Senior Project

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The Impact of Brexit on UK Trade Flows: A Product-Level Analysis

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Abstract

The United Kingdom formally left the European Union in 2020, a significant event known as Brexit. The separation caused political and economic consequences for the UK, particularly affecting trade flows in and out of the country. However, the extent of these impacts-both in the short and long term-remains uncertain. This paper analyzes the impact of Brexit on exports and imports for the United Kingdom and the rest of the EU. The study also looks at industry-specific data, giving a detailed perspective on sectors that experienced the biggest consequences of the event.

The World International Trade Solution (WITS) by the World Bank provides data for all the countries in this study from 2007-2023. This allows a two-way fixed effects difference-in-difference model to see the effects of imports, exports and total trade flow on a per capita basis. The regression controls for country, product, and year fixed effect, and clusters standard error at the country level.

The results indicate that Brexit had a significant negative impact on trade flows on the UK and the European Union. Across both linear and log-linear models, there was a decline in imports, exports, and total trade after the 2016 vote to leave the EU. In the log-linear model, total trade saw a decline of 13%. The product level analysis finds that food and agricultural goods, materials and fuels, chemicals and related goods, and transportation-related products saw significant decrease in trade. These findings suggest that Brexit caused a significant decline in trade activity for the UK and the EU.

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I. Introduction

The United Kingdom (UK) formally left the European Union on January 31, 2020, a significant historical event known as Brexit. However, the path to Brexit came much earlier when the public participated in a referendum in June 2016 on whether to stay or leave the European Union (EU). The vote resulted in 52% to 48% in favor of leaving the EU (NPR, 2016). The decision to leave was driven by numerous concerns such as Britian losing political and economic control and the free movement immigration policy (Mauldin, 2016). After 4 years of negotiating, the UK entered a transition period of leaving the EU which lasted until December 31, 2020.

The European Union provides its member states with a single market, which allows free trade between each other with no (or very limited) trade restrictions, tariffs, or non-tariff barriers. Members of the EU have seen growth in their economies for the past half century due to labor mobility and lack of trade restrictions (OECD, 2016). Since the UK's departure, it has been negotiating its own trade regulations with Europe and the rest of the world for the first time since 1973. While some new trade agreements have been made post-Brexit, the short- and long-term effects of trading and the economy remain uncertain.

This paper investigates how Brexit affected imports and exports of UK products, especially in comparison to other EU members. The database, World Integrated Trade Solution (WITS), provides imports and exports by product category for UK and EU countries from 2006-2023. By analyzing specific product categories, this paper will examine Brexit's heterogenous effect on UK industries and the change of imports and exports outside the EU.

This paper helps policy makers identify which industries are most affected by Brexit in the United Kingdom. Other countries which are a part of the EU could interpret the results of this

paper to see if they want to follow the footsteps of the UK. While the analysis of this paper is limited to Brexit, it can potentially educate other countries on the value of trade agreements.

Currently published papers about how Brexit affects trading were written before 2021 and focused on models and forecasts and not actual results. These models in the past provided great foresight into the possible effects that were to have. However, since Brexit has been in place for four full years now, there is data currently available for up until 2023, it should provide a short-term analysis of the consequences it has had on the United Kingdom and the entirety of the European Union. Looking at this recent data will provide a better estimate of how trading has been impacted compared to the previous forecasts.

The rest of this paper will be organized as follows. The literature review provides an overview of the current research and analysis done surrounding Brexit. The theoretical discussion outlines the economic predictions of the results of this analysis. The data section references the data sources used and any data cleaning that occurred. The sections after that summarizes the analysis being done and the results. This includes further implications and an overview of the key findings in this paper.

II. Literature Review

The European Union, as a high-level Regional Trading Agreement (RTA), has provided benefits to the members of the agreement. With removal of trade barriers such as tariffs and promoting free movement of labor and capital, the EU has resulted in exponential economic growth and increased amounts of trading and jobs. (Smith, 1993) So, Brexit has affected the economy of the United Kingdom and their neighboring countries in different aspects such as amount of trade, Gross Domestic Product (GDP), policies and workers. Van Reenen (2016) took

a deep dive into how Brexit will affect the overall economy in the UK. The variables that the paper looked at included GDP, Foreign Direct Investment (FDI) and workers' compensation.

Another reason why Brexit took place was the concern of free-flowing migration within the member countries (Hobolt, 2016). Campos & Timini (2019) focused on how this event will affect the mobility of people, specifically the movement of labor. As the UK may get more power by restricting movement of migrants, the researchers were concerned about how the costs are associated with not having other workers throughout the EU. Portes and Springford (2023) highlighted how the new migration system has led to an increase in labor shortages since Brexit. Other papers looked at the sector level impact of Brexit). That paper examined the data on "production, bilateral trade flows, and trade costs" (Gasiorek & Smith, 2019). Having this data by industry and by country, they were able to run their model and get results by how every industry will be affected. However, these findings were from 2018, before the actual split and doesn't consider data since the event. My paper will be similar by looking at data on the product and industry level but will consider the period immediately before and after Brexit officially occurred.

