What are the Key Economic Determinants of Merchandise Trade? Evidence from India

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Abstract- **There has been an unprecedented growth in international merchandise trade across economies with India being not an exception. This growth has been instrumental in shaping the economy of India. There are vast array of economic and non-economic factors affecting the international merchandise trade and the study aims to empirically estimate the key determinants of international merchandise trade to understands its dynamics and be useful in formulation of suitable trade strategies. Extensive literature review enables identification of factors on which empirical estimation has been done using the ARDL Bounds test approach to cointegration for a period of 1995-2019. The approach was helpful to estimate the long-term and short-term relationship between merchandise trade and factors undertaken in the study. Using world bank indicators database, study found that global income, services trade, world's population and Real effective exchange rate have positive and significant impact on merchandise trade of India. Based on the results, suitable practical and policy implications of the study have been suggested.**

Keywords- ARDL Bound test approach to cointegration, economic determinants, global income, merchandise trade, real effective exchange rate

I. INTRODUCTION

The growth of merchandise trade has been a defining aspect of the global economy over the past few decades. The increasing interconnectedness of nations, advancements in transportation and communication, and liberalization of trade policies have facilitated the exponential expansion of international trade in goods. Since 1995, the world has witnessed an extraordinary surge in merchandise trade. The advent of globalization and the formation of various trade agreements, such as the World Trade Organization (WTO), North American Free Trade Agreement (NAFTA), and the European Union (EU), have played a pivotal role in fostering trade relationships among nations. According to World Bank data, the value of global merchandise exports in 1995 stood at approximately $5.36 trillion USD. Fast forward to 2023, and this value has soared to an estimated $19.2 trillion USD, representing a staggering growth rate of over 257% in just under three decades.

The growth of merchandise trade worldwide has been a transformative force in the global economy, facilitating prosperity and development across nations. India, too, has been an integral part of this journey, embracing economic reforms and leveraging its strengths to emerge as a key player in the global market. India, as one of the fastest-growing economies in the world, has also experienced remarkable growth in merchandise trade over the past few decades. As per the World Bank Indicators database, in 1995, India's merchandise exports were valued at around $33 billion USD. By 2023, this figure is projected to reach approximately $545 billion USD, representing an astounding growth rate of nearly 1556%. India started major economic reforms in the early 1990s, opening up its economy to international investment and liberalizing its trade regulations. India's competitiveness in the international market was enhanced by this move towards a more market-oriented strategy following the implementation of economic policy reforms. It also had a favourable effect on the country's foreign trade sector, where exports have increased significantly [1]. Additionally, export development has been fueled by India's varied manufacturing capabilities, which have drawn demand from throughout the world, especially in industries like textiles, pharmaceuticals, and autos. Particularly in the last few decades, the industrial sector has seen significant liberalization and openness along with growth and productivity. In actuality, imports play a major role in the productivity-boosting impacts of economies of scale, reallocation, and spillover, and there is a statistically significant positive correlation between productivity and exports [12].

India's economy has witnessed transformative growth over the years, and international trade in goods has played a pivotal role in shaping this development. As a diverse and populous nation, India has actively engaged in global trade, driving economic expansion and industrialization.

Understanding India's competitive strengths and comparative advantages has been instrumental in shaping its international trade policies. By focusing on industries where it has a comparative advantage, India has been able to enhance its global market presence and attract foreign investments [14]. International trade in goods has allowed India to access crucial resources and commodities that are essential for its industries and citizens' well-being. This has furthered Economic Development and improved the standard of living for many Indians [10].

Thus, it can be said that there has been transformative and significant role of international trade on Indian Economy, therefore understanding factors that influence India's international trade is vital. There lies a complex network of

factors that govern the flow of goods across borders such as Income, Population, trade agreements and tariffs, exchange rates, Infrastructure and logistics, political and economic stability, services trade etc. Understanding these underlying influences is paramount for policymakers, businesses, and economists to navigate the challenges and capitalize on the opportunities presented by international trade. Insights into these factors can be utilised by policymakers to design effective trade policies that promote export growth, boost domestic industries, and enhance overall economic performance. In fact, policymakers can assess potential risks and vulnerabilities in the trade sector based on the fluctuations in these factors.

Therefore, this study aims to empirically estimate the impact of diverse factors on India's merchandise trade during the period of 1995 to 2019. The factors chosen for this study is based on extensive literature review. All the data has been collected from World Bank Indicators database for the aforesaid time period. It endeavours to identify and highlight the key determinants that significantly impact India's trade in goods.

