

Ireland's Trade Analysis: Patterns and Opportunities

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Abstract – In this paper, we have performed the analysis of Ireland's import-export trades over the period of 1992 to 2017. We have gathered the data from the World Bank's country wise trade statistics. We considered different parameters such as Gross Domestic Product (GDP), commodities, trade balance, import and export partners, growth rate, percentage share for the analysis of Ireland's trade. Our analysis shows export trades have a substantial impact on Ireland's economic growth.

Keywords: Trade, Ireland, economic growth, GDP, import and export

1. INTRODUCTION

In 2017, the Republic of Ireland was holding 29th rank in terms of biggest economy of export in the world and as per Economic Complexity Index (ECI), it was the 13th most complex economy. Ireland's Export in 2017 was 138072 million USD, with a positive trade balance of 107241 million USD. Ireland's trade Growth rate was 1% in comparison to world's trade growth rate of 1.5%.

Ireland's economy is a knowledge economy, primarily focusing on service sectors like technology, bio sciences and financial industries. In terms of ease of doing of business, Ireland was holding 17th rank in the world, which is very promising. Ireland had faced a recession during 2007 to mid-2009. In 2010, also Ireland's economic activity was partially immobile, however in 2011, GDP was increased by 2.3%, primarily due to boom in exports. In 2017, export was contributing 41% of Gross domestic product in 2017, overall GDP in 2017 was 333731 million USD. Exports has a significant function in economic growth of Ireland. 1 Major Exports from Ireland across the world are chemicals, machinery and electrical goods, and animals.

2. DATA SOURCES

Data for analysis and visualization has been sourced from World Bank's country wise trade statistics. Data has been updated on 4th June 2019. Detailed export - import and other parameters (GDP, Trade Balance, Commodities, partners, growth rate, percentage share etc.) which were available in the data from 1992-2017 were used for analysis and visualization. Data was downloaded in CSV format and all the manipulation, analysis and visualizations were performed in Tableau, Power BI, and MS Excel.

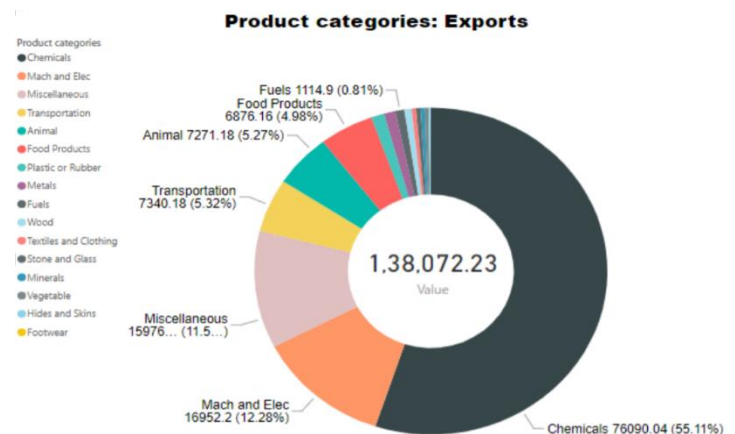


Figure 1. Doughnut chart was used to show commodity wise exports in 2017 created by PowerBI.

3. EXPLORATORY DATA ANALYSIS

A. Commodity Wise Exports In 2017

In 2017, top 5 highest exported commodity were chemicals i.e. 76,090 million dollars, followed by machinery and

electrical goods (16,952 million dollar), miscellaneous (15,977 million dollar), animal (7,271 million USD), and metals (1,449 million USD) (Figure 1). Overall export in 2017 was 138072 million USD.