The initial studies on the impact of Brexit on UK and EU countries do predictive analysis and were conducted immediately following the referendum vote in 2016. Even though the breakup did not happen for another four years, researchers still wanted to forecast the impact of Brexit on trade. Campos and Timini (2019) and Van Rennen (2016) both use their own models to estimate effects before the event took place. Since forecasts are not always accurate, they did consider multiple scenarios and currently available data on trade volumes and data (Van Rennen, 2016). However, the addition of COVID-19 in 2020 disrupted trade flows all over the world including the United Kingdom and the European Union. Du & Shepotylo (2022) analyzed how

trading in the UK was affected and with it occurring concurrently with Brexit, it could have altered the original impact of Brexit on trade in Europe.

The results from the industry specific analysis (Lawless & Morgenroth, 2019) have predicted many negative effects for industries such as automobiles and textiles. They predicted, with the new tariffs being presented implemented and a decrease in consumer demand and labor supply, these industries will suffer greatly. Van Reenan's 2016 paper showed negative results as well with regards to FDI. His model predicted that the FDI in the United Kingdom would drop more than 20% after Brexit would take place due to the split of the market in Europe and broken partnerships from the event. While it has only been about five years since Brexit has taken effect, a number of studies have examined the initial post-Brexit data to determine the actual effect it has had on the UK and its economy (Buigut & Kapar, 2023; Oliver, 2023; Portes & Springford, 2023).

However, the papers currently published about the actual effects that Brexit were published couple of years ago and do not use data up to 2023 (Buigut, & Kapar, 2023 and Oliver, 2023). Current analysis pertains more to the policy effects that have taken place, and with the event being so recent, it would be difficult to analyze and answer questions with this lack of data. However, this paper will include export and import data through 2023 and will thus provide a more comprehensive answer. With some unsettled problems and deals to replace the agreement within the EU, the UK has suffered costs (Oliver, 2023). The main takeaway from the papers is that the United Kingdom experienced a significant decline in trade, with some estimates predicting a decrease of 6% to 28% (Campos & Timini, 2019). They concluded that with the disruptions and price increases due to UK leaving the EU, the inevitable decrease in trade flows

will happen. Steven Buigut, & Burcu Kapar (2023) using post-Brexit data, found there has been a decline in exports and imports with the member countries of the EU.

Despite using different methods and models, research leaned to the same conclusion of decreased trading. These models range from gravity models to general equilibrium models. Even though they are different, they do provide a diverse and unique approach based on the researcher which considers perspectives and calculates unbiased results. Campos and Timini (2019) uses the gravity model of international trade, which controls for the size of the economies that trade and their physical distance from their trading partner. They focused on the prestigious economy of Britain and how much it will affect their trade flows. Most other papers used equilibrium models such as De Ville & Siles-Brugge (2019), Sanquinet & Alvim (2024) and more. This model simulates an "economy" that will eventually reach a equilibrium of supply and demand. The models throughout the papers were not identical, as there were ones that studied the country as a whole, with some looking at specific sectors or industries. In this paper, a Two-Way Fixed Effects (TWFE) Difference-in-Difference (DID) Model will be used, which will analyze data before and after the event took place. It also considers other variables that could have been omitted, which would have or have not shown a causal impact (Athey & Imbens, 2021). DID methods are also more reliable at determining the causal effect of the variable of interest by using pre- and post-treatment data.

With many papers declaring the weaknesses that the UK will get from this event, some do point out that there can be positive results in other areas besides trade. Oliver (2023) points out that despite a decrease in trade power between other EU countries, the United Kingdom can take this as a steppingstone to create new and stronger partnerships. One of the more recent

papers by Sanguinet & Alvin (2024) breaks down new partnerships between countries outside of Europe, such as Australia and Brazil.

III. Theoretical Discussion

Did Brexit have a positive or negative impact on the number of exports and imports in the United Kingdom compared to the rest of the European Union? Economic theory would suggest that leaving a Regional Trade Agreement (RTA) would be a decline in both exports and imports due to the new trade barriers and tariffs. RTAs seek to minimize or eliminate trade barriers for member countries to encourage trade by reducing costs and increasing access to the market (World Bank, 2024). By exiting the EU, the UK became subject to the regulations seen by other non-EU countries which can decrease trade with member countries. However, leaving the European Union can allow the UK to establish new agreements with new countries. The overall net effect of United Kingdom's trading depends on how successful the new agreements and deals can be.

