

Comparative Study Of Trade Outcome Indicators Using World Bank's Competitive Diagnostic Toolkit In Case Of India, Russia, And USA

PS Arun

Rupak Saxena

Abstract: This study is an attempt to study and compare the trade scenarios in the USA, Russia, and India, using the Trade Outcome Indicators given in the World Bank's Trade Competitiveness Diagnostic Toolkit. The study managed to provide us with interesting insights from very simple but effective tools, about the trade standings of these countries in the world, and the reason of them being the way they are. The inconsistency of the relationship between trade openness and the economic condition of a country, is proposed to be found due to the differences in the types of goods exported, and the analysis of exports concentration and competitiveness, gave the insights of the trends in the current trade positions of these countries. The results obtained from our study, can help these countries identify the shortcomings in their current trade scenarios, making it easier for the policy makers in taking informed and more effective decisions.

Keywords: Trade Openness, Revealed Comparative Advantage, Hirschman- Herfindahl Index, Trade Outcome Indicators

Jel Codes: F14, F15,

I. BACKGROUND

The purpose of this paper is to evaluate the trade scenarios in the three countries, India, Russia, and USA, by using the Trade Outcome Indicators based on the World Bank's Trade Competitiveness Diagnostic Toolkit. The reason behind choosing these three countries for the analysis is that, the three countries shows the three different income groups, where India is a lower middle income country, Russia has just entered into the category of high income countries and it is still just above the threshold, and USA which is a full-fledged High income country. This paper will aim at finding the insights from the trends of different trade outcome indicators of these countries and try to analyze and propose reasons for the results obtained.

In 1990, USSR was India's top goods export destination with shipments to the tune of \$2.9 billion. Major item of export were Cashew nuts, pepper, Virginia tobacco, cotton textiles, garments, bed linen etc. And items of import from the

USSR included crude oil and oil products like kerosene and petrol, sugar etc. Trade with USSR was especially favorable to India not only from the point of view of the total trade volume, but also from the point of view of the total economic relations between the two countries. Most favorable condition was that trade between the two countries was in Rupee terms. But, gradually the trade relation faded and the trade volumes decreased. The decrease has various reasons, the main ones being the economic breakdown in Russia after the disintegration of the Soviet Union and the changes in the trade policies of the two countries which occurred due to the changed political relations between them. The sudden change from Rupee trade to hard currency was disadvantageous to the Indian traders. The Governments failed to introduce a new exchange rate, which adversely affected the trade.

Total Indian exports to Russia in 2017 amounts to \$1.53billion. The exported goods include pharmaceutical products, machinery, nuclear reactors, boilers, organic chemicals etc. Share of India's export to Russia is a meagre

7.2% of India's total export. Russian imports from India forms only 1.3% of Russia's total imports. Similarly, India's imports from Russia in 2017 totaled \$6.13 billion which form 1.9% of India's total imports. Goods imported include minerals, fuel, oils, distillation products and fertilizers. Viewed from the side of Russia, their exports to India is 1.8% of their total exports.

In the period of the Soviet Union, its trade with foreign countries, especially Western capitalist countries was very inconspicuous. The main reason was the availability of unlimited resources they possessed and the political disagreements which prevented them from trading with the western countries. During 1970s and 80s trade between the Soviet Union and the United States was about 1% of their total trade. During the period 1970 to 1985, the Soviet Union had a trade deficit with the US, but from 1985 onwards, the USSR cut imports from the USA so as to balance the trade between the countries. The Soviet exports included chemicals, metals, petroleum products, alcoholic beverages and fish products to the United States, while the US exported agricultural products and industrial equipment. In 1987 the scenario changed.

After the collapse of the Soviet Union in 1991, trade between Russia and USA steadily increased. In 2017 the total exports from USA to Russia amounted to \$6.99 Billion whereas the imports from Russia were \$17.02 Million. The export which includes aircraft, super craft (34%), machinery, nuclear reactors, boilers (19%), vehicles and tramways constituted 0.46% of the total exports of the USA. The USA imported \$17.22 Billion worth of materials from Russia which included mineral fuels, oils, distillation (45%), Iron and Steel (15%), Aluminum (9.3%) which forms 0.75% of USA's total imports. Russia's imports from USA forms 5.8% of its total imports whereas its export to USA is 3% of its total exports.

