

**Analysis of International Trade Relation Regarding India and the European Union****Khan, M.<sup>1</sup>, Hajdú, N.<sup>\*2</sup>**<sup>1</sup> MBA Student, Faculty of Economics, University of Miskolc<sup>2</sup> Associate Professor, Faculty of Economics, University of Miskolc\*Corresponding email: [hajdu.noemi@uni-miskolc.hu](mailto:hajdu.noemi@uni-miskolc.hu)

Hungary

**ABSTRACT**

*The world's major importers and exporters are India and the European Union. When considering the notions of growth, the flow of trade plays a significant part in defining a country's economic development rate since business allows for the improvement of technology in an area critical to production and competitiveness. estimates argue that commerce alone cannot result in monetary growth and development since other elements such as political stability, the extent to which the rule of law is enforced, and the population growth rate, among other critical concerns, all contribute to a country's economy.*

*In the study, the influence of the EU exports and imports on India's GDP will be analyzed. The results of the data processing and calculation are summarized. The prediction of Indian export and import by 2025 is also included in the research.*

**Keywords: International trade, Relations, Export, Import, Forecast****1. Introduction**

The primary goal of the article is to understand concerns relating to global wealth, and direct enterprise and provide a concrete holistic conclusion for the benefit of the international economy as well as analyze the most dominant sector of Indian export for Indian GDP with the forecast of Indian export and import to and from EU. This analysis gives you a clear understanding of the futuristic target, which will help raise the Indian GDP.

The data and information were collected in different kinds of ways as follows: (1) initial data was gathered from various websites, including Euro-Statistics, economic growth, and Indian policy manuals. In addition, many books and e-books have been referenced. (2) Information may be gathered through Indian government portals and European web information. (3) The tertiary source of information material is research papers and publications. (4) Data used in the OLS analysis and export-import forecasting is taken from the European Commission (2022) – Directorate-General for Trade 2021.

**2. Literature Review**

In Trading Economics (2022) regarding India, several indices are shown, which means a great basis for an economic analysis regarding international trade. Among the indicators e.g. GDP, inflation rate, current account, business, and consumer confidence, manufacturing, and services PMI (purchasing managers index), etc. can be found. The current article's main aspect focuses on exports and imports, thus relations as well.

India's place as one of the EU's top trading partners in 2020 is depicted below according to Eurostat (2020b). The top four export partners for the EU were the United States (18.3%), the United Kingdom (14.4%), China (10.5%), and Switzerland (7.4%). On the other hand, the EU's top four import partners were China (22.4%), the United States (11.8%), the United Kingdom (9.8%), and Switzerland (9.8%).

(6.3 percent). After Canada (EUR 33 billion, or 1.7 percent) and Mexico (EUR 33 billion, or 1.7 percent), India was the EU's tenth largest export partner (EUR 32 billion, or 1.7 percent) (EUR 31 billion, 1.6 percent). In terms of imports, India was the EU's tenth most significant trading partner (EUR 33 billion, 1.9%), trailing only Vietnam (EUR 34 billion, 2.0%) and Taiwan (EUR 34 billion, 2.0%). (EUR 26 billion, 1.5 percent).

According to OECD (2020) in 2019, the EU exported EUR 55 billion in goods and services to India while receiving 59 billion euros in goods and services. Trade between the EU and India has nearly tripled in the last decade, from USD 28.76 billion in 2010 to USD 48.45 billion in 2019. Furthermore, trade between the EU and India is quite balanced, with slight trade imbalances, with the EU's goods trade deficit with India totaling EUR 1.4 billion in 2019.

Accordingly, to Eurostat (2020a), due to the COVID-19 dispute, exports and imports between the EU and India decreased in 2020. Exports reached a minimum of EUR 1.3 billion in April 2020. By December 2020, they'd recovered to EUR 3.1 billion. Imports were at a minimum of EUR 1.5 billion in May 2020. By December 2020, they will have recouped EUR 3.0 billion.

