जर्नल ऑफ एकेडमिक एडवांसमेंट

JOURNAL OF
ACADEMIC ADVANCEMENT

[Bi-Annual Peer Reviewed Refereed Journal]

Volume No. 4 | Issue No. 02 | December, 2025

Editor-in-Chief

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Kolkata, INDIA

EDITORIAL

We feel honoured and privileged to present the Bi-Annual Peer Reviewed Refereed Journal, ISSN (Online): 2583-5203, Volume 4, No. 02, December, 2025 among our esteemed readers and academic fraternity.

This Journal is the outcome of the contributions of insightful research-oriented papers/articles by various eminent academicians, and research scholars in a highly organized and lucid manner with a clear and detailed analysis related to the emerging areas in the fields of Social Sciences and Allied Areas.

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We also express our sincere thanks and gratitude to all the contributors to research papers/ articles who have taken pain in preparing manuscripts, incorporating reviewer(s) valuable suggestions and cooperating with uxs in every possible way.

We also express our heartfelt gratitude to all the esteemed members of the Editorial Board, Esteemed Reviewer(s) who despite their busy schedules have given their valuable time, suggestions and comments to enrich the quality of the contributory resears paper(s) in bringing to light this June issue.

Last, but not least, we revere the patronage and moral support extended by our parents and family members whose constant encouragement and cooperation made it possible for us to complete on time.

We would highly appreciate and look forward to your valuable suggestions, comments and feedback at **editorbr2022@gmail.com**

December, 2025
West Bengal, India

PEMA LAMA
Editor-in-Chief

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RESEARCH ARTICLE

Decades of Trade: A Comparison Between the Pre-Liberalisation and Post-Liberalisation Periods with an Insight into India's Export Growth and its Share in GDP

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ABSTRACT

The present study sets the trends of India's exports and its GDP share for Pre-Liberalisation (1960 - 1990) and Post-Liberalisation (1991-2022). It focuses on large increases in exports and GDP contribution after liberalisation. The paper employs yearly export and GDP share based on different methodological techniques, such as Pearson's correlation and linear regression to support the comparison between export growth and GDP. The strong positive correlation means that exporting has been a major driver of the Indian economy.

These findings offer valuable insights for policymakers aiming to develop strategies for sustainable and inclusive economic development in India.

1 INTRODUCTION

India had been a witness to the cautious policy landscape and socialist approach during the pre-liberalisation period (before the economic reforms of 1991). The pre-liberalisation era projected India as an 'Import Substituting Country' with the prima facie objective to reduce dependence on imports and attain self-reliance in the production of goods and services. High tariffs, import restrictions functioned simultaneously with the public sector supremacy. Though high government intervention existed in the functioning of the economy, the private sector survived. But the private sector that existed got protection behind the tariff restrictions, reducing their competitiveness and increasing inefficiency in production (Sharma and Panagiotidis, 2004). The post-liberalisation in 1991 in India made a complete overhaul of the centralised planning and protectionist policies. The Liberalisation, Globalisation and Privatisation opened the economy with less Government intervention, elimination of trade barriers, and reduction of tariffs. Eventually, the economic reforms enabled in making of free trade and trade openness, thereby not jeopardising international trade (Meraj, 2013).

Since 1960, the relationship between export growth and economic growth has been a matter of research and enquiry for policymakers and researchers. But there exist four possibilities of this relationship as cited by Mehrara and Firouzjaee (2011). While one of the schools of thought believes that the direction of causality flows from export to economic growth, forming the   Export-Led Growth, the other

school believes in the Growth-Led Export hypothesis. The other approach focuses on the chance of a feedback relationship between export and economic growth. The last possibility considers either a no relationship between the two variables or a simple co-existence of both in each situation. The current dimension of international trade is transforming in the light of geopolitical tensions, growth in e-commerce, and intellectual property-based exports. The aftermath of the pandemic, disclosing the fragility of international trade and the move to align the export-led growth strategies with economic, social and environmental goals, highlights the significance of the present study.

