and exports. In 1995 the World Trade Organization (WTO) was established with an objective of trade cooperation among the member countries. India is one of the founder members of WTO, whereas China became the member of this organization in 2001.

Continuous reduction in import tariff has been one of the frequently used instruments of trade liberalization by both these countries. After liberalization, India has reduced its average tariff rate more aggressively than China. In 1991 the simple average import tariff rate imposed by India was 124.25% which has been reduced by almost twelve times in 2017 to 10.53% (WITS). China on the other hand reduced its average tariff rate by five times (from 44.10% to 8.68%) during the same period. However, the average tariff rate in China always has been lower than that in India. A second policy instrument adopted by India and China is to encourage foreign enterprises to invest in their land. In this regard China has succeeded to attract massive FDI in last three decades. On the other hand, when compared with China, India has failed to attract a large volume of FDI due to a number of reasons. In 2017, FDI in India was only 39.96 billion dollar (World Bank) as against 166.08 billion dollar in China. Exchange rate policy is another instrument applied intensively by these two countries after liberalization to foster exports. Both India and China have depreciated their nominal effective exchange rates (NEER) on an average during this period. In real terms, Indian currency lost about 52% (computed from World Bank data) and that of China lost almost 76% of its value between 1988 and 2017. So, the rate of depreciation in currency was also faster in China compared to India. Many other trade liberalization policies were adopted along with these for the better performances in foreign trade by these two countries.

In the past three decades the importance of foreign trade has increased enormously in these two countries. In 1988 the trade to GDP ratio of India and China was 11% and 7% (computed from World Bank data) respectively which became 28% for India and 34% for China in 2017. Per capita GDP of these two countries has increased many times during this period with a superior performance by China. India's per capita GDP increased by more than 5 times (from 361.5 dollar in 1988 to 1981.49 dollar in 2017) whereas, China recorded a 31 times increment (from 282.1

dollar in 1988 to 8759.04 dollar in 2017) in the same period. Although, the global exports by these two countries in 1988 were almost same (13.87 billion dollar for India and 14.25 billion dollar for China), the difference has become very large in 2017. In this year China's export to the world was 2263.37 billion dollar (WITS) which is 8 times more than that of India (294.36 billion dollar). The share of India in world export has increased from 0.93% in 1991 to 1.65% in2017. During the same period China's share in world export has increased from 3.01% to 12.71%. Interestingly, the share of USA in world export has come down from 22% in 1991 to 9% in 2017 (WITS). These figures indicate the magnitude of success of China in international trade in the period of liberalization. China's export growth has been accompanied by tremendous growth in product variety and changes in composition of exported commodities. It is estimated that China will become the world's top exporter by the beginning of the next decade owing to the attractiveness of FDI, a high domestic saving rate, improvements in productivity and a significant surplus of labour (OECD 2005). Two factors need to be mentioned here in respect of China's edge over India in growth and trade. Firstly, the political systems in two countries are different. China, being a communist country can regulate everything easily and take bold decisions favourable to FDI, land acquisition, technological development, labour cost and trade policies. But India is a democratic country. It has many constraints, legal barriers and policy problems. Naturally, China is definitely in a better position than India in respect of growth and foreign trade. Secondly, China has started its economic reform and trade liberalization more than one decade earlier than India. The exposure and experience of China for starting earlier have created positive externality in future growth. Another point to be noted here is that technological process has played a crucial role in China's growth in income and trade. Research and development expenditure on technological innovations, the policy of technological progress, transfer of technology from advanced countries along with FDI and in other forms, have largely helped China's advancement. In terms of geographical orientation of goods and services exports in recent years India has registered an increment in its shares in all partner countries' markets but these shares remain relatively small and concern a few low-technology products (Kowalski [2008]).

As a trading partner, the importance of both these countries to each other has increased over time. China's share in India's total trade with the world was only 0.42% in 1988 which has grown up to 11.43% (computed from WITS data) in 2017. With the advancement of time, China's share in India's total imports from the world has grown at a faster rate than the share of China in India's total exports to the world. As a result, India has suffered from deficit in trade balance with China in

almost all the years during this period. The deficit was moderate till 2005 but from 2006 onwards it has accelerated at a very fast rate to reach a huge 59.43 billion dollar in2017. Factors responsible for this persistent trade deficit of India are to be identified and for this; a detailed analysis of pattern of trade, changes in composition of trade over time and prospects in trade of these two countries is needed.

With this background, the objective of this paper is to examine the changes in trade policy and their impact on the nature and composition of trade and the balance of trade between India and China in the period of trade liberalization.

This paper has been arranged as follows: A brief review of literature has been given in section 2. Section 3 describes the methodology and data used in this paper. Section 4 analyses the changes in nature and composition of trade between these two countries. Section 5 deals with the changes in the trade policies of two countries and their impact on their bilateral trade.

2. Review of Literature

2.1 Important findings from recent studies

Historically, China is a labour abundant and capital scarce country. Prior to 1978 China's commodity trade was determined almost entirely by economic planning. The State Planning Commission's import plan covered more than 90 percent of all imports in China. The export plan was similarly comprehensive, specifying the physical quantities of more than 3,000 individual commodities. This system not only depressed the overall volume of trade, it also distorted the commodity composition of foreign trade, particularly on the export side. Rather than concentrating on labor-intensive goods, China exported significant quantities of capital-intensive goods. By the end of the 1990s this system of foreign trade was largely abandoned. Most of the trade was decentralized and increasingly market determined (Lardy [2003]).

Although China and India share generally similar historical economic development paths, China adopted an export-oriented strategy in 1978. India adopted the export-promotion development strategy more than a decade later in 1991. One outcome of this timing difference in policy enactment is India's smaller base of exports today, both relative to the size of its economy and to the world export market (Tian and Yu [2012]).

India's exports are frequently of capital and skill-intensive goods, while China has emphasized exports of labor-intensive goods-although these are increasingly sophisticated (Rodrik [2006]). While in both China and India the share of agriculture in GDP has been declining, its place has been taken primarily by manufacturing in China and by services in India (Kowalski [2008]). Within manufactures, China has relied heavily on exports of finished goods, while India has focused much more on exports of intermediate inputs. Majority of India's imports (between 72% and 100%) are not imported for domestic consumption but, rather, are used as intermediate inputs by the domestic manufacturing and services sectors (Kowalski [2008]). India's demographic structure is an asset for promoting growth but it can only do so if the young are educated and trained (Wei and Balasubramanyam [2015]). The age dependency ratio in India is higher than that in China at present because of the relatively high proportion of non- working young and not the non- working old people.

China has double role in international market – first it attracts inputs from the East and South East Asia and secondly pushes the products in international market with a comparative advantage in price competition (Dinda, 2011). One of the driving forces behind the rapid expansion of China's exports over the past three decades is the successful implementation of duty drawback system that supports China's export processing programme (Lardy [2003]). The duty drawback system rebates import duties on raw materials, parts and components which are used for export processing, allowing export processing to take place at world prices. The ratio of imports for processing to total imports increased from about 35 percent of all imports in the early 1990s to about 50 percent by 1997 and has remained at about that level since then (Prasad [2004]). Another important development in China's trade composition is the rising share of domestic content in the processing trade, which is particularly significant for Machinery and Textiles. Imported equipment was replaced by domestic products indicating a higher domestic value contribution in the production chain. From India's point of view, these shifts in Chinese exports can result in further increase in high value imports from China and can also restrict India's export opportunities (Raju [2014]).

Change in the commodity composition of China's export basket over time is another determining factor of China's better performance in trade. China exported primarily agricultural products, petroleum, and petroleum products in the early years of reform. Later China shifted increasingly into manufactured goods, particularly light manufactures. More recently China has become an important location for the assembly of consumer electronics, computers and other information technology

products. While some of these goods have a high tech appearance, the high value parts and components are mostly imported and the assembly of the final goods in China is relatively labor intensive (Lardy [2003]).