The trade openness indices for developing and developed economies are convergent. Least developed countries (LDCs) have always had lower trade openness than other emerging economies, as measured by the ratio of exports and imports to GDP (UNCTAD, 2020). A trade must occur between a vendor in a developing country and a buyer in an industrialized country to transport goods from a developing country to a high-income country (Dao, 2014). Trade liberalization significantly impacted growth (Wacziarg and Welch, 2008). Sabade (2014) discovered several factors that influence India's balance of payment failure and foreign exchange reserve position, such as globalization and currency depreciation. This balance of payment assists in determining a government's trade position with foreign countries, the extent to which a country



accepts foreign money, and the impact of a country's foreign exchange reserve. The primary purpose of liberalization reforms for developing countries is to increase product and resource exports (Paudel, 2014). Economic liberalization and policy reforms are critical for universal market possibilities (Kumar, 2010). India has undergone a wide range of economic policy reforms and has had consistent economic development in recent decades (Sahoo and Dash, 2009). According to Bond, Jones, and Wang, (2005), a significant part of the growth of the fare segment is that global exchange commonly necessitates specific task administrations to monitor and advance remote deals.

However, according to The World Bank (2017) report, the Indian economy will return to its trend growth rate of 7.5 percent in the following years due to the two significant measures implemented by the Indian government, namely, demonetization and the Goods and Service Tax (GST). Castor oil, shrimp and prawns, grapes, mollusks, espresso, rice, soya oil-cake, cashew nuts, tobacco, and others were among India's most important export items during this period (Government of India, Ministry of Agriculture and Farmers Welfare, 2014).

Although services have historically been the primary driver of economic growth, industrial activity accounted for most of the increase in GDP, with manufacturing predicted to pick up following the adoption of the GST and agriculture expected to grow at its long-term average rate. In addition, prudent macroeconomic policy has aided India's recent growth: a new inflation-targeting framework, energy subsidy reforms, fiscal consolidation, improved quality public spending, and a stable balance of payments. Furthermore, recent policy reforms have aided India in improving the economic environment, easing FDI inflows, and improving credit behavior.

According to Christiansen, Kirchner, and Murray (2013), the EU must contend with self-assured Indian positions on foreign exchange, environmental change, and India's legal standing and place in the rising structures of global administration. The section looks into some of the EU's general lack of success in establishing a 'significant force' dialogue with India (Allen 2013).

However, foreign direct ventures might occasionally affect trade prices to benefit one nation and to the detriment of another, providing a more favorable situation for you as the speculator and advantages for local industry. The regulations governing remote exchange rates and direct endeavors may harm the contributing country. India's exchange situation changed from 2012 to 2016 regarding its commitment to India's universality of exchange, development, and dependability in business, change in exchange framework, and relative price expansions of farm products (Deshpande and Deepika, 2004).

### 3. Research Methodology

The impact of Indian exports to the EU on the Indian economy and the outlook for Indian imports and exports to and from the EU will be analyzed. We will use the OLS model for this analysis and Excel for the forecasts. Ordinary least squares (OLS) regression is a type of generalized linear modeling that can be used to describe a single response variable on at least one interval scale (Hutcheson, 2011). It is also known as linear regression. It can be done by excel and XLSTAT as well. Here we use Google Colab to do this analysis. The method can be used with single or multiple explanatory variables and categorical explanatory variables that have been coded correctly.

OLS regression will be explained in this case in a bivariate model, which is a model with only one independent variable at a time ( $X$  = Export sector) predicting a dependent variable ( $Y$  = GDP of India). This whole data is on the scale of time from 2017 to 2020. We have two main variables: Export sectors based on SITC (Standard International Trade Classification) and the other is GDP (Gross Domestic Product). In the first variable, we have ten independent variables, namely food, beverages, crude materials, minerals, animal and vegetable fats and waxes, chemicals and related products, goods classified mainly by material, machinery and transport equipment, and miscellaneous manufactured goods.

Commonalities and transactions and an independent variable, Indian GDP. Lewis-Beck (1980) finds the connection between variable  $X$  and variable  $Y$ , bivariate regression is suggested to solve this problem if the connection is believed to be linear. It works by fitting a straight line to a scatter plot of observations on variable  $X$  and variable  $Y$ . A straight line can be expressed as the most straightforward statement of such a relationship between an independent variable, labeled  $X$ . A dependent variable, labeled  $Y$ , in this formula. As per the OLS, the relationship of the  $X$  and  $Y$  variable is as follows:  

$$Y = \beta_0 + \beta_1 X + \epsilon$$

We will analyze the impact of these variables on GDP using the OLS model. For each sector, we have a null hypothesis and an alternative hypothesis. For the null hypothesis, we analyze whether this hypothesis has no significant impact on GDP, while the alternative hypothesis states that there is an impact on the dependent variable (GDP). We calculated the value of the three parameters  $T$ ,  $P$ , and  $R$  to test the formulated hypothesis using the OLS model. Indian GDP is assumed to be growing, but some sectors are declining in exports to EU countries while others are growing. Therefore, this analysis will provide a clear picture of the sectors that contribute the most to India's GDP exports.

