

Chapter 02 - An Overview of India's Trade for The Period 1992-2018

2.1 Introduction:

During early nineties India faced a severe balance of trade crisis and in order to mitigate it a bunch of reforms in the form of New Economic Policy was adopted and India's external sector was formally liberalized. Further impetus in liberalization effort was provide when GATT was replaced by WTO in 1995. India was one of the founding members of WTO. These developments draw the attention of scholars, researchers, and policymakers, as a consequence large volume of works related to performances of India's trade during the post liberalization period was produced.

In this chapter we will not analyse the impact of New Economic Policy on India's trade rather we will analyze the performances of India's trade during the post liberalization period from 1992-2018. For this purpose, we have used several trade related indices along with other measures. To understand the performance of trade we should understand the performances of its constituents which are exports and imports. So, we focus our study on examining the performances of these two constituents of trade. We will examine the growth rates of exports and imports along with their shares of in the world trade. India's share in the beginning of liberalization period was insignificant and stagnant. We will find out whether there is an improvement in the share over the years. We will also analyse the growth rates of exports and imports using CAGR (Compound Annual Growth Rate), along with that we will analyse the actual growth is both exports and imports. Another important issue is the difference between exports and imports. When exports are greater than imports then it is called trade surplus and when it is less than imports then it is called trade deficit. We will examine the trend in difference in export and import by using an index called Export-Import Coverage. It helps us to understand whether India's exports during the study period were sufficient to cover its import bills. An important aspect related to exports is RCA (Revealed Comparative Advantage). If a country has RCA in more products, it will have more exports. What are the sectors in which India had RCA during the study period ? We will try to find the answer to this question by identifying sectors with RCAs. International trade not only brings beneficial effects to a country, but it has certain disadvantages too. On such disadvantage is vulnerability of domestic consumers and producers to external shocks due to increased dependence for their demand(of imports) and supply (of exports). We will use two indices to capture the vulnerability of India's domestic consumers and producers due to increased reliance on partner countries during the study period. These indices are i) Export Propensity Index and ii) Import

Penetration Index. We will also examine the composition and direction of exports and imports in detail. We have used some other indices and measures to make sense of performance of India's trade during the study period.

The rest of the chapter is arranged in following manner. In section 2.2 we have presented review of literature. Then in section 2.3 we have data and methodology. In the next section of 2.4 we have discussion and finally we conclude our chapter with conclusions in section 2.5.

2.2 Review of Literature:

In this section we have reviewed works of different scholars on different aspects of India's trade during post reform period. Their studies covered the issues such as, exports, imports, comparative advantages, composition, direction and so on. We have reviewed some relevant literatures on the issues related to India's trade in the post reform period.

O.P Sharma (1996), suggest that the positive export performance during Eight Five Year Plan, can be sustained in the Nineth Five Year Plan if policy reforms were continued. According to him India's export in the Nineth Five-year Plan depends on the growth performance of Indian economy during that period. Another factor according to him was increasing outward orientation which is reflected in the rise in export- GDP ratio. According to this ratio was rising during the Eight Five Year Plan period and he expected that given the experiences of Asian countries, India can increase this ratio during Ninth Five Year Plan. He suggested that increase in the exports during the Ninth Five Year Plan depends upon two factors: performance of the economy and outward orientation.

H.A C Prasad (1996), also studied the effect of economic reforms on India's major exports. His study shows that during the study period the share of major export items was more than 90 percent. There was rise in the number of export items during this period. India's export was also found to be more competitive during this period as compared to previous period. Another important inference of this study was that during this time there was he rise in India's share in world export as compared to previous period.

Charan Wadhva (1998) studied the export performance of India from 1950-1997 focusing on two sub- groups viz. 1950-1990 and 1991 -1997. He concluded that during the study period India failed to "take off to a long-term self-sustaining high growth path". He attributed this failure to inability of India's policy to align to world standard at both macro and micro level. According to him it was the domestic supply related constraint and not the external factors which was responsible for relatively low export performance. He asserts that since India's trade policy was unable to evolve into 'strategic and comprehensive national

export policy' over the years, there is a need for reformulation of India's export strategy as a part of national macroeconomic strategy.

M Talha (2001), found that India's economic policy for globalization during the period of 1991-2001 was that of export led growth policy. He suggested that in order the increase exports Indian products need to be more competitive in the world market. Another suggestion for increasing exports according to him was diversification of Indian products. On the issue of direction of trade, he found that 40 percent of India's exports is concentrated in few countries viz. United States, Japan, United Kingdom, and Germany during the study period and on the other hand more than 60 percent of India's imports were from ten countries which includes France, Hong Kong, Singapore and so on. He also reveals that Asia and Oceania were the largest market for India's exports and constituted more than 30 percent of total market.

Nilanjan Banik (2001), in his paper identified the factors responsible for significant decline in India's exports during the post reform period. He found that India that decline in India's growth rate was mainly because of fall in growth rate of export volume. And the factors responsible for declined export growth rates were related to demand side factors rather than supply side ones. But he also suggested that, taking care of supply side factors is also important for the revival of exports growth. According to him, the actual demand for India's exports was due to sharp decline in India's competitiveness caused by depreciation of the currencies of many Southeast Asian countries during that time. Another reason for the decline according to him was imposition of high non- tariff barriers by many developed countries during that period.

C. Veeramani (2007), compared the export growth between the pre reform period of 1950-1990 and post reform period of 1993-2005 and found that growth rate during post reform period was not very high as compared to pre reform period. Comparing the potential and actual growth rates of exports during the post reform period he found that during this period actual growth rate was higher than potential growth rate. The reason he gave for this was overall improvement in competitiveness of India's export during this period. He also identified that appreciation of real effective exchange rate had adverse effect on India's exports during post reform period.

Arvind Panagariya (2006), in his studies found that India's domestic policies have impacted the export of labor-intensive products and lack of attention on small scale industries (SSI) is mainly responsible for India's poor performance in external trade.

A.O Krueger, (2008), in her paper observes that Indian economy had substantially liberalized after the crisis of early 1990s. According to her, India's exports

increased rapidly after liberalization. She observed that improvement in India's trade sector had contributed majorly to growth performance of India which was rising rapidly. She also suggested measures to meet policy challenges in order to sustain existing growth rate. in post liberalization period.

P. C. Athukorala (2008) , studied export performance of India during the reform period. He found that there was improvement in the performance of both service and merchandise exports of India. In could not find the exact reason for the growth in merchandise exports. He found that during reform period India exports basket was dominated by resource-intensive manufacturing. His study also reveals that India's export share with developing nations remain stagnated at 2 percent during the period. According to his study there was mild gain for India in world. Another important result of this study was related to India's comparative advantage in export goods. According to the author, during this period there was a structural shift in comparative advantage from labour intensive to resource, capital, and skill intensive products. India's export in the labor-intensive product was heavily dependent on textile and clothing sector.

Hulten and Srinivasan (1999) in their study pointed out that Indian manufacturing performance is sound and in line with the general experience of the Asian Tigers.

Burange and Chaddha (2008), while studying India's revealed comparative advantage in merchandise goods for the period of 1996-2005 found that during that period India had revealed comparative advantages in the exports of labor-intensive goods like Textiles and in scale intensive goods like chemicals and iron and steel.

Ruma Bhattacharyya (2012), in her study compared India's revealed comparative advantage and competitiveness in vegetables, fruits and flower trade with other Southeast Asian nations in the Asian , European Union and North American markets. Her study revealed that in EU markets India had significantly high comparative advantage in vegetables and fruits but same is not true for flowers.

Asish and Kannan (2015) studied the comparative advantage of India's agro-processed products. For this purpose, they categorized 116 items into three categories viz. processed animal, processed vegetables, and processed food products. Their study concludes that India had comparative advantage in exports of 7 items out of 32 items in the category of processed animal products, 12 items out of 40 items in the category of processed vegetable products and 7 items out of 44 items in the category of processed food products. They also concluded that India's RCA in these three categories had declined over time.

C. Veeramani (2012), analyzed the growth and pattern of India's merchandise trade and found that during the first decade after reform there was relatively low export growth rate whereas in the second decade there was strong export growth rate. He also found that there was steady change in the composition of India's exports towards capital and skill intensive products. With respect to export destination, he found that there was a shift in India's export destination from markets of developed countries to that of emerging economies of Asia and Africa.

Sai Hara Gopal (1999) compared different variables viz, exports, imports, trade deficits, foreign exchange reserves, and the external debt related to India's external sector. For the study the author used the data from 1980-81 to 1996-97 which he divided into pre liberalization and post liberalization period. The study shows that the liberalization had positive effect on the export, import, and foreign exchange reserves, and negative effect on external debt. Another finding of the study shows that rate of growth of imports was higher than the rate of growth of exports during the post liberalization period as compared to pre-liberalization period. So, like many other works his work also confirmed that liberalization had positive impact on India's trade.

S.M. Ahsan Habib and Pinki Shah (2003) , in their study found that volume of India's trade registered a considerable growth during the post liberalization (post-openness) period. They also found that, as compared to other developing countries India's barriers to trade were relatively higher. They also conclude that as compared to other developing countries considered for comparison, India's share in world trade was insignificant. Their study also found that during the given period very strong association was found between India's trade and its economic growth.

Anjali Tandon (2005) compared the export and import performance of India's agricultural sector during the pre and post reform period. She found that on the one hand there was acceleration in the imports of agricultural products and on the other, there was deceleration in exports. Another inference she made was that the significance of agricultural product in total merchandise trade, though they had higher values in both import and export, had reduced during the period.

Pushpalata Singh (2014) studied performance of India's foreign trade during the post liberalization period. She found that during this period both imports and exports increased but as compared to exports, the growth rate of imports was higher. As far as export and import compositions are concerned, she found that manufactured items constituted the major position of India's exports and petroleum, and crude products constituted the major

portion of India's imports.

2.3 Data and Methodology:

In this chapter we will use various measures and trade related indices to analyse the performances of India's trade. These formula of the related indices and measures had been detailed in the Appendix of this chapter. The data that we have used in this analysis has been taken from WITS – COMTRADE website. The period that we have considered are between 1992-2018. All data are at current price in \$US terms. For the analysis of RCA and composition of goods we have considered goods at sector level. And for the direction of trade, we have considered regions and not individual countries. The data that has been used are not whole trade data, but it is limited to trade in goods or merchandise trade. So, our analysis is basically focused on India's merchandise trade and trade in services are not considered.