Hence, the present study tries to establish and confirm the Export-Led Growth Hypothesis by analysing the historical export data of India from 1960 to 2022 with their corresponding percentage shares in the GDP. The pre- and post-liberalisation periods' contrast in analysing the contribution of export towards GDP growth has been done using some Measures of Central Tendency and Measures of Dispersion. The trend between the two periods' export and percentage share of export in GDP has been studied along with the statistical significance between the difference in mean export and share of export in GDP between the pre-liberalisation and post-liberalisation periods. Thereafter, the linear regression model has been used to determine the strength and the nature of the relationship between the two variables from 1960 to 2022. The same has been corroborated with the help of a data visualisation technique in the form of a scatter plot. Furthermore, a Pearson correlation test has been applied to statistically validate the strength and significance of the association between export and the share of export in GDP.

2   LITERATURE REVIEW

There has been extensive study on the relationship between exports and economic growth. Studies have focused on the existence and the nature of the causal relationship between export growth and economic growth in different economies. Some studies have analysed the sectoral composition of exports, how the same has changed over a time frame and its contribution to GDP growth. Moreover, others have extended the

study to evaluate the impact of the policy interventions and economic reforms on export growth and their eventual impact on economic growth. Hence, for this paper, the literature has been subdivided into three main themes, namely

- Export Led Growth Hypothesis
- Sectoral Diversification and Analysis of the Exports and
- Policy Interventions and Reforms impacting Export Growth
- Export Led Growth Hypothesis

Pereira and Xu (2000) have used the VAR approach to check whether export growth has a positive impact on the evolution of GDP, domestic employment and investment in 39 countries. The result obtained disclosed that export growth has a favourable impact on 30 economies, whereas for the other 6 economies that had protectionist economic policies had a negative impact of export growth on GDP as well as on domestic employment and investment. Thus, the study also reflected the indirect impact of the export on GDP. On the contrary, Sharma and Panagiotidis (2005) have probed whether export, import and GDP are cointegrated and whether export growth leads to GDP growth, investment growth in India over the period 1971 to 2001. The uniqueness in the study is the focus on Feder's (1982) model and the consideration of both GDP growth and GDP growth net of exports. Though the study confirms that the variables are cointegrated but the study upholds the argument against the Export Led Growth hypothesis and concludes that export growth does not lead to investment growth. The authors extend their research by also examining that major shocks in the economy fail to generate a significant response in exports in India.

Again, Ray (2011) has validated the existence of a long-term equilibrium relationship between export and economic growth in India, applying the Johansen cointegration test on the data covering the period from 1972-73 to 2010-11. The study has also established the presence of a bidirectional relationship between export

and economic growth using the Granger Causality test. The study concludes that the bi-directional relationship between export and economic growth is also relevant in the short run. One of the novelties in the study of Mehrara and Firouzjaee (2011) is the exploration of the causality relationship between non-oil export and economic growth of 73 developing economies spanning a time frame of 1970 to 2007, where the countries have been classified as oil-dependent and non-oil developing countries. The study adopted both bivariate and trivariate specifications in the causality relationship. Bi-directional long-run causality was established in both the bi-variate and tri-variate models in both groups of countries, while bi-directional short-run causality was authenticated for non-oil developing nations in the bi-variate model. But Hosseini and D.S. (2014) have corroborated the presence of a unidirectional relationship between export and economic growth, whereby economic growth is the causal factor leading to export, using the Johansen cointegration test and Granger Causality test. The study focuses on India from 1960 to 2010.

However, Singh (2015) has also established that bi-directional causal relationships exist both in the short-run and long-run between export and economic growth in India over the period April 2005 to March 2014, applying the Cointegration and Granger Causality Tests. The Index of Industrial Production has been used as a measure of economic growth. Another dimension has been studied by Kaur, Sarin and Dhami (2017) where the relationship between export and GDP has been explored for BIMSTEC nations from 1997 to 2015. The study has conducted the cointegration and causality tests and has proved the presence of bidirectional causality between the two variables in the BIMSTEC block. Rejuvenating the coastal shipping preparations, inter-modal transport, and smooth flow of goods and services may be adopted to enable the BIMSTEC zone to be a more thriving regional block.