In course of time, China's export base has also become diversified from heavy reliance on textiles and other light manufacturing. In the early 1990s, light manufacturing accounted for more than 40 percent of China's exports. These products largely consisted of footwear, clothing, toys, and other miscellaneous manufactured articles. In recent years, China has made substantial gains in other export categories, including more sophisticated electronics (office machines and automated data processing equipment, telecommunications and sound equipment, and electrical machinery), furniture, travel goods, and industrial supplies (Prasad [2004]).

There has been a continuous increment in India's demand for the Chinese products in the past two decades. An increasing number of Indian companies are sourcing their supplies from China. This is mainly due to relatively cheaper prices of products, acceptable quality and prompt delivery. Most of the Indian manufacturing companies buy inputs from China to use in the manufacturing processes to make their products cost competitive. Low prices are the main consideration in imports from China (Bhat et al. [2006]).

China's global pattern of export is similar to its bilateral exports to India. Constant up-gradation of technology, product development, constant rise in R&D expenditure and indigenization of foreign technology accompanying FDI are the important factors for the structural transformation taking place in Chinese export. India's exports to China are mostly resource-based and labour intensive in nature, though some of them are partially technology intensive. Advanced and medium technology products dominate the China's global import basket. To enhance trade complementarities with China, India needs to diversify export products towards these technology-oriented products (Bhat et al. [2006]). China is heavily dependent on the imports of parts and component to support its export sector. In the process, several countries/regions are emerging as dominant suppliers to China. Most of the ASEAN countries are beneficiaries from this sector as exporters despite their weak competitive position in some product segments. In several lines of products in this sector, India can emerge as an efficient supplier to China.

China is one of the largest recipients of FDI in the world. With the combination of China's low-cost labor and low-cost foreign capital and intermediate inputs,

manufacturing in China is economically highly efficient. The foreign invested enterprises (FIE's) played a significant role in export expansion of China. The share of MNCs in exports is over 50 per cent in case of China as compared to mere 3 percent for India (Bhat, Guha and Paul [2006]). FDI had not only compensated a shortage of capital in China but also induced high economic growth through domestic investment. More than 50 per cent of investment in China consisted of self-financing by enterprises including that made by state-owned enterprises. The high investment rate in the country was more than fully supported by an increase in domestic savings. The Chinese government assured certain key conditions for profitability such as low taxes, reliable infrastructure, adequate power, decent logistics for imports and exports. Conducting international trade is easier in China than in India in terms of cost to export/import, number of documents required, and time to import. Significantly greater improvement in labor productivity within China as against India is also responsible for better performances in trade by China. Technology is another important factor for both production and exports of China as technology embodied FDI and the domestic innovation system have contributed to the growth of product development for exports (Fu and Balasubramanyam [2005]).

A number of capital account reform measures have been undertaken by India after 1991, which considerably liberalized FDI inflow in the country. However, owing to Indian indirect taxes and transportation infrastructure FDI flows has been lower with respect to the Chinese experience. It is observed that primary sector consistently shows a very meager share in total FDI inflow. In comparison with the primary sector, manufacturing sector has enjoyed a better FDI attractiveness. However, service and the related sector remains the most attractive destination for FDI inflow in India (Mukherjee, Chakraborty and Sinha [2013]). FDI inflow into India focuses mainly on sectors such as infrastructure, power, capital goods and food processing. Among these sectors, many of them do not fall under export activities and have little impact on India's exports (Bhat, Guha and Paul [2006]).

India has gone a long way in reducing its tariffs on non-agricultural products as well as certain non-tariff barriers but moderate protection still persists which likely adds to the costs of intermediate inputs and, thus, to the hurdles faced by the Indian manufacturing sector. In general, tariffs in China are lower than those in India particularly, for India's major export items such as ores, pharmaceutical products, plastics, manmade staple fibers, and iron and steel. India started its comprehensive trade policy reforms one and a half decades later than China, and therefore, the tariff regime in China was much more liberal than in India. The non-tariff barriers and informal restrictions in China are of greater concern. Indian industry and business

organizations have identified some constraints in promoting their exports to China, for example: customs procedures, standards, certification and regulatory practices, and quantitative restrictions. In both the countries, agriculture is relatively protected and the manufacturing sector is subject to unilateral liberalization. While all the sectors in agriculture are subject to double digit import weighted tariff in both the countries, China is seen as being more liberal than India in this sector. In the manufacturing sector, on the other hand, India has a more liberalized regime compared to China. Trade liberalization unilaterally or on a reciprocal basis should be made gradual, and sequencing of sectoral liberalization is required based on sensitivity of sectors. Time is not yet appropriate to move towards 'zero tariff' regime in the manufacturing sector. As India and China are almost at similar levels of tariff regimes, further tariff liberalization may not be a critical negotiating point for India in order to secure better market access in China (Mohanty [2014]). Tariff does not seem to emerge as a major constraint for India's exports to China, except for agricultural products. Each product is subject to a number of non-tariff barriers that cover Import licensing and Inspection, Registration of environmental management, labeling requirements etc. In addition to tariff, agricultural products are subject to Food safety law, Quarantine measures, Food additive standards, MRL standards etc (Raju [2014]).

The nominal effective exchange rate (NEER) measuring the value of country's currency relative to the currencies of principal trading partners depreciated by India on a yearly basis till 2004-05 but appreciated in 2005-06. In China, the state fixed the exchange rate at an overvalued level in the pre-reform era to implicitly subsidize the import of high priority capital goods that could not be produced domestically. Beginning in the early 1980s the state gradually modified this feature of the foreign exchange system. The government substantially devalued the domestic currency from a nominal exchange rate of RMB1.5 to the dollar at the outset of reform to RMB 8.7 in 1994. In real terms China's currency lost just over 70 percent of its value between 1980 and 1995 (Lardy [2003]).

2.2 Theoretical foundation

The text book arguments of trade theory explains when a gainful trade is possible between two countries and examine how the volume of trade and trade balance are influenced by changes in tariff rates and foreign exchange ratios. The movement of capital along with technology transfer across countries and their impact on economic growth, balance of payments and trade patterns are also explained by economic arguments. The Ricardian theory of international trade suggests that the

basis of trade is comparative advantage. In the simple form of the theory, Ricardo assumes a two-country two-commodity (2×2) model with labour as the only factor of production. Suppose, the countries are A and B and the commodities are *X* and *Y*. P_X and P_Y are prices of *X* and *Y* respectively. With fixed coefficient production function, the relative price of *X* is (P_x/P_y). According to this theory a gainful trade is possible between the countries, if the relative price of *X* in the two countries is different. That is, if $(Px/P_y)^A \neq (P_x/P_y)^B$ there will be gainful trade. If, $(P_x/P_y)^A < (P_x/P_y)^B$, the country A has comparative advantage in the production of *X* and it will export *X* in exchange for *Y*. Here, in Ricardian model, relative price is different due to difference in production technology in the two countries. The Ricardian theory, in its generalized form (2×2×2) assumes two factors – labour and capital in the production function. The production functions are:

$$X = X(K, L) \text{ and } Y = Y(K, L)$$

The production possibility frontier (PPF) or transformation curve is drawn from optimum allocation of factors in production in each country. The domestic prices in the two countries $(P_x/P_y)^A$ and $(P_x/P_y)^B$ are determined by PPF and indifference curves indicating the taste of the country. Identical taste is assumed in the two countries. Here again, if prices are different, there will be gainful trade and the pattern of trade will be determined by the theory of comparative advantage. In generalized model also, the difference in production technology in the two countries makes the difference in price, comparative advantage and the pattern of trade (Caves, Frankel and Jones [2004]; Krugman and Obstfeld [2000]).