The USA is India's second largest trading partner and India is the 9th largest trading partner of the US. India's export to USA in 2015 amounted to \$46.6 billion which is 15.3% of India's total exports and it constitutes 2% of US's overall imports. Products exported to the USA from India include gems and precious metals and coins (\$9.5 bn), Pharmaceuticals (\$6.1bn), Oil, machinery, clothing, organic chemicals, vehicles, Iron & steel etc. India's imports from the USA amounted to \$20.5bn which is 5.2% of India's total imports and 1.5% of USA's total exports. Articles imported by India from the US include gems and precious metals and coins (\$3.4bn), machinery (\$3bn), electronic equipment (\$1.4bn), oil (\$1.3bn), aircraft, spacecraft (\$1.1bn), Plastics, organic chemicals, fruits and nuts etc. Apart from this, there is a considerable amount of trade in services taking place between the countries. Total Indo US trade in services amounts to \$47.2 bn. Of this India's export comes to \$26.8bn and India's import of services from the US amounts to \$20.3bn.

We see from the above discussion that the trade relations of these three countries have been vibrant, and also the type of goods traded are quite specific country wise. These will be the reasons of the differences in their trade outcome indicators and their export goods composition.

In the further analysis we will be looking at the literature review of past studies on the subject, take a look at the data sources, see the methodology and the results and interpretation. And will finally conclude the study.

II. LITERATURE REVIEW

It was difficult to find a straightforwardly similar kind of study in the previous literature, but there are a few studies which distantly discusses about the similar issues, given in this study. Indo-US Economic Relations-Prospects and Challenges by Pravakar Sahoo, Ashwini and Geethanjali Nataraj is a study which primarily deals with the effect of the "India-US Strategic Dialogue", but also explains how the Comprehensive Economic Partnership Agreement (CEPA) has helped in improving the relation between the two countries, given the trade potential among these two countries. Brief on India-US Relations is a paper published by the Ministry of External Affairs, India. This paper is a study on the present stage of relations between India and the USA, similar to our study, trying to find the current position and the way to improve. India-US Economic and Trade Relations is a report by Michael F. Martin and K. Alankronstadt It deals with the Historical stages of India-US relations, its ups and downs and the present scene, attempting to find out the things that have shaped the current trade situation of the country, the way they are.

India -Russia Relations in a Changing Eurasian Perspective is an article written by Nirmala Joshi and Rajkumar Sharma. It analyses India-Russia relations after the year 2010 when Dmitry Medvedev, the then President of Russia described it as "Privileged Strategic Partnership". The essay concludes that as in the case of other nations, India-Russia relations also showed two opposing tendencies, that of co-operation and competition.

As suggested by Alcalá and Capone (2004), it can be useful to look at the changes in trade openness over time to check the degree to which a country has integrated into global markets, which we have attempted to show in our study. Regarding choosing the Revealed Comparative Advantage Methodology over the Comparative Advantage technique, the RCA has always proved to be a better indicator of the competitiveness according to Siggel (2006).

Easterly et al. (2009) show that for every country, exports are dominated by a few "big hits", especially in manufacturing. They find that success in exports, and specialization, is driven by a narrow range of specific exports. While this undercuts the argument for export diversification. But, Imbs and Wacziarg (2003) found that economies tend to diversify over most of their development path. Only after reaching a relatively high threshold of income is further growth associated with specialization. Klinger and Lederman (2004) found a relationship in which the trade is increasing but at a decreasing rate between income and trade activity. Diversification is important for developing countries because it allows them to develop competence over a broader range of manufactured goods. Countries develop by learning to make new things, and through entrepreneurial dynamism and growth, not only relying on what they have traditionally done well.

III. DATA SOURCES & METHODOLOGY

In our study which is completely based on the World Bank's Competitiveness Diagnostic toolkit, we have used the variables suggested in the reports and the data sources are broadly the WDI Database, World Integrated Trade Solution (WITS) Database, UN COMTRADE and World Trade Organization (WTO) Database.