Borkakoty (2019) has investigated and confirmed that there is no long-term cointegration relationship between export and GDP, and there exists only unidirectional causality from export to GDP in India during the post-reform period. Thus, the study suggests that the government must take export-conducive measures to boost India's GDP. Giang and Nurudeen (2020) have verified the validity of the Export-led Growth hypothesis by analysing the GDP, export and import data from the second quarter of 1992 to the second quarter of 2019. They discover the presence of only long-run causality between the variables.

Sectoral Diversification and Analysis of Exports

Meraj (2013) has studied the short-run and long-run causal relationship between economic growth and globalisation, impacting trade openness in the form of exports and imports in Bangladesh from 1971 to 2005. Bidirectional causality is found to exist between export and economic growth, but import is not found to cause GDP or export. The study has importance in the form of policy formulation relating to export expansion policies with checks on imports for developing countries like Bangladesh. Goel and Goel (2014), while studying the trends in trade in the textile industry in India, have evaluated the impact of doing away with quotas on textile trade in 2005 on textile exports from India and competing countries. The study makes a comparison of India's textile export share vis-à-vis other competing countries in the imports of the USA and the EU and concludes with some policy measures that can eliminate the issues facing the sector, hence making it more globally competitive.

On the other hand, Singh (2014) has studied the pattern and the makeup of the foreign trade in India since 1991 and its effect on economic growth. The author explores that growth in imports surpasses the growth in exports. While manufactured commodities form the major chunk of exports in India, petroleum and crude oil products form the majority share in Indian imports. The study concludes with the negative influence of imports on economic growth and the positive influence of exports and trade openness on economic growth. Mousavi and Leelavathi (2014) examined the short-run and long-run relationship between growth in agricultural export and economic growth in India during 1980 to 2010. Though the result indicated the existence of a long-run relationship between the two variables, the causality was

from economic growth to export in agricultural export.

Altiner, Cihan and Bozkurt (2018) have made an extensive study in investigating the relationship between economic growth and export diversification in 10 emerging market economies during the time span of 1968 to 2014. The study has potential implications in framing policy decisions regarding product diversification. While Indonesia reflected a unidirectional causality relationship from economic growth to export diversification, the unidirectional causality relationship was from export diversification to economic growth in Argentina, Colombia, India, Malaysia, and Turkey. The remaining economies did not reflect any causal relationship. Onose and Aras (2021) have checked the relevance of the Export-Led Growth Hypothesis by examining the causality between exports of services and economic growth in 5 budding economies, including India, from 1980 to 2019. The research discloses that export growth in services impacts GDP only in the short run. On the other hand, Foreign Direct Investment (FDI), gross capital formation and labour positively impact the GDP in the long run.

Chippalakatti and Nagoor (2025) study the evolving relationship between pharmaceutical exports and GDP in India from 1995 to 2022, but conclude the existence of a causal relationship between the two variables. The study has a far-reaching impact for utilising the untapped potential of the pharmaceutical sector in influencing sustainable economic development. Policy Interventions and Reforms impacting Export Growth. In another dimension, Agrawal (2023) explores the leverage impact between Foreign Direct Investment (FDI) and India's exports from 1991 to 2023. The study observes that there is no significant impact of FDI on exports, both in the short run and long run. The study emphasises the need for India to orient FDI-related policies to boost export growth, like the Make in India initiative, to integrate FDI with export-oriented sectors.

3 SIGNIFICANCE OF THE STUDY AND OBJECTIVES OF THE STUDY

This study tries to add to the existing literature by showing how the economic reforms of 1991 have led to significant changes in the export and share of export in GDP in India. For this, an attempt has been made to do a comparative analysis of the two variables, i.e., export and share of export in GDP in India, between pre-liberalisation and post-liberalisation phases through some statistical measures. The present study, then, tries to reestablish the Export-Led Growth hypothesis as described in some of the literature above. Hence, the study is significant as it once again discloses the positive impact of trade openness in boosting exports and its eventual impact on raising the GDP of the country.