In Heckscher-Ohlin (2×2) model, factor abundance determines the comparative advantage and pattern of trade. Two factors are: capital and labour. According to physical definition, the ratio of two factors (K/L) indicates the factor abundance in a country. If the value of (K/L) is high, the country is capital abundant. In price definition, the ratio of the factor prices (w/r) indicates factor abundance in a country. If (w/r) is low, it means that labour is relatively cheaper than capital in the country. So, the country is labour abundant. The factor intensities in production of the two goods are different but they are same in the two countries. The taste is also identical in two countries. Given these specifications, if a country (say country A) is labour abundant and X is a labour-intensive good, then the country A will have comparative advantage in labour-intensive good *X* and it will export *X*. The same logic will be applicable for capital intensive good in a capital abundant country. In the present context, it follows that technology, efficiency in production and factor abundance (i.e., cheaper factor supply) will determine the nature and volume of

trade. These will also explain the situation of trade balance (Bhagawati and Srinivasan [1983]; Caves, Frankel and Jones [2004]).

Trade policy is an important aspect of international trade. Before the establishment of WTO in 1995 and adoption of trade liberalization policy, trade was basically protected almost in all countries. The main instruments of trade protection were: (i) imposition of tariff on the imported goods and (ii) quantitative restrictions (quota on the volume of import). In the regime of trade liberalization, tariff rates have been curtailed and quota has been removed. As a result, imported goods have become cheaper in the domestic market leading to larger volume of import and possibility of adverse impact on balance of payment. Similar arguments can be put forward in case of devaluation also. If the value of home currency (say Indian Rupee) depreciates in terms of US Dollar, the Indian goods become cheaper in the US market. Then, India's export to US is likely to increase leading to improvement in India's balance of payments. But the success of this policy depends on Marshall-Lerner conditions. This condition suggests that if the price elasticities of demand for imported and exported items are high, then only export will increase and import will decline significantly resulting in improvement of balance of payments of the home country. Otherwise, the policy of devaluation or currency depreciation will not be effective (Krugman and Obstfeld [2004]; Bhagawati [1988]). In the present context, both countries China and India are following the policy of trade liberalization. But which goods are in the export and import baskets and what are the rates of change in tariff and foreign exchange rates of the two countries will finally decide the volume of trade and net trade balance.

Foreign Direct Investment (FDI) and Foreign Portfolio Investment (FPI) are playing important role in foreign trade and economic growth in the period of trade liberalization. FDI and FPI increase capital investment in the home country thereby increasing production and export. If capital endowment increases then the production of the capital intensive goods increases more relative to other goods due to Rybczynsky effect (Jones [1965]). FDI very often brings technology embedded capital. That means, FDI not only increases capital investment but also brings modern technology with it (Findley [1978]; Kabiraj, and Marjit [1992]; Chaudhuri [2007]). Naturally, if a country becomes successful in attracting FDI by its policy measures, favourable business environment and cheap supply of factor endowments, it gets an edge over other countries in GDP growth, employment generation and export promotion (Aitkin, and Harrison [1999]; Khan [1982]; Marjit and Beladi [1996]).

Export increases income through higher effective demand (Keynesian theory). At the same time export of the home country depends on GDP in foreign country in addition to foreign exchange rate of the home country. i.e., $X_A = X_A (GDP_F , \varepsilon_A)$, where X_A and ε_A are export and exchange rate of the home country. GDP_F is gross domestic product of the foreign country. If GDP_F increases, purchasing power in the foreign country increases. Then demand for imported goods (which are domestic country's export) also increases. If ε_A declines, it means that the value of home currency in terms of foreign currency (say, US Dollar) declines. As a result, imported goods become cheaper in foreign market. In effect, export of home country A, increases. So, in the present context of Indo-China trade, the GDP growth, reduction of tariff rates, decline of Exchange rates with respect to international currency (say, US Dollar), flow of FDI, technological factors, factor prices and overall efficiency in production, will largely explain the trade between the two countries (Acharyya [2010]; Helpman [1993]). Along with capital mobility, there is mobility of labour also across countries in the free trade regime. So, migration of skilled labour is also playing an important role in trade and development (Marjit and Acharyya [2003]; Marjit and Kar [2004]). Technology determines productivity, comparative advantage and trade pattern. Suppose, production function is: $Y = AK^{\alpha} L^{\beta}$. Here, A captures technological efficiency in production. If A is high, productivity is also high. Technology can be improved by R&D expenses on innovation and technological progress, technology transfer, and technology embedded capital investment in FDI.

Limited literature is available which analyses the trade relation of India and China for a long span of time to judge the changes in the nature and composition of trade between these two countries and their consequent effect on trade balance. In this paper time series analyses have been conducted using data from 1988 to 2017 comprising a 30 years span to shed light on these issues. Moreover, majority of the papers have adopted partial approaches in addressing the problems. In the present paper attempt has been made to analyze the trade relation between India and China in a comprehensive manner so that the real problems can be identified.

3 Data and Methodology

There are two phases of our statistical analysis. In the first phase, a comprehensive analysis of trade data has been conducted to assess the changes in nature and composition of trade between India and China. The second phase deals with the econometric time series analysis to judge the implication of different trade policies adopted by these two countries on their trade performances. Annual data on

different variables from 1988 to 2017 for India and China have been used in our analysis. Relevant data are taken from the official websites of World Integrated Trade Solution (WITS), World Bank, Trade Map Database, IMF and UN Comtrade database. Variables used in abbreviations in this paper are: the ratio of India's export to China and import from China (Expi_Impi_ratio), real exchange rate of China (R_Exch_rt_Chn), net inflow of foreign direct investment in China (FDI_Chn) and ratio of trade weighted import tariff rates imposed by India and China (W_trfi_ trfc_ratio). Time series analysis has been done on these variables using EVIEWS software. Before going to the estimations, the methodology has been presented in detail.

The methodology used in the time series analysis of this paper is based on the econometric methods specified in Enders (2004). The ARMA (Autoregressive moving average) model has been used for analysis of time series data following the econometric techniques: (i) Stationarity Test, (ii) Test of Co-integration, (iii) Test of Causality and (iv) OLS regression. We start with the stochastic autoregressive linear difference equation of ARIMA (Autoregressive integrated moving average) model with order p and q respectively as

$$y_t = \alpha_0 + \alpha_1 y_{t-1} + ...+ \alpha_p y_{t-p} + \varepsilon_t + \beta_1\varepsilon_{t-1} + ...+ \beta_q\varepsilon_{t-q} \qquad (1)$$

where y_t is the variable y in period t and ε_t is error term in time t. The stationary ARIMA model is called ARMA model. ε_t is a white-noise process if the sequence ε_t has a zero mean, constant variance and is serially uncorrelated. Since y_t is a linear stochastic difference equation, the stability is a necessary condition for the time series (y_t) to be stationary. Again, if (y_t) is a stationary series, the mean, variance and covariance will be time-invariant. If a series is non-stationary, covariance, variance and mean will vary at different period of time. If two series are non-stationary, the regression between them will be spurious. That means, there is no meaningful relationship between them in the long run.

Test of Stationarity:

There are various methods to check whether a series is stationary or not and one important of them is Unit Root Test. The most commonly and widely used methods of unit root test are Augmented Dickey-Fuller (ADF) test and Phillips-Perron (PP) test. ADF is used in the form of the following three equations. Let us consider a time series variable Y_t with white noise error term ε_t as

$$Y_t = \alpha Y_{t-1} + \varepsilon_t \qquad (2)$$

where, the error term is generated from a white-noise process.