We are using the World Bank's Trade Competitiveness Diagnostic (TCD) Toolkit, to study the Trade Outcome Indicators in the case of India, USA, and Russia. The TCD toolkit is divided into two parts, first being the Trade Outcome Analysis and the next part being Trade Competitiveness Diagnostics. Both these parts, answer two different kinds of question. First one being the prerequisite for the next one to be performed. The motive of the toolkit is to provide the framework and guidance of the tools to perform competitiveness analysis. Trade Outcome Analysis helps in studying the quantitative and qualitative aspects of the historical performances of a country's trade and its current standing in the world trade. It helps in identifying the level, the growth and the market share of a country's trade, then it looks at the kind of goods a country trade in, and also if a country's trade volume is majorly affected by a few goods or is it well distributed among different types of goods. The Trade Outcome Analysis also tries to find the quality of the goods being traded, and check the sustainability of a country's trade position. While the Trade Outcome Analysis gives an overview of a country's current position, the next big step which is the Trade Competitiveness Analysis, helps in finding the factors that are affecting a country's trade position like the market access to the importers and exporters, the supply side factors like trade policies, governance, and the trade promotion infrastructure like the SEZs, the standard regimes and industry coordination. Our study is a comparative discussion based on the trade outcome analysis, in the case of India, USA and Russia.

There are different questions which we will be answering in our study. Firstly, how the countries with different level of Income, are differently integrated with the world, i.e. the Trade-to-GDP ratio. The ratios of Total trade (exports and imports) to the GDP of the countries are calculated and are mapped against the Log (GDP per capita), of the countries, this helped us in seeing that how the countries trade integration changed as they grew to become more prosperous on the basis of their GDP per capita.

The second question which we attempt to answer is how the services growth has been throughout all these years. How the services exports of these countries have fared over the time. We will be looking at the services as a percentage of the exports in the countries.

We will then be looking at the Revealed Comparative Advantages of all three countries in the cases of Consumer Goods and Capital goods, and will try to identify a trend, if any, and also would like to see if their competitiveness in terms of the Revealed Comparative Advantages have evolved or they have remained the same.

$$RCA = \frac{[x_{ik}/X_i]}{[x_{wk}/X_w]}$$

Where, ' x_{ik} ' is the volume of the product ' k ' (consumer or capital goods in our case) which is being exported by the domestic country ' i ', in comparison to the volume of all the exports of the country i , ' X_i '; divided by the ratio of ' x_{wk} ' which is the volume of the product ' k ' being exported by the world, in comparison to the volume of all the goods exported by the world, ' X_w '.

Hirschman-Herfindahl (HH) Index, another tool for trade outcome analysis, helps us in finding the concentration of different goods in an economy's exports, and in analyzing if a country is dependent upon a few goods for their total exports.

$$H_i = \sum_j (S_{ij})^2$$

It is the sum of the squares of all the ' (S_{ij}) ', which are the share of the j^{th} good in the country i 's total exports.

Our next analysis answers whether over the years, has a country's dependence over the exports changed from the primary and resource based goods to the medium and high tech manufactured goods' exports.

We will now be looking at the results of our different Trade Outcome Indicators, and the important conclusions we can make from them.

IV. RESULTS INTERPRETATION

We will one by one go through each of our results for all the three countries and mark key takeaways, from each of them.

TRADE-TO-GDP RATIO

Trade to GDP ratio is a measure of a country's trade integration and trade openness with the rest of the world. It takes both exports and imports in account, and can be seen as an indicator of the acceptance of a country's goods by the other countries, and the acceptance of foreign goods in the domestic country.

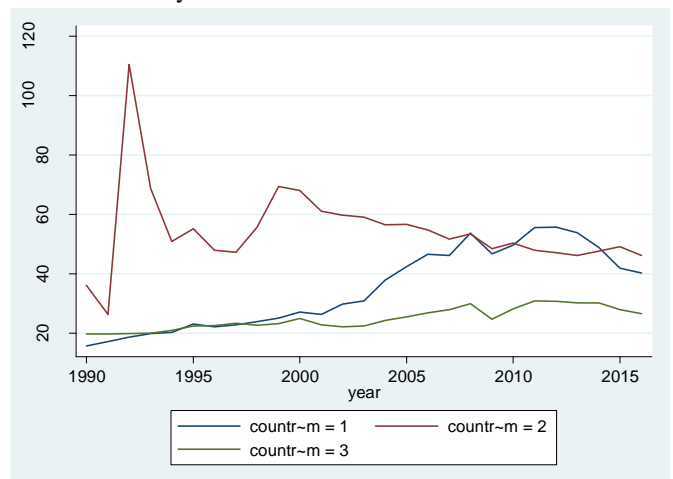


Figure 1 Trade to GDP ratio of the 3 countries over the time period

In the above figure 1, country 1 is India, country 2 is Russia, and country 3 is USA. We can see that the Trade to

GDP ratio of India is showing an upward trend, since the liberalization regimes of 1991. While the trade to GDP ratio of Russia is falling over the time period, on the other hand USA's Trade to GDP ratio has shown some improvement.