2.4 Discussion:

Now in this section we will discuss various aspects of India's trade on using various trade related indicators.

2.4.1 Growth Rate of Exports:

The table below shows the growth of India's exports during the period of 1992-2018. In 1992 export registered 15.71 percent growth rate and in 2018 it registered 9.49 percent. So, the growth rate in the first year of period was better than the last year. During this period, the maximum growth rate registered was 36.78 percent in 2011 and lowest was registered in 2015 at -16.74 percent. So, India experienced both negative growth and positive growth during this period.

Table 2.1: Export Growth Rate (%)

Year	Export growth rate	Year	Export growth rate	Year	Export growth rate
1992	15.71	2001	3.59	2010	24.69
1993	7.37	2002	14.17	2011	36.78
1994	18.41	2003	18.49	2012	-3.95
1995	20.39	2004	27.87	2013	16.25
1996	5.58	2005	32.21	2014	-5.66
1997	3.96	2006	20.77	2015	-16.74
1998	-4.56	2007	20.38	2016	-1.53
1999	11.18	2008	24.65	2017	13.07
2000	14.73	2009	-2.8	2018	9.49
				1991-2018	11.3

Author's calculation

Data Source: WITS- COMTRADE

Now let us discuss year to year trend in India's exports growth during the period. As we have seen India's growth rate in 1992 was 15.71 percent in declined to 7.37

percent in 1993 but after that it again rise to 18.41 percent in 1994 and further to 20.39 percent in 1995. After that the growth rate continuously declined for next three years. From 20.39 percent in 1995 it sharply declined to 5.58 percent in 1996 and further to 3.96 percent in 1997 and it became negative for the first time in 1998 at -4.56 percent. In the next two years India's again registered positive growth rate. It registered 11.18 percent in 1999 and further 14.73 percent in 2000. After declining sharply to 3.59 percent in 2001 the growth rate increased continuously for next four years from 2002 to 2005. From 3.59 in 2001 it increased sharply to 14.17 percent in 2002 and reached 18.49 percent in 2003. It further increased to 27.87 percent in 2004 and then in 2005 it reached 32.21 percent. After that the growth rate declined to 20.77 in 2006 and further marginally to 20.38 percent in 2007. After declining for two years the growth rate again increased to 24.65 percent in 2008. There was a sharp decline in the growth rate in 2009 and a negative growth rate of -2.80 was registered in this year.

After the negative growth rate of 2009 there was sharp increase in the export growth rate in 2010 to 24.69 percent and further in 2011 to 36.78 percent, which was also the highest growth rate registered throughout the period. After achieving the highest growth rate in 2011, India's export growth rate dipped into another negative growth rate of -3.95 percent in 2012. This was compensated by 16.25 percent growth rate in the next year of 2013. The three years after that was worst from the point of view of India's export growth. India registered negative growth rates continuously for three years from 2014 to 2016. India experienced the growth rate of -5.66 percent in 2014 and worst ever growth rate of -16.74 in 2015 followed by another negative growth rate of 1.53 percent in 2016. There was sharp recovery and improvement in the growth rate in 2017 at 13.07 percent. In the final year as mentioned earlier India's growth rate was 9.49 percent which was less than the previous year's rate. The period between 1999 to 2011 was the best period for India's export growth except for 2009 when the rate was negative.

2.4.2 Growth Rate of Imports:

After discussing growth rate of exports now, we will discuss growth rate of imports. For the same period.

The table shows growth rate of India's imports from China for the period of 1992-2018. As before calculation is based on the formula for CAGR. In 1992 the growth rate was 25.34 percent compared to 39.16 percent in 2018. The highest growth rate was registered in 2008 at 44.39 percent and lowest growth in -15.62 percent in 2009. So, there was a huge gap between the highest and lowest growth rate during this period. Now let us consider the trend in growth rate of imports during this period. The growth rate drastically fell to -4.70

percent in 1993 from 25.34 percent in 1992. But after that there was a sharp increase to 22.96 percent in 1994 and further to 27.70 percent in 1995. The growth rate then continuously declined from next three years to 6.89 percent in 1996 to 2.40 percent in 1998.

Table 2.2: Import Growth Rate (%)

Year	Import growth rate	Year	Import growth rate	Year	Import growth rate
1992	25.34	2001	-4.29	2010	31.39
1993	-4.70	2002	13.39	2011	32.10
1994	22.96	2003	26.07	2012	5.75
1995	27.70	2004	36.66	2013	-4.69
1996	6.89	2005	42.31	2014	-1.43
1997	5.92	2006	26.52	2015	-14.94
1998	2.40	2007	22.69	2016	-8.71
1999	17.88	2008	44.39	2017	24.49
2000	5.86	2009	-15.62	2018	39.16
				1992-2018	13.65

Author's calculation

Data Source: WITS- COMTRADE

After that in 1999, it increased sharply to 17.88 percent but again declined to 5.86 percent in 2000 and become – 4.29 percent in 2001. Thereafter from 2002 to 2005, the growth rate continuously increased from 13.39 percent to 42.31 percent. The next two years saw decline in the growth rate to 26.52 percent in 2006 and further to 22.69 percent in 2007. Then again in 2008 it increased sharply to 44.39 percent. In 2009, there was again negative growth of -15.62 percent which was higher than previous negative growth rate of -4.29 percent in 2001. But the growth recovered in next year to 31.39 percent and it increased further to 32.10 percent in 2011. 2012 saw another sharp decline in the growth rate and registered 5.75 percent but next four-year experienced continuous negative growth rate. In 2013 it was – 4.69 percent which improved to -1.43 percent but again deteriorated sharply to -14.94 percent in 2015 but again relative improvement in 2016 when a growth rate of -8.71 percent was registered. After that import growth improved continuously to 24.49 percent in 2017 and then to 39.16 percent in 2018. During the entire period of 1992-2018, the annual average growth rate of import was decent 13.65 percent.

2.4.3 India's Share in World Trade:

India's share in the world trade was not very significant during the period of 1992-2018. Throughout the period it was around two percent. From 1992 to 2004 the share was less than one percent. It was only after 2004 that India's share exceeded one percent

mark and reached two percent in 2011. The minimum share was 0.71 percent and maximum were 2.37 percent during this period. It does not mean that India's trade is not growing. Let us discuss the trend in India's trade share during the period.

Table 2.3: India's Share in World Trade (%):

year	Trade share	Year	Tade share	Year	Trade share
1992	0.92	2001	0.71	2010	1.78
1993	0.80	2002	0.78	2011	2.00
1994	0.73	2003	0.82	2012	2.04
1995	0.72	2004	0.90	2013	2.03
1996	0.72	2005	1.10	2014	1.97
1997	0.71	2006	1.17	2015	1.91
1998	0.71	2007	1.25	2016	1.84
1999	0.78	2008	1.47	2017	1.99
2000	0.71	2009	1.69	2018	2.37

Author's calculation

Data Source: WITS- COMTRADE

In 1992, the share of India in the world trade was only 0.92 percent which declined to 0.80 percent in 1993 and further to 0.73 percent in 1994. There was further marginal decline in the share in 1995 to 0.72 percent and this share continued in the next year of 1996. But it again declined marginally to 0.71 percent in 1997 and remain at that level in 1998. After that the share increased in 1999 to 0.78 percent only to decline in the next year to 0.71 percent. This share continued in 2001 as well. After that India's share in the world trade increased continuously from 0.78 percent in 2002 to 2.04 percent in 2012. India crossed one percent share in 2005 and reached two percent share in 2011. After that the share continuously declined in next four years from 2.03 in 2013 to 1.84 percent in 2016. The share increased in the next two year to 1.99 percent in 2017 and 2.37 percent in 2018.

Even though India's share showed increasing tendency during the period, but it increased very slowly. Next, we will discuss India's share in World exports and Imports.

2.4.4 India's Share in World Exports and Imports:

We have discussed India's share in world trade. Now we will discuss share of India's imports and exports in the world. This will give us a better picture of India's position in world trade. The table shows that share of India's imports was higher than that of exports during the said period. The maximum share of imports during this period was 3.27 percent in 2018 and minimum was in 0.75 percent in the year 1994. Similarly for the exports,

maximum share was 1.60 percent and minimum were 0.60 percent in 2000. The share of imports was higher than that of exports in the case of both maximum and minimum.

Table 2.4: India's Share in World Exports and Imports (%)

Year	Import	Export	Year	Import	Export	Year	Import	Export
1992	0.99	0.84	2001	0.81	0.64	2010	2.31	1.31
1993	0.81	0.79	2002	0.88	0.69	2011	2.56	1.49
1994	0.75	0.70	2003	0.95	0.70	2012	2.71	1.44
1995	0.77	0.68	2004	1.06	0.74	2013	2.52	1.60
1996	0.77	0.67	2005	1.34	0.87	2014	2.48	1.52
1997	0.77	0.66	2006	1.47	0.91	2015	2.42	1.45
1998	0.79	0.63	2007	1.57	0.95	2016	2.26	1.47
1999	0.89	0.67	2008	1.96	1.03	2017	2.52	1.51
2000	0.82	0.60	2009	2.15	1.28	2018	3.27	1.51

Author's calculation

Data Source: WITS- COMTRADE

Comparison of shares of imports and exports during this period shows that the share of imports was always greater than that of exports for every year. There was not a single year during this period where the share of export was higher than that of imports. The maximum difference in the share of imports and exports was in 2018 and minimum was in 1993.

During the period of 1992-2001 the average import share was 0.82 and average export share was 0.69. The table shows that there was a decline in the share of imports for the first three years from 1992 to 1994 and after that it increased or remain same for next five years till 1999. The share declined during 2000 and 2001. So, this decade exhibited both contraction and expansion in the share of India's imports. On the other hand, the share of exports showed declining trend from 1992 till 1998 and after rising in 1999 again it declined for the next two years of 2000 and 2001. So, in case of exports share during this decade the tendency was that of contraction rather than that of expansion. So, the pattern of imports shares and that of export share was dissimilar during this period. And the share of import was relatively greater than export share.