Thus, $Y_t - Y_{t-1} = \alpha Y_{t-1} - Y_{t-1} + \varepsilon_t$ or,

$\Delta Y_t = \delta Y_{t-1} + \varepsilon_t$ where $\delta = \alpha - 1$

If $\alpha = 1$ or $\delta = 0$, there is unit root and the series is non-stationary. Here, the procedure is testing the hypothesis whether alpha is equal to unity or delta is equal to zero.

Similarly, time series variable (Y_t) with white noise error term and drift or intercept is:

$$Y_t = \beta + \alpha Y_{t-1} + \varepsilon_t \text{ or } \Delta Yt = \beta + \delta Y_{t-1} + \varepsilon_t \qquad (3)$$

Another specification is: (Y_t) with white noise error term with drift (intercept) and trend, i.e.

$$Y_t = \beta + \alpha Y_{t-1} + \gamma t + \varepsilon_t$$

or,

$$\Delta Y_t = \beta + \delta Y_{t-1} + \gamma t + \varepsilon_t \qquad (4)$$

The ADF test corrects for presence of serial correlation in the disturbance term by including appropriate lags of the dependent variable (ΔY_t) in these three forms of equations. PP test, on the other hand, allows some relaxation on the restriction of error term distribution and makes a correction to the computed τ-statistic of the estimated coefficient of δ to account for serial correlation in ε_t. Both methods have been used to check stationarity of the series in this work.

Co-integration Test and Regression:

If series are stationary at level, i.e., *I* (0) then OLS regression estimates give efficient and meaningful results. Test of co-integration is not necessary here. If series y_t and x_t are not stationary at level, then regressing y_t on x_t by OLS method we can have estimates of residuals $\hat{e}_t$, which can be expressed as

$$\hat{e}_t = \alpha_0 + \alpha_1 \hat{e}_{t-1} + n_t \qquad (5)$$

where, η_t is error term. Thus,

$$\Delta \hat{e}_t = \alpha_0 + (\alpha_1 - 1)\hat{e}_{t-1} + \eta_t$$

If $\alpha_1 \neq 1$ or $(\alpha_1 - 1) \neq 0$, the series are stationary at first[t] difference and co-integrated, CI (1, 1). As they are co-integrated, their long run relationship is meaningful. To be co-integrated, two series are to be stationary of the same order. In case of non-stationary variables in a multivariate context, it is quite possible that a linear combination of the integrated variables is stationary. Then such variables are called co-integrated and from that relationship, error correction model can be estimated to explain the causes of short term deviations from long run equilibrium. Engle-Granger (1987) introduced such a method for testing co-integration. Once the series are found co-integrated; the OLS estimates will be consistent and efficient. Since there might be multiple regression relation or co-integrating equations, Johansen (1988) test is used as a better method in such cases. In simultaneous equation system, VAR (vector autoregressive) method is used to find the relationship between the time series variables incorporating their lag values in the equations.

Test of Causality:

Whether one variable causes another and the vice versa or there is bi-directional causality between the two variables are checked by the test of pair wise Granger causality. If there is both-way causality, it is better to use VAR model with simultaneous equation system where the difference between dependent variable and independent variable becomes meaningless.

To sum up, in this paper unit root test has been done to check the stationarity of the time series variables using both ADF and PP method. After that, test of co-integration has been done to check whether there exists any long run meaningful relationship between the variables. Then, the test of causality has been done to check which factor causes the other factor. Lastly, OLS regression has been done for the co-integrated series to find out the magnitude and direction of impact of one variable on the other. The following three equations have been estimated applying OLS method in this paper:

i. $Expi\_Impi\_ratio_t = \alpha_1 + \beta_1 R\_Exch\_rt\_Chn_t + u_{1t}$
ii. $Expi\_Impi\_ratio_t = \alpha_2 + \beta_2 FDI\_Chn_t + u_{2t}$
iii. $Expi\_Impi\_ratio_t = \alpha_3 + \beta_3 W\_trfi\_trfc\_ratio_t + u_{3t}$

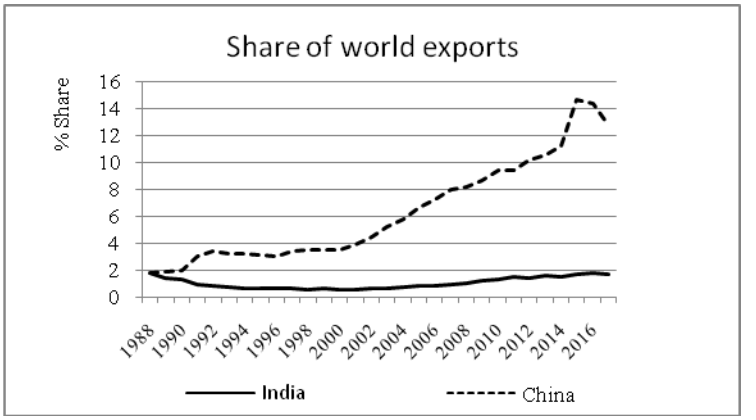
where, Expi_Impi_ratio is the dependent variable and the other three, R_Exch_rt_Chn , FDI_Chn and W_trfi_trfc_ratio are independent variables and u_{1t} , u_{2t} , u_{3t} are white noise error terms.

4 Changes in the nature and composition of trade

India and China, with large geographical boundaries and dense population, are having intense trade relationship from the time much earlier than the establishment of World Trade Organization (WTO) in 1995. The political and economic relations of these two countries are largely determined by their bilateral trade. Significant changes have taken place in the nature and composition of trade between these two countries after liberalization.

The volume of world trade has grown up at a rapid pace in the last three decades. Total world export in 2017 was nearly 23 times more than what it was in 1988. Trade performances of different countries are judged by their respective shares in world exports. India and China have shown a contrasting feature in this regard. While India has been able to retain the share of world exports around 2% (1.77% in 1988 and 1.65% in 2017), China's share has grown up to 12.70% in 2017 from a mere 1.81% in 1988. The respective shares of these two countries from 1988 to 2017 are presented in figure 1. Clearly, China's performance has been much better than that of India during this period.

Figure 1: China and India's Share of World Exports (1988–2017)



Source: WITS

As a trading partner, the importance of both the countries has increased over time. This is supported by the fact that the share of total world exports by these two countries going to each other is increasing continuously. India's exports to China was only 0.33% of its total world exports in 1988 and it has increased to 4.24% in

2017 and the same for China has increased from 0.67% in 1988 to 3% in 2017 (calculated from WITS data).

Shares of different product groups based on their level of processing in total exports to the world as well as to the partner country by India and China have been computed separately for 1988 and 2017. This will give an overall idea about the changes in composition of exports of each country over time. Respective shares of different product groups for these two countries are shown in table 1. Initially, both of them were capital scarce countries, which are reflected in low shares of capital goods exported by these two countries either to the world or to the partner country in 1988. With the passage of time, China made the most remarkable change in this product group in its export basket. The export share for capital goods from China to the world became 45.19% in 2017 from a mere 2.04% in 1988 and that to India became 49.69% from 2.09% (see table 1) respectively. Almost 50% of India's imports from China comprise of capital goods at present, which is quite remarkable. Most of the Indian manufacturing and service sector enterprises purchase capital goods needed for their production from China mainly due to the cost competitiveness of Chinese products. Similar pattern of change is observed in the export share of capital goods for India too. The shares of these goods have increased in total exports of India to the world as well as to China in 2017 than 1988 (see table 1), but the intensity of changes is not as high as China. In 2017 India exported capital goods worth 1.32 billion dollars and imported it by 40.59 billion dollars with a huge trade deficit of 39.27 billion dollars with China.