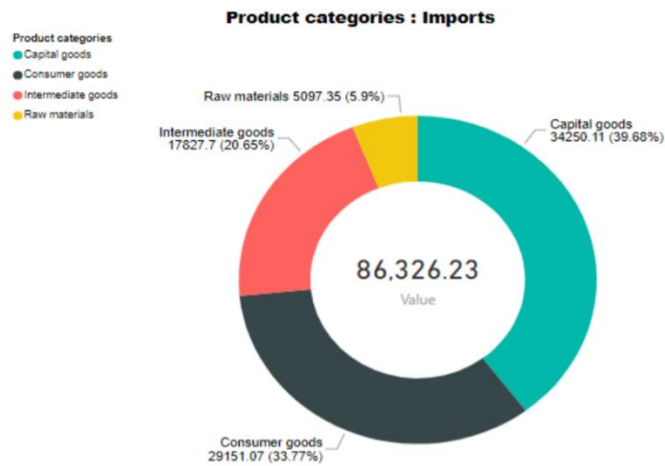


Figure 2. Doughnut chart was used to show commodity wise imports in 2017 created by Power BI.

B. Commodity Wise Imports In 2017

Highest import was observed for capital goods (34,250 million USD) followed by consumer goods (29,151 million USD), intermediate goods (17,828 million USD), and raw materials (5,097 million USD). Overall import in 2017 was 88828 million USD (Figure 2).

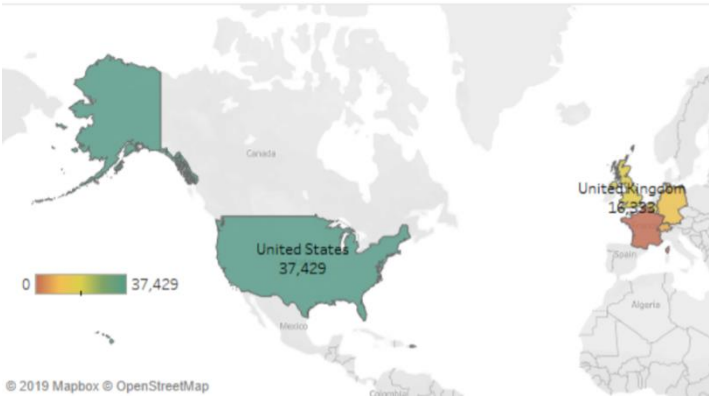


Figure 3. Top 5 export partners have been plotted in world map in Tableau.

C. Export Partners

Top 5 export partners in 2017 were United States (37428.63 million USD), United Kingdom (16333.25 million USD),

Belgium (15047.54 million USD), Germany (11373.57 million USD and Switzerland (6998.856 million USD) (Figure 3).

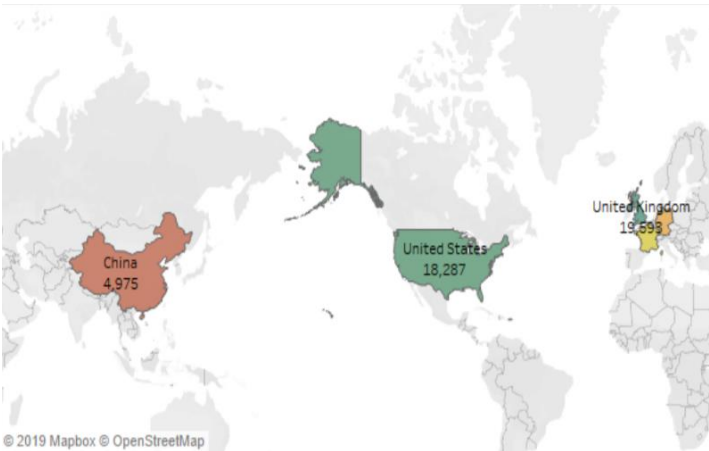


Figure 4. Top 5 import partners have been plotted in world map in Tableau.

D. Import Partners

Top 5 import partners were United Kingdom (19592.68 million USD), United States (18286.96 million USD), France (11791.44 Million USD), Germany (7729.685 million USD), and China (4974.682 million USD) (Figure 4).