During the next period of 2002-2011, the average import share was 1.63 percent and average export share was one percent. The trend was quite different during this period for both import and export share than preceding period. The share of both exports and imports exhibited a secular expansion. The import share during this period expanded from 0.88 percent in 2002 to 2.56 percent in 2011. Similarly, export share increased from 0.69 percent in 2002 to 1.49 percent in 2011. Comparison of export share and import share shows

that just like previous period the expansion in imports was higher than that of exports. This period was interesting in the sense that unlike in the previous period there was expansion in both exports and imports share during this period.

During the seven years period of 2012-2018, there was a mixed trend of expansion and contraction for both imports and exports share. The average share of import and export during this period was 2.60 and 1.50 percent respectively. In case of import share, it declined continuously for four years from 2013 to 2016 and then increased during next two years of 2017 and 2018. The highest share was in 2018 with 3.27 percent. Similarly, in case of export share, it was 1.44 percent in 2012 which increased to 1.60 percent in 2013. After that, there was a decline in its share in next two years of 2014 and 2015. In 2016 and 2017 there was an expansion in the share. The share in 2018 was same as that in 2017. During this period also the share of imports was higher than that of exports for every year just like in case of previous two periods.

2.4.5 Export Value Index (EVI):

This indicator helps us to understand the growth in India's exports. Here we have used 1992 as base year and its value as 100 and we have transformed the value of other years based on the value of 1992. This will help us to understand the extent of growth in India's exports during the given period. As we have already discussed the share of India's export in world exports. We found that there was not much change in India's share in world exports and it remained stagnant. That was true when we discussed India's exports relative to the world. But that does not mean India's export was not growing or remained stagnant.

The table shows that from 100 in 1992 the value of EVI increased to 153 in 1995 and further to 204 in 2000. The value reached 484.53 in 2005. After that in 2010 it increased significantly to 1064.19. There was further increase in the value to 1276.51 in 2015 and in the final year the value was 1556.12. So, there was continuous increase in the value of EVI during this period. The highest value was registered in 2013 at 1625.26. The trend shows that there was continuous rise in the value from 107.37 in 1993 to 167.99 in 1997, Then it declined to 160.33 in 1998 and after that it increased continuously for another ten years from 178.26 in 1999 to 878.08 in 2008. This means that India's exports increased by more than eight times in 2008 as compared to its value in 1992. The value declined to 853.47 in 2009. After that it increased continuously for next two years to 1064.19 in 2010 and further to 1455.65 in 2011.

In 2011 the value was more than fourteen times the value of 1992. In 2012 again there was a slight decline in the value to 1398.10 but it increased and reached

highest in 2013 at 1625.26. So, the maximum value was more than sixteen times the value of 1992. For the next four years the value of EVI declined continuously from 1533.20 in 2014 to 1421.28 in 2017. Then in the final year it increased to 1556.12. So, in the final year the value of exports was fifteen times more than the value of 1992.

Table 2.5: Export Value Index (EVI) (1992 =100)

Year	EVI	Year	EVI	Year	EVI
1992	100	2001	211.86	2010	1064.19
1993	107.37	2002	241.89	2011	1455.65
1994	127.13	2003	286.61	2012	1398.1
1995	153.05	2004	366.49	2013	1625.26
1996	161.6	2005	484.53	2014	1533.2
1997	167.99	2006	585.19	2015	1276.51
1998	160.33	2007	704.44	2016	1256.93
1999	178.26	2008	878.08	2017	1421.28
2000	204.52	2009	853.47	2018	1556.12

Author's calculation

Data Source: WITS- COMTRADE

So, we can conclude that India's export had increased continuously during the said period. The growth was rapid during the period from 2003 to 2011. During this period, as compared to the value in 1992, the export value grew as high a sixteen times. So even though India's export share in the world was apparently stagnant but in absolute sense India's export had increased many fold during the given period of 1992-2018.

2.4.6 Import Value Index (IVI):

After discussing export value index, we will now discuss import value index of India for the same period. This discussion will help us to understand the extent of India's imports during this period on the basis of its imports in 1992. Even though just like exports India's import in the world was either stagnant or increased very slowly. But this discuss will show that even though the performance was insignificant relative to world imports but in had increased manyfold in absolute sense during the given period.

On the basis of import value of 1992 = 100, in 1995 the value rises to 147.20 and then to 218.53 in 2000. In 2005 it further increased to 605.97 and reached as high as 1485.49 in 2010. The rise in the valued continued even in 2015 to 1666.32 and finally it reached the maximum value of the period of 2165.95 in the final year of 2018. Let us look at the trend now. In 1993 the value declined to 96.66 which was the only value in the entire period which was less than that of 1992. Afte that it improved continuously from 113.85 in 1994 to

218.53 in 2000. It declined in 2001 to 213.75 but after that it again improved continuously from 239.71 in 2002 to 1361.65 in 2008. The value declined in the next year of 2009 to 1090.91 but again increased continuously for next three years from 1485.49 in 2010 to 2077.01 in 2012. The value followed declining trend continuously for next four years from 1973.95 in 2013 to 1532.04 in 2016. After that the value increased continuously to 1901.97 in 2017 and further to 2165.95 in 2018.

Table 2.6: Import Value Index (IVI) (1992=100)

Year	IVI	Year	IVI	Year	IVI
1992	100.00	2001	213.75	2010	1485.49
1993	96.66	2002	239.71	2011	1970.00
1994	113.85	2003	307.76	2012	2077.01
1995	147.20	2004	423.19	2013	1973.95
1996	160.93	2005	605.97	2014	1963.40
1997	175.72	2006	756.71	2015	1666.32
1998	182.30	2007	972.86	2016	1532.04
1999	199.26	2008	1361.65	2017	1901.97
2000	218.53	2009	1090.91	2018	2165.95

Author's calculations

Data Source: WITS- COMTRADE

This means that the value was almost 1.5 time higher in 1995 and was two time higher in 2000 and in 2005 it was six times higher than the value of 1992. In 2010 the value further increased and become more than fourteen times higher and in 2015 more than sixteen times higher. And finally in 2018 the value was more than twenty-one times higher than 1992. The discussion shows that most of the increase in India's imports happened in the latter part of the period particularly after 2005.

So, on the basis of this discussion, we may infer that even though India's imports did not rise satisfactorily relative to world imports but in absolute terms or in comparison to its own earlier value in this case the value of 1992) it had increased tremendously as high as twenty-one times more as shown in the table.

2.4.7 Export Import Coverage:

Another index we have considered here is the Export Import coverage. This index shows that during the said period of 1992-2018, India's exports were enough or not to cover its import bills. Since this index is measured as ratio of import value and export value, if the value of index exceeds one then it means that exports of the country is more than enough to cover its imports and if the value of index is less than one then it means that exports of the

country is not enough to cover its imports and if its value is exactly one then it means that the country's exports is just enough to cover its imports.

Table 2.7: Export Import Coverage

Year	EIC	Year	EIC	Year	EIC
1992	0.85	2001	0.87	2010	0.63
1993	0.95	2002	0.87	2011	0.65
1994	0.92	2003	0.82	2012	0.59
1995	0.87	2004	0.77	2013	0.72
1996	0.86	2005	0.71	2014	0.69
1997	0.84	2006	0.68	2015	0.68
1998	0.78	2007	0.67	2016	0.73
1999	0.74	2008	0.58	2017	0.66
2000	0.80	2009	0.66	2018	0.52

Author's calculation

Data Source: WITS- COMTRADE

The table shows that in 1992 the value of EIC was 0.85 and in 1995 it increased to 0.87. The value then declined to 0.80 in 2000 and reached 0.71 in 2005. The value become even less in 2010 at 0.63 percent. In 2015 there was some improvement in value at 0.68 but then again in 2018 it declined and reached as low as 0.52. The maximum value of the index during this period was 0.92 in 1992 and minimum value was 0.52 in 2018.

The trend shows that the value increased from 0.85 in 1992 to 0.95 in 1993 after that it continuously declined from 0.92 in 1994 to 0,74 in 1999. After that, the value increased for next two years as it increased to 0.80 in 2000 and further to 0.87 in 2001 In 2002 the value remained at 0,87 but after that it continuously declined for next six years from 0.82 in 2003 to 0.58 in 2008. In 2009 value increased to 0.66 but again declined to 0.63 in 2010 which again increased to 0.65 in 2011. But again in 2012 it declined to 0.59. It was again followed by a rise in the value to 0.72 in 2013. In next two years the value declined continuously, first to 0.69 in 2014 and then to 0.68 in 2015. Then again in increased to 0.73 in 2016. After that in the last two years the value continuously declined first to 0.66 in 201 and then to 0.52 in the final year of 2018.

This discussion shows that India's exports were never enough to cover its imports during the period. The value of EIC was neither equal to nor exceeded one in any of the years. Its value was always less than one and declined over the period.

2.4.8 Export Market Penetration:

India's performance in this index had improve throughout the period from 1992-2018. Its value was maximum in 2017 at 29.53 percent and minimum in 1992 at 7.44 percent. From 7.44 percent in 1992 it rose to 10.33 percent in 1995 and further to 16.64 percent in 2000. After that in 2005 it improved further to 22.97 percent and reached 27.08 percent in 2010. It slowed down from that and reached 28.12 percent in 2015 and finally in 2018 it was declined to 27.15. percent.

Table 2.8: India's Export Market Penetration (EMP) (%)

Year	EMP	Year	EMP	Year	EMP
1992	7.44	2001	17.59	2010	27.08
1993	8.34	2002	18.61	2011	26.91
1994	9.82	2003	19.86	2012	27.46
1995	10.33	2004	20.5	2013	28.53
1996	11.29	2005	22.97	2014	28.25
1997	12.31	2006	23.8	2015	28.12
1998	13.18	2007	25.01	2016	28.62
1999	14.06	2008	25.79	2017	29.53
2000	16.64	2009	25.78	2018	27.15

Source: WITS- COMTRADE

The trend shows that from 7.44 percent in 1992 it increased continuously for next 16 years from 8.34 percent in 1993 to 25.79 percent in 2008 but declined marginally to 25.78 percent in 2009. It again improved to 27.08 percent in 2010 but again declined to 26.91 percent in 2011. After that it improved continuously for next two years first to 27.46 percent and then to 28.53 percent in 2013. Then it again declined continuously for next two years first to 28.12 percent in 2015 and then to 28.62 percent in 2016. It again improved and reached its highest in 201 at 29.53 percent. In the final year of 2018, it again declined to 2.15. percent.