The rest of this paper is organized as follows: Section 2 presents the *Literature Review*, examining the relevant studies that investigate the factors influencing merchandise trade, In Section 3, an *Empirical Analysis*, utilizing various datasets in the case of India to examine these relationships in-depth and observing the movements in the data was conducted and this section also provides the empirical model and technique of estimation. Section 4 presents the *Empirical Results and Findings* derived from econometric estimation. Finally, in Section 5, a comprehensive *conclusion and Discussion of Results* is providing which is summarizing the key insights from the literature review and empirical analysis, and offer recommendations for policymakers and businesses to enhance merchandise trade and foster sustainable economic development.

II. LITERATURE REVIEW

Jafari et al. [5] state that a number of factors affect the export flows of the D8 countries. According to the results of a gravity model estimated using Panel Correlated Standard Errors (PCSE), the primary factors influencing the volume of export flow among the countries in the D8 group are the GDP, exchange rate, exporter country population, border, and distance. The results showed that the countries would do better if they focused on exporting more to the countries that bordered the group and also made the required actions to ensure low transportation costs.

Yeshineh [16] examines the short- and long-term relationships between Ethiopia's trade balance and explanatory factors such as foreign income, budget balance, real exchange rate, money supply, and income. By employing annual data from 1970–71 to 2010–11, the possibility of a long-term relationship between trade balance and its factors is investigated. The autoregressive distributed lag, or ARDL, model framework's bound testing methodology for cointegration and error correction is used. Using this approach, he discovered proof of enduring relationships between trade balance and its determinants. The computed findings show a negative (positive) short- and long-term link between the trade balance and currency rate appreciation and depreciation, in accordance with economic theories. The empirical findings offer compelling evidence that the behaviour of Ethiopia's trade balance is less dependent on currency rates. Trade balance is more strongly impacted by income, budget balance, and money supply.

In the instance of Malaysia, Duasa [2] investigates the short- and long-term links between trade balance, real exchange rates, income, and money supply. He examined whether there is a long-run equilibrium link between trade balance and the determinants using the bound testing technique to cointegration and error correction models, established inside an autoregressive distributed lag (ARDL) framework. By applying this method, he was able to discover evidence of a long-term correlation between trade balance and factors related to income and money supply, but not between trade balance and real exchange rate. The results also imply that Malaysia's Marshall-Lerner criterion is not long-term valid, and that monetary and absorption methodologies should be used to assess the country's trade and payments balance.

Using quarterly data from 1994: Q1–2012: Q3, Sertoglu and Dogan [3] conducted an empirical analysis of the long-term link between Turkey's agricultural trade performance and real exchange rate. The model is expanded to include additional variables that are anticipated to impact the agricultural trade balance, such as the ratio of agricultural product import and export prices, producer pricing, and the nation's real income. To demonstrate the presence of a long-term link between the agricultural trade balance and its drivers in Turkey, the ARDL (Autoregressive Distributed Lag) method and the limits test strategy for co-integration are employed. The findings indicate that agricultural producer prices, real GDP, and the real exchange rate are all very important and negatively affect Turkey's agricultural trade balances. Accordingly, research indicates that policies or reforms that lower producer prices and use new technology to boost productivity could contribute to Turkey's agricultural trade surplus.

Hoang, Truong, and Dong [6] examine the determinants influencing bilateral trade flows between Taiwan and ASEAN at the sectoral and aggregate levels using a gravity model with a PPML (Poisson pseudo-maximum-likelihood) estimator. They find that the economic size and per capita income of ASEAN have a far bigger impact on total commerce and manufacturing level than Taiwan's. The findings also demonstrate that, with the exception of Myanmar and Cambodia, bilateral commerce between Taiwan and ASEAN has been carried out effectively in recent decades. For this reason, going forward, both parties should adopt a proactive strategy to advance bilateral commercial relations. Fidrmuc and Helmenstein [4] use the Ricardian model of comparative advantage to investigate the link between population size and international commerce. According to the authors, countries with bigger populations tend to specialize in the production of particular items and trade with other nations for a variety of goods, which is why greater trade levels are linked to larger populations.