The following figure 2 shows the average trade to GDP ratios (in percentage), and the natural log of GDP per capita for all three countries, from the time period of year 1990 to year 2016.

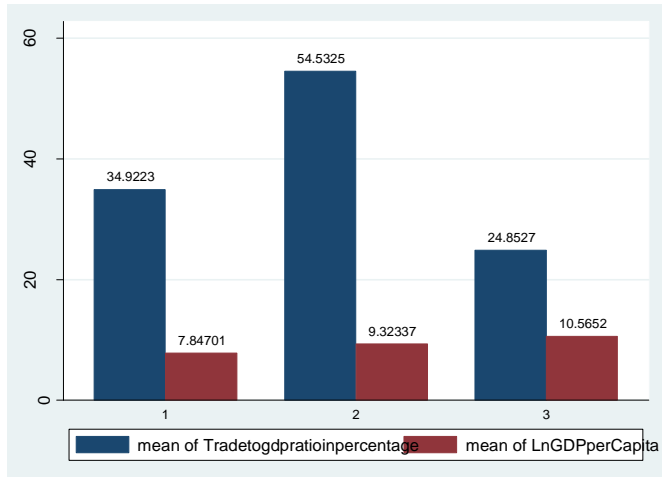


Figure 2: Average Trade-to-GDP ratios (in percentage), and the natural log of GDP per capita

The country 1 here is India, 2 is Russia, and 3 is United States. It can be very clearly seen that the country with the highest per capita GDP that is Russia, is the one with the lowest trade to GDP ratio. But the country with the lowest GDP Per capita which is India, is not the one with the lowest trade-to-GDP ratios. This means that the relationship is not monotonic or linear between the economic prosperity in a country, and the Trade to GDP ratio. So, how the relationship does look like.

Let's look at each country's movement of Trade to GDP ratio, over the movements of its per capita GDP, which also means the change in country's Trade openness with the improvement in the economic condition of the country. In case of India, as we can see from the figure 3, the overall trend is of rise in the trade openness with the increase in the economic status of the citizens of the country. The figure 4 shows the trend of the Russia's Trade to GDP ratio with respect to the economic prosperity in the country. Surprisingly, here the country's trade to GDP ratio is falling. This is an interesting result, and we will be talking about it in future. The figure 5 is showing the above relationship in case of USA, which is similar, to India's increasing trend. The only difference which can be seen is that the India's trade openness is increasing at a decreasing rate, and the USA's trade openness is increasing at an increasing rate.

We see that, USA's and India's Trade to GDP ratios are non-linearly rising with an increase in the per capita GDP of both the countries, but the increase in USA is at increasing rate, while for India, this rise is at decreasing rate. This can be intuitively seen from this difference, that the amount of innovation done by the USA in its exports, should be able to keep its increase in

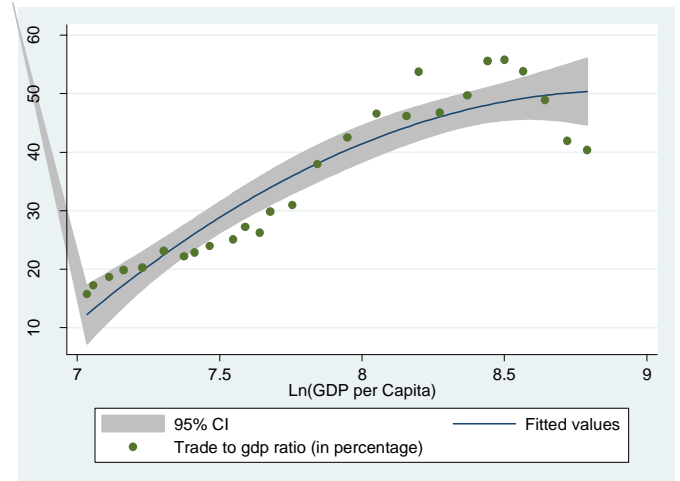


Figure 3: India's Trade to GDP ratio mapped over the Ln (GDP per capita)