Even though the value of India's EMP fluctuated from 2006 onwards but the value increased continuously over the period. India's export market penetration had increased almost four-fold during this period.

2.4.9 Revealed Comparative Advantage (RCA) Selected Years:

Now we will discuss the sector wise RCA of India for the given period from 1992-2018. But here we have taken seven sleeted years of 1992,1995, 2000, 2005, 2010, 2015, and 2018 and 16 sectors.

In 1992, India had RCA in eight sectors and RCDA (Revealed comparative disadvantage) in eight sectors. So, 50 percent sectors hade RCA and other 50 percent had RCDA in this year. The sectors in which India had RCA were Stones and Glass,

Minerals, Hides and Skins, Textiles and Clothing, Vegetables, Animal, Footwear, and Food Products. Among these eight sectors with RCA Stone and Glass had the most comparative advantage 5.82 and Food products had the least comparative advantage with 1.21. Similarly, the sectors eight sectors with RCDA during this year were: Metals, Chemicals. Fuels, Plastic or Rubber, Miscellaneous, Machinery and Electricals, Transportation, and Wood. Among these sectors Metals with a value of 0.92 had the least comparative disadvantage and Wood with 0.12 had the most comparative disadvantage.

Table 2.9: Revealed Comparative Advantage (RCA) Selected Years:

Year	1992	1995	2000	2005	2010	2015	2018
Stone and Glass	5.82	6.16	6.37	7.27	5.22	3.56	4.00
Hides and Skins	5.04	5.24	4.06	3.11	2.43	2.50	2.33
Textiles and Clothing	4.02	4.14	4.22	3.62	3.33	3.34	3.16
Vegetable	2.31	2.39	3.20	1.94	1.57	1.96	1.63
Footwear	1.65	1.97	1.79	1.62	1.56	1.62	1.49
Minerals	5.64	4.14	4.40	6.35	3.53	0.95	0.90
Animal	1.66	1.69	2.04	1.17	0.97	1.42	1.35
Food Products	1.21	0.74	0.95	0.65	0.74	0.70	0.59
Metals	0.92	0.83	1.12	1.25	1.00	1.23	1.33
Chemicals	0.76	0.80	1.25	1.14	1.20	1.55	1.64
Fuels	0.37	0.24	0.18	0.46	0.91	0.83	0.77
Plastic or Rubber	0.33	0.40	0.54	0.74	0.55	0.63	0.76
Mach and Elec	0.16	0.19	0.22	0.27	0.37	0.34	0.39
Miscellaneous	0.17	0.23	0.27	0.25	0.24	0.33	0.38
Transportation	0.12	0.22	0.19	0.28	0.46	0.55	0.57
Wood	0.12	0.15	0.21	0.22	0.27	0.27	0.31

Source: WITS - COMTRADE

In 1995, seven sectors had RCA and nine sectors had RCDA. The sector that lost RCA in this year was Food Products which had the least RCA in 1992. The sector with RCA includes Stones and Glass, Minerals, Hides and Skins, Textiles and Clothing, Vegetables, Footwear, and Animal. In this year also Stone and Glass had the most comparative advantage with 6.16 and Animal sector had the least RCA with a value of 1.69. The nine sectors with RDCA were Metals, Chemicals. Fuels, Plastic or Rubber, Miscellaneous, Machinery and Electricals, Transportation, Wood. and food products. The sector with the least comparative disadvantage during this year was Metals sector and the sector with most comparative

disadvantage was again Wood sector. In percentage terms, in this year 43.75 percent of the sectors had RCA and 56.25 percent of sectors had RCDA.

The number of sectors with RCA in 2000 increased to nine and the sectors with RCDA declined to seven. The Chemicals sector and Metals sectors were the two sectors included in the sectors with RCA in this year and excluded from the sectors with RCDA. The sectors that had RCA in this year were Stones and Glass, Minerals, Hides and Skins, Textiles and Clothing, Vegetables, Footwear, Animal, Chemicals, and Metals. Among these sectors Stone and Glass sector continued to have the most RCA with 6.37 and the sector with least RCA was newly added Metals sector with a value of 1.12. Similarly, the sectors with RCDA includes. Fuels, Plastic or Rubber, Miscellaneous, Machinery and Electricals, Transportation, Wood, and Food products. In this year the sector with most RCDA was Fuels with 0.18 and sector with least RCDA was Food Products with 0.95. In this year 56.25 percent of sectors had RCA and 43.75 percent of sectors had RCDA.

There was no change in the number of sectors with RCA and with RDCA in 2005. In this year also same nine sectors of Stones and Glass, Minerals, Hides and Skins, Textiles and Clothing, Vegetables, Footwear, Animal, Chemicals, and Metals had RCA and same seven sectors of Fuels, Plastic or Rubber, Miscellaneous, Machinery and Electricals, Transportation, Food Products and Wood had RCDA. With a value of 7.27, Stone and Glass sector continue to have the most RCA and with a value of 1.14 Chemicals had the least RCA in this year. Similarly, with a value of 0.74 Plastic and Rubber had the least RCDA and Wood continue to have the most RCDA in this year. In this year also 56.25 percent of the sectors had RCA and 43.75 percent sectors had RCDA.

In 2010, there were again eight sectors which had RCA and eight sectors which had RCDA. In this year Animal sector was excluded for the first time from the sectors with RCA. The following sectors had RCA in this year: Stones and Glass, Minerals, Hides and Skins, Textiles and Clothing, Vegetables, Footwear, Chemicals, and Metals. In this year also, Stone and Glass sector with a value of 5.22 had the most RCA and Metals with a value of 1 had the least RCA. As compared to 2005, with the addition of Animal sector, the number of sectors with RCDA in this year increased to eight. It includes Fuels, Plastic or Rubber, Miscellaneous, Machinery and Electricals, Transportation, Food Products, Animal and Wood. In this year, the sector with least RCDA was changed from Plastic and Rubber sector in 2005 to Animal sector and the sector with most RCDA was also changed from Wood sector in 2005 to Miscellaneous. in this year. in this year 50 percent of the sector had RCA and other 50 percent had RCDA.

The situation was no different in 2015. In this year also eight sectors had RCA and another eight had RCDA. Even though numbers of sectors were same as in 2010 but sectors changed in this year. Animal sector which had RDCA in 2010 was excluded from sectors with RCDA and included in sectors with RCA in this year and Mineral's sector which had RCA in 2010 was excluded from sectors with RCA and included in the sectors with RCDA. So, the sectors with RCA in this year were Stones and Glass, Animal, Hides and Skins, Textiles and Clothing, Vegetables, Footwear, Chemicals, and Metals. In continuation to 2010, in this year also Stone and Glass were the sector with a value of 3.56 had the most RCA and Metals sector with 1.23 was the sector with least RCA, Similarly, sectors with RCDA in this year were Fuels, Plastic or Rubber, Miscellaneous, Machinery and Electricals, Transportation, Food Products, Minerals and Wood. In this year Minerals sector was the new sector with least RCDA replacing Animal sector and sector of Wood was again the sector with most RCDA replacing Miscellaneous sector. There were 50 percent sectors in this year which had RCA and 50 percent sector which had RCDA.

Finally in 2018, there was neither any change in the number of sectors nor change in sectors which had either RCA or RCDA. In other words, same sectors had RCA and RCDA in this year as in 2015. So, the sectors that had RCA in 2018 were Stones and Glass, Animal, Hides and Skins, Textiles and Clothing, Vegetables, Footwear, Chemicals, and Metals. In this final year also Stone and Glass sector with a value of 4 had the most RCA and Metals sector with a value of 1.33 had the least RCA. In this year, Fuels, Plastic or Rubber, Miscellaneous, Machinery and Electricals, Transportation, Food Products, Minerals and Wood were the sectors with RCDA. Just like in 2015, in this year also Minerals was the sector with least RCDA, and Wood sector was the sector with most RCDA, Fifty percent of the sectors had RCA in this year and fifty percent had RCDA.

2.4.10 Hirschman Herfindahl Index (HH Index):

This index shows that whether a country's trade is concentrated within a few partners of it is diversified. If the value of this index is near zero, then the country in question is said to have diversified its trade across many countries and if value approaches one then this means that country's trade is concentrated in fewer countries.

The above table shows the HH index of India for the period of 1992-2018. The value of index in 1992 was 0.12 which declined to 0.07 in 1995. The value remained at 0.07 in 2000 and in 2001 it declined to 0.06. Then in 2010 it further declined to 0.04. In 2015 there was a rise in the value to 0.05 and in the final year of 2018 it remained at 0.05. The trend shows that the value of HH index declined continuously from 0.12 in 1992 to 0.06 in 1996. In

1997 it remained at 0.06 but increased in next two years to 0.07 in 1998 and to 0.08 in 1999. After that, the value declined to 0.07 in 2000 and further to 0.06 in 2001. In 2002 it again increased to 0.07 and then in 2003 it declined to 0.06. The value remained at 0.06 for next two years and declined to 0.05 in 2006. Same value of 0.05 continued in 2007 and then in 2008 it declined to 0.04. This value of 0.04 continued for next six years till 2014. After that, the value increased to 0.05 which continued 2018.

Table 2.10: Hirschman Herfindahl index

Year	HHI	Year	HHI	Year	HHI
1992	0.12	2001	0.06	2010	0.04
1993	0.09	2002	0.07	2011	0.04
1994	0.08	2003	0.06	2012	0.04
1995	0.07	2004	0.06	2013	0.04
1996	0.06	2005	0.06	2014	0.04
1997	0.06	2006	0.05	2015	0.05
1998	0.07	2007	0.05	2016	0.05
1999	0.08	2008	0.04	2017	0.05
2000	0.07	2009	0.04	2018	0.05

Source: WITS- COMTRADE

Even though India's value of HH index was low in 1992 and its trade was therefore diversified but over the years its value further declined to as low as 0.04. This indicates that India's trade over the given period of 1992-2018 become increasingly diversified.

2.4.11 Export Propensity:

The table below shows the value of export propensity index of India. There was an improvement in the value of this index over the years. The highest value was registered in 2013 at 18.13 percent and lowest value in 1992 at 7.19 percent. From 1992 the value increased to 8.80 in 1995 and then in 2000 it further improved to 9.04. It increased continuously and reached 12.23 in 2005 and in 2010 further to 13.15. After that there was decline in value to 12.57 in 2015 and it further declined to 11.88 in 2018.