The data for this analysis comes from the Directorate General of Trade (EU). This data is based on the sector defined by SITC. The data was collected from 2017 to 2020.

**Table 1: Import and export to and from EU**

Indian Export to EU (million Dollars)											Indian GDP
year	Food and Live animals	Beverages and Tobacco	Crude materials inedible, except fuels	Mineral fuels, lubricants and related materials	Animal and vegetable oils, fats and waxes	Chemicals	Manufactured goods	Machinery and transport equipment	Miscellaneous manufactured	Commodities and transactions	GDP (mn \$)
2017	2929	188	934	1983	281	6797	11435	6885	8575	155	2651470
2018	2519	196	1035	2964	286	7439	11881	7298	8643	110	2294120
2019	2445	195	999	4083	308	8389	10969	7742	8949	102	2103590
2020	2129	181	923	1389	260	8664	9119	7022	7044	136	2039130

Source: Own editing according to European Commission (2022)

However, the 2021 directorate-general for trade is not published yet by the European Union, so we took the GDP of India from 2017 to 2020 to analyze the impact.

## 4. Results

For every variable, null and alternate hypothesis were defined to check their effect on GDP. We have used the OLS model and observed some specific parameters of this model

like R Square T and P for the rejection or acceptance of the hypothesis.

### 4.1. Food and Live Animals

Null Hypothesis: The mean effect of food on GDP over the years remains the same. Alternate Hypothesis: Mean effect of food on GDP varies.

**Figure 1: OLS Regression Results of Food and Live Animals**

OLS Regression Results						
=====						
Dep. Variable:	GDP	R-squared:	0.908			
Model:	OLS	Adj. R-squared:	0.862			
Method:	Least Squares	F-statistic:	19.79			
Date:	Sat, 16 Apr 2022	Prob (F-statistic):	0.0470			
Time:	14:50:16	Log-Likelihood:	-0.89940			
No. Observations:	4	AIC:	5.799			
Df Residuals:	2	BIC:	4.571			
Df Model:	1					
Covariance Type:	nonrobust					
=====						
	coef	std err	t	P> t	[0.025	0.975]
-----						
const	2.776e-17	0.214	1.3e-16	1.000	-0.922	0.922
food and Live animals	0.9530	0.214	4.448	0.047	0.031	1.875
=====						
Omnibus:	nan	Durbin-Watson:	2.558			
Prob(Omnibus):	nan	Jarque-Bera (JB):	0.671			
Skew:	-0.907	Prob(JB):	0.715			
Kurtosis:	2.141	Cond. No.	1.00			
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Source: Own calculation

In Figure 1, the deciding parameter is the P-value, where the value is 0.047 which is less than 0.05. So we reject the null hypothesis that the mean effect of the food varies over the year. Based on the T value, we are deciding whether this variable has a significant impact on GDP. The T value=4.448, which is very high, so we can say there is a perfect considerable effect of Food and Live Animals on GDP over the years. Based on this result, we got the R square adjusted 0.862 and R squared 0.908.

### 4.2. Beverages and Tobacco

Null Hypothesis: The mean effect of Beverages on GDP over the years remains the same. Alternate Hypothesis: Mean effect of the Beverages on GDP varies. In Figure 2, the P-value is 0.0891, which is more than 0.05. The null hypothesis is accepted, which means the mean effect of the Beverages has been the same over the year. The T value is 0.155, which is low, so we can say there is a less substantial effect of Beverages and Tobacco on GDP over the years. Based on this result, we got the R square adjusted, and -0.482 R squared 0.012.