Table 1
Shares of different product groups in total exports by India and China (%)

	Share in China's total Exports				Share in India's total Exports			
	to the World		to India		to the World		to China	
	1988	2017	1988	2017	1988	2017	1988	2017
Capital Goods	2.04	45.19	2.09	49.69	6.23	13.78	4.20	10.57
Consumer Goods	38.21	36.44	3.66	20.96	34.32	44.02	1.04	12.57
Intermediate Goods	25.67	16.31	70.19	28.23	42.37	33.20	39.49	55.99
Raw Materials	32.38	1.82	24.03	1.06	14.74	8.63	55.27	20.73
Total	98.3	99.76	99.97	99.94	97.66	99.63	100	99.86

Source; compiled from WITS data

The share of consumer goods in total exports of China to the world has declined slightly, whereas, the respective share to India has increased considerably during this period (from 3.66% in 1988 to 20.96% in 2017). For India, the shares have

increased both to the world and to China as well. China's import of consumer goods from India increased to 12.57% in 2017 from a very low 1.04% in 1988. In spite of this, India had a deficit of 8.50 billion $ in this product group with China In 2017.

For intermediate goods, the export shares of India and China to the world have declined, but the respective shares to their partner country have shown opposite results. India's export share has increased (from 39.49% to 55.99%) and for China it has declined steadily (from 70.19% to 28.23%). Intermediate inputs and raw materials are very important items in China's imports from the World. India is one of the important sources of these goods to China. More than 50% of China's imports from India were intermediate goods in 2017. In spite of being the top export item to China, India still had to suffer a trade deficit of 12.74 billion $ in this category in 2017.

Shares of raw materials exported by these two countries have declined both to the world as well as to their partner country during this period. In 1988, China's export share for these products to the world was 32.38% and came down to a nominal 1.82% in 2017. The respective shares of exports for India to the world in this product group are 14.74% in 1988 and 8.63% in 2017. Bilateral export shares of these goods have also declined sharply during this period. In 1988 India's share of exports for raw materials to China was more than half (55.27%) of total exports which became 20.73% in 2017. Downfall in China's export share to India for this product group has been even faster. From 24.03% in 1988 it has declined to 1.06% in 2017. This is the only product group in which India has been enjoying trade surplus with China since 1988. In 2017, India's trade surplus in raw materials trade with China was 1.80 billion dollars.

Volumes of India's top ten export items and their respective shares in total exports to China for 1988 and 2017 have been presented in Table 2.1. India's top 10 export items comprise of 98.52% of total exports in 1988, among which the major share is held by mineral products like ores, slag and ash (HS-26) at 52.10%, followed by inorganic chemicals (HS-28), organic chemicals (HS-29), machinery and mechanical appliances (HS-84) among others. In 2017 the top 10 export items comprise of 75.04% of total exports to China. Export of Organic chemicals (HS-29) occupied the highest share of 13.58% followed by Ores, slag and ash (HS-26), Copper and articles thereof (HS-74), Cotton (HS-52) etc.

Table 2.1
Volume of India's top 10 export items and their respective shares in total exports to China in 1988 and 2017

India's top 10 exports to China in 1988				India's top 10 exports to China in 2017			
HS code	Product Label	Value thousand $	% Share	HS code	Product Label	Value thousand $	% Share
26	Ores, slag and ash	23697	52.1	29	Organic chemicals	1697399	13.58
28	Inorganic chemical; organic or inorganic compounds…	14775	32.48	26	Ores, slag and ash	1507829	12.07
29	Organic chemicals	2131	4.69	74	Copper and articles thereof	1379972	11.04
84	Machinery, mechanical appliances, nuclear..	1741	3.83	52	Cotton	1147603	9.18
51	Wool, fine or coarse animal hair….	842	1.85	27	Mineral fuels, mineral oils and products of their distillation...	1017796	8.15
24	Tobacco and manufactured tobacco substitutes	376	0.83	84	Machinery, mechanical appliances, nuclear…	665826	5.33
55	Man-made staple fibers	370	0.81	25	Salt; sulphur, earth and stone, plastering materials...	651032	5.21
30	Pharmaceutical products	337	0.74	85	Electrical machinery and equipment and parts thereof…	460600	3.69
23	Residues and waste from the food industries; prepared	327	0.72	39	Plastics and articles thereof	426442	3.41
12	Oil seeds and oleaginous fruits; miscellaneous grain	215	0.47	15	Animal or vegetable fats and oils and their cleavage…	421332	3.37
Total value of top 10 exports		44811	98.52	Total value of top 10 exports		9375831	75.04
Total exports to China		45484	100	Total exports to China		12495230	100

Source: compiled from Trade Map Database and UN Comtrade Database

India's exports in1988 were highly concentrated in items from minerals and chemicals. Almost 90% of total exports to China were from these product groups.

The high concentration in few items in the export basket of India has dissolved gradually and the products have become more diversified in recent year which is indicated by the smaller shares of top 10 export items in 2017. Although the weights of different products has changed, India's exports to China are still dominated by primary and resource based products at present.

Table 2.2: Volume of India's top 10 import items and their respective shares in total imports from China in 1988 and 2017

India's top 10 imports from China in 1988				India's top 10 imports from China in 2017			
Hs code	Product Label	Value thousand $	% Share	HS code	Product Label	Value thousand $	% Share
07	Edible vegetables and certain roots and tubers	26765	28.07	85	Electrical machinery and equipment and parts thereof; sound …	27538998	38.29
50	Silk	13354	14.01	84	Machinery, mechanical appliances, nuclear reactors, boilers...	12808123	17.81
74	Copper and articles thereof	12642	13.26	29	Organic chemicals	6570779	9.14
27	Mineral fuels, mineral oils and products of their distillation...	8744	9.17	39	Plastics and articles thereof	2137748	2.97
29	Organic chemicals	8279	8.68	72	Iron and steel	1633195	2.27
72	Iron and steel	5992	6.29	90	Optical, photographic, cinematographic, measuring, checking…	1598753	2.22
25	Salt; sulphur; earths and stone; plastering materials...	3026	3.17	73	Articles of iron or steel	1375816	1.91
9	Coffee, tea, maté and spices	1853	1.94	87	Vehicles other than railway or tramway rolling stock...	1319297	1.83
28	Inorganic chemicals; organic or inorganic compounds of…	1650	1.73	38	Miscellaneous chemical products	1243588	1.73
38	Miscellaneous chemical products	1616	1.7	31	Fertilizers	1113722	1.55
Total value of top 10 imports		83921	88.03	Total value of top 10 imports		57340019	79.72
Total imports from china		95334	100	Total imports from China		71922748	100

Source: compiled from Trade Map Database and UN Comtrade Database.

Volumes of India's top ten import items and their respective shares in total imports from China in 1988 and 2017 have been presented in Table 2.2. India's Top 10 import items consisted 88.03% of total imports in 1988. The share of vegetable products like Edible vegetables and certain roots and tubers (HS-07) at 28.07% was the highest among all imports followed by silk (HS-50), Copper and articles thereof (HS-74), mineral fuels and oils (HS 27) and organic chemicals (HS-29) respectively. This implies that the principle import items from China in 1988 were primary and resource based products which support the fact that in the early years of reform, China was a capital scarce and labour abundant economy.

A distinct change is observed in the composition of India's imports from China in 2017. Most of the import items of India in 2017 were more sophisticated and advanced technology based products. The top import item in 2017 was electrical equipments (HS-85) with a share of 38.29% followed by mechanical appliances (HS-84), organic chemicals (HS-29), Plastics and articles thereof (HS-39) etc. HS-84 and HS-85 which were at the top of the list in 2017 were not even among top ten import-items of India in 1988. Thus we find that significant changes have taken place in the composition of China's export to India but the composition of India's export to China did not change that way during this period. Policies responsible for such changes in composition could not be examined in econometric estimation due to lack of industry specific data on policy changes. So, we have estimated the effect of policy changes on export, import, and trade balance in an overall framework in this paper.