Year wise Export Trend

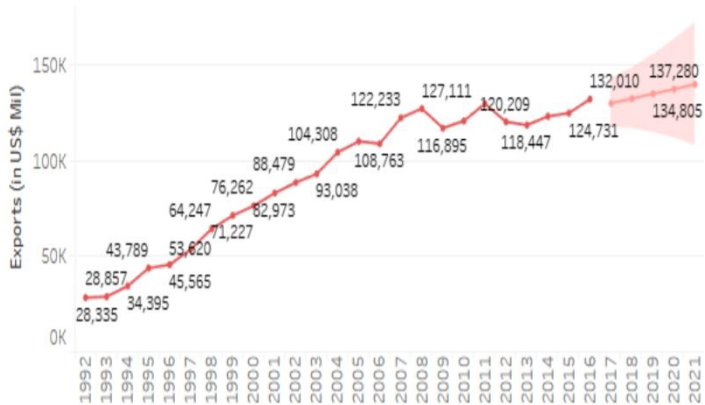


Figure 5. To observe trend in export, a line chart has been plotted for years, and exponential smoothing technique has been implemented for forecasting of next 5 years in Tableau.

E. Export Trends

Overall inclining trend was observed for export during 1992-2017. Time series forecasting also shows that there will be steady increase in next 5 years. Mean absolute scaled

error (MASE) in the forecast was $\pm 9.71\%$ to $\pm 22.79\%$ (Figure 5)

Year wise Import Trend

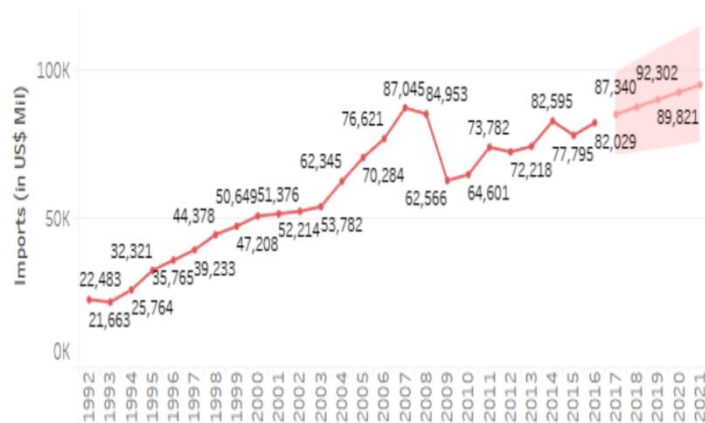


Figure 6. To observe trend in import, a line chart has been plotted for years, and exponential smoothing technique has been implemented for forecasting of next 5 years in Tableau.

F. Import Trends

Overall inclining trend was observed for import during 1992-2017. There were dips during 2007-2009, but from 2010, import is increasing steadily. Time series forecast also shows that there will be steady increase in next 5 years. Mean absolute scaled error (MASE) in the forecast was $\pm 16.2\%$ to $\pm 20.5\%$ (Figure 6).

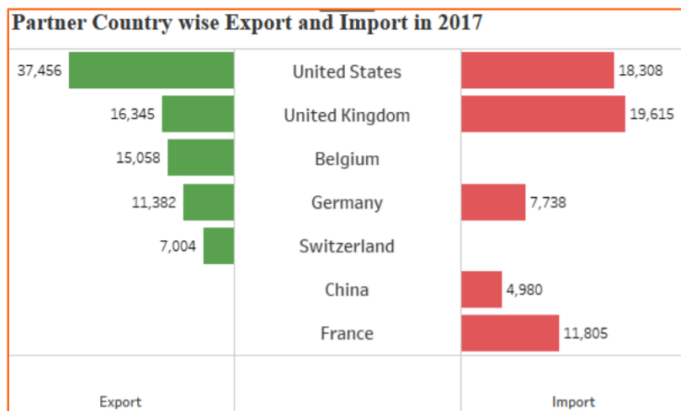


Figure 7. Butterfly (dual axis bar chart) has been created in Tableau and used to understand trade patterns for partner countries. Balance of trade was calculated subtracting import from export.