**Figure 2: OLS Regression Results of Beverages and Tobacco**

OLS Regression Results						
Dep. Variable:	GDP	R-squared:	0.012			
Model:	OLS	Adj. R-squared:	-0.482			
Method:	Least Squares	F-statistic:	0.02399			
Date:	Sat, 16 Apr 2022	Prob (F-statistic):	0.891			
Time:	14:51:41	Log-Likelihood:	-5.6519			
No. Observations:	4	AIC:	15.30			
Df Residuals:	2	BIC:	14.08			
Df Model:	1					
Covariance Type:	nonrobust					
	coef	std err	t	P> t	[0.025	0.975]
const	2.776e-17	0.703	3.95e-17	1.000	-3.024	3.024
Beverages and Tobacco	0.1089	0.703	0.155	0.891	-2.915	3.133
Omnibus:	nan	Durbin-Watson:	0.839			
Prob(Omnibus):	nan	Jarque-Bera (JB):	0.624			
Skew:	0.833	Prob(JB):	0.732			
Kurtosis:	2.019	Cond. No.	1.00			

Source: Own calculation

### 4.3. Crude Materials, Inedible, except fuel

Null Hypothesis: The mean effect of Crude materials, inedible, except fuels, on GDP over the years remains the

same. Alternate Hypothesis: Mean effect of the Crude materials, inedible, except fuels on GDP varies.

**Figure 3: OLS Regression Results of Crude Materials, Inedible, except fuel**

OLS Regression Results						
Dep. Variable:	GDP	R-squared:	0.019			
Model:	OLS	Adj. R-squared:	-0.471			
Method:	Least Squares	F-statistic:	0.03934			
Date:	Sat, 16 Apr 2022	Prob (F-statistic):	0.861			
Time:	14:53:43	Log-Likelihood:	-5.6368			
No. Observations:	4	AIC:	15.27			
Df Residuals:	2	BIC:	14.05			
Df Model:	1					
Covariance Type:	nonrobust					
	coef	std err	t	P> t	[0.025	0.975]
const	2.776e-17	0.700	3.96e-17	1.000	-3.013	3.013
Crude materials, inedible, except fuels	-0.1389	0.700	-0.198	0.861	-3.152	2.874
Omnibus:	nan	Durbin-Watson:	0.639			
Prob(Omnibus):	nan	Jarque-Bera (JB):	0.390			
Skew:	0.401	Prob(JB):	0.823			
Kurtosis:	1.696	Cond. No.	1.00			

Source: Own calculation

In Figure 3, the P-value is 0.861 which is more than 0.05. So we accept the null hypothesis that the mean effect of the Crude materials, inedible, except fuels same over the year. Then, based on the T value, we decide whether this variable has a significant impact on GDP. Here we got the T value= -0.198, which is low, so we can say there is a less substantial effect of Crude materials, inedible, except fuels on GDP over

the years. Based on this result, we got the R square adjusted -0.471 and R squared 0.019.

### 4.4. Mineral fuels, lubricants, and related materials

Null Hypothesis: The mean effect of Mineral fuels, lubricants, and related materials on GDP over the years remains the same. Alternate Hypothesis: Mean effect of Mineral fuels, lubricants, and related materials on GDP vary.



**Figure 4: OLS Regression Results of Mineral fuels, lubricants and related materials**

OLS Regression Results						
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Dep. Variable:	GDP	R-squared:	0.040			
Model:	OLS	Adj. R-squared:	-0.441			
Method:	Least Squares	F-statistic:	0.08226			
Date:	Sat, 16 Apr 2022	Prob (F-statistic):	0.801			
Time:	14:55:12	Log-Likelihood:	-5.5951			
No. Observations:	4	AIC:	15.19			
Df Residuals:	2	BIC:	13.96			
Df Model:	1					
Covariance Type:	nonrobust					
=====						
	coef	std err	t	P> t	[0.025	0.975]
-----						
const	2.776e-17	0.693	4.01e-17	1.000	-2.982	2.982
Mineral fuels, lubricants and related materials	-0.1988	0.693	-0.287	0.801	-3.180	2.783
=====						
Omnibus:	nan	Durbin-Watson:	0.699			
Prob(Omnibus):	nan	Jarque-Bera (JB):	0.296			
Skew:	0.352	Prob(JB):	0.862			
Kurtosis:	1.868	Cond. No.	1.00			
=====						

Source: Own calculation

In Figure 4 the P-value is 0.801, so the null hypothesis can be accepted. The mean effect of the Mineral fuels, lubricants, and related materials has been the same over the year. Then, based on the T value, we decide whether this variable has a significant impact on GDP. Here we got the T value= of -0.287, which is low, so we can say there is a less substantial effect of Mineral fuels, lubricants, and related materials on GDP over the years. Based on this result, we got the R square adjusted -0.441 and R squared 0.040.