The table shows that from 7.19 percent it improved continuously for next three years from 7.96 in 1992 to 8.80 in 1994. Then it declined continuously for next three years from 8.52 in 1996 to 7.88 in 1998. It again improved to 8.05 in 1999 and reached 9.04 in 2000. The value remained at 9.04 in 2001 and after that it improved continuously for next five years from 9.73 in 2002 to 12.89 in 2006. It declined to 11.99 in 2007 but again increased to 15.1 in 2008. After that it again declined continuously for next two years first to 13.17 in 2009 and then to 13.15 in 2010. It was followed by increase in value to 16.54 in 2011 but again in

2012 it declined to 15.84. In 2013 it again improved to 18.13. But after that it declined continuously for next four years from 15.57 in 2014 to 11.10 in 2017. In the final year it improved to 11.88.

Table 2.11: India's Export Propensity (1992-2018)

Year	EPI	Year	EPI	Year	EPI
1992	7.19	2001	9.04	2010	13.15
1993	7.96	2002	9.73	2011	16.54
1994	8.05	2003	9.77	2012	15.84
1995	8.80	2004	10.70	2013	18.13
1996	8.52	2005	12.23	2014	15.57
1997	8.37	2006	12.89	2015	12.57
1998	7.88	2007	11.99	2016	11.34
1999	8.05	2008	15.17	2017	11.10
2000	9.04	2009	13.17	2018	11.88

Author's calculation

Data Source: WITS- COMTRADE

So, even though India's performance on export propensity fluctuated but over the period it had improved considerably as compared to its value in the initial years.

2.4.12 Import Penetration Index:

According to the table below. the maximum value of the index during this period was 24.12 in 2012 and minimum was 8.31 in 1993. It increased from 8.38 in 1992 to 10.02 in 1995 and further to 11.05 in 2000. In 2005 it further improved to 16.36 and improvement continued, and it reached 19.29 in 2010. There was a decline in value in 2015 to 17.52 but again it improved to 20.54 in 2018.

The trend shows that the value declined from 8.38 in 1992 to 8.31 in 1993 but improved continuously for next two years first to 8.69 and then further to 10.02. After that it gain declined to 9.81 in 1996. In 1997 the value remained the same at 9.81 but after that it improved continuously for next three years from 9.85 in 1998 to 11.05 in 2000. In 2001 it again declined to 10.29 but after that it improved continuously for next five years from 11.00 in 2002 to 17.87 in 2006. In 2007 it declined to 16.96 but again it improved to 23.69 in 2008. The fluctuation continued and in 2009 it again declined to 18.61 followed by continuous increase from 19.39 in 2010 to 24.12 in 2012. After that it continuously declined for next four years from 23.46 in 2013 to 14.92 in 2016. In the final two years the value improved first to 15.85 and then to 20.54.

Table 2.12: India's Import Penetration Index

Year	IPI	Year	IPI	Year	IPI
1992	8.38	2001	10.29	2010	19.39
1993	8.31	2002	11.00	2011	23.31
1994	8.69	2003	11.67	2012	24.12
1995	10.02	2004	13.52	2013	23.46
1996	9.81	2005	16.36	2014	21.06
1997	9.81	2006	17.87	2015	17.52
1998	9.85	2007	16.96	2016	14.92
1999	10.60	2008	23.69	2017	15.85
2000	11.05	2009	18.61	2018	20.54

Author's calculation

Data Source: WITS-COMTRADE

So, we can infer that India's reliance on imports had increased and it may not be good for India as it makes Indian economy dependent and vulnerable to external shocks.

2.4.13 Trade Entropy Index:

The table shows that the value of TEI was more than one for India throughout the period. This means that the exports of India were diversified across the geographical locations, and we had already discussed that in direction of exports section.

In 1992, the value of TEI for India was 1.98 which increased to 1.76 in 1995. In 2000 it remained at 1.76. But in 2005 its value declined marginally to 1.75. There was an improvement in the TEI value for India in 2010 to 1.82 which further improved to 1.87 in 2015. The value declined marginally to 1.86 in 2018. During this period, the highest value of TEI was 1.89 in 2011 and lowest value was 1.67.

Table 2.13: Trade Entropy Index

Year	TEI	Year	TEI	Year	TEI
1992	1.98	2001	1.85	2010	1.85
1993	1.99	2002	1.81	2011	1.93
1994	1.99	2003	1.84	2012	1.87
1995	1.96	2004	1.86	2013	1.81
1996	1.96	2005	1.91	2014	1.79
1997	1.90	2006	1.88	2015	1.77
1998	1.93	2007	1.86	2016	1.78
1999	1.91	2008	1.86	2017	1.81
2000	1.88	2009	1.89	2018	1.79

Author's calculation

Data Source: WITS-COMTRADE

Trend shows that the value continuously increased from 1.73 in 1992 to 1.80 in 1998 then declined to 1.67 in 1999. After that it increased to 1.76 in 2000 and further to 1.82 in 2001. The value declined for the next two years to 1.78 in 2002 and further to 1.76 in 2003. In 2004 it increased to 1.77 but again declined to 1.5 in next year. The value again increased continuously from 1.78 in 2006 to 1.89 in 2011. After declining in 2012 to 1.84 it again increased to 1.87 and continued with that for next two years. In 2016 there was a decline in value to 1.86 and further to 1.84 in 2017. Then finally in 2018 it again increased to 1.86.

It clearly shows that India's export was diversified not only during the early years of the period, but also in the latter half of the period. But it was less diversified in the latter half of the period than the earlier half. In other words, India had become less diversified over the period.

2.4.14 Composition of Exports and Imports

A. Export Composition:

We will first discuss export composition of India and after that we will discuss import composition. For this we have considered five-year average share of each of the sixteen goods.

During 1992-1996 the top five sectors with highest contribution in total export were: Textiles and Clothing, Stone and Glass, Vegetables, Chemicals, and Metals. The share of these five sectors during this period was 67.12 percent. On the other hand, the bottom five sectors with least contribution in exports were: Miscellaneous, Plastic or Rubber, Footwear, Fuels and Wood. The share of these bottom five sectors in total exports was 9.47 percent. So, whereas the share of top five sectors was more than 60 percent but that of bottom five sectors was less than 10 percent during 1992-1996. Among the top five sectors, the share of Textiles and Clothing was highest at 26.71 percent and that of Metals was lowest at 5.84 percent. On the other hand highest contributor among the bottom five sectors was Miscellaneous with a share of 2.56 percent and least contributor was Wood with a share of as low as 0.50 percent.

During 1997-2001 also the top five sectors were same as during the period of 1992-1996. These were: Textiles and Clothing, Stone and Glass, Vegetables, Chemicals, and Metals. As compared to previous period the combined share of these five sectors had increased from 67.12 percent during previous period to 69.93 percent i.e., almost 70 percent in this year. On the other hand, the bottom five sectors during this period were Plastic and Rubber, Minerals, Fuels, Footwear, and Wood. So, in this period Miscellaneous sector was replaced by Mineral's sector. The combined contribution of these bottom five

sectors was 8.47 percent which was less than 9.47 percent in the previous period. The highest share among the top five sectors was from Textiles and Clothing sector with a share of 26.32 percent which was less than its share in previous period. And the lowest contribution was again made by Metal sector with 6.24 percent. On the other hand, the highest contributor among the bottom five sectors was made by Plastic and Rubber sector with a share of 2.16 percent and lowest contribution was made again by Wood sector with 0.53 percent.

Table 2.14a: Five Year Average Export Composition (%)

Sector/Period	1992- 96	1997-2001	2002-2006	2007-2011	2012-2016	2017-2018
Animal	4.25	3.95	2.6	1.83	3.22	3.58
Chemicals	7.6	9.39	10.09	9.8	11.37	13.22
Food Products	4.37	2.92	2.3	2.62	2.29	2.12
Footwear	2.09	1.67	1.23	0.93	1.02	1
Fuels	2.04	2.02	8.83	16.77	16.32	13.63
Hides and Skins	4.06	3.2	2.12	1.19	1.21	1.07
Mach and Elec	4.8	5.7	6.63	7.98	7.65	9.32
Metals	5.84	6.24	9.34	9.09	7.74	8.9
Minerals	3.08	2.09	4.03	3.76	1.24	1.28
Miscellaneous	2.56	3.47	3.21	4.09	2.41	1.96
Plastic or Rubber	2.28	2.16	3.14	2.45	2.75	3.2
Stone and Glass	17.44	18.58	17.35	15.6	15.26	14.24
Textiles and Clothing	26.71	26.32	19.02	12.52	12.61	12.06
Transportation	2.85	2.36	3.3	5.8	7.49	7.75
Vegetable	9.53	9.4	6.17	5.03	6.8	5.89
Wood	0.5	0.53	0.65	0.53	0.62	0.76

Author's calculation

Data Source: WITS- COMTRADE

In the next period of 2002-2006, we observed some changes in the contribution of the top five sectors. During this period Vegetables sector was replaced by Fuels sector in the top five sectors. It was one of the bottom five sectors in previous period. So, the top five sectors were: Textiles and Clothing, Stone and Glass, Chemicals, Metals, and Fuels. A decline in the combined share of top five sectors, from 69.93 percent to 64.63 was observed. The decline was mostly attributed to the decline in the share of Textiles and Clothing. Except for Footwear and Wood sectors, all other sectors were replaced in the bottom five sectors. Plastic and Rubber, Minerals and Fuels were replaced by Animal, Food Products and Hides and Skins. Their combined share during this period was 8.9 percent which was a marginal rise as compared previous period. During this period Textiles and Clothing still had the highest share among the top five sectors but its share declined from 26.32 in the previous period to

19.02 percent and as said earlier this decline is responsible for the decline in overall share of top five sectors. Fuels had the lowest share among the top five sectors at 8.83 percent. Among the bottom five sectors, most contribution was made by Animal sector with a share of 2.60 percent and least contribution was made again by Wood sector with a share of 0.65 percent.