5. **Changes in the trade policies of two countries and their impact**

If we consider total trade between India and China, India's exports to China increased from 0.05 billion $ in 1988 to 17.44 billion $ in 2010, although, in the subsequent years it has declined gradually to reach 12.5 billion $ in 2017. On the other hand, China's exports to India have shown a steady increment throughout in the same period with a huge acceleration in recent years. India has been suffering from trade deficit in all the years during this period except in 1991 and1992. Since 2006 India's trade deficit has grown at a faster rate and has reached 59.43 billion $ in 2017 which is more than 1100 times larger than what it was in 1988 (see Table 3).

India's annual exports per unit imports from China (Export to China/Import from China) have been examined for the selected period and presented in the last column

Table 3
India's balance of trade situation with China from 1988 to 2017 (in USD billion)

	India's exports to China	India's imports from China	Trade balance of India	Exp/Imp of India
1988	0.0454838	0.095334	-0.05	0.48
1989	0.02326998	0.040901	-0.02	0.57
1990	0.0179402	0.032882	-0.01	0.55
1991	0.04826998	0.02096	0.03	2.3
1992	0.15784701	0.140806	0.02	1.12
1993	0.27905459	0.299428	-0.02	0.93
1994	0.25421931	0.757267	-0.5	0.34
1995	0.33169165	0.810135	-0.48	0.41
1996	0.6147755	0.756522	-0.14	0.81
1997	0.71812307	1.110556	-0.39	0.65
1998	0.42700621	1.097686	-0.67	0.39
1999	0.54200854	1.294883	-0.75	0.42
2000	0.73488775	1.47758	-0.74	0.5
2001	0.92254234	1.827549	-0.91	0.5
2002	1.5316038	2.619849	-1.09	0.58
2003	2.5671619	3.615126	-1.05	0.71
2004	4.09851437	6.051257	-1.95	0.68
2005	7.18379231	10.16706	-2.98	0.71
2006	7.82916758	15.63906	-7.81	0.5
2007	9.49197818	24.57577	-15.08	0.39
2008	10.09392679	31.58602	-21.49	0.32
2009	10.37005249	30.61337	-20.24	0.34
2010	17.43999128	41.24912	-23.81	0.42
2011	16.71778626	55.48303	-38.77	0.3
2012	14.72931656	54.14046	-39.41	0.27
2013	16.41682529	51.63544	-35.22	0.32
2014	13.43425052	58.23055	-44.8	0.23
2015	9.5765788	61.60443	-52.03	0.16
2016	8.91607298	60.4831	-51.57	0.15
2017	12.49523046	71.922748	-59.43	0.17

Source: compiled from WITS data

of Table 3. Values more than one of this ratio indicate trade surplus for India. As India has been suffering from deficit in trade balance in most of the years the value

of this ratio is more than one only for those two years (1991 and 1992) when India enjoyed surplus in it. For all the other years the values are less than one. In figure 2, this ratio has been presented graphically. After 1992, this ratio has declined sharply to reach 0.17 in 2017. This mounting trade deficit has become a matter of concern for India to deal with in future.

In this section, econometric time series analysis has been conducted to identify the factors responsible for the downfall of India's export-import ratio over time. Selected macro economic variables, which affect exports and imports of a country, are gross domestic product (GDP), relative tariff rates (tariff rate of the home country/tariff rate of the partner country), net inflow of foreign direct investment (FDI) and real exchange rate. The real exchange rates of India and China have been calculated using the method as specified in text books.

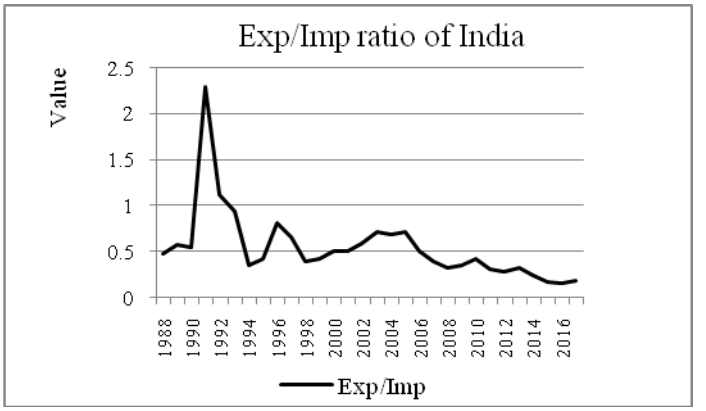
Real exchange rate of country A with country B = n. exch ^{A}. (cpi ^{B} / cpi ^{A}),

where, n. exch ^{A} = nominal exchange rate of the currency of country A with US dollar,

cpi ^{B} = consumer price index of country B,
and cpi ^{A} = consumer price index of country A

Taking annual data of all the variables for India and China the econometric analysis has been done in four steps: in the first step, Augmented Dickey Fuller (ADF) test and Phillips-Perron (PP) test for all the selected variables have been performed to test the stationarity of these series.

Figure 2: Export –Import ratio of India's trade with China (1988-2017)



Source : WITS

In the second step, pair wise co-integration test has been conducted to identify the existence of meaningful long run relationship between the variables. In the third stage, Granger causality test has been done to check whether there exist any causal relationships between two variables or not. In the last step, Ordinary Least Square (OLS) regression has been done for the co-integrated series to estimate the parameters.

5.1. Unit Root Test (level and First difference of the variables)

The results of ADF and PP test for the variables at level and at first difference which have given meaningful results till the end of our econometric exercise are summarized in section-A of Table 4. Four such variables are export-import ratio of India with China, real exchange rate of China, net inflow of foreign direct investment (FDI) in China and the ratio of trade weighted average annual tariff rates of India with China. The export-import ratio of India is found to be stationary at level with significant drift and trend components in it. In other words, Expi_Impi_ratio is a trend stationary series. The unit root test of this series at first difference shows that the series is again stationary which is free from any trend factor. In other words, Expi_Impi_ratio is a difference stationary series too. As the probability of having a unit root in this series is less in first difference than in level we consider Expi_Impi_ratio as a stationary series at first difference in our model. Two series, namely, real exchange rate of China and FDI in China are found non stationary at level but stationary at first difference in both ADF and PP test. The last one, weighted tariff rates ratio is a non stationary series at level in the ADF test but it is a trend stationary series in the PP test. The first difference of this series is found to be stationary in both ADF and PP test and so we consider it as a stationary series at first difference in our model. In all the cases, lag length selection in ADF test has been attributed to the software to choose it automatically. Hence, all the four variables are free from the presence of unit root at first difference and therefore, will give reliable and unbiased results.

5.2. Bivariate Cointigration Test

Co-integration of two time series suggests that there is a meaningful long run relationship between them. In our model Engel-Granger co-integration tests have been conducted. India's export-import ratio with China (Expi_Impi_ratio) is paired with three other stationary variables, namely, real exchange rate of China (R_Exch_rt_Chn), FDI in China (FDI_Chn) and the ratio of weighted tariff rates imposed by India and China (W_trfi_trfc_ratio) separately. Results are shown in

section-B of table 4. Expi_Impi_ratio as a dependent variable is co-integrated with three other variables, indicating the existence of meaningful long run relationship with them.