The objectives of the Study are as follows –

- To summarise the average values of export and the share of export in the GDP of the two phases

- To understand the variability in export and the share of export in the GDP across the periods;

- To measure the annual growth rate of exports and the share of exports in the GDP across the periods

- To reconfirm whether there exists a significant difference in the mean values of export and the share of export in GDP between the two periods

- To develop and confirm the Export Led Growth strategy from 1960 to 2022 in India

- To explore the presence of correlation between export and the share of export in GDP of the entire period of study.

4 RESEARCH METHODOLOGY

The present study is empirical and is based on secondary data. The secondary data of the export (in billion US$) and percentage share of export in GDP have been collected from © *2010–2024 Macrotrends LLC*. The first part of the study, focusing on the comparison of the export (in billion US$) and percentage share of export in GDP between the two periods (1960-1990: Pre-liberalisation; 1991-2022: Post-liberalisation) has been done where Mean and Median are used to show the summarised view of the average values of the two variables of the two periods. Standard Deviation and Coefficient of Variation have been used to map the

variability in export and the share of export in the GDP across the periods. The annual growth rate has been computed using Compounded Annual Growth Rate (CAGR), and the trend of the variables has been visualised using trend lines. Assuming a normal distribution, firstly t-test has been administered on both export and percentage share of export in GDP to check the null hypothesis [H_0:

There does not exist a significant difference in mean values of export and percentage share of export in GDP between the pre-liberalisation (1960-1990) and post-liberalisation (1991-2022) periods.] Thereafter, a non-parametric Mann-Whitney U test has been conducted assuming the distribution as not being normal to check the same Null Hypothesis as given above. In the second part of the study, regression analysis has been done to evaluate how the change in the export is causing the change in the share of export in the GDP. Thereafter, an attempt has been made to investigate the existence of long-term correlation between export and share of export in GDP in India from 1960 to 2022 [H_0: There does not exist a correlation between export and share of export in GDP from 1960 to 2022]. All the statistical analyses have been done using MS Excel and SPSS.

5	TIME SERIES DIAGNOSTICS: STATIONARITY AND AUTOCORRELATION TESTS

Stationarity and Unit Roots Test

To check the compatibility of the time-series predictions and to avoid unnecessary regression problems, it is required to check the stationarity properties of the variables. In this paper, two of the annual series for the period 1960–2022 were examined: (i) India's merchandise exports (in billions of US dollars) and (ii) exports as a percentage of GDP. Stationarity was evaluated using the Augmented Dickey–Fuller (ADF) unit root test, which tells us whether a series follows a unit-root process. The null hypothesis (H_0) assumes that there is a unit root test present, implying non-stationarity; on the other hand, the alternative hypothesis (H_1) shows stationarity.

ADF Test Analysis

The results clearly state that both variables are non-stationary at their levels, as indicated by high p-values and the conventional 5% significance threshold. India's export values represent strong upward growth over the decades, which is displayed by the positive ADF statistic (1.24) and a high p-value (0.996), which confirms non-stationarity. Similarly, exports take a share of GDP produced with an ADF statistic of −0.059 and a p-value of 0.953, which fails to reject the null hypothesis.

When the first difference of each series is tested, some mixed outcomes are out. Exports (in USD) stayed non-stationary even after differencing, with the first-difference ADF statistic (−0.102) producing a p-value of 0.949. This clearly shows that the growth rate of exports is itself highly steady and does not exhibit mean reversion. In contrast, the exports-to-GDP ratio became strongly stationary even after first differencing. The first-difference ADF statistic is −7.856, which has a near-zero p-value, which clearly rejects the null hypothesis and confirms that this variable is integrated of order one. A summary of the results is shown below

Table 1
ADF UNIT TEST RESULT (1960-2022)

Variable	ADF Statistic (Level)	p-value	ADF Statistic (1st Diff)	p-value	Conclusion
Exports (Billion USD)	1.242	0.996	−0.102	0.949	Non-stationary at the level and first difference
Exports (% of GDP)	−0.059	0.953	−7.856	0.000	I (1): Stationary after 1st difference

Source: Author's Calculation – Computed by SPSS

Inference: The results show us that India's export values mark a highly steady non-stationary process over time, which reflects the structural upward trend driven by the long-term economic expansion, trade liberalisation, and global market integration. While exports as a percentage of GDP indicate a trend component, but became stationary after the first differencing, suggesting fluctuations around a long-run path when linear trends

were removed.