With less opportunity to trade with EU countries, the UK is faced with a problem of how their goods and services will be supplied. Options include paying the extra costs of trading with countries in the European Union, increasing domestic production, or explore increasing trade with countries outside of the EU (such as Japan or Australia) and establishing new RTAs. The expected outcome is that the UK will shift its focus to trading with other countries and increasing domestic production. Negotiating agreements with other countries can create new and even better partnerships resulting in lower trade costs. However, these new agreements may not cover the opportunity costs of trading with neighboring countries with lower transportation costs. Increasing production in the United Kingdom after Brexit will impact the labor market in an extreme way. Due to the more labor demanded with more production, and with the labor supply

remaining constant (or slightly decreasing due to the removal of free migration), real wages for workers could see a major increase.

Overall, there are two main economic predictions that can be drawn from Brexit from the perspective of the United Kingdom. First, imports and exports are expected to significantly decline due to the increased trade barriers. Second, the UK will seek to increase trade volume with non-EU countries, but this may not cover the benefits of being in the European Union due to other associated costs such as transportation costs. These hypotheses lay foundation for the consequences of Brexit which will be determined through my analysis.

IV. Data

The World International Trade Solution (WITS) website provides trade data for most countries worldwide (World Bank, 2023). It is one of the many tools hosted by the World Bank that allows users to access statistics about world trade flows, tariff information, and policies. This source provides this analysis with export and imports data for all countries by year of various product groups from 2007 to 2023. The WITS platform also allows users to choose between multiple trade nomenclatures such as Standard Industrial Classification (SIC), Harmonized System (HS), and Standard International Trade Classification (SITC). For this analysis, I decided to use SITC Revision 4 as my nomenclature as it provides sixty-six different product categories that I will divide into eight different product categories. By using this data source, it is possible to analyze the trade data almost a decade before the referendum in 2016 as well as three years following the actual exit of the European Union in 2020.

The data pulled from the WITS website required minimal data as most of the dataset was complete and had all the data. However, smaller countries such as Cyprus did have missing values in the earlier years of analysis, which had to be dropped. Other smaller countries also

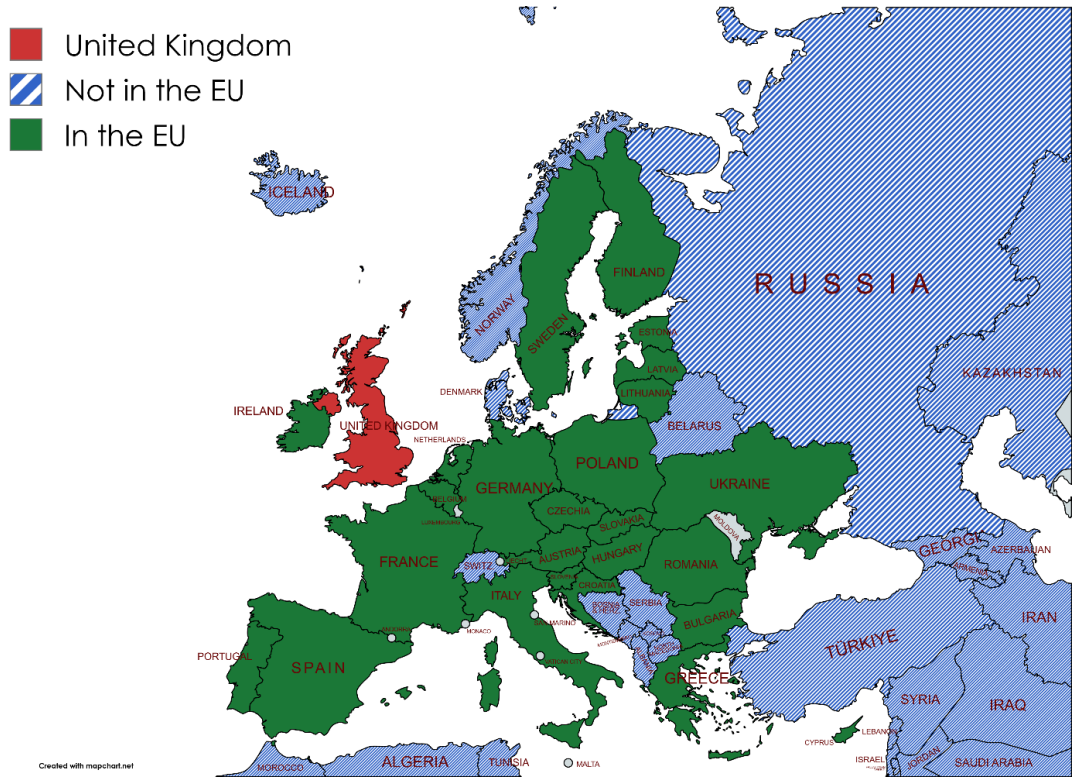
created outliers by having such low trade flow volume compared to other countries, specifically for some products. To avoid outliers and get reliable results, I calculated the trade flow per capita by using population and gross domestic product (GDP) data also received by the WITS website. The dataset also included several variables not used in this analysis such as net weight of trade flows.