#### 4.5. Animal and Vegetable Oils, Fats, and Waxes

Null Hypothesis: The mean effect of Animal and vegetable oils, fats, and waxes on GDP over the years remain

the same. Alternate Hypothesis: Mean effect of Mineral fuels, lubricants, and related materials on GDP vary.

In Figure 5 the P-value is 0.968, which is more than 0.05. So we accept the null hypothesis that the mean effect of the Animal and vegetable oils, fats, and waxes is the same over the year. Based on the T value, we decide whether this variable has a significant impact on GDP. Here we got the T value= of 0.046, which is low, so we can say there is a less substantial effect of Animal and vegetable oils, fats, and waxes on GDP over the years. Based on this result, we got the R square adjusted -0.498 and R squared 0.001.

**Figure 5: OLS Regression Results of Animal and Vegetable Oils, Fats and Waxes**

OLS Regression Results						
Dep. Variable:	GDP	R-squared:	0.001			
Model:	OLS	Adj. R-squared:	-0.498			
Method:	Least Squares	F-statistic:	0.002092			
Date:	Sat, 16 Apr 2022	Prob (F-statistic):	0.968			
Time:	14:57:06	Log-Likelihood:	-5.6737			
No. Observations:	4	AIC:	15.35			
Df Residuals:	2	BIC:	14.12			
Df Model:	1					
Covariance Type:	nonrobust					
	coef	std err	t	P> t	[0.025	0.975]
const	2.776e-17	0.707	3.93e-17	1.000	-3.041	3.041
Animal and vegetable oils, fats and waxes	0.0323	0.707	0.046	0.968	-3.009	3.073
Omnibus:	nan	Durbin-Watson:	0.755			
Prob(Omnibus):	nan	Jarque-Bera (JB):	0.538			
Skew:	0.710	Prob(JB):	0.764			
Kurtosis:	1.900	Cond. No.	1.00			

Source: Own calculation

## 4.6. Chemicals and Related Products

Null Hypothesis: The mean effect of Chemicals and related products on GDP over the years remains the same.

Alternate Hypothesis: Mean effect of the Chemicals and related products on GDP varies.

**Figure 6: OLS Regression Results of Chemicals and Related Products**

OLS Regression Results						
=====						
Dep. Variable:	GDP	R-squared:	0.939			
Model:	OLS	Adj. R-squared:	0.908			
Method:	Least Squares	F-statistic:	30.58			
Date:	Sat, 16 Apr 2022	Prob (F-statistic):	0.0312			
Time:	14:58:22	Log-Likelihood:	-0.094567			
No. Observations:	4	AIC:	4.189			
Df Residuals:	2	BIC:	2.962			
Df Model:	1					
Covariance Type:	nonrobust					
=====						
	coef	std err	t	P> t	[0.025	0.975]
-----						
const	2.776e-17	0.175	1.58e-16	1.000	-0.754	0.754
Chemicals and related prod, n.e.s.	-0.9688	0.175	-5.530	0.031	-1.723	-0.215
=====						
Omnibus:	nan	Durbin-Watson:	2.597			
Prob(Omnibus):	nan	Jarque-Bera (JB):	0.532			
Skew:	-0.770	Prob(JB):	0.766			
Kurtosis:	2.093	Cond. No.	1.00			
=====						

Source: Own calculation

In Figure 6 the P-value is 0.031 which is less than 0.05. So we reject the null hypothesis that the mean effect of the Chemicals and related products varies over the year. The T value is 5.538, which is very high on the negative side, so we can say there is an excellent considerable effect of Food on GDP over the years. Based on this result, we got the R square adjusted 0.908 and R squared 0.939.

## 4.7. Manufactured Goods Classified Chiefly by Material

Null Hypothesis: The mean effect of manufactured goods classified chiefly by material on GDP over the years remains the same. Alternate Hypothesis: Mean effect of the manufactured goods classified chiefly by material on GDP varies