The given mixture of integration orders, exports (% of GDP) being I(1), while exports (USD) act like a higher-order non-stationary series. If we want to use both the variables in regression analysis, further diagnostic methods such as Johansen or Engle–Granger cointegration tests are required to determine the existence of a long-run equilibrium relationship.

The Export Series is Non-Stationary

- A stationary series is that, has a constant mean and variance over time. Here:

- The mean increases sharply over decades.

- The variance also increases as the fluctuations become larger as the level rises.

- Visual inspection alone strongly suggests a unit root (typical for macroeconomic time series).

Auto Correlation Test

Autocorrelation refers to the correlation of a time-series variable with its own past values. In time-series analysis, calculating autocorrelation is very important because the presence of serial correlation violates the classical linear regression assumptions, which leads to biased statistical inferences. To examine whether India's export series exhibits autocorrelation, the **Durbin-Watson (DW) test** was applied. The Durbin–Watson statistic values fall between **0 and 4,** where:

DW ≈ 2 indicate *no autocorrelation*, **DW < 2** indicates *positive correlation*

DW > 2 indicate a *negative correlation*, and **DW approaching 0** represents a *strong positive correlation*.

Using the export values from 1960 to 2022, the Durbin–Watson statistic was calculated based on the residuals from the mean-adjusted export series. The computed statistic is:

Durbin Watson Test (DW) = **0.028**

Source: *Author's Calculation – Computed by SPSS*

This value computed is extremely close to **0,** which indicates a **very strong positive autocorrelation** of the

export data. Such a high degree of serial dependence is consistent with the nature of macroeconomic time series, which generally display a trend nature and non-stationarity. The result verifies that each year's export values are strongly influenced by past export performances, reflecting a steady upward trend in India's export behaviour over the decades. The indication of strong positive autocorrelation tells us the need for further transformations, such as **first differencing,** before we predict the time-series models or conduct regression analysis. This step is essential to ensure that the assumptions of independence and stationarity are compatible, hence improving the reliability of further or later econometric results.

Table 2
COMPARISON OF INDIA'S EXPORTS (IN BILLION US$ $) AND THE PERCENTAGE SHARE OF EXPORTS IN GDP IN INDIA BETWEEN THE PRE-LIBERALISATION AND POST-LIBERALISATION PERIODS

|	Pre-Liberalisation (1960-1990)		Post-Liberalisation (1991-2022)	
	Export	Export as a % of GDP	Export	Export as a % of GDP
Mean	7.67	5.12%	265.39	17.16%
Median	5.56	5.20%	226.53	18.75%
Standard Deviation	6.22	1.16	222.97	5.41
Coefficient of Variation	0.81 (81.09%)	0.23 (22.65%)	0.84 (84.01%)	0.32 (31.52%)
CAGR	9.12% per year	1.54% per year	11.95% per year	3.19% per year

Source: Data from© 2010–2024 Macrotrends LLC

The average values reflected in terms of Mean and Median of Export have increased largely after the economic reforms, and they have also increased in the case of the percentage share of Export in GDP in the post-liberalisation period. The standard deviation of the export in the 1960-1990 phase, 6.22, is relatively close to the mean value of 7.67, implying significant variability of export around the mean value. This shows that the export performance in India in this phase has been inconsistent due to the absence of trade openness and rigid economic policies. This is corroborated by the high

Coefficient of Variation of 81.09% signifying variation in exports during this period. But in the post-liberalisation period too, the standard deviation of export of 222.97 with a mean of 265.39 discloses high fluctuations and unpredictability in the export performance. In spite of the opening of the economy, removal of trade barriers and policy reform measures, the Coefficient of Variation is higher than pre-liberation phase at 84.01%. Such a picture during 1991-2022 in India may be attributed to exchange rate volatility, imbalanced export performance across different sectors, and vulnerability to international markets.