The relationship between commerce and population growth is examined by Hinz and Maissonneuve [7] in the context of both industrialized and developing nations. According to the study, trade expansion may be furled by population growth, especially in emerging economies where growing populations may raise demand for specialization and

other related factor. Using data specific to the United States, Mattoo and Ng [9] examine the complementarity and substitutability between trade in products and services. The authors discover evidence of a positive correlation between trade in goods and services, indicating that nations with higher levels of trade engagement in one area also typically have higher levels of trade engagement in the other. Implications for trade agreements such as the Trans-Pacific Partnership (TPP) are also covered in the paper. Chou [8] uses a spatial econometric model to investigate the potential influences of political risk, economic integration, and geographical impacts on China's exports. The findings indicate that there has been a noticeable home market effect for China's exports as its economy has expanded. China's exports benefit from greater economic integration. There is shown to be a substitutive link between exports and OFDI from China. Furthermore, China's exports benefit from both the high level of economic openness and the greater per capita income of partner nations.

Based on the literature review, it can be seen that factors such as income, prices, services trade and population have impact on goods trade in several nations. Therefore, the next section 3 gives an overview of the movements in these factors when considered along movement in goods trade for the chose time period.

III. EMPIRICAL ANALYSIS

A. Overview

An overview of the growth trajectory of merchandise imports and exports, taking into account changes in the Real Effective Exchange Rate for India, is provided in Fig. 1. After accounting for inflation differences, REER is a metric that shows how much a nation's currency is worth in relation to a weighted average of the currencies of its trading partners. A greater REER denotes a currency appreciation, which makes imports comparatively less expensive for local consumers and exports comparatively more expensive for overseas customers. On the other hand, a lower REER indicates currency depreciation, which raises the cost of imports for domestic consumers and lowers the cost of exports for overseas purchasers. The REER shows some fluctuations over the years but generally remains within a relatively narrow range. It started at around 104.59 in 1995, declined to a low of 92.84 in 1999, and then fluctuated between 95 and 114 in the subsequent years, with a peak of 119.71 in 2018. Merchandise exports (X) show a generally increasing trend over the years. It grew from 30.63 billion US dollars in 1995 to 324.34 billion US dollars in 2019, with some intermittent fluctuations. Merchandise imports (M) also exhibit an increasing trend, rising from 34.707 billion US dollars in 1995 to 486.059 billion US dollars in 2019.

One interesting observation is that merchandise exports and imports tend to rise even during periods when the REER is relatively high, indicating a stronger currency. This suggests that the Indian economy has been able to maintain export competitiveness and domestic demand for imports, despite currency appreciation. Throughout the analyzed period, India generally had a trade deficit (imports exceeding exports), as the value of imports (M) consistently exceeded the value of exports (X).

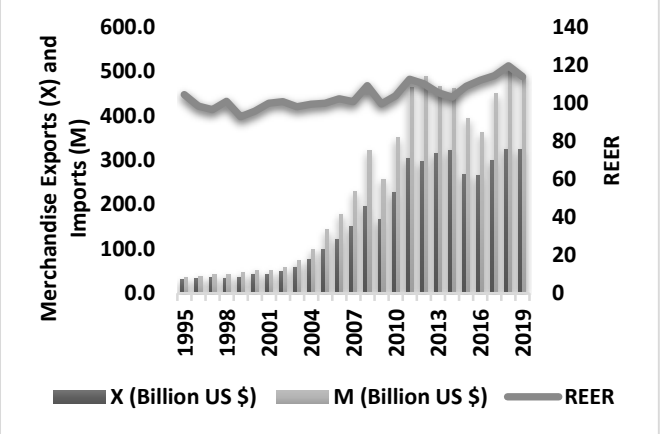

Fig. 1. Growth trend of Merchandise Exports and Imports considered along movement in REER

Fig. 2 gives an overview of growth trend in total merchandise trade of India considered along movements in GDP of India and World. Total merchandise trade refers to the sum of both exports and imports of goods. It has been measured in Billion US $. India's GDP, measured in constant 2015 US dollars and the world's GDP, also measured in constant 2015 US dollars. As GDP grows, so does the overall purchasing power of individuals and businesses. With higher incomes, people tend to consume more goods, and businesses increase their production to meet the rising demand. This results in higher imports of raw materials and intermediate goods and increased exports of finished goods.

The movement of total merchandise trade shows fluctuations over the years. It grew rapidly in the late 1990s and early 2000s, with notable peaks in 2004 and 2005. However, after 2011, there was a noticeable slowdown in growth, and in 2015, there was a significant decline in merchandise trade (a decrease of 15.9%). The trade recovered slightly in subsequent years but remained volatile.