The dataset, all gathered from the WITS website, includes many key variables to analyze trade patterns in the EU and the UK over time. The data includes the United Kingdom and current twenty-seven countries in the European Union. It also includes the full name and three-digit country codes (ISO3) for the reporter country and trade partner. This can show country-specific analysis and effect, either on the side of the reporter or the trade partner. The data also determines whether it is an export or import and the values are measured in thousands of U.S. dollars. There is also weight aspect that calculates the net weight of the products in kilograms which can be useful for some product categories. Overall, each entry in the excel file is classified by year, the two countries involved, whether it is part of exports and imports, and the product type which is a very detailed view that can provide more accurate results to effects of trade in the United Kingdom.

The following is a map of all countries in Europe, organized based on their European Union membership status. Countries that are currently part of the EU are shaded green while those that are not a part of it are shaded blue and white. The United Kingdom is highlighted in red because this is the primary focus of the analysis due to its recent departure from the EU. The countries that are shaded with blue and white are not a part of the analysis, meaning there is a total of 27 member countries and the UK. A significant observation from the map is the proximity of the EU countries to the UK. However, there are numerous non-EU countries, such

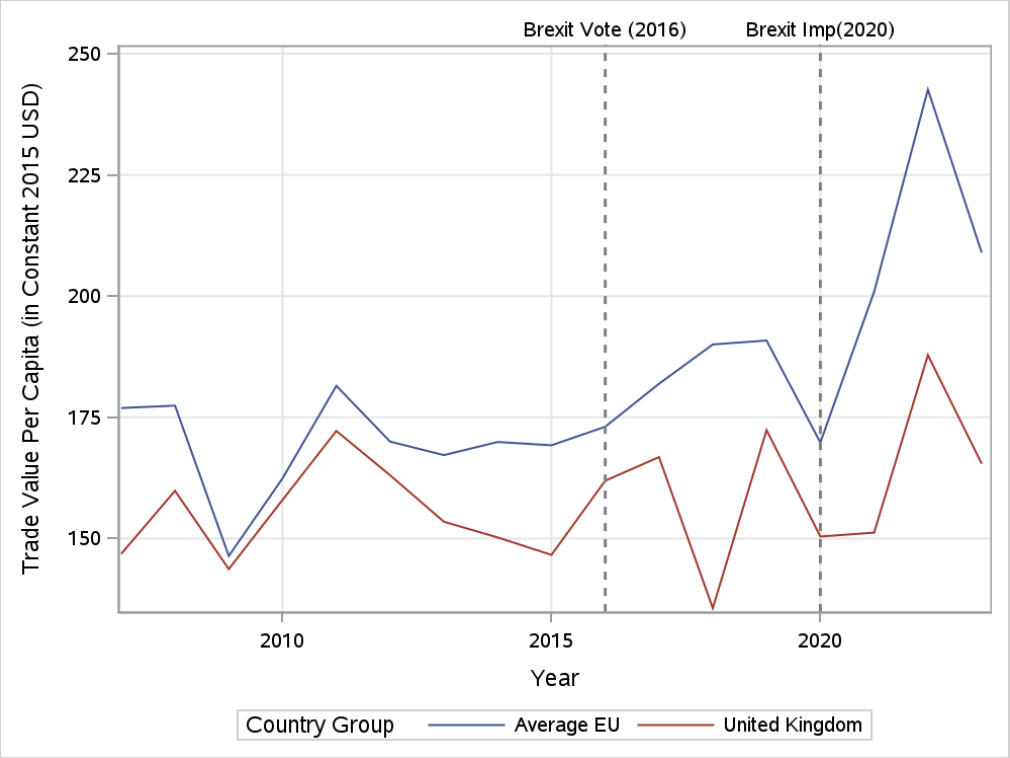
as Norway and Iceland, that are neighboring the United Kingdom and could be potential new significant trading partners.