**Figure 7: OLS Regression Results of Manufactured Goods Classified Chiefly by Material**

OLS Regression Results						
=====						
Dep. Variable:	GDP	R-squared:	0.393			
Model:	OLS	Adj. R-squared:	0.090			
Method:	Least Squares	F-statistic:	1.296			
Date:	Sat, 16 Apr 2022	Prob (F-statistic):	0.373			
Time:	15:01:33	Log-Likelihood:	-4.6768			
No. Observations:	4	AIC:	13.35			
Df Residuals:	2	BIC:	12.13			
Df Model:	1					
Covariance Type:	nonrobust					
=====						
	coef	std err	t	P> t	[0.025	0.975]
-----						
const	2.776e-17	0.551	5.04e-17	1.000	-2.370	2.370
Manufactured goods classified chiefly by material	0.6270	0.551	1.138	0.373	-1.743	2.997
=====						
Omnibus:	nan	Durbin-Watson:	1.598			
Prob(Omnibus):	nan	Jarque-Bera (JB):	0.514			
Skew:	0.694	Prob(JB):	0.773			
Kurtosis:	1.923	Cond. No.	1.00			
=====						

Source: Own calculation

In Figure 7 the P-value is 0.373, which is more than 0.05. So we accept the null hypothesis that the mean effect of the manufactured goods classified chiefly by the material is the same over the year. The T value is 1.138, which is high, so we can say there is a perfect considerable effect of manufactured goods classified chiefly by material on GDP over the years. Based on this result, we got the R square adjusted 0.090 and R squared 0.393.

## 4.8. Machinery and Transport Equipment

Null Hypothesis: The mean effect of machinery and transport equipment on GDP over the years remains the same. Alternate Hypothesis: Mean effect of the machinery and transport equipment on GDP varies.

In Figure 9 the P-value is 0.465 which is more than 0.05. So we accept the null hypothesis that the mean effect of the machinery and transport equipment is the same over the

year. Based on the T value, which is -0.896, which is not that high, we can say there is a less substantial effect of machinery and transport equipment on GDP over the years. Based on this

result, we got the R square adjusted -0.070 and R squared 0.287.

**Figure 8: OLS Regression Results of Machinery and Transport Equipment**

OLS Regression Results						
=====						
Dep. Variable:	GDP	R-squared:	0.287			
Model:	OLS	Adj. R-squared:	-0.070			
Method:	Least Squares	F-statistic:	0.8037			
Date:	Sat, 16 Apr 2022	Prob (F-statistic):	0.465			
Time:	15:02:32	Log-Likelihood:	-5.0002			
No. Observations:	4	AIC:	14.00			
Df Residuals:	2	BIC:	12.77			
Df Model:	1					
Covariance Type:	nonrobust					
=====						
	coef	std err	t	P> t	[0.025	0.975]
-----						
const	2.776e-17	0.597	4.65e-17	1.000	-2.570	2.570
Machinery and transport equipment	-0.5354	0.597	-0.896	0.465	-3.105	2.034
=====						
Omnibus:	nan	Durbin-Watson:	0.975			
Prob(Omnibus):	nan	Jarque-Bera (JB):	0.337			
Skew:	-0.534	Prob(JB):	0.845			
Kurtosis:	2.061	Cond. No.	1.00			
=====						

Source: Own calculation

#### 4.9. Miscellaneous Manufactured Articles

Null Hypothesis: The mean effect of miscellaneous manufactured articles on GDP over the years remains the

same. Alternate Hypothesis: The average impact of miscellaneous manufactured goods on GDP varies.

**Figure 9: Miscellaneous Manufactured Articles**

OLS Regression Results						
=====						
Dep. Variable:	GDP	R-squared:	0.175			
Model:	OLS	Adj. R-squared:	-0.238			
Method:	Least Squares	F-statistic:	0.4241			
Date:	Sat, 16 Apr 2022	Prob (F-statistic):	0.582			
Time:	15:03:49	Log-Likelihood:	-5.2911			
No. Observations:	4	AIC:	14.58			
Df Residuals:	2	BIC:	13.35			
Df Model:	1					
Covariance Type:	nonrobust					
=====						
	coef	std err	t	P> t	[0.025	0.975]
-----						
const	2.776e-17	0.642	4.32e-17	1.000	-2.763	2.763
Miscellaneous manufactured articles	0.4183	0.642	0.651	0.582	-2.345	3.182
=====						
Omnibus:	nan	Durbin-Watson:	1.200			
Prob(Omnibus):	nan	Jarque-Bera (JB):	0.368			
Skew:	0.575	Prob(JB):	0.832			
Kurtosis:	2.060	Cond. No.	1.00			

Source: Own calculation

In Figure 9 the P-value is 0.582 which is more than 0.05. So we accept the null hypothesis that the mean effect of the Miscellaneous manufactured articles is the same over the year. The T value is 0.651, which is low, so we can say there is a less substantial effect of Miscellaneous manufactured articles on GDP over the years. Based on this result, we got the R square adjusted -0.238 and R squared 0.175.