In the case of export's share in the GDP, both the standard deviation and the Coefficient of Variation show moderate variability in the pre-liberalisation span, whereas the two statistics point out high variability in the post-liberalisation span of time. This again leads us to the conclusion that, though the mean values have increased in the case of export and the percentage share of export in the post-economic reforms period, they are subjected to more instability. The CAGR for exports shows that growth nearly accelerated post-reform (from 9.12% to 11.95% annually), indicating a structural shift. The CAGR for the share of exports in GDP is more than doubled post-reform (from 1.54% to 3.19%), confirming stronger integration of exports into the economy. This highlights the long-term impact of economic liberalisation on India's trade. The above analysis can also be depicted in the form of trend lines of export as given below-

Figure 1
TREND LINES
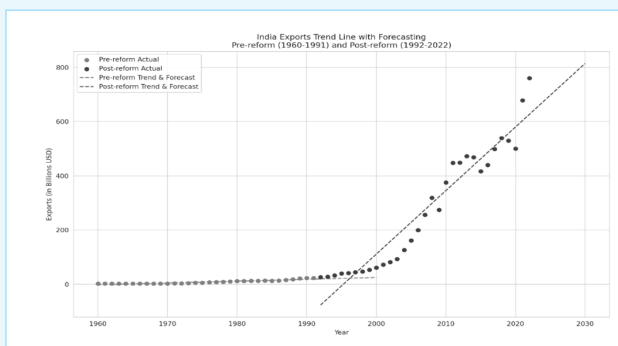
Interpretation

Pre-Reform (1960–1991): The analysis indicates that starting exports were around $1.65 billion in 1960

and rose to approximately $22.94 billion by 1991.In this period, there was a relatively slower growth with an average annual growth rate of about 9.25% and with a compound annual growth rate (CAGR) of 8.86%. The linear regression estimated that period marked an increase of around $0.67billion per year.

Post–Reform (1992-2022): In contrast to the pre-reform period, the post-reform period showed an enigmatic acceleration. Started at $25.49 billion in 1992, then reached a remarkable $759.93 billion in 2022. The exports increased with an average annual growth rate of around 12.73% and a CAGR of 11.98%. The linear trend resembles an increase of roughly $23.44 billion per year.

Comparison and Acceleration

The acceleration factor is the ratio of the slopes of the post-reform to pre-reform periods, which is approximately calculated as 34.93x. This huge factor highlights the extent of economic growth that happened in Indian exports at the post at the post-reform period. The post-reform export values grew 34 times faster than they were in the pre-reform era.

Graphical Implications

The plot (shown above) visually separates the two periods:

- *Blue Line:* Indicates the pre-reform data points and the linear forecast.

- *Green Line:* Indicates the post-reform data points and the linear forecast.

The steeper green trend line shows the market thrust in exports after 1992, marking both existing performance and the predicted forecast trend. Overall, the analysis vividly contrasts the export performance before and after the economic reforms, demonstrating the substantial impact the reforms had in stimulating export growth in India. In order to reconfirm whether there exists a significant difference in the mean values of export and share of export in GDP between the two periods, the following tests of the Hypothesis have been done.

H_0: There does not exist a significant difference in mean values of export and percentage share of export in GDP between the pre-liberalisation (1960-1990) and post-liberalisation (1991-2022) periods.

H_1: There exists a significant difference in mean values of export and percentage share of export in GDP between the pre-liberalisation (1960-1990) and post-liberalisation (1991-2022) periods.

Both a t-test (assuming normality) and a Mann-Whitney U test (non-parametric) have been performed to test the above hypothesis.