India's GDP growth has been generally positive throughout the analysed period. It shows some fluctuations, but the growth rate has generally remained above 3% annually. There was a dip in GDP growth during the global financial crisis in 2008-2009 but recovered well in subsequent years. The world's GDP growth also fluctuates over the years. It experienced a decline during the global financial crisis but generally remained positive. The growth rate varied between 2% to 4.5% annually.

There seems to be a positive correlation between total merchandise trade and India's GDP and the world's GDP. When both India and the world experienced higher GDP growth, total merchandise trade tended to grow more rapidly. he global financial crisis in 2008-2009 had a significant impact on both India's GDP and the world's GDP, leading to a slowdown in trade growth. Similarly, the sharp decline in total merchandise trade in 2015 might be linked to global economic challenges during that period.

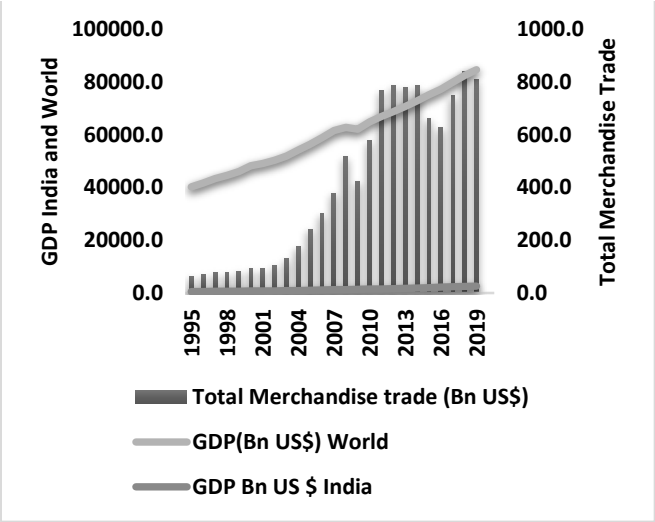

Fig. 2. Growth trend in Total merchandise trade of India considered along movements in GDP of India and World

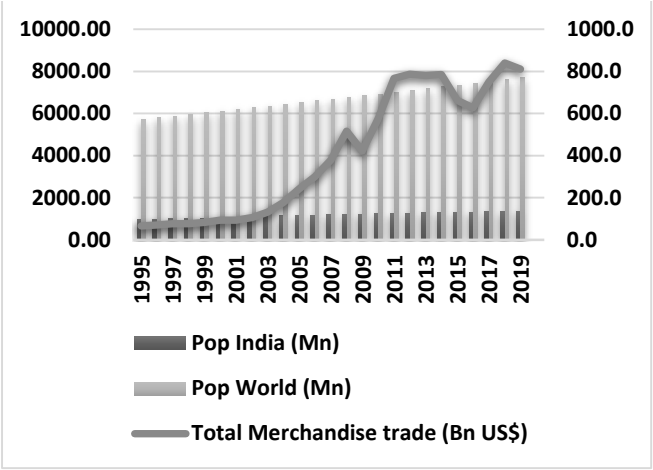

Fig. 3: Growth trend in Total Merchandise Trade of India considered along movements in Total Population of India and World

Fig. 3 provides an overview of growth trend in total merchandise trade considered along movements in total Population of India and World. It is believed that a larger population creates a larger consumer base, leading to increased demand for goods and services. This can stimulate domestic production and exports and also attract imports to meet the rising demand. A larger population provides a larger labour force, which can be advantageous for industries that rely on labour-intensive production processes. This can enhance export competitiveness in certain sectors.

The movement of total merchandise trade shows fluctuations over the years. It experienced significant growth in the late 1990s and early 2000s, with a peak of 37.4% growth in 2005. After 2011, there was a slowdown in trade growth, and in 2015, there was a notable decline (a decrease of 15.9%). The trade recovered slightly in subsequent years but remained volatile.

India's population growth rate has gradually declined over the years but still remains above 1% annually. It reflects the country's continuing population expansion, which influences its domestic market and labour force. The world's population growth rate has also been gradually declining, but the global population continues to increase. The world's population growth has been relatively stable around 1.2% annually.

The analysis shows that the growth in total merchandise trade is not directly proportional to the growth in population. while population growth can influence trade, it is just one of many factors affecting the movement in total merchandise trade. Other economic and global factors have a more prominent role in determining trade volumes between countries.