G. Top 5 in Partners Country Wise Trade

In 2017, among top partner countries, for USA, Belgium, Germany and Switzerland balance of trades were positive, whereas for France, UK, and China balance of trades were

negative. For USA, balance of trade was highest 19148 million USD, and for France balance of trade was lowest - 11805 million USD (Figure 7).



Figure 8. Butterfly (dual axis bar chart) has been created in Tableau and used to understand trade patterns for different commodity groups, and balance of trade was calculated subtracting import from export.

H. Commodity Wise Trade

Raw materials, intermediate goods, and consumer goods had positive balance of trade, whereas capital goods had negative balance of trade in 2017. For intermediate goods, balance of trade was highest 42878 million USD, and for capital goods, balance of trade was lowest -2473 million USD (Figure 8).

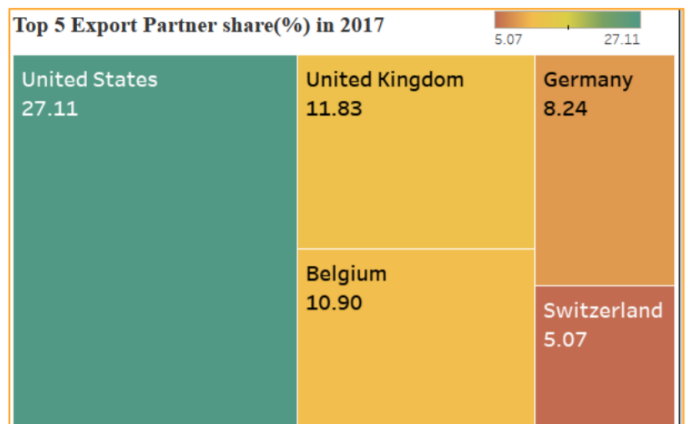


Figure 9. Tree Map created in Tableau shows the top 5 export partner share in 2017.

I. Export Share Analysis

For, export in 2017, highest partner share was observed for United States (27.11%), followed by United Kingdom (11.83%), Belgium (10.90%), and Switzerland (5.07%).

These top 5 partners account for 63.14 % of total exports of Ireland in 2017 (Figure 9).

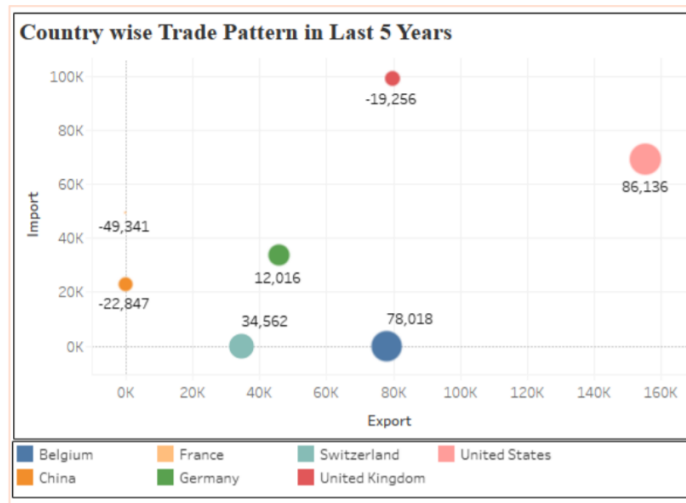


Figure 10. Scatter plot has been created in Tableau and used to understand the trade pattern for partner countries in the 5 years 2013- 2017.

J. Trade Patterns with Partner Country

Trade with USA was most profitable in terms of balance of trade, and overall trade. Both exports and imports were high for USA. Overall balance of trade for USA in last 5 years was 86136 million USD. From UK, import was higher than export. Negative balance of trade was observed for France, where no export was made to France and only commodities were imported. As a result, overall balance of trade was highly negative - 49341 million dollar (Figure 10).



Figure 11. Bar chart was plotted in Excel to observe the trend in balance of trade during 1992-2017.