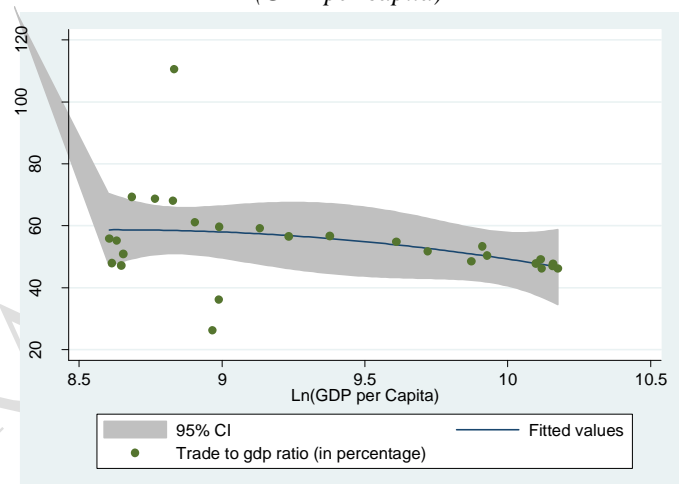


Figure 4: Russia's Trade to GDP ratio mapped over the Ln (GDP per capita)

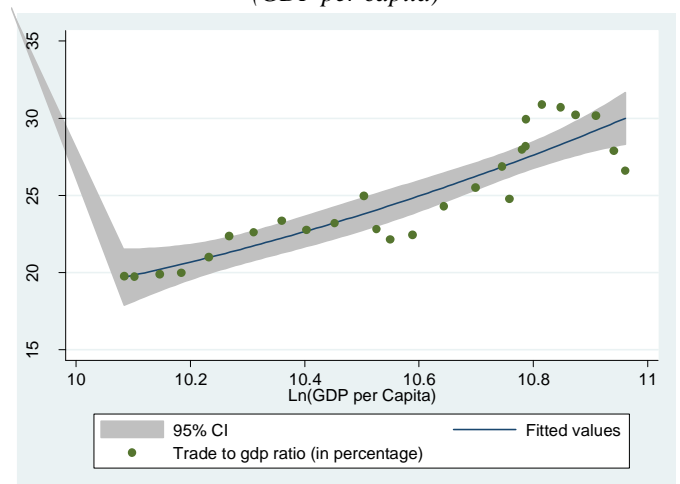


Figure 5: USA's Trade to GDP ratio mapped over the Ln (GDP per capita)

in the long term intact, while the increase in trade to GDP ratio of India would have increased by a splurge in the beginning due to the opening of the gates of economy to foreign investments, but the deficiency of investment in more technologically advanced goods, would have led to a gradual fall in the rate at which the trade to GDP ratio is increasing.

The Russia's trade to GDP ratio is interestingly seen to be falling with the rise in the per capita GDP, when looking at the distribution of the types of goods which are being traded in an economy, our picture can become clearer. The essence of these issues, and a better insight into these results, can be taken from the results of our further diagnostic tools.

SERVICES EXPORTS AS THE PERCENTAGE OF THE TOTAL EXPORTS

The services exports as the percentage of the exports is an indicator of the improvement in the sophistication of the exports of a country. The services sector is, the last sector supposedly in which the growth takes place in an economy, after exhausting the potential in the Primary and the Manufacturing sector. An increase of exports of services from a country can give, interesting insights about the economic condition of the country. In the figure 6 we have, Services exports as a percentage of total exports in case of India, USA and Russia.

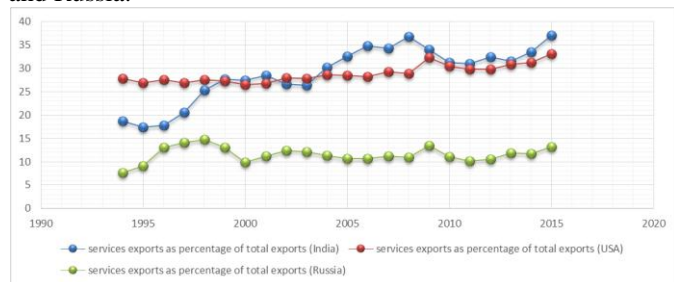


Figure 6: Services exports as a percentage of total exports

The above graph shows how the services have fared as the percentage of total exports over the time. We see that the India's share of services in the total exports has risen steeply over the years, this may be due to the fact that the growth in India economy missed the phase of growth in manufacturing sector in its growth path and directly jumped into the service sector development. The Russia and USA, are also showing an increase in the share of services in their exports, over the time. However, Russia's share of services in export has been low overall throughout the years, this may be because the high dependence on the exports of natural resources for Russia, which we will be seeing further in our analysis.