Table 4: Results of Unit Root and Co integration Test

A. Unit Root Test				
a. Level of the variables (Null hypothesis: Variables has a unit root.)				
Variables	Augmented Dickey- Fuller test results		Phillips-Perron test results	
	Statistics	Probabilities	Statistics	Probabilities
Expi_Impi_ratio	-5.364788	0.0009	-5.686645	0.0004
R_Exch_rt_Chn	-2.383973	0.3792	-2.004281	0.5747
FDI_Chn	-1.650367	0.7471	-1.795425	0.6808
W_trfi_trfc_ratio	-2.875923	0.1847	-3.714992	0.0373
b. First difference of the variables (Null hypothesis: Variables has a unit root.)				
Variables	Augmented Dickey- Fuller test results		Phillips-Perron test results	
	Statistics	Probabilities	Statistics	Probabilities
Expi_Impi_ratio	-4.42823	0.0001	-16.14644	0.0000
R_Exch_rt_Chn	-5.929525	0.0000	-5.916882	0.0000
FDI_Chn	-4.849013	0.0006	-4.831702	0.0006
W_trfi_trfc_ratio	-4.632011	0.0012	-15.52244	0.0000
B. Pairwise Cointegration Test (Null hypothesis: Series are not co integrated)				
Dependent Variables	z-statistics		MacKinnon p values	
Expi_Impi_ratio	-307.7954		0.0001	
R_Exch_rt_Chn	-9.330481		0.3404	
Expi_Impi_ratio	-22.99545		0.0065	
FDI_Chn	-8.761978		0.3816	
Expi_Impi_ratio	-20.15393		0.0179	
W_trfi_trfc_ratio	-15.27171		0.0802	

5.3. Granger Causality test

In the third stage, pair wise Granger causality test has been examined to identify the causal relationships in our model. The null hypothesis for this test is set as; one variable does not cause the other. Rejection of null hypothesis will ensure that the variable in consideration causes the other variable and therefore, can be considered as an independent variable. The results of our causality test are shown in table 5

below. Expi_Impi_ratio has been paired with three other variables (R_Exch_rt_Chn, FDI_Chn and W_trfi_trfc_ratio) separately. In all these three cases one way causal relations are found. The null hypothesis of Expi_Impi_ratio does not Granger cause each of R_Exch_rt_Chn , FDI_Chn and W_trfi_trfc_ratio has been accepted , which implies that , these three are not explained by Expi_Impi_ratio. However, Expi_Impi_ratio is found to be explained by each of R_Exch_rt_Chn , FDI_Chn and W_trfi_trfc_ratio. These results give us a clear insight of our model specification. Expi_Impi_ratio can be treated as dependent variable in our model as it is explained by all the three other variables.

Table 5: Results of pair wise Granger Causality test

Null Hypothesis	F-Statistic	p-values
R_Exch_rt_Chn does not Granger cause Expi_Impi_ratio	5.68408	0.0099
Expi_Impi_ratio does not granger cause R_Exch_rt_Chn	0.87267	0.4312
FDI_Chn does not Granger cause Expi_Impi_ratio	3.01987	0.0685
Expi_Impi_ratio does not Granger cause FDI_Chn	0.00609	0.9939
W_trfi_trfc_ratio does not Granger cause Expi_Impi_ratio	9.56901	0.0009
Expi_Impi_ratio does not Granger cause W_trfi_trfc_ratio	0.43983	0.6495

5.4. Ordinary Least Square (OLS) estimation

In the last step, OLS estimation has been done with Expi_Impi_ratio as dependent variable and the other three variables as explanatory variables separately. Results of all the three OLS regressions are presented in table 6.1, 6.2 and 6.3 respectively. Expi_Impi_ratio has shown a declining trend over time because of faster acceleration of India's imports from China than its exports. In our OLS estimation, R_Exch_rt_Chn, FDI_Chn and W_trfi_trfc_ratio are found to be statistically significant as independent variables which influence Expi_Impi_ratio.

In real terms, China has depreciated it's currency at a faster rate than India. Ratio of real exchange rates of India and China exhibits a declining trend for more than two decades since 1995 (see figure-3). The coefficient of the OLS estimation for R_Exch_rt_Chn as independent variable is negative (see table 6.1); implying that, with faster devaluation of Chinese currency over time, Expi_Impi_ratio has declined or, in other words, India has imported at a faster rate from China than what has been exported there. A continuous devaluation of renminbi in real terms has made Chinese products relatively cheap and thus more cost competitive with respect to the

products of other countries in Indian market causing huge acceleration of India's imports from China.

Table 6.1: OLS regression of Expi_Impi_ratio on R_Exch_rt_Chn

Dependent variable	Independent variable	coefficient	t-value	Prob.	Adjusted R- squared	F-statistic	Prob. (F)
Expi_Impi_ratio	R_Exch_rt_Chn	-0.117	-3.278	0.003	0.252	10.745	0.003

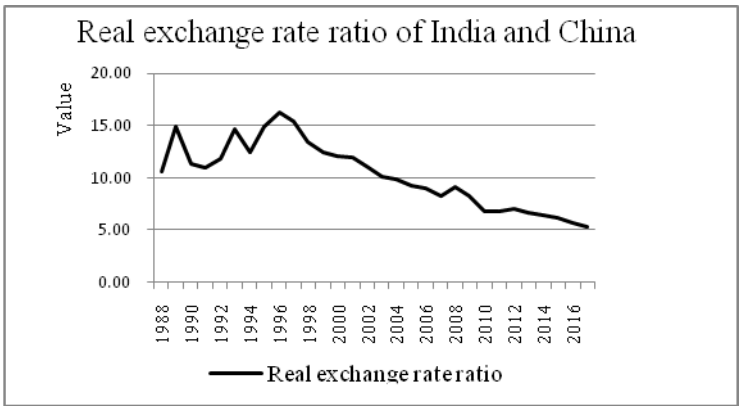
Table 6.2: OLS regression of Expi_Impi_ratio on FDI_Chn

Dependent variable	Independent variable	coefficient	t-value	Prob.	Adjusted R- squared	F-statistic	Prob. (F)
Expi_Impi_ratio	FDI_Chn	-0.002	-3.169	0.004	0.238	10.04	0.004

Table 6.3: OLS regression of Expi_Impi_ratio on W_trfi_trfc_ratio

Dependent variable	Independent variable	coefficient	t-value	Prob.	Adjusted R- squared	F-statistic	Prob. (F)
Expi_Impi_ratio	W_trfi_trfc_ratio	0.149	4.4087	0.000	0.389	19.437	0.000