Figure 1: European Union Membership Map

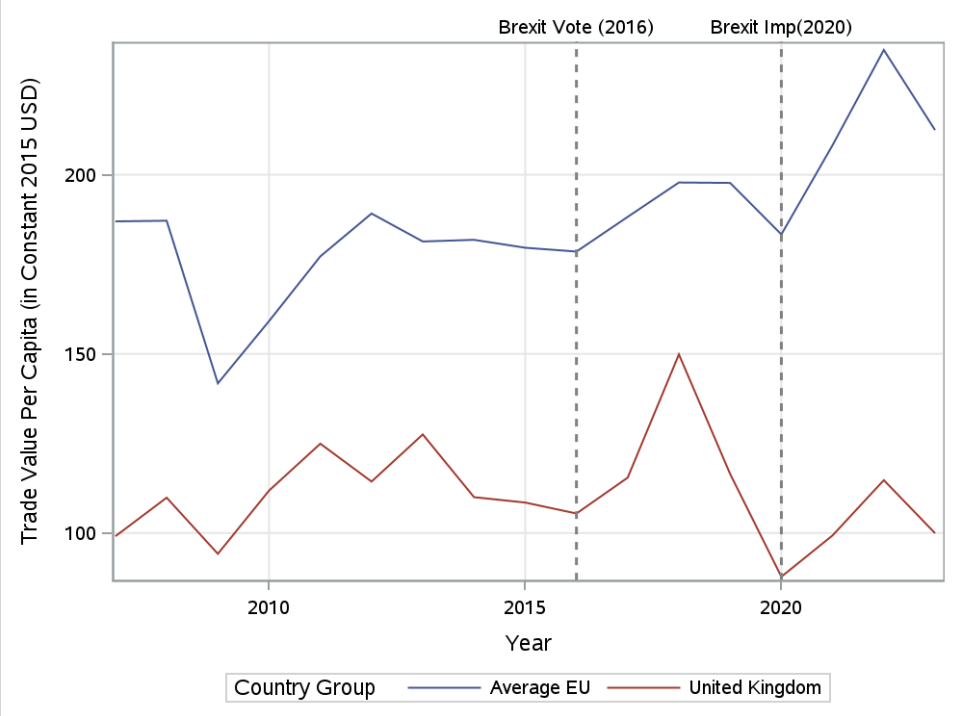


Graphs 1, 2, and 3 demonstrate the parallel trend between the control and treatment groups. They illustrate the trend in per capita trade volume in constant 2015 USD from 2007 to 2023. Vertical lines in each graph show the Brexit referendum in 2016 and its implementation in 2020. These can provide visual insight into the trends of trade activity was altered after these events.

Graph 1: Imports Over Time by Country Group



Graph 2: Exports Over Time by Country Group



Graph 3: All Trade Over Time by Country Group

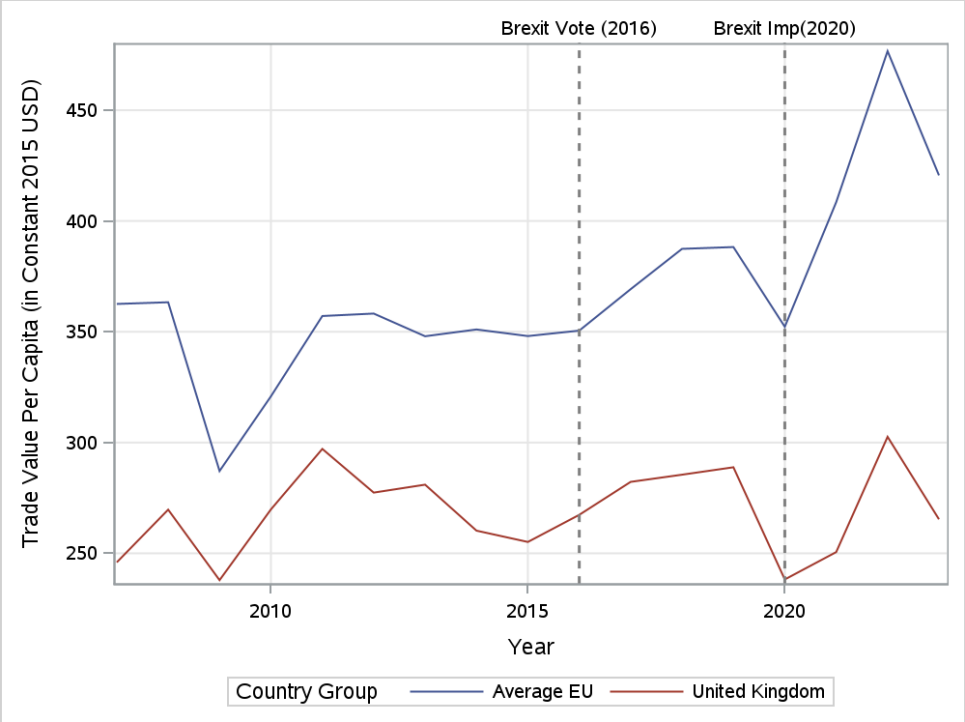


Figure 2 presents the summary statistics for per capita trade flow in constant 2015 USD. It is separated by country groups and trade flow, with United Kingdom being the treatment and the average of the European Union being the control. This summarizes all trade flows from 2007 to 2023 for both groups. This also lists the number of observations for each country group over the 16 years. The Average EU group has a higher mean compared to the United Kingdom but with a much larger standard deviation due to the variability in country size and trade activity.