REVEALED COMPARATIVE ADVANTAGES

The revealed comparative advantage of a country show the competitiveness of that country in a particular category, in comparison to the whole world. An RCA index of more than unity, indicates that the country's share of exports in the particular category is more than the world's share of exports in the same category. The RCA are sometimes criticized on the basis that, a large subsidy in a particular sector or undervalued exchange rates, can also lead to higher RCA for a country. But, it still is preferred to the general Comparative Advantage index. The following figure 7, shows the Revealed Comparative Advantages of all three countries in the case of Consumer Goods. We see that India, clearly has a revealed comparative advantage in the exports of consumer goods in comparison to USA and Russia, both of which are in the major section of the graph, below unity.

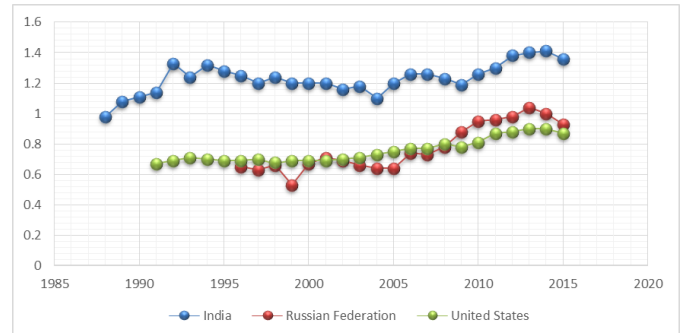


Figure 7: Revealed Comparative Advantage Index in case of Consumer goods

The figure 8, represents the revealed comparative advantage index of the three countries in case of Capital goods. We can see that, United States is the ultimate leader in the Capital goods as far as the RCA index is concerned. We also see that, the USA's RCA in capital goods showing a downward trend since last few years, while the India's RCA index in Capital Goods sector is at a rise, but still very low in comparison to USA.

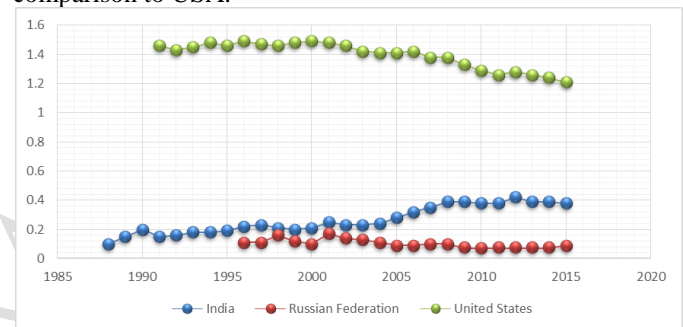


Figure 8: Revealed Comparative Advantage index in case of Capital Goods

We see that how the RCA index in the capital and consumer goods sector of the three countries behaved. India and Russia are seen to be having a low RCA in capital goods because the major share of their exports are minerals and metal ores, and not the manufactured goods. While on the other hand, India is showing a rising trend in the revealed comparative advantage of the country in Consumer goods, in comparison to the USA and the Russia.

HIRSCHMAN - HERFINDAHL (HH) INDEX

This index is a measure of a country's export concentration, which means it is a measure of the diversity in a country's exporting products portfolio. Closer it is to zero, more the diversified is a country's exports portfolio, while a value closer to unity, is an indicator of the country's dependence on the exports of a particular good. The figure 9 represents, the increase in HH index for all the three countries. It is quite prevalently visible that India's HH index figures have shown great improvement since 1991. This means that, India's exports portfolio is now more diversifies and is no more dependent on a few goods. USA's HH index has also shown improvement through the time period. While, Russia's HH index figures are no more or less the same in the last ten years.