During the period of 2007-2011, the top five sectors remained the same as before, but their position changed. These sectors include Textiles and Clothing, Stone and Glass, Chemicals, Metals, and Fuel. There was further decline in the combined share of top five sectors to 63.78 percent as compared to 64.63 percent in the previous period. There was a change in the bottom five sector during this year. Food Products sector was replaced by Plastic and Rubber sector. Other sectors were Animal, Hides and Skins, Footwear, and Wood. The combined contribution of these five sectors was 6.93 percent which was less than 8.9 percent share in the previous period. Textiles and Clothing was replaced for the first time during this period as the sector with most contribution and its place was taken by Fuels sector with a share of 16.77 percent. Metals continued to have the least share of 9.09 percent among the top five sectors. Among the bottom five sectors, Plastic and Rubber sector had the highest share of 3.14 percent and Wood continued to have the lowest share of 0.53 percent during this period. The share of Wood sector had declined during this period.

During 2012-2016 also, there was no change in the top five sectors but among the bottom five sectors Plastic or Rubber sector and Animal sector were replaced by Food Products and Minerals. The top five sectors during this period were Fuels, Stone and Glass, Textiles and Clothing, Chemicals and Metal. The combined share of these five sectors in India's total export was 63.30 percent which was again less than 63.78 percent in the previous period. The bottom five sectors during this period were Food Products, Minerals, Hides and Skins, Footwear, and Wood. Their combined contribution during this period was 6.38 percent which was less than 6.93 percent in previous period. Among the top five sectors Fuels sector again had the highest contribution during this year with a share of 16.32 percent and the lowest contribution was from Metal sector with a share of 7.74 percent. The share of both Fuels and Metals had declined during this period. On the other hand, among the bottom five sectors, most contribution was made by Food Products with a share of 2.29 percent and least contribution was made again by Wood sector with a share of 0.62 percent.

Finally, during the last period of 2017-2018, there was change in the top five sectors, as well as in the bottom five sectors. In the top five sector Metals was replaced by Machinery and Electricals sector and in the bottom five sectors Food Product was replaced by Miscellaneous. The top five sectors were Fuels, Stone and Glass, Textiles and Clothing, Metals,

and Machinery and Electricals. Their combined contribution during this period was 62.47 percent which was again less than previous periods share of 63.30. The bottom five sectors were Miscellaneous, Minerals, Hides and Skins, Footwear, and Wood. The combined contribution of these five sectors was 6.07 percent which was less than 6.38 percent of previous period. During this period Fuels sector was replaced by Stone and Glass sector as the highest contributor among the top five sectors with a share of 14.24 percent and Metals sector which was the lowest contributing sector among the top five sectors was also replaced by Machinery and Electricals sector with a share of 9.32 percent. Among the bottom five sectors, highest share was contributed by Miscellaneous with a share of 1.96 percent and lowest was again by Wood sector with a share of 0.76 percent, which was an improvement as compared to previous periods share of 0.62 percent.

So, on the basis of this discussion, we can conclude that the top five sectors combined share was more than 60 percent of the total exports and bottom five sectors had the share of less than 10 percent throughout the period. The sectors that remained in the top five sectors were Textiles and Clothing, Stone and Glass and Chemicals and those which remained in the bottom five sectors throughout the period were Footwear and Wood. As far as the combined share of top five sectors are concerned, it increases in the second period but after that it continuously declined for the rest of the period. But it was above sixty percent throughout the period. Similarly, the combined share of bottom five sectors also declined throughout the period. Its share never exceeded ten percent mark in the entire period.

B. Import Composition:

Now we will discuss the import composition of India in the same manner in which we discussed India's export composition by considering the five-year average share of each of these sixteen sectors. The table below shows the five – year average share of all the sixteen sectors.

We will start our discussion from 1992-1996. During this period, the top five sectors with highest shares in India's imports were Fuels, Machinery and Electricals, Chemicals, Stone and Glass, and Metals. The combined share of these five sectors in India's total export was 72.81 percent. On the other hand, the bottom five sectors with lowest shares were Minerals, Food Products, Hides and Skins, Footwear, and Animal. The total share of these five sectors was only 3.3 percent. Among the top five sectors highest share was contributed by Fuels with 26.68 percent and lowest was contributed by Metals with 8.66 percent. Similarly, among the bottom sectors, highest share was contributed by Minerals with 1.72 percent and

lowest was by Animal with 0.07 percent share. The rest 23.89 percent share was contributed by the six sectors between these two groups.

Table 2.14b: Five Year Average Import Composition (%)

Period	1992- 1996	1997-2001	2002-2006	2007-2011	2012-2016	2017-2018
Animal	0.07	0.08	0.05	0.05	0.04	0.04
Chemicals	12.42	10.14	8.29	8.47	8.50	9.02
Food Products	0.99	0.61	0.37	0.35	0.47	0.61
Footwear	0.10	0.07	0.06	0.07	0.12	0.16
Fuels	26.68	27.95	32.02	33.39	33.57	30.46
Hides and Skins	0.42	0.37	0.28	0.19	0.21	0.22
Mach and Elec	14.38	13.87	17.06	16.12	15.45	18.65
Metals	8.66	5.60	5.61	6.30	5.95	6.21
Minerals	1.72	1.43	1.75	2.25	2.10	1.78
Miscellaneous	8.65	5.54	3.39	4.38	4.88	3.34
Plastic or Rubber	2.93	2.17	2.17	2.45	3.31	3.70
Stone and Glass	10.67	19.49	16.73	16.33	15.09	15.37
Textiles and Clothing	2.50	2.30	2.19	1.18	1.34	1.46
Transportation	3.65	2.12	3.74	3.97	3.13	3.02
Vegetable	3.44	5.37	4.04	2.95	4.19	4.30
Wood	2.72	2.90	2.24	1.56	1.66	1.66

Author's calculation

Source: WITS – COMTRADE

During the period of 1997-2001 also the top five sectors in order of their share were Fuels, Stone and Glass, Machinery and Electricals, Chemicals and Metals. The joint contribution of these five sectors during this period was 77.05 percent which was higher than their combined share in the previous period. The bottom five sectors also did not show any change. These sectors in descending order of their share are Minerals, Food Products, Hides and Skins, Animal, and Footwear. The combined share of these five sectors was 2.56 percent which was less than their previous combined share. During this year among the top five sectors Fuels sectors continued to have the highest contribution with a share of 27.95 percent which was slightly higher than its previous share and Metals also continued to have the lowest contribution of 5.6 percent which was lower than its previous contribution. On the other hand, among the bottom five sectors' Minerals continue to have the highest share with 1.43 percent which had 1.72 percent share in previous period. Footwear replaced Animal sector with a share of .07 percent to be the least contributing sector. Remaining 20.39 percent of the imports was shared by rest of the six sectors.

The top five sectors did not change during the next period of 2002-2006 even though due to change in their share their order change. These five sectors in ascending order in accordance with their share were Fuels, Machinery and Electricals, Stone and Glass, Chemicals, and Metals. So, during this period, Machinery and Stone and glass interchanged their respective places. As far as the combined share of these five sectors are concerned, their share was even higher than before at 79.71 percent. So, these five sectors had almost 80 percent share in India's total imports. On the other hand, the bottom five sectors also did not change during this period but just like in the case of top five sectors, there was change in the position of few sectors in terms of their share. Particularly, during this period the position of Footwear and Animal sectors were interchanged. So, the bottom five sectors in order of their share were Minerals, Food Products, Hides and Skins, Footwear, and Animal. The contribution of these five sectors in total imports contracted again marginally to 2.51 percent as compared to 2.56 percent in the previous period. Among the top five sectors, highest share was contributed by Fuels again with a share of 32.02 percent and the sector that contributed lowest share continued to be Metal sector with a share of 6.61 percent. In comparison to previous periods share, the share of both Fuels and Metals had increased. Similarly, among the bottom five sectors, Mineral's sector continued to have the highest share, but lowest share was contributed by Animal sector again replacing Footwear. The shares of both Minerals and Animal had improved during this period. The remaining six sectors had the share of 17.78 percent which was lower than their previous share.

During 2007-2011 the top five sectors in descending order of their contributions were Fuels, Stone and Glass, Machinery and Electricals, Chemicals, and Metals. Except for the positions of Stone and Glass and Machinery and Electricals, there was no change in the top five sectors. With a share of 80.61 percent, their combined share crossed 80 percent mark during this period. On the other and among the bottom five sectors, Minerals was replaced by Textiles and Clothing sector, all other sectors along with their position remained the same. These bottom five sectors were Textiles and Clothing, Food Products, Hides and Skins, Footwear, and Animal. Their combined contribution during this period was only 1.84 percent i.e., not even two percent. With an increased share of 33.39 percent as compared to previous share of 32.02 percent, Fuels continued to be the sector with highest share and with an increased share of 6.3 percent as compared to 5.61 percent in the previous period Metals sector also continued to be the sector with least contribution among top five sectors. On the other hand, among the bottom five sectors, Textiles and Clothing sector which replaced Mineral sectors from bottom five sector had the highest share of 1.18 percent and Animal sector with a share

of 0.05 percent continued to be the sector with least contribution among bottom five sectors. The remaining share of 17.55 percent was contributed by remaining six sectors. As compared to 17.78 percent in the previous period, their share had marginally declined during this period.

The situation was similar to previous period during 2012-2016. Neither there was any change in the top five sectors nor in the bottom five sectors. Same sectors remained in these two groups. In case of top five sectors there was change in the position of same Stone and Glass and Machinery and Electrical sectors due to change in their shares. These five sectors in descending order of their contribution were So, compared to previous period only Machinery and Electricals and Stone and Glass had interchanged their positions. Their combined share in India's total imports during this period was 78.56 percent which was a slight lower as compared to share in the previous period. The bottom five sectors not only remain the same as the previous period, but their position also did not change. They had the same order in this year as they had in the previous period. i.e., Textiles and Clothing, Food Products, Hides and Skins, Footwear, and Animal, their combined contribution was 2.18 percent which was an improvement as compared to previous share. During this period also Fuels had the highest contribution among top five sectors with a share of 33.57 percent, marginally more than previous period. And Metals also continued to have the lowest share with 5.95 percent, which was lower than its previous share. Among the bottom five sectors, Textiles and Clothing with a share of 1.34 continued to have the highest share and Animal sector with a share of 0.04 percent continued to have the least contribution. 19.26 percent is the combined share of remaining six sectors during this period. which was comparatively higher than their share in the previous period.