K. Year Wise Balance of Trade

Overall balance of trade was positive for all these years, maximum balance of trade was observed in 2017 i.e. 107242 million USD, and lowest balance of trade was observed in

1992 i.e. 4063 million USD. In comparison to 2016, balance of trade in 2017 increased sharply by 60% (Figure 11).

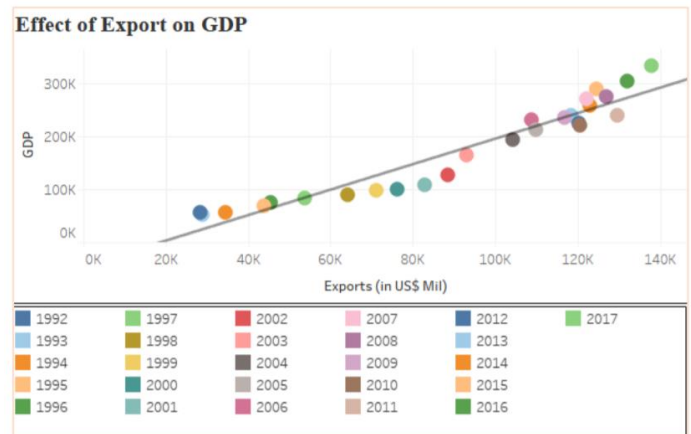


Figure 12. Scatter plot has been used to understand the impact of export on GDP in various years, linear regression analysis has also been made keeping GDP as target variable and export as predictor variable in Tableau.

4. HYPOTHESIS TESTING

Research Question: What is the effect of Export On GDP?

We tried a hypothesis test to check whether there is a correlation between GDP and Export.

Null Hypothesis, H₀: There exists is no association among GDP and exports

Alternate Hypothesis, H_a: There exists a relationship between GDP and exports

P-value (Exports) << 0.05

Plot in Figure 12 clearly shows linear trend among GDP and export, GDP increases with increase in exports. P value for Exports comes up < 0.0001, hence the null hypothesis that there is no association among GDP and exports is rejected. A very high R-Squared value indicates that the model is fits perfect, and 92% of variation in GDP can be explained by exports variable. The obtained linear regression equation of GDP vs export is

$$\text{GDP} = 2.40678 * \text{Exports (in US\$ Mil)} + 45283.2$$

It can be stated that for every unit of export there will be a 2.4 unit increase in GDP, hence it is clearly observed that economy of Ireland is highly dependent on exports.



Figure 13. Bullet graph has been plotted in Tableau to show the growth of trade (in percentage) in Ireland vs world.

5. GROWTH OF TRADE IN IRELAND VS WORLD

Overall during 1992-2017, most of Ireland's trade growth was better or at least approximately the same in comparison to world's growth. In 2017, growth for Ireland was 1%, while growth for world was 1.5%. While sometime during the years 2002-2011 Ireland lacked behind, it could possibly be the aftermath of the recession and economic crisis (Figure 13).

6. CONCLUSION

Exports has a significant function in economic growth of Ireland. Major exports from Ireland across the world are chemicals, machinery and electrical goods, and animals. Major import of Ireland is capital goods. Top 5 export partners for Ireland are United States, United Kingdom, Belgium, Germany and Switzerland. Top 5 import partner was United Kingdom, United States France, Germany, and China. Overall flow of trades is very suitable of United States, Belgium, Germany and Switzerland, as the balance of trades were favorable, whereas for France, UK, and China

balance of trades were non-favorable and negative. Particularly for China and France no exports are being made. For commodities, raw materials, intermediate goods, and consumer goods had positive balance of trade, whereas capital goods had negative balance of trade. Though during 2007-2011, Ireland's trade went through the little gloomy phase, but overall Ireland is performing exceptionally well in trades, as balance of trades for all the years were positive. The impact of export is very high on GDP of Ireland, to boost the economy Ireland need to focus more on export.

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