Fig. 4 gives an overview of the growth trend in Total merchandise trade of India considered along movements in Total Services trade. Countries often engage in both merchandise and services trade with each other. For example, when a country exports goods to another country, it may also provide related services, such as technical support, maintenance, or consultancy for those goods. This creates a complementary relationship between the two types of trade. Modern international trade often involves global value chains, where products are manufactured using components and services from different countries. A finished product's trade may include both the value of the physical goods (merchandise) and the value of related services involved in its production.

The movement of total merchandise trade shows fluctuations over the years. It experienced significant growth in the early 2000s, with a peak of 37.4% growth in 2005. After 2011, there was a slowdown in growth, and in 2015, there was a notable decline (a decrease of 15.9%). The trade recovered slightly in subsequent years but remained volatile. The movement of total services trade also shows fluctuations but generally exhibits less volatility compared to total merchandise trade. The services trade experienced steady growth, with peaks in 2003 (20.7% growth) and 2004 (50.5% growth).

The analysis shows that total merchandise trade and total services trade of India have both experienced growth over the years, but they exhibit different patterns of volatility. Merchandise trade tends to be more sensitive to global economic conditions and fluctuations in commodity prices, leading to more significant year-to-year changes. Services trade, on the other hand, is influenced by factors such as foreign direct investment, the outsourcing of services, and global demand for various services, making its growth relatively steadier.

Despite these differences, there is an underlying trend of growth in both sectors, indicating the importance of both goods and services in India's overall international trade. The complementarity of goods and services trade, especially in the context of global value chains, plays a crucial role in driving the overall trade growth of the country. Additionally,

the services sector's sustained growth reflects the increasing significance of knowledge-based and technology-driven services in India's trade portfolio.

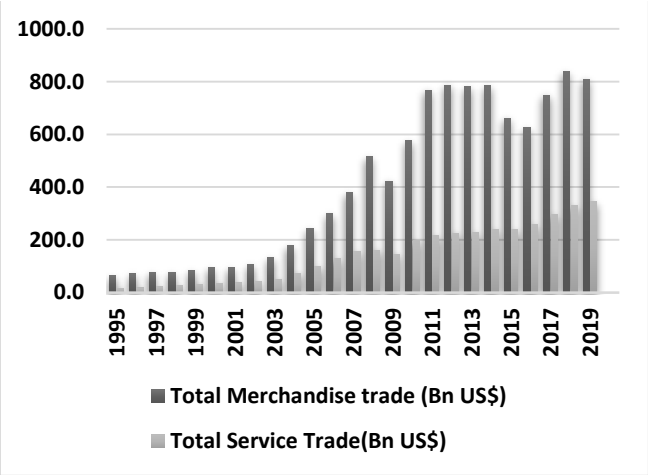

Fig. 4: Growth trend in Total merchandise trade of India considered along movements in Total Services trade of India

B. Empirical Model and Technique of Estimation

The study outlines that India's total merchandise trade is determined by Real effective exchange rate (REER), GDP of India and World, Population of India and World, Services trade of India as per equation 1. The coefficients of GDP of India and World, Services trade of India, Population of India and World are expected to show positive signs while the coefficient of REER will show a positive sign if on its increase, decline in exports is less than increase in imports and therefore the total merchandise trade which is the sum total of merchandise exports and imports will rise. While it will show a negative sign if on its increase, decline in exports is more than increase in imports and therefore the total merchandise trade will fall. Now it depends on relative price elasticity of merchandise exports and imports that whether the exports will fall more than increase in imports on an increase in REER on account of rise in REER. If exports are more price elastic than imports, their fall will be higher than rise in imports while if imports are more price elastic than exports, their rise will be higher than fall in exports on account of rise in REER.

$$MerTrade_t = f(GDPInd_t, GDPWorld_t, PopInd_t, PopWorld_t, REER_t, SerTrade_t) \quad (1)$$

The study aims to estimate the key economic determinants of merchandise trade through time series methodology. It basically aims to estimate the long run and short run relationship between merchandise trade and its determinants given on the right-hand side of equation 1 and to estimate whether they play statistically significant role in altering the amount of merchandise trade of India. The analysis is based on calculating the coefficients of sensitivity or change in merchandise trade to 1% change in chosen variables.

Time series methodology is particularly suitable and advantageous when you are dealing with data that is collected over time, such as observations taken at regular intervals (e.g., daily, monthly, yearly). This methodology is often preferred and can be better suited than other methodologies for estimating the determinants of a variable because it inherently contains temporal dependencies, meaning that the observations at one time point are likely to be related to observations at previous or subsequent time points. Time series methods are designed to capture and model these dependencies, which can lead to more accurate and robust estimates of relationships between variables.