During the final two-year period of 2017-2018 both the top five sectors and bottom five sectors did not change. Even their positions remained same as the previous period. The top five periods in ascending order of their shares were Fuels, Machinery and Electricals, Stone and Glass, Chemicals, and Metals. These five sectors made a combined contribution of 79.71 percent during this period, an improvement as compared to previous period. Similarly, the bottom five sectors were Textiles and Clothing, Food Products, Hides and Skins, Footwear, and Animal. Their combined contribution during this period was 2.49 percent, a slight improvement as compared to previous period. Just like every other period, in this period also fuels had the highest contribution among the top five sectors of 30.46 percent, a slight decline as compared to share in previous period and Metals had the lowest contribution of 6.21 percent, an improvement in the share as compared to previous period. Similarly, in this period also, Textiles and Clothing continued to have the highest share among the bottom five

sectors and Animal sector continued to have the least contribution among them. On the one hand there was an improvement in the share of Textiles and Clothing, but the share of Animal sector remained same as before. As far as the share of remaining six sectors were concerned, their combined share during this year was 17.80 percent. As compared to previous period the combined share of these six sectors had declined in this period.

2.4.15 Direction of Trade:

Now we will discuss India's direction of trade for both exports and imports in seven regions for the given period of 1992-2018. Here also we have considered the five-year average share of each region. First, we will consider the direction of exports and after that we will discuss direction of imports.

A. Direction of exports:

The table below shows the five-year average exports of India in different region of the world. We will now discuss them for each five-year period, starting from the period of 1992-1996.

Table 2.15a: Direction of Exports (five -year average) (%)

Period	1992-96	1997-2001	2002-2006	2007-2011	2012-2016	2017-2018
East Asia & Pacific	24.33	21.33	23.99	25.84	23.58	25.28
North America	19.62	22.42	19.69	12.29	14.75	16.65
Europe & Central Asia	29.77	28.64	25.99	22.58	19.96	20.72
Middle East & North Africa	10.37	12.24	15.05	20.78	21.22	17.61
South Asia	4.72	4.50	5.51	4.89	5.81	7.25
Sub-Saharan Africa	3.46	4.55	5.02	6.45	7.86	6.49
Latin America & Caribbean	1.16	2.02	2.39	3.66	4.46	4.07
Unspecified	6.57	4.30	2.36	3.52	2.36	1.92

Author's calculation

Data Source: WITS- COMTRADE

During the period of 1992-96, the top three regions for India's exports in order of their respective share were Europe and Central Asia, East Asia and Pacific and North America. The combined share of these three regions was 73.72 percent of the total exports of India during this period. On the other hand, the bottom three regions with lowest share were South Asia, Sub Saharan Africa, and Latin America. Their combined share in the total exports of India was only 9.34 percent. Among the top three regions Europe and Central Asia had the highest share of 29.77 percent and North America had the lowest share of 19.62 percent. East Asia and Pacific had a share of 24.33 percent. Similarly, among the bottom three regions, South Asia had the highest share of 4.72 percent and Latin America, and Caribbean

had the lowest share of 1.16 percent. Sub-Saharan Africa had a share of 3.46 percent during this period.

As far as their combined share is concerned it improved during this period to 11.07 percent from 9.34 percent during the previous period. Among the top three regions highest contribution was made again by Europe and Central Asia with a share of 28.64 percent and lowest by East Asia and Pacific with a share of 21.33 percent. The share of North America during this period was 22.42 percent. As compared to previous period the shares of Europe and Central Asia and East Asia and Pacific had declined and that of North America had improved during this period. Among the bottom three regions, highest share was contributed by Sub-Saharan Africa with 4.55 percent and lowest again by Latin America and Caribbean with 2.02. The share of South Asia during this period was 4.50 percent. As compared to previous year the share of Sub-Saharan Africa and that of Latin America and Caribbean had improved but that of South Asia declined. The share of Middle East and North Africa also improved during this period from 10.37 to 12.24 percent.

B. Direction of Imports:

After discussing direction of exports now we will discuss direction of India's imports among the seven regions. The table below shows the five-year average import share of different regions for the period of 1992-2018 as before.

During 1992-1996, the top three import regions for India's imports in order of their share were Europe and Central Asia, East Asia and Pacific and Middle East and North Africa. On the other hand, three bottom three regions in order of their shares were Sub-Saharan Africa, Latin America, and Caribbean. The combined shares of top three regions during this period were 64.87 percent and that of bottom three regions was 6.61 percent. Among the top three regions highest share was contributed by Europe and Central Asia with 27.5 percent and lowest share was by Middle East and North Africa with a share of 16.42 percent. Europe and East Asia had a contribution of 20.88 percent share. On the other hand, among the bottom three regions highest share was contributed by Sub-Saharan Africa with a share of 4.33 percent and lowest share was contributed by South Asia with a share of 0.65 percent. Latin America and Caribbean from the same group contributed a share of 1.63 percent during this period. In between these groups was North America and its share during this period was 11.39 percent.

During the next period of 1997-2001 also the top three regions remain the same in the same order i.e., Europe and Central Asia, East Asia and Pacific and then Middle

East and North Africa. The combined share of these three regions was 66.91 percent which was higher than their share in the previous period. On the other hand, the bottom three regions also remain the same in the descending order of Sub- Saharan Africa, Latin America and Caribbean, and South Asia. Their combined share was 9.08 percent which was higher than their share of 6.61 percent in the previous period. Europe and Central Asia continued to have the highest share among top three regions with a share of 28.4 percent which was higher than its share in the previous period. And Middle East had the lowest share of 15.04. During this period the share of Middle East and North Africa had declined as compared to 16.42 percent share in previous period. From the same group, East Asia and Pacific had also increased share of 23.40 percent as compared to 20.88 percent in the previous period. On the other hand, among the bottom three regions Sub- Saharan Africa continued to have the highest share of 6.48 percent even though it declined as compared to previous periods share of 4.33 percent. And South Asia also continued to have the lowest share of 0.94 percent which was 0.65 percent in previous period. Latin America and Caribbean, from this group had an increased share of 1.66 percent. Its share in the previous period was 1.63 percent. During this period North America which was again was neither in any of the two groups had a declined share of 8.19 percent as compared to its share on 11.29 percent in the previous period.

Table 2.15b: Direction of Imports (five- year average) (%)

Region/ Period	1992-96	1997-2001	2002-2006	2007-2011	2012-2016	2017-2018
East Asia & Pacific	20.88	23.40	25.98	31.05	32.98	37.91
Middle East & North Africa	16.42	15.04	10.28	28.55	26.46	22.80
Europe & Central Asia	27.57	28.47	24.85	21.24	18.30	17.13
Sub-Saharan Africa	4.33	6.48	4.04	6.79	7.37	7.21
North America	11.29	8.19	7.17	6.85	5.83	6.76
Latin America & Caribbean	1.63	1.66	1.94	3.33	6.15	5.25
South Asia	0.65	0.94	0.90	0.63	0.59	0.68
Rest of the world	17.21	15.82	24.84	1.56	2.31	2.26

Author's calculation

Data Source: WITS- COMTRADE

During the period of 2002-2006, again there was no change in the top three regions, but the order of these regions had changed with East Asian and Pacific at top, followed by Europe and Central Asia, and then Middle East and North Africa. There was also a decline in the combined share of these three regions from 66.91 percent in previous period to 61.11 percent. But the bottom three regions continued to remain same and in same order of Sub- Saharan Africa, Latin America and Caribbean, and South Asia. The combined share of this group of nations also declined from 9.08 in the previous period to 6.88 percent. During this

period Europe and Central Asia was replaced by East Asia and Pacific to be the region with highest share among top three regions. Its share was 25.98 percent which was higher than its value of 23.40 percent in the previous period. And the region with lowest share in this group was still Middle East and North Africa with a decreased share of 10.38 percent as compared to 15.04 percent in the previous period. The share of Europe and Central Asia from the same group declined to 24.85 percent as compared to 28.47 percent in the previous period. Similarly, the highest share among the bottom three regions was contributed again by Sub Saharan Africa with a decreased share of 4.04 percent as compared to 6.48 in the previous period and the lowest share was also again contributed by South Asia with a decreased share of 0.90 percent as compared to 0.94 percent. The other region in the group was again Latin America and its share was 1.94 percent which was an improvement as compared to previous share of 1.66 percent. The share of North America, which was again not in any of the above two groups above further declined to 7.17 percent as compared to 8.19 percent.

Again in 2007-2011, even though there was no change in the top three regions as before, but order of the regions again changes in descending order of their share as East Asia and Pacific, Middle East and North Africa, and Europe and Central Asia. Their combined share this time had increased sharply to 80.84 percent as compared to 61.11 percent in previous period. But during this year also there was no change in the regions and their order among the bottom three regions. Their order continued to be Sub- Saharan Africa, Latin America and Caribbean, and South Asia. Just like the combined share of top three, the combined share of these bottom three regions had also increased from 6.88 in previous period to 10.75 percent during this period. During this period also East Asia and Pacific had the highest share of 31.05 percent which was higher than its share of 25.98 percent in the previous period but there was a change in the region with lowest share in this group from Middle East and North Africa to Europe and Central Asia. Its share was 21.24 percent during this year which was less than its share of 24.85 percent in the previous period. The other regions in this group were Middle East and North Africa and its share had increased sharply to 28.55 percent during this period as compared to just 10.28 percent in the previous period. Among the bottom three region Sub Saharan Africa still contributed the highest share of 6.79 percent which was higher than its previous share of 4.04 percent and South Asia still contributed the lowest share with 0.63 percent, and this was less than its share of 0.90 percent in previous period. The other region in this group was Latin America and its share was 3.33 percent during this period which was an improvement in its share as compared to 1.94 percent in the previous period. The region

of North America which was in between these two groups had a share of 6.85 percent during this period which was less than its share of 7.17 percent in the previous period.