Exports (in billion US$)
Table 3
T-TEST

Name	t	p	Remark
t- Test	t=−6.54t	p≈2.68×10-7	Highly Significant

Source: Author's Calculation – Computed by SPSS

Table 4
MANN-WHITNEY U TEST

Name	U	p	Remark
Mann-Whitney U test	U=0	p≈9.61×10–12	Highly Significant

Source: Author's Calculation – Computed by SPSS

Exports as a % of GDP
Table 5
T-TEST

Name	t	p	Remark
t-Test	t=−12.30t	p≈4.68×10–14	Highly significant

Source: Author's Calculation – Computed by SPSS

Table 6
MANN-WHITNEY U TEST

Name	U	p	Remark
Mann-Whitney U test	U=0	p≈9.61×10–12	Highly significant

Source: Author's Calculation – Computed by SPSS

Both tests show extremely low p-values (< 0.05), confirming that exports (both absolute and as a share of GDP) significantly increased after the 1991 economic reforms. The Mann-Whitney U test reinforces that the distributions of pre-and post-reform data are distinct, even without assuming normality. These tests prove that the Null Hypothesis is rejected and the alternative hypothesis is accepted. Developing and confirming the Export Led Growth strategy from 1960 to 2022 in India, and exploring the existence of the Correlation between export and share of export in GDP of the entire period of study. A linear regression model was employed to quantify the relationship between 'Exports' and 'Exports percentage GDP'. The model was formulated as:

$$Exports\ percentage\ GDP = \beta0 + \beta1 \times Exports + \epsilon$$

where:

- Exports percentage GDP is the percentage contribution/share of exports to GDP.
- Exports is the export value in billions of US dollars.
- $\beta0$ is the intercept.
- $\beta1$ is the regression coefficient (slope).
- ϵ is the error term.

The analysis is aimed to yield the following key outputs:

- Regression coefficient (slope): Indicates the change in the percentage of GDP for a one-unit change in export value.
- Intercept: The baseline percentage contribution to GDP if exports were zero.
- R-squared: Measures the goodness of fit, indicating the proportion of variance in 'Exports percentage GDP' explained by 'Exports'.
- Mean Squared Error (MSE): A measure of the model's prediction error.
- A scatter plot was generated with the regression line overlaid to visually represent the model's fit to the data.

The linear regression model, expressed as Exports percentage GDP = β0 + β1 × Exports + ϵ, yielded the following results:

Table 6
REGRESSION STATISTICS

Coefficient (slope, β1)	0.0136
Intercept (β0)	0.0136
R-squared	0.974
Mean Squared Error (MSE)	0.036

Source: Author's Calculation – Computed by SPSS

*Coefficient (slope, β1): 0.0136.* This indicates that for a one billion-dollar increase in exports, the contribution to GDP increases by approximately 0.0136 percentage points

Intercept (β0): 12.21. This indicates what should be the minimum contribution to GDP if the exports were zero.

R-squared: 0.974. The high value indicates that 97.4% of the variation that occurred in the percentage contribution of exports to GDP is well explained by the export value. This explains the best model fit.

Mean Squared Error (MSE): 0.036. The low MSE value further supports the model's high accuracy and predictive nature.

Figure 2
SCATTER PLOT AND
THE REGRESSION LINE
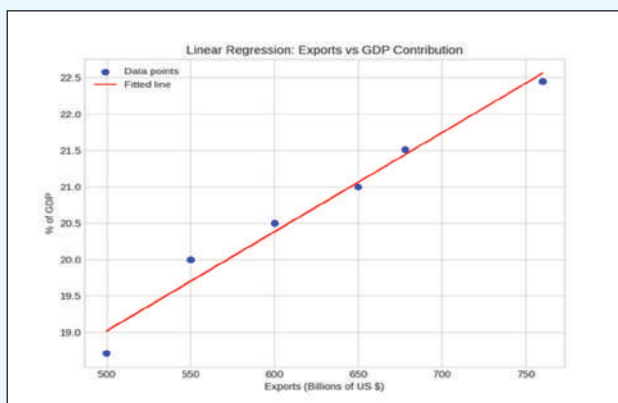
The study shown above tests the comparison between two continuous variables, 'Exports' and 'Exports percentage of GDP' and for that a Pearson correlation test was performed. This test presented a correlation coefficient (r) and a p-value. The correlation coefficient gives us an idea about the strength and direction of the linear relationship, whereas the p-value computes the statistical significance of the correlation.

H_0: There is no correlation between the exports and the share of the exports in GDP% from 1960 to 2022.

H_1: There exists a correlation between the exports and the share of the exports in GDP% from 1960 to 2022.

Thus, the Pearson correlation test provides additional evidence about the strong relationship between export values and their contribution to GDP. The results were:

Correlation Coefficient (r): 0.987. The high value indicates a strong positive linear correlation between the two variables.