Figure 2: Summary Statistics for Per Capita Trade Flow in Constant 2015 USD

Country Group	Trade Flow	N	Mean	Std Dev	Minimum	Maximum
Average EU	Exports	30,106	187.407	454.687	0.000	15,144.83
	Imports	30,201	181.128	344.101	0.000	7,247.29
	Total Trade	30,227	367.630	713.283	0.002	17,325.37

United Kingdom	Exports	1,122	111.140	171.017	0.088	1,246.71
	Imports	1,122	157.973	218.704	0.077	1,844.56
	Total Trade	1,122	269.113	370.341	0.316	2,593.83

V. Empirical Methodology

In this study, I will use a two-way fixed effects difference-in-differences (TWFE DID) model to analyze the impact of Brexit on trade flows as a whole and on a product level for the United Kingdom compared to the European Union The DID model allows for more accurate results of the causal effect of Brexit by analyzing data prior and after the UK left the EU. Two-way fixed effects also provides more credible results as it controls for both time effects and country effects. This means that we can account for factors that do not change over time and some that do affect all countries. Model (1) is the first regression equation used in this analysis.

$$Y_{PCT} = \beta_0 + \beta_1 Brexit_{CT} + Product_P + Country_C + Year_T + \varepsilon_{PCT} \qquad (1)$$

Outcome variable Y is the outcome of the change of trade volume such as exports and imports in country *c*, product *p*, and year *t.* Brexit is an indicator variable equal to 1 if United Kingdom has membership in the European Union in a given year; zero otherwise. Product, Country, and Year are product, country, and year fixed effects, respectively. ε is the white noise. Product fixed effects controls for the difference in good that could affect the outcome variable. Country fixed effects account for outside variables such as economic and geographic conditions. Year fixed effects captures effects that affect all countries over time.

The revised following model (2), which takes the natural log of the trade volume, log(Y), gives a better representation of trade flows because of the non-linear relationships in trade data. Trade volumes can have exponential growth or decline, and a log-linear model captures the full

effect of the proportional changes. Also, model (2) handles the concern of heteroskedasticity. Not all countries trade the same amount due to the size of their economy. The second model will adjust for the variances in trade flows making the results more accurate.

$$\log(Y)_{PCT} = \alpha_0 + \alpha_1 Brexit_{CT} + Product_P + Country_C + Year_T + \varepsilon_{PCT} \quad (2)$$

VI. Results

The Difference-in-Differences (DID) variable, in the first regression, measures the effect of Brexit by using pre- and post-referendum periods with treatment and control groups. As seen in Table 1, which just does not break down by product, the models include fixed effects for country, product, and year. Standard errors are also clustered at the country level. The results of the first regression indicate that after the UK voted to leave the EU in 2016, exports, imports, and total trade experienced a statistically significant decrease at the 1% level of significance. In the linear model, Brexit caused a decrease of $48.71 per capita of total trade while imports and exports decreased $22.73 per capita and $25.80 per capita, respectively. These effects are also economically meaningful as trade activity saw a significant reduction due to the decision. The results stay consistent in the log-linear regression model. Total trade saw a 13% decrease in logged per capita trade, while imports and exports saw a 19% and 20% decrease in per capita trade, respectively.

The DID variable, in the second regression, measures the effect of Brexit on specific product categories using pre- and post-referendum periods with treatment and control groups. The results of this regression can be seen in Tables 2-5 which includes fixed effects for country, product, and year and the standard errors are clustered at the country level. The results indicate that after the UK's vote to leave the EU in 2016, several product categories saw a statistically

significant decline in trade. These categories include food and agricultural goods, materials and fuels, chemicals and related goods and transportation-related products. Consumer goods were the only category to see a statistically significant increase. Trade of manufactured goods and coin and commodities saw mixed results. The two categories which saw the most decrease were transportation-related products, which had a 66% decrease in logged per capita total trade and materials and fuels, which saw a 38% decrease.

Given the statistical significance of the DID coefficient across all models and regressions we fail to reject the null hypothesis that Brexit had a negative effect on trade. This provides very strong evidence that Brexit led to a decrease in trade activity among the United Kingdom and the rest of the European Union on a per capita basis. On the product level analysis, we can also fail to reject that null hypothesis as most categories did see a significant decrease, but some did see positive mixed results.

Table 1. Linear and Log Regression Model for Total Trade, Imports, and Exports

Regressors	Total Trade	Imports	Exports	Total Trade (Log)	Imports (Log)	Exports (Log)
DID	-48.71*** (14.74)	-22.73*** (6.02)	-25.80*** (9.09)	-0.13*** (0.04)	-0.19*** (0.04)	-0.20*** (0.05)
Intercept	580.32*** (131.30)	298.53*** (50.41)	281.31*** (84.12)	5.71*** (0.25)	5.15*** (0.28)	4.26*** (0.43)
Country, Product, and Year Fixed Effects?	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	31,349	31,323	31,228	31,349	31,304	31,203
Adjusted R-Square	0.1133	0.09636	0.09227	0.1424	0.1298	0.1542
Overall Significance	48.10***	16,592.1***	1.8E16***	46.85***	64,632.0***	16.32***

Sources: World Integrated Trade Solution (WITS) 2024 and own calculations.
Notes: Robust standard errors are in parentheses and clustered at the country-level. *, **, and *** indicate 10%, 5%, and 1% significance levels, respectively.