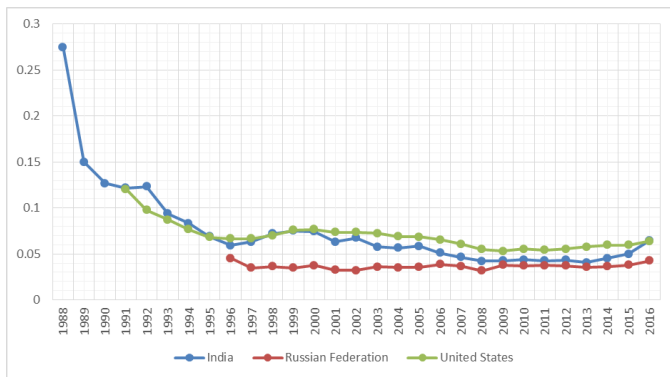


Figure 9: Hirschman-Herfindahl (HH) Index of India, Russia, and USA

PRIMARY AND RESOURCE BASED GOODS TO THE MEDIUM AND HIGH-TECH MANUFACTURED GOODS' EXPORTS

Our last outcome indicator will help us in looking at the sophistication of the exported goods of these countries, and will also give a deeper reasoning for some of the previous results. We will be looking at the share of High-tech goods in exports, share of medium and High-tech goods in exports, and the share of Ores and minerals in the exports of goods of the three countries, to have an idea of the composition of the export portfolios of the countries based on the types of the goods exported by them.

Figure 10 shows the share of high-tech goods in exports of all the three countries. USA leads the pack and that too with a great margin as far as the share of the most sophisticated high-tech goods in the exports of the countries is concerned. India is far behind USA, but not so far behind Russia because of the composition of Russia's exports, which we will be seeing in the next graphs. The high share of high-tech goods by USA, can be the reason of the rise in trade to GDP ratio with an increase in the per capita income of the country at an increasing rate, due to a higher plough back investments in Research and Development, while the India's trade to GDP ratio rose at a decreasing rate with comparison to the GDP per capita, because of the absence of high-tech exports.

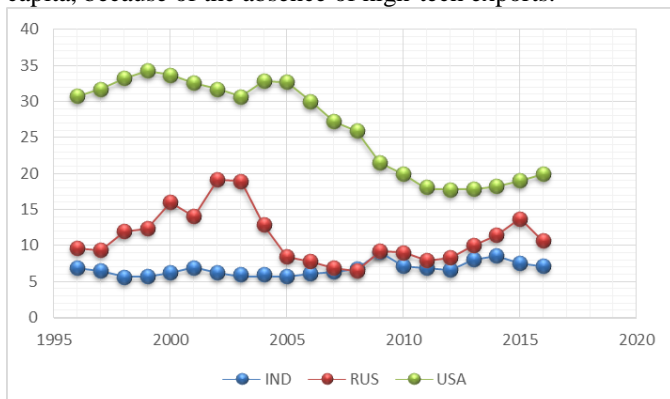


Figure 10: Share of High-tech goods in exports

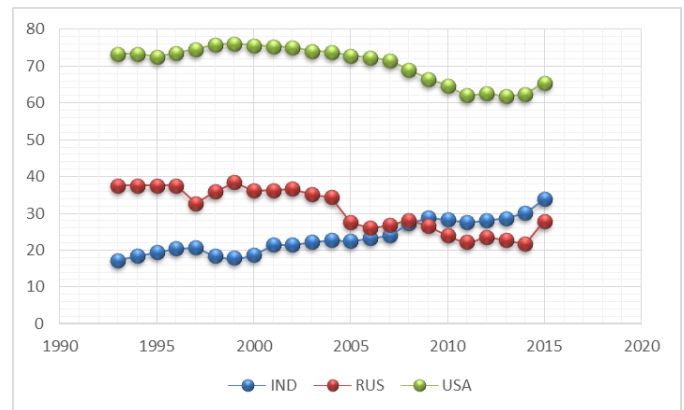


Figure 11: Share of Medium and High-tech goods in exports

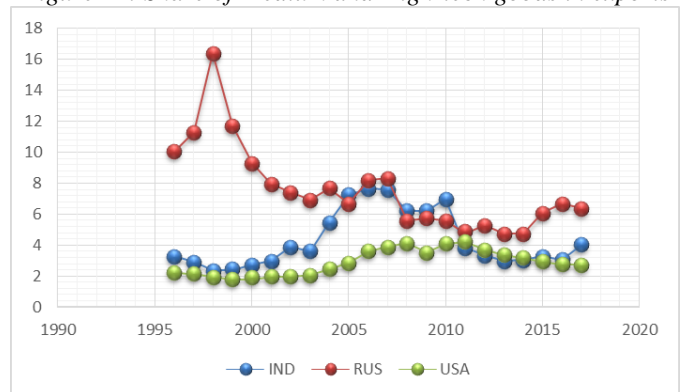


Figure 12: Share of Ores and minerals in the exports of goods.