The stationarity properties of each macroeconomic variables are tested using Augmented Dickey Fuller Test.

The co-integration of the variables is then assessed using the bound testing method for the Auto-Regressive Distributed Lag (ARDL) model. Since the direction of causality is predetermined and the variables of interest are not solely I (1), the ARDL technique is favored over Johansen's approach. Furthermore, the ARDL model allows for the assignment of varying lag lengths to various variables. When both short-term and long-term dynamics are present, the ARDL approach provides a strong and flexible time series tool for estimating the relationship coefficients between variables. While the cointegration relationship depicts the long-term equilibrium, the ARDL model's incorporation of lagged variables takes short-term effects into account. This makes ARDL suitable for analyzing how variables respond to short-term shocks and how they converge to their long-run equilibrium.

The following ARDL models are estimated to check for the presence of cointegration-

Equation 2-

$$\Delta LnMerTrade_t = \alpha_1 + \sum_{i=1}^{m} \beta_{1i} \Delta LnMerTrade_{t-i} + \sum_{i=0}^{n} \beta_{2i} \Delta LnGDPInd_{t-i} + \sum_{i=0}^{p} \beta_{3i} \Delta LnREER_{t-i} + \sum_{i=0}^{q} \beta_{4i} \Delta LnGDPWorld_{t-i} + \sum_{i=0}^{r} \beta_{5i} \Delta LnPopInd_{t-i} + \sum_{i=0}^{s} \beta_{6i} \Delta LnPopWorld_{t-i} + \sum_{i=1}^{t} \beta_{7i} \Delta LnSerTrade_{t-i} + \beta_8 \Delta LnMerTrade_{t-1} + \beta_9 \Delta LnGDPInd_{t-1} + \beta_{10} \Delta LnREER_{t-1} + \beta_{11} \Delta LnGDPWorld_{t-1} + \beta_{12} \Delta LnPopIndia_{t-1} + \beta_{13} \Delta LnPopWorld_{t-1} + \beta_{14} \Delta LnSerTrade_{t-1} + \cup_{1t} \quad (2)$$

The existence of long run cointegrated relationship between variables in the ARDL models is determined through F statistic in Bound test. The joint null hypothesis of zero cointegration is tested (in case of equation 2, H0: β8 = β9 = β10 = β11= β12= β10= β14=0) against the alternative hypothesis of cointegration. Pesaran, Shin, and Smith's Bound test Approach is used to calculate critical values for a specified level of significance (2001). The ARDL model's suitability for estimating the long-term relationship between the variables is assessed using the Bound Test. The null hypothesis that there is no long-term link or zero cointegration is rejected if the calculated F statistic is higher than the upper critical constraint. On the other hand, the null hypothesis cannot be disproved if the F statistic is less than the lower critical bound. The test is inconclusive, nevertheless, if the computed F statistic is inside the boundaries. The ARDL model's error correction representation is estimated to examine short-run dynamics in the event that the null hypothesis is rejected. The model's error correction term, which should have a negative sign, gauges how quickly departures from the long-run equilibrium are rectified.

After estimating the ARDL models as per equation 2, regression diagnostic tests are performed. The LM test checks if the estimated ARDL models suffers from residual serial correlation, while the Breusch-Pagan-Godfrey Test checks for

homoskedasticity and independence of errors. The Jarque-Bera test tests if the residuals are normally distributed. The CUSUMSQ test is also carried out to check for parameter instability in the estimated ARDL model. If the movement is outside the pair of 5 percent critical lines, it indicates parameter instability. CUSUMSQ test is a variant of CUSUM (cumulative sum of recursive residuals) test. The results of all the regression diagnostic tests have been presented in appendix 1.

IV. EMPIRICAL RESULTS

TABLE I. RESULTS OF ADF TEST FOR STATIONARITY

	Level		First Difference	
Variable	Intercept	Trend & Intercept	Intercept	Trend & Intercept
Lnmertrade	0.7035	0.9669	0.0137	...
Lngdpind	0.9738	0.1092	0.0033	...
Lngdpworld	0.7537	0.4165	0.0024	...
Lnpopind	...	0.0437	...	...
Lnpopworld	0.0453	...	...	...
LnREER	0.4898	0.0262	...	...
Lnsertrade	0.4026	0.8378	0.0484	...

Source: Author's Calculation

Since the macroeconomic variables are found to be a mix of I (1) and I (0), the bound-testing approach to the ARDL model is implemented to check for the presence of any co-integrating relationship among these variables and subsequently estimate the model. This approach cannot be used if any of the variables are found to be I (2).