Table 2. Log Regression Model for Total Trade, Imports, and Exports for Product Categories 1 and 2

	Product 1			Product 2		
Regressors	**Total Trade**	**Imports**	**Exports**	**Total Trade**	**Imports**	**Exports**
DID	-0.15*** (0.03)	-0.23*** (0.04)	-0.31*** (0.05)	-0.38*** (0.13)	-0.28* (0.15)	-0.40** (0.17)
Intercept	5.44*** (0.24)	4.81*** (0.26)	4.08*** (0.42)	6.49*** (0.12)	5.54*** (0.16)	5.84*** (0.20)
Country, Product, and Year Fixed Effects?	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	12,349	12,316	12,265	952	950	938
Adjusted R-Square	0.2244	0.2134	0.2394	0.6346	0.6186	0.5585
Overall Significance	2,205,215***	2,929,987***	38.52***	6.58***	2.27E16***	4.7E17***

Sources: World Integrated Trade Solution (WITS) 2024 and own calculations.

Notes: Robust standard errors are in parentheses and clustered at the country-level. *, **, and *** indicate 10%, 5%, and 1% significance levels, respectively. Product category one is defined as food and agricultural goods. Product category two is defined as materials and fuels.

Table 3. Log Regression Model for Total Trade, Imports, and Exports for Product Categories 3 and 4

	Product 3			Product 4		
Regressors	**Total Trade**	**Imports**	**Exports**	**Total Trade**	**Imports**	**Exports**
DID	-0.47*** (0.08)	-0.54*** (0.07)	-0.42*** (0.11)	0.06 (0.05)	-0.11* (0.05)	0.05 (0.07)
Intercept	6.10*** (0.22)	5.22*** (0.27)	5.26*** (0.24)	5.51*** (0.19)	4.85*** (0.21)	4.30*** (0.21)
Country, Product, and Year Fixed Effects?	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	4,284	4,284	4,277	4,284	4,283	4,282
Adjusted R-Square	0.2119	0.1878	0.1769	0.2695	0.2637	0.248
Overall Significance	40.40***	78.17***	2.5E15***	51.85***	8.11***	2.54E15***

Sources: World Integrated Trade Solution (WITS) 2024 and own calculations.

Notes: Robust standard errors are in parentheses and clustered at the country-level. *, **, and *** indicate 10%, 5%, and 1% significance levels, respectively. Product category three is defined as chemicals and related goods. Product category four is defined as manufactured goods.

Table 4. Log Regression Model for Total Trade, Imports, and Exports for Product Categories 5 and 6

	Product 5			Product 6		
Regressors	**Total Trade**	**Imports**	**Exports**	**Total Trade**	**Imports**	**Exports**
DID	-0.07 (0.07)	-0.13 (0.08)	-0.13 (0.08)	-0.66*** (0.13)	-0.58*** (0.13)	-0.75*** (0.17)
Intercept	4.87*** (0.20)	4.26*** (0.23)	3.48*** (0.21)	4.58*** (0.16)	4.09*** (0.17)	1.62*** (0.19)
Country, Product, and Year Fixed Effects?	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	3,332	3,330	3,327	952	952	952
Adjusted R-Square	0.2095	0.1816	0.2074	0.4505	0.368	0.4539
Overall Significance	1.23E17***	73.79***	9.89E16***	4.19***	2.31E13***	5.13***

Sources: World Integrated Trade Solution (WITS) 2024 and own calculations.

Notes: Robust standard errors are in parentheses and clustered at the country-level. *, **, and *** indicate 10%, 5%, and 1% significance levels, respectively. Product category five is defined as machinery and equipment. Product category six is defined as transportation-related products.

Table 5. Log Regression Model for Total Trade, Imports, and Exports for Product Categories 7 and 8

	Product 7			Product 8		
Regressors	**Total Trade**	**Imports**	**Exports**	**Total Trade**	**Imports**	**Exports**
DID	0.14** (0.05)	0.17* (0.10)	0.21*** (0.07)	0.05 (0.10)	-0.15 (0.10)	-0.14 (0.11)
Intercept	5.68*** (0.22)	4.83*** (0.20)	4.54*** (0.27)	6.81*** (0.17)	6.13*** (0.18)	5.93*** (0.25)
Country, Product, and Year Fixed Effects?	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	3,808	3,804	3,804	1,388	1,385	1,358
Adjusted R-Square	0.3054	0.2965	0.2971	0.4572	0.4526	0.4871
Overall Significance	5.527E7***	2.63E15***	4.29E12***	287,709***	1.13E16***	2.07E15***

Sources: World Integrated Trade Solution (WITS) 2024 and own calculations.