#### 4.10. Commodities and Transactions

Null Hypothesis: The mean effect of commodities and transactions on GDP over the years remains the same. Alternate Hypothesis: Mean effect of the commodities and transactions on GDP varies.

**Figure 10: Commodities and Transactions**

OLS Regression Results						
=====						
Dep. Variable:	GDP	R-squared:	0.382			
Model:	OLS	Adj. R-squared:	0.073			
Method:	Least Squares	F-statistic:	1.237			
Date:	Sat, 16 Apr 2022	Prob (F-statistic):	0.382			
Time:	15:05:07	Log-Likelihood:	-4.7130			
No. Observations:	4	AIC:	13.43			
Df Residuals:	2	BIC:	12.20			
Df Model:	1					
Covariance Type:	nonrobust					
=====						
	coef	std err	t	P> t	[0.025	0.975]
-----						
const	2.776e-17	0.556	4.99e-17	1.000	-2.392	2.392
Commodities and transactions n.c.e.	0.6181	0.556	1.112	0.382	-1.774	3.010
=====						
Omnibus:	nan	Durbin-Watson:	0.789			
Prob(Omnibus):	nan	Jarque-Bera (JB):	0.576			
Skew:	-0.779	Prob(JB):	0.750			
Kurtosis:	1.984	Cond. No.	1.00			
=====						

Source: Own calculation

In Figure 10 the P-value is 0.382 which is more than 0.05. So we accept the null hypothesis that the mean effect of the commodities and transactions is the same over the year. The T value is 1.112, which is high, so we can say there is a highly effective effect of commodities and transactions on GDP over the years. Based on this result, we got the R square adjusted 0.073 and R squared 0.382.