The relationship between merchandise trade and its determinants in log-linear functional form has been estimated as per equation 2, and the model (1, 2, 1, 1, 1, 2, 0) has been chosen based on Akaike Info Criterion. Lag 1 corresponds to Total Merchandise trade, GDP of world, Population of India and world. Lag 2 corresponds to GDP of India and REER while Lag 0 corresponds to Services trade of India. The long run coefficients estimated from ARDL (1, 2, 1, 1, 1, 2, 0) model are reported in Table 2. When the Long-Run Bound test is performed for the ARDL (1, 2, 1, 1, 1, 2, 0) model, the F statistic is found to be = 7.61. At the 10% level of significance, the asymptotic lower and upper bound values of the F-statistic from, assuming a model with six regressors (k = 6), no trend, and a Restricted Constant, are [1.99, 2.94]. In this instance, the null hypothesis of zero cointegration or no long-term relationship can be rejected because the calculated F statistic is greater than the critical upper bound at the 10% significance level. This suggests that there is a long-term equilibrium relationship between merchandise trade and its factors.

TABLE II: LONG RUN DETERMINANTS OF MERCHANDISE TRADE FUNCTION: ESTIMATES FROM ARDL APPROACH TO COINTEGRATION

Dependent Variable is LnMertrade		
Regressors	Co-efficient	T-Ratio (p value)
Lngdpind	1.24	0.70(0.50)
Lngdpworld	4.90	1.21(0.03) **
Lnpopind	21.64	1.77(0.11)
Lnpopworld	69.68	2.49(0.03) **
LnREER	3.97	2.61(0.03) **
Lnsertrade	0.82	2.79(0.02) **
c	459.14	2.64(0.02)
R-squared=0.95		

Source: Author's Calculation
Note: Lag Length is chosen on the basis of Akaike Info Criterion (AIC)
*Denotes significance at 10% level

As per the estimated results, it was found that the total merchandise trade of India is positively impacted by all the determinants taken in the estimation. However, only GDP of the world, Population of the world and Services trade of India and REER impacts the total merchandise trade significantly. The estimated long run relationship coefficient between merchandise trade and GDP of the world is found to be 4.90 and it statistically significant. This implies that 1% increase in GDP of the world causes 4.90% increase in merchandise trade of India. The estimated long run coefficient between merchandise trade and world population is found to be 69.68 and it statistically significant. This means that 1 % increase in the population of the world will raise the merchandise trade of India by 69.68%. The estimated long run coefficient between merchandise trade and services trade is found to be 0.82 and is statistically significant which means 1% increase in services trade cause 0.82% increase in merchandise trade. This shows high complimentary and linkage between these trades. The estimated long run coefficient between merchandise trade and REER is found to be 3.97 and is statistically significant which means 1% increase in services trade cause 3.97% increase in merchandise trade.

The Error Correction Representation of ARDL (1, 2, 1, 1, 1, 2, 0) model gives the short-run dynamics. The estimation results are reported in Table 3. Short run coefficients are found to have predicted sign and are statistically significant in the case of GDP of India, GDP of the world, REER, and population of India & world while it is insignificant in the case of services trade. The error correction term (ECT) is found to be negative and statistically significant, providing further empirical evidence in support of presence of cointegration between total merchandise trade and its determinants. ECT= -1.09 implies that about 10.9 per cent of the short-run disequilibrium between these variables is corrected every year.

TABLE III: ESTIMATION RESULTS OF ERROR CORRECTION REPRESENTATION OF ARDL (1, 0, 1, 1, 0, 1, 0) MODEL

Dependent Variable is LnMertrade		
Regressor	Coefficient	T-Ratio (p value)
Lngdpind	1.70	2.94 (0.01)
Lngdpind(-1)	2.13	2.46 (0.03)
Lngdpworld	4.08	2.78 (0.02)
Lnpopind	729.75	10.15 (0.00)
Lnpopworld	253.44	12.59 (0.00)
lnREER	1.59	6.63 (0.00)
LnREER(-1)	2.29	6.62 (0.00)
CointEq(-1)	-1.09	10.68 (0.00)

Source: Author's Calculation

V. Discussion, Conclusion and Policy Implication

The study aimed at estimating the key economic determinants of merchandise trade of India. For this purpose, the study adopted the ARDL approach to cointegration and found that Indian merchandise trade is positively and significantly impacted by GDP of the world, REER, Population of the world and Services trade of India.