Figure 11 shows the share of Medium and High-tech goods in the total exports of the countries and interestingly, India, is seemed to be surpassing Russia in last few years in the graph. One of the reasons behind this may also be that, India has a significant comparative advantage in the exports of Consumer Goods. Also, we see that both the Russia and USA are showing a downward trend, while India is showing an upward trend this means, that the newly emerging Asian economies have started taking their positions in the world trade.

Figure 12 which is showing the share of minerals and ores exports in a country's total exports, is showing that although India has shown an improvement in the medium and high-tech exports, the dependence on the minerals and exports as the exporting goods, have not decreased in last few years, and is rather the same. The USA is the least dependent on the exports of natural resources. But, Russia is seemed to be dependent a lot, with comparison to the other countries on the exports of natural resources. This can be the reason of, Russia showing no improvement in the Hirschman-Herfindahl Index in the last few years.

V. CONCLUSION

The study bestowed us with a number of interesting results and cleared the surface for the reasons to be come out in case of different indicators for each of the country. The Trade to GDP ratio over the GDP per capita, proved the presence of a non-linear relationship among the trade openness of a country and its economic prosperity, but it also showed the inconsistency in the pattern of this non-linear

relationship. Later in the study we found out that the types of goods in the total exports drives the mechanism behind this inconsistency.

We found out that, the services as a percentage of exports, is showing an increasing trend in all the countries, this indicates that the services trade have the potential and should be seeing a rise in near future, for everyone. India is seemed to be showing its dominance in the comparative advantage of consumer goods, while the USA has the comparative advantage in capital goods trade. The comparative advantage of all the countries in the case of consumer goods is seemed to be improving over time. The HH index also showed the improvement in the exports product diversification for India and USA, except Russia, which see virtually no change in its product diversification.

The analysis of the composition of the goods based on the technological sophistication showed that, USA dominantly exports the high tech goods, which is a result of high investments in research and development for the country. While, India which has a comparative advantage in the exports of the consumer goods is seemed to be doing fairly well in the exports of medium and high tech goods. But, Russia is experiencing a decline in its trade openness, low ratio of services in exports, comparatively non-improving HH index, and dependence of exports on a few goods concentrated in minerals and ores.

The results from our study, can help the policymakers in making sure, that the policies are made in such a way, that the sector which is seem to be having the most room for

improvement, or the sector which is expected to be giving the most benefits are allocated with the most resources.

REFERENCES

- [1] (n.d.). Retrieved from <http://www.census.gov>
- [2] (n.d.). Retrieved from <http://www.tradingeconomics.com>
- [3] (n.d.). Retrieved from <http://www.thehindu.com/business/economy>
- [4] (n.d.). Retrieved from US Russia Economic Relations-Myths and Realities by Vadim Grishin
- [5] (n.d.). Retrieved from <https://www.india.gov.in/>
- [6] (n.d.). Retrieved from <http://unctadstat.unctad.org/EN/>
- [7] (n.d.). Retrieved from <https://comtrade.un.org/>
- [8] (n.d.). Retrieved from <http://databank.worldbank.org/data/reports.aspx?source=world-development-indicators>
- [9] (n.d.). Retrieved from <https://wits.worldbank.org/>
- [10] Martin, M. F., & Alankronstadt, K. (n.d.). India-US Economic and Trade Relations.
- [11] Reis, J. G., & Farole, T. (2011). Trade Competitiveness Diagnostic Toolkit. International Trade Department, World Bank.
- [12] (n.d.). Russia Statistical Paper 2016. Data Portal.
- [13] Sahoo, P., Nataraj, G., & Ashwani. (n.d.). Indo-US Economic Relations-Prospects and Challenges.
- [14] Sharma, R., & Joshi, N. (n.d.). India –Russia Relations in a Changing Eurasian Perspective.