During 2012-2016 also the top three regions were East Asia and Pacific, Middle East and North Africa and Europe and Central Asia in the same order as in the previous period. Their combined share was 77.74 percent which was a reduction as compared to previous share. On the other hand, the bottom three regions in descending order of their share were Latin America, North America, and South Asia. The combined share of this group of regions was 12.57 percent which was relatively higher than the share in the previous period. The highest share among the top three was contributed by East Asia and Pacific with a share of 32.98 percent, which was a relative improvement in its share compared to 31.05 percent in 2007-2011. The lowest share was contributed by Europe and Central Asia, whose share declined during this period from 21.24 percent to 18.30 percent. Another region in the group was Middle East and North Africa and its share was 26.46 percent, which was less than its share of 28.55 percent in the previous period. Among the bottom three, highest share was contributed by Latin America and Caribbean with a share of 6.15 percent. Its share was improved from 3.33 percent in the previous period. The lowest contribution was made again by South Asia with a share of 0.59 percent, a decline as compared to 0.63 percent in the previous period. During this period among the bottom three regions, Sub Saharan Africa was replaced by North America whose share declined from 6.85 percent in the previous period to 5.83 percent during this period. The region of Sub-Saharan Africa which was replaced from the bottom three group had shown improvement in its share to 7.37 percent as compared to 6.79 percent in the previous period.

In continuation to previous three period, in this period also the top three regions in descending order of their shares were East Asia and Pacific, Middle East and North Africa and Europe and Central Asia. Their combined share during this year marginally increased to 77.84 percent from 77.74 percent in the previous period. The bottom three regions also were the same as the previous period but order of Latin American and Caribbean and North America was interchanged. Their position in descending order of their share were North America, Latin America and Caribbean, and South Asia. The combined share of this group of regions was 12.69 percent. This also had marginally increased as compared to previous period. As far as the individual share was concerned, East Asia and Pacific had the highest share of 37.91 percent among the top three regions and Europe and Central Asia with a share of 17.13 percent had the lowest share in the group. Middle East and North Africa was the other region in the group and its share was 22.80 percent. As compared to the share of previous period,

shares of Middle East and North Africa and that of Europe and Central Africa declined but the share of East Asia and Pacific had increased during this period. On the other hand, the highest share among the bottom three regions was contributed by North America with a share of 6.76 percent and lowest by South Asia with a share of 0.68 percent. Interestingly, South Asia remained the region with least contribution throughout the period. Latin America and Caribbean with a share of 5.25 percent was the other region with the bottom three group. As compared to their share in the previous period, the shares of North America and South Asia showed improvement whereas that of Latin America and Caribbean showed decline. During this period also, Sub Saharan Africa continued to be the region in between the top three and bottom three regions with a share of 7.21 percent which was relatively less than its share in the previous period.

2.5 Conclusion:

In this chapter we discussed the overall scenario of India's trade for the period 1992-2018. For the purpose of analysis, we used various trade related indices. During the study period the share of India's exports, imports and overall trade in the world was insignificant and more or less stagnant throughout the period. This does not mean that India performed poorly in external sector during this period. Even though India's share was insignificant and stagnant with respect to world trade, there was significant growth in both exports and imports of India during the study period. With reference to base year of 1992, there was many folds growth in both exports and imports. In fact, the growth in imports was found to be higher than the growth in exports throughout the study period. As a result of this India experienced persistent balance of trade deficit during that period. This persistent balance of trade deficit is one of the areas of concern in India's external sector. As far as the sector wise performance is concerned, our study found that India had comparative advantages in few sectors and comparative disadvantages in few other sectors. Another positive finding of our study relates to diversification of India's trade (exports). India's trade was diversified across many countries instead of concentrated in fewer countries. This makes India less vulnerable to economic shocks in a partner country. Even though India as a whole was less vulnerable but same is not true for domestic producers. Our study finds that the reliance of domestic producers on foreign market had increased during the study period. This means that on the one hand there was an increase in production of exportable, but it also means that the domestic producers of exportable are more vulnerable to external shocks. Any disruption in partner country will have negative impact on domestic producers of exportable. In the same manner the reliance on imports had increased during the study period for satisfying domestic demand. This also makes

Indian consumers in particular and Indian economy in general vulnerable to external shocks. Growth in exports and imports have both cost side and benefit side and as long as benefits outweighs costs, growth in exports and imports are both advantageous to a country. We also discussed composition of exports and imports along with direction of exports and imports. As far as the composition of India's exports and imports are concerned some changes were experienced during the study period. Our study on the direction of trade revealed that there was not much change in the direction of trade (both exports and imports) as well during the study period. On the basis of these analyses, we recommend that, the government should identify and focus on the problems related to India's external sector and adopt adequate policy responses to mitigate these problems.

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Appendix:

1) Growth rate of exports and imports

We define growth rate of export as the annual compound percentage change in the value of exports between two periods. This comparison is important for producers, exporters, investors, policy makers and trade negotiators. This is written as

$$\left[\left(\frac{\sum_{s\omega} X_{s\omega}^1}{\sum_{s\omega} X_{s\omega}^0} \right)^{\frac{1}{n}} - 1 \right] \times 100$$

Here, s is the set of countries in the source; w is the set of countries in the world; X^0 is the bilateral total export flow in the start of the period; X^1 is the bilateral total export flow in the end of the period; and n is the number of periods. We do not include starting year in calculation. The value it takes ranges from -100 percent to $+\infty$. -100 means the trade has ceased. When the value becomes zero, it indicates that value of trade has remained same.

In the same way growth rate of imports is written as

$$\left[\left(\frac{\sum_{s\omega} M_{s\omega}^1}{\sum_{s\omega} M_{s\omega}^0} \right)^{\frac{1}{n}} - 1 \right] \times 100$$

where, M^0 is the bilateral total import flow in the start of the period; M^1 is the bilateral total import flow in the end of the period.

2) Export value Index :

This index is the ratio of current value of export and the value of export in base year (1992=100). It tells us how much exports have increased or decreased over a period of time. It is written as

$$\frac{x_t}{x_b} \times 100$$

Here, x_t is the value of export in current year; x_b is the value of export in base year.

3) Import value index:

Import value index can be calculated in similar manner by replacing exports by imports.

$$\frac{m_t}{m_b} \times 100$$

Here, m_t is the value of export in current year; m_b is the value of export in base year.

4) Export Import coverage:

This indicator helps us to know whether a country's import bill is fully paid by its exports each year or not. It is defined as the ratio of total exports to total imports. It is given as

$$\frac{\text{Total Export in year } t}{\text{Total Import in year } t}$$

The value of this index ranges from 0 to ∞ . When its value is zero, this means that country does not export and when it is ∞ , this means that country does not import. If the value of this indicator is one in a particular year, this means that country export is fully capable of covering its import bill during that year.

5) Export Market Penetration:

This index is calculated as the ratio of number of countries to whom a country exports a particular good and number of countries that import that particular good in a year. If the value of this index is zero, then the country is not exporting to any country and if it is 100 then it is exporting to maximum number of countries

$$\frac{\text{Number of countries where a country A exports } x}{\text{Number of countries that imports } x} \times 100$$

6) Revealed Comparative Advantage (RCA):

The RCA index is the ratio of a country's total exports of a commodity in its total exports and shares of world exports of the same commodity in total world exports. This index uses trade pattern to identify the sectors in which an economy has a comparative advantage. This is done by comparing the trade profile of the country of interest with the world average. It is written as

$$\frac{\sum_d x_{isd} / \sum_d X_{sd}}{\sum_{\omega d} x_{\omega d} / \sum_{\omega d} X_{\omega d}}$$

Here, s is the country of interest; d and w are the set of all countries in the world; i is the sector of interest; x is the quantity of commodity i and X is quantity of total exports. In the above expression, share of good i in the exports of country s is given by numerator and the share of good i in the exports of the world is given by denominator. This index takes the value from 0 to $+\infty$. The country s is said to have revealed comparative advantage in good i if its value is

greater than one and if its value is less than one then the country will have revealed disadvantage in the good i.

7) The Herfindahl- Hirschman Index:

This index is the measure of geographical concentration of exports. This tells us the degree to which a region or country’s exports are dispersed across different destinations. This index is defined as the square root of the sum across destinations of the squared export share for the region under study to all destinations. This index is given by

$$\sqrt{\sum_d \left[\frac{\sum_s X_{sd}}{\sum_{sw} X_{sw}} \right]^2}$$

Here, s is the set of source countries under study; d is the set of destinations; w is the set of countries in the world; and X is the bilateral flow of exports form the source to the destination. The value of this index lies between 0 and 1. Higher value of this index indicates that exports are concentrated on fewer markets and lower value indicates exports are diversified.

8) Export Propensity Index:

This index tells us about the degree of reliance of domestic producers on foreign markets. Even though this index is similar to trade dependence index, the advantage of this index is that it provides better indicator of vulnerability of certain types of external shocks such as fall in export prices, change in exchange rates etc. This index is defined as the ratio of exports to GDP in percentage terms. It can be written as

$$\frac{\sum X_{ds}}{GDP_d} \times 100$$

Here, d is the country under study; s represents set of all countries; X represents total bilateral exports; GDP is the gross domestic product of country d. The value of this indicator ranges from 0 to 100. When the value is 0, it means that there was no export and 100 means that all domestic production was exported.

9) Trade Entropy Index:

This index is a measure of the ‘geographical concentration’ or dispersion of exports. This measure tells us the degree of integration of a country in study with the world economy and it can be used to understand the vulnerability of the country in question to external shocks when it relies on limited number of partners. This index is calculated by summing the export shares multiplied by natural log of the reciprocal of the export share (this is a weight which decreases with the size of the share) of the country under stud across all destinations. This can be expressed as

$$\sum_d \left(\frac{\sum_s X_{sd}}{\sum_{sw} X_{sw}} \right) \ln \left(\frac{1}{\sum_s X_{sd} / \sum_{sw} X_{sw}} \right)$$

Here, s is the set of source countries under study; d symbolizes set of destination countries; w is the set of countries in the world; X is the bilateral export flow from source country to destination country. The sets d and w contain the same elements as we want to sum over all destinations. Entropy index can be calculated using imports or exports shares as well. This index takes the values ranging from 0 to $+\infty$. Higher value of this indicator means greater uniformity in geographical dispersion of exports. Maximum value of this index indicates that the export share in every market is same.

10) Import Penetration Index:

This index is helpful in knowing that to what degree domestic demand is satisfied by imports. It is also known as self-sufficiency ration. This index can provide an indication of vulnerability of importing country to external shocks. This index is defined as the ratio of total imports of a country to its domestic demand in percentage terms. It is given as

$$\frac{\sum_s M_{sd}}{GDP_d - \sum_s X_{ds} + \sum_s M_{sd}} \times 100$$

The value of this indicator ranges from 0, where there is no import to 100 where all domestic demand is satisfied by imports only. This means there will be no domestic production and no exports.