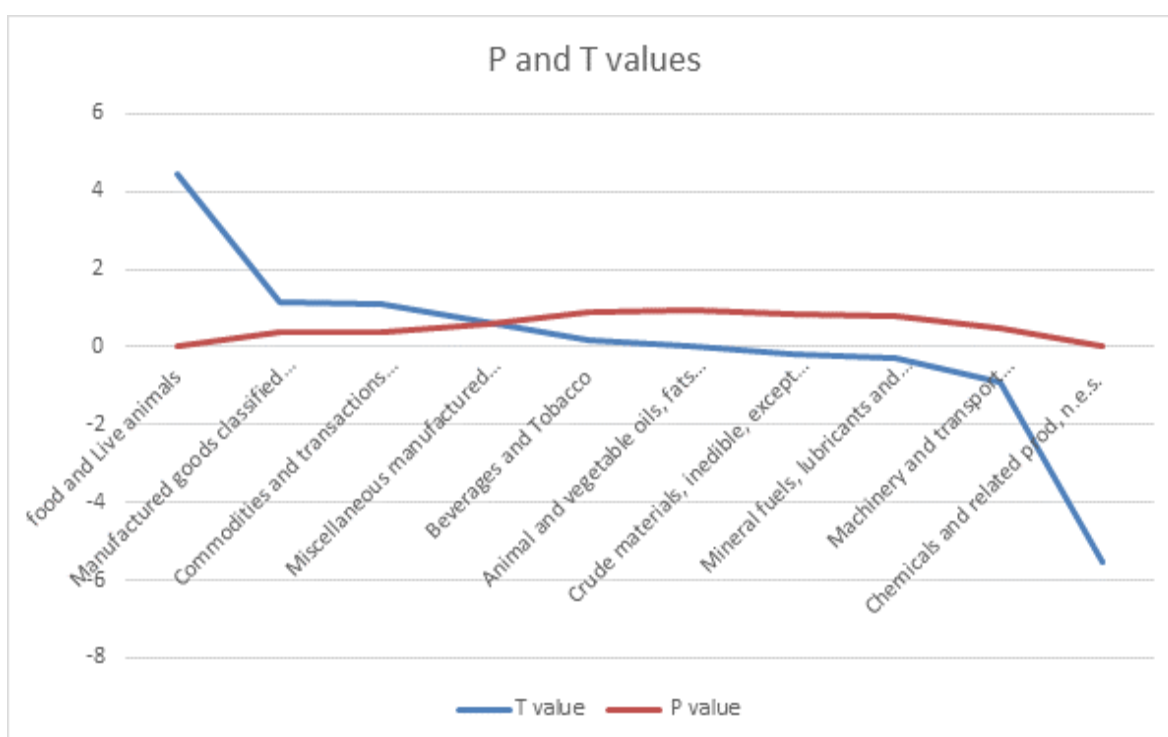
## 5. Summary of the results

In summary (Figure 11), based on these T and P values, we can say which sector affects the Indian GDP most and which one is fluctuating the most. Or in other words, which one has a variation effect over the years, and which one is high or less significant in terms of Indian GDP. According

to the P-value, the mean effect of the Food and live animals varies over the years along with the chemical products; both come under the 0.05 value. Mean values change over the years. The overall analysis of the T value described the significant impact of the particular sector on the Indian GDP.

The graph mentioned above clearly shows that Chemicals and related products, food, and beverages have the highest impact on Indian GDP and then manufactured goods are classified chiefly by material and third Commodities and transactions. While the most negligible impact comes from crude oil. Beverages and Tobacco, Animal and vegetable oils, fats, and waxes.

**Figure 11: Commodities and Transactions**



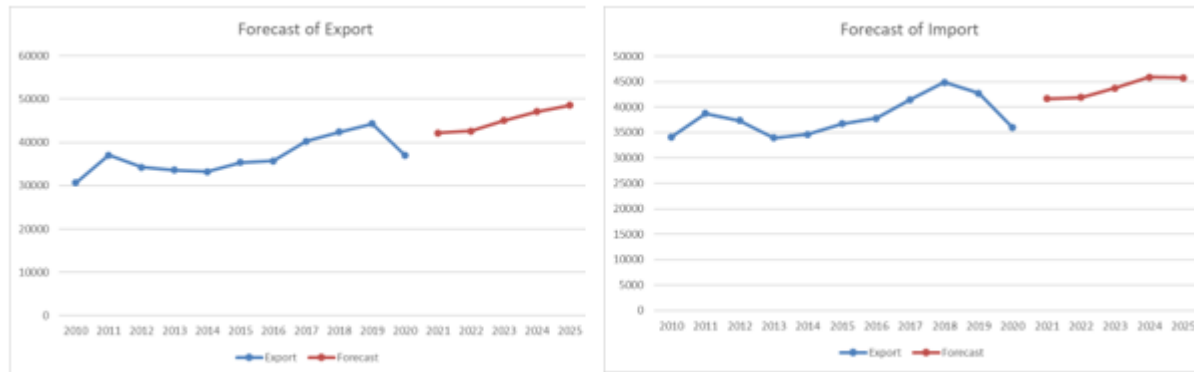
Source: Own calculation



## 5.1. Forecast of Import and Export

Based on the data regarding the export and import from the EU to India in the last ten years, we forecast the import and export up to 2025, which can be seen in Figure 12.

**Figure 12: Forecast of Export and Import**



Source: Own calculation according to European Commission (2022)

Based on these ten years' data the forecasted data for the next five years shows a growth in the export. This data is completely showing that 31% of growth will occur by 2025 from 2020. Based on this forecast we can say that Import will also rise in the upcoming years. This increment will give a boost to the economies. The predicted numbers are higher by 2025 but per year growth is not as big in numbers as we can see in 2020 to 2021.

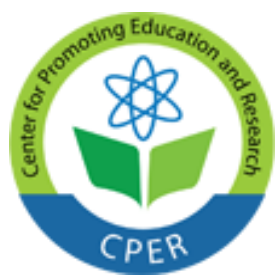
## 6. Conclusion and Summary

In this article, the most influential sectors and the impact of these sectors on India's GDP over the years were analyzed. According to the analysis, it can be claimed that

food and chemical products have been the most important over the years, while beverages and tobacco account for the smallest share of India's exports to the EU. In the projections section, we have analyzed that the results will show growth in both sectors over the next five years, suitable for an increase in GDP at the global level. Exports are projected to increase to \$48.537 million and imports to \$45.764 million by 2025. By 2025, exports are expected to grow by 31% and imports by 27%. Regarding the projected growth rates, the growth of India's exports is high while it is comparatively 3% lower for imports. So for the future, the chances of trade on both sides are optimistic and it will grow based on this analysis.

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