P-value: 0.00026. The highly significant p-value ($p < 0.001$) affirms that the observed correlation is statistically significant, rejecting the null hypothesis that there is no correlation.

A scatter plot was made to visualise the relationship between export values and their contribution to GDP%. The plot showed a strong positive association, where higher export values correspond to a higher percentage contribution to GDP. This visual representation gave an initial indication of a strong positive correlation.

Figure 3
SCATTER PLOT WITH EXPORT
VALUES AND EXPORT'S PERCENTAGE
SHARE IN GDP
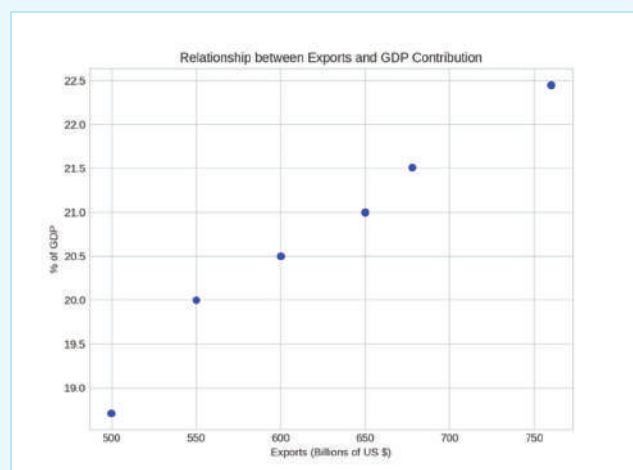
The combined results from the linear regression and Pearson correlation analyses strongly support

the hypothesis that India's export growth has been significantly associated with an increasing share of GDP over the period 1960-2022. The near-perfect correlation coefficient (0.987) and the high R-squared value (0.974) demonstrate a remarkably strong and consistent relationship. The positive slope of the regression line confirms that increases in export values are associated with proportional increases in their contribution to GDP. The low MSE value indicates that the model accurately predicts the percentage contribution of exports to GDP based on export values.

6 CONCLUSION AND SCOPE FOR FURTHER RESEARCH / LIMITATIONS OF STUDY

Comparison of exports and percentage share of exports in the pre- and post-reform periods showed that though the mean values have increased in the case of export and percentage share of export in the post-economic reforms period, they are subject to more instability and high variability in the post-liberalisation period. CAGR also disclosed a structural shift and stronger integration of exports into the economy. Both the t-test and Mann-Whitney U Test confirm that exports (both absolute and as a share of GDP) significantly increased after the 1991 economic reforms.

The results of the linear regression analysis and the correlation analysis confirm that India's export growth has been significantly associated with an increasing share of GDP over the period 1960-2022. While the analysis reveals a strong statistical association, it's crucial to acknowledge that correlation does not imply causation. Other factors include such as domestic economic policies, global economic conditions, and technological advancements, had a serious impact on both export and GDP. Further research can tell us more about these factors to provide us with a more comprehensive understanding of the association between exports and GDP growth in India. However, the findings suggest that the export-led growth has played a significant role in India's economic development for the past six decades.

India has undertaken various steps to boost exports recently, emphasising building sectoral competitiveness, strengthening the Micro Small and Medium Enterprises (MSMEs) and bringing simplicity and ease in the export procedures. Most recently, the cabinet's approval for the Export Promotion Mission (EPM) in the Union Budget of 2025-26, with a total outlay of Rs. 25,060 crore spanning over financial years from 2025-26 to 2030-31, underlines the fact that policymakers understand that the growth in exports leads to economic development of the nation (PIB, 2025).

Other initiatives like One District One Product - Districts as Export Hubs (ODOP-DEH), where products with export ability have been tagged with 765 districts of the country, paving the path of balanced regional development highlight policy interventions to use export as a tool for overall socio-economic development across the nation and eventually economic development of the country (PIB, 2023). Hence, the results of the study may help policymakers to address the challenges and roadblocks in the path of export promotion and continue promoting reforms to improve exports, improve investment in research, innovation and skills, especially in higher value sectors for enhancing its global competitiveness (India's Growth Strategy amidst shifting Dynamics, 2023).

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