The merchandise trade getting positively and significantly impacted by world GDP, shows that as the global income rises, the merchandise exports and imports of India increases indicating that demand for our exports are income elastic and it responds positively to change in global GDP. Also, as global GDP (or global output) increases, India starts to import more goods and leading to higher merchandise trade. Thus, as global output expands, India opens its door and purchases increases significantly. Thus, we can say that our country is import intensive country. India is a country which is economically integrated and open to trade at global level and is therefore experiencing positive impact of rise in global

GDP on the growth of its merchandise trade. Thus, there is a need for the governments to focus on developing and implementing export-oriented policies to capitalize on the positive impact of world GDP growth on merchandise trade. This involve providing incentives, subsidies, and support to industries with strong export potential, as well as streamlining export procedures to make it easier for businesses to access international markets. And since the dependence on world market is high and so there is a need to encourage diversification of exports across various sectors and markets to reduce dependency on a single market's economic performance. Diversification can help mitigate risks associated with fluctuations in the world GDP and ensure sustained trade growth even when certain markets face economic challenges.

The merchandise trade getting positively and significantly impacted by world population, shows that as customer base for Indian products increases, its exports increase significantly. This means that global population has liking towards Indian goods and thus Indian goods has responsive global customer base. Also, when global population increases the Indian imports also increase. This signifies that India has high opportunities with the rising global population and therefore developing such trade policies to leverage market opportunities, enhance competitiveness, and facilitate efficient trade flows. Policy makers should aim to promote sustainable trade growth, capitalize on demographic trends, and enhance a country's ability to meet the demands of a larger and more diverse global consumer base.

The author also found high complementarity between merchandise and services trade of India. This means that these two trades are highly interlinked and depict positive and mutually beneficial relationship with each other. It highlights the importance of a holistic and integrated approach to trade policy. Policymakers should invest in data collection and analysis to better understand the linkages between services and merchandise trade. This can inform evidence-based policies that maximize the benefits of this interrelationship.

Merchandise trade is also getting positively and significantly influenced by REER. This means that with the fall or rise in REER, merchandise trade of India will fall or rise respectively. When REER reduces, the imports of country become costlier while exports become cheaper but the fall in imports is more than rise in exports and therefore the total merchandise trade which is the sum total of exports and imports will fall. On the other hand, when REER rises, merchandise exports become costlier while imports cheaper, but the rise in exports will be higher than fall in imports and thereby resulting in higher merchandise trade. We can say that India's exports and imports are both price elastic. A positive impact of REER on merchandise trade can contribute to achieving a more favourable trade balance. Thus, in this scenario a favourable REER can help address trade deficits by boosting exports and potentially curbing imports, leading to a more balanced trade position. Policymakers may consider adopting exchange rate management strategies to maintain a competitive REER. This might involve interventions in the foreign exchange market, monetary policy adjustments, or other measures aimed at influencing the exchange rate to support export-oriented industries. While a competitive REER can be advantageous for merchandise trade, policymakers should also consider the importance of maintaining an appropriate level of exchange rate flexibility. An overly rigid exchange rate regime might hinder the economy's ability to adjust to changing global conditions.

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APPENDIX 1

Regression diagnostic tests performed for the estimated ARDL (1, 2, 1, 1, 1, 2, 0) model are reported in Table 4. From Table 4, it is found that none of null hypotheses of LM test, Jarque Bera test and Breusch-Pagan-Godfrey Test can be rejected in case of ARDL (1, 2, 1, 1, 1, 2, 0) Model, we consider the F version of test statistic. Hence, it can be concluded that the Merchandise trade determinants estimated as ARDL (1, 2, 1, 1, 1, 2, 0) model is free from serial correlation, heteroskedasticity and non-normality. The results of CUSUMSQ test for ARDL (1, 2, 1, 1, 1, 2, 0) model. The CUSUM of squares of recursive residuals is found to lie well within the 5 per cent critical lines, indicating parameter stability.

TABLE IV: DIAGNOSTIC TESTS ARDL (1, 2, 1, 1, 1, 2, 0) MODEL

Diagnostic Tests	**Null Ho**	**Statistic**	**Probability Value**
Jarque-Bera Test	Normality (normally distributed residuals)	0.05	0.97
Lagrange-Multiplier Test	Zero-serial correlation	3.82	0.08
Breusch-Pagan Godfrey Test	Homoskedasticity	0.90	0.57

Source: Author's Calculation