Figure-3: Real exchange rate Ratio of India and China



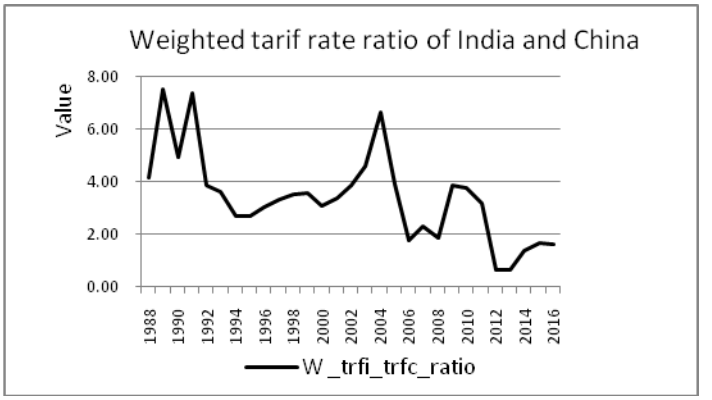
Source: Compiled from World Bank data

In our OLS estimation, FDI of China has been found statistically significant again in explaining the downfall of export-import ratio of India. The coefficient for FDI_Chn as an independent variable is negative (see Table 6.2). This implies that, with an increment in the FDI_Chn, the Expi_Impi_ratio has declined over time. At the outset of liberalization, both China and India had to rely heavily on the exports of primary and resource based products due to the scarcity of capital, lack of advanced technological knowledge, inefficiencies in research and development sector, inadequate infrastructural facilities etc. Gradually, China adopted some export led development strategies to remove these constraints for foreign trade. China started importing huge amount of low cost raw materials and intermediate inputs from the Asian countries and parallely encouraged foreign enterprises to invest there by providing various facilities like tax exemption, adequate supply of power, superior transport services etc. With the cheap imported inputs and huge low cost labour supply in China these facilities put a great impetus for a huge inflow of FDI in the manufacturing sector of this country and thus resolving the problem of capital to a great extent and at the same time inflow of modern technologies of production with the foreign companies made the Chinese production system more technology intensive with time, which has been reflected in the changes in the nature of India's imports from China. In 1988, India's imports were dominated by primary and resource based products whereas imports in 2017 were mostly sophisticated and technology intensive in nature. It is important to mention here that, most of the FDI investments in China were directed towards the objective of export promotion. After liberalization, India also undertook several stimulating policies to attract FDI in our country. As a result of which FDI inflow in India has increased during last two and half decades, but with a very slow pace as compared to China. Not only that, the primary objective of most of the foreign companies to invest in India is to sell their products in the domestic market here and not to export in foreign markets. India is one of the principal sources of cheap raw materials and intermediate inputs and at the same time, a leading destination of finished products to be sold by China. This causes Expi_Impi_ratio to fall continuously with time. This fact is reflected in the result of our OLS estimation with FDI_Chn as independent variable.

Another crucial factor affecting foreign trade of a country is the import tariff rates imposed by that country with respect to the partner country. The ratio of weighted tariff rates imposed by India and China is having a declining trend over time (see Figure 4), which implies that India has adopted a faster opening up strategy of its economy than China by aggressive tariff cuts after liberalization. The coefficient of OLS estimation with W_trfi_trfc_ratio as independent variable is found positive (see Table 6.3), i.e., Expi_Impi_ratio has declined with the decline in

W_trfi_trfc_ratio during the last three decades. In 1988, the import weighted average tariff rate imposed by India was 53.47%, which came down by more than nine times to 5.74% in 2017. For China, on the other hand, it was 12.84% in 1988 and was reduced by more than three times to 4.24% in 2017.As a result of which, China has got greater access in Indian market to sell their products than what India got in China. To sum up, as India has reduced the tariff rates at a faster

Figure 4: Ratio of weighted tariff rates imposed by India and China.



Source: WITS

rate than China, which has caused the downfall of W_trfi_trfc_ratio, the imports from China has grown at faster rate than its exports to China, causing a downfall in Expi_Impi_ratio.

Different trade theories have identified a number of factors responsible for regulating the trade flows between two countries. In most of the contemporary literature export and import of a country have been considered separately in conducting time series analysis. We have considered export-import ratio of India as a single variable (Expi_Impi_ratio) to capture the overall situation of Indo-China trade and has been used as dependent variable in the paper. The time series analysis of this paper reveals that faster devaluation of Chinese renminbi than that of Indian rupee, huge inflow of FDI in China and relatively slow pace of tariff reduction by China in comparison to India played the decisive role in Indo-China trade during the liberalization regime favouring China's exports to India rather than India's exports there. Among the three explanatory variables adjusted R^2 is highest for W_trfi_trfc_ratio (see table 6.3). This implies that policies relating to tariff rate of the two countries have been found the most crucial factors influencing the trade flows between these two countries. In general, average tariff rate in China is lower

than that in India and it is a widely accepted view in the existing literature is that the main constraint to India's exports to China are the non tariff barriers imposed by China and not the tariff rates as such. But the results of time series analysis of this paper differ from this view. It shows that not the absolute value of tariff but the rate at which the tariff rate is being reduced in a country relative to the partner country plays the crucial role in determining the trade flows and trade balance. Actually, India's export to China did not increase much due to slow reduction of tariff rates in China whereas export of China to India increased rapidly as tariff rates were significantly reduced in India.

Undoubtedly, the role of technological change in foreign trade is very crucial through its effect on cost of production, quality of product, product innovation and demand generation. Since it is a huge task to incorporate industry specific technological progress in India and China in the econometric model and industry specific data on technological change in these two countries are not easily available, we could not include this factor in our analysis. It could be a separate topic for further research.

5 Conclusions

This paper analyses the significant changes that have taken place in the nature, volume and trade balance of Indo-China trade in the last three decades. Not only the nature of trade, especially from China's point of view has undergone a notable change, but also late and limited adoption of free trade policy has forced India to compete with a more market oriented China in the new era of foreign trade. In 1991, when India adopted trade liberalization policy, China's simple average tariff rate was only 44.10% as compared to India's 124.25%. In that year, the FDI inflow in China was 4.37 billion dollars, which was 62 times more than that of India (0.07 billion dollars). In the initial years of trade liberalization both these countries were suffering from the shortage of capital which is reflected by the nature of commodities exported by them. In 1988, China's exports to India were dominated by primary and resource based products like vegetables, silk, copper, mineral fuels, organic and inorganic chemicals etc. On the other hand India's exports to China were also dominated by the same type of products like ores, slag and ash, organic chemicals, wool, tobacco, oil seeds etc. This pattern of trade has largely changed in the period of trade liberalization. A quick glance on top export items of India and China to each other in 2017 reveals that there has been a distinct difference in the trade performances of these two countries with respect to 1988. Top 10 exports of China in 2017 do not include any primary product, rather is crowded by technology

intensive manufactured products which indicate that China has made the significant change in the composition of exports to India from primary and resource based products to advanced technology intensive goods during this period. For India, on the other hand, though the share of sophisticated and technology intensive products has increased in its export basket, most of the items in it are primary and resource based products still now.

After liberalization, China made an attempt to compensate the shortage of capital through inviting FDIs by adopting different policy measures to make the atmosphere of production in China conducive for foreign companies and export promotion. In this effort, China has been quite successful to attract huge FDI in the last three decades. Foreign companies were encouraged to engage themselves mainly in the export sector and in the export promotion activities. Like China, India also undertook different stimulating policies to attract FDIs from abroad. It is true that FDI inflow in India has increased in last three decades, but compared to China it was very less. Not only that, India has failed to inspire foreign enterprises to engage themselves in the export promotion of our country. Most of the products produced by the foreign companies here are sold domestically in Indian market.

A second policy instrument which has been very effectively implemented by China is depreciating its currency in real terms at a faster rate than India, which has made Chinese products relatively cheap and more cost competitive with respect to the products of other countries in Indian market and at the same time Indian products became dearer in Chinese market. As a result, China's export to India accelerated at a fast rate than its imports, causing a persisting trade deficit for India.

The third and most effectively applied policy instrument which worked as a positive force behind fast acceleration of China's exports to India after liberalization is the tariff rate policy. China now exports mainly manufacturing goods to India and India's exports to China are dominated by primary and resource based products. During the last three decades India has reduced its import tariff rates for manufacturing goods more aggressively than China which has created an opportunity for Chinese manufacturers to avail a wider market access in India. In China, on the other hand, although tariffs are relatively low in absolute value, its rate of reduction has been slow as compared to India during the liberalization period resulting a slow pace of export promotion for India.

Almost after three decades of trade liberalization, India's trade performance with China has failed to achieve its objective of removing the trade deficit. The

ineffectiveness of India's trade policies is responsible for this situation. All the policies adopted by India have been overshadowed by the trade policies of China. It is better to say that India's trade performances have been controlled by the trade policies adopted by China, not by its own policies. The econometric results of time series analysis of this study show that the increasing trade deficit of India with China is explained by trade policies of China like FDI, tariff rates and exchange rates.

It would have been a better exercise if the changes in the composition of trade between these two countries could be explained in light of industry specific policies with more micro level data and the effect of technological changes on their trade performances could be incorporated in our econometric analysis. Considering these as limitations of this paper there is a scope for further in-depth study in these areas and future research.

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