Notes: Robust standard errors are in parentheses and clustered at the country-level. *, **, and *** indicate 10%, 5%, and 1% significance levels, respectively. Product category seven is defined as consumer goods. Product category eight consists of gold, coins, and special commoditie

VII. Conclusion

This study examined the impact of Brexit on trade flows between the United Kingdom and the European Union in the TWFE DID linear and log-linear regression models. The results of the first regression show that Brexit decreased trade, showing declines in imports, exports, and total trade. Both linear and log models were significant at a 1% level on a per capita basis. Based on the second model, most product categories saw a decrease in trade to Brexit. These findings can contribute to economic literature and policymakers on the consequences of leaving trade agreements such as the EU or remaining in their regional trading agreement. Seeing how some product categories were effected heavily, the government can step in and help these industries to help stable the loss of trade they are experiencing. Having results in per capita shows the effect of impact on individuals or citizens. This can encourage current member countries of the EU to stay and not follow the lead of the United Kingdom. Future research that could be done can include more long-term effects and focus on economic effects beyond just the trade flows.

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Appendix: SAS Codes

```
/*importing trade flow data*/
proc import datafile="/home/u63744480/MySAS/Senior Project/Test8_AllYears_SITCRev4.xlsx"
	out=work.Brexit
		dbms=xlsx
		replace;
	sheet="DataJobID-2803106_2803106_test8";
	getnames=yes;
run;

/*importing population data*/
proc import datafile="/home/u63744480/MySAS/Senior Project/PopulationGDPbyCountry.xlsx"
	out=work.population
		dbms=xlsx
		replace;
	sheet="data";
	getnames=yes;
run;

/*importing GDP and exchange data*/
proc import datafile="/home/u63744480/MySAS/Senior Project/GDP_Data.xlsx"
	out=work.GDP
		dbms=xlsx
		replace;
	sheet="Data";
	getnames=yes;
run;
```

```
proc sort data=GDP;
	by Country_Name;
run;

data GDP2;
	set GDP;
	if Series_Name = "GDPDeflator" then varname = "GDPDeflator";
	else if Series_Name = "GDPCurrent" then varname = "GDPCurrentUS";
	else if Series_Name = "ExchangeRate" then varname = "ExchangeRate";

run;

/*preparing GDP exchange dataset to combine*/
Proc transpose Data=GDP2 Out=GDP2long;
	by Country_Name;
	var "2007"n-"2023"n;
	ID Series_Name;
run;

data DFEX2015;
set GDP2long;
	where _LABEL_ ="2015";
	rename GDPDeflator = GDPDeflator2015;
	rename ExchangeRate = ExchangeRate2015;
	drop GDPCurrent _NAME_ _LABEL_;

run;

data GDP3long;
```

```
	merge GDP2long DFEX2015;
	by Country_Name;
run;

data GDP4long;
	set GDP3long;
		ConstantGDP =
GDPCurrent*(ExchangeRate/ExchangeRate2015)*(GDPDeflator2015/GDPDeflator);
		Year = input (_LABEL_,4.0);
run;

proc sort data=Brexit;
by ReporterName Year;
run;

proc sort data=GDP4long;
by Country_Name Year;
run;




/*preparing population dataset to combine*/
Proc Transpose Data=population Out=populationlong;
	by Country_Name;
	var "1960"n-"2023"n;
run;

Data populationlong2;
```

```
        Set populationlong;
        Year=input(_Name_,4.);
        Population=Col1;
        keep Country_Name Year Population;
run;

Data populationlongfiltered;
        Set populationlong2;
        where Year BETWEEN 2007 AND 2023;
run;

/*grouping countries into UK and EU*/
data Brexit1;
        set Brexit;
        if ReporterName = "United Kingdom" then Country_Group = "United Kingdom";
        else Country_Group = "Average EU";
        Country_Name= ReporterName;
run;

proc sort data=Brexit1;
        by Country_Name Year;
run;

proc sort data=populationlongfiltered;
        by Country_Name Year;
run;

/*combining and sorting the dataset*/
Data Combined;
```

```
	Merge populationlongfiltered Brexit1;
	By Country_Name Year;/*code on how to calculate DID as 0 or 1*/
	/*If FirstEffectedYear="0" then DID=0;
		else if Year>=FirstEffectedYear then DID=1;
		else DID=0;*/
	/*keep County Year RelNumGoodDays FirstEffectedYear DID;*/
run;

proc sort data=Combined;
	by Country_Name Year ProductCode TradeFlowName;
run;

/*making variable per capitia*/
Data Combined2;
	set Combined;
	TradeFlowPC = (TradeValuein1000USD/Population)*1000; /*per capitia value is in $*/
run;

/*following code makes a graph but it looks weird*/
proc sgplot data=Brexit1;
	series X=Year Y=TradeFlowName / group=Country_Group markers lineattrs=(thickness=2);
	title "UK vs EU Exports By Year";
footnote1 justify=left "Source: WITS (2023)";
footnote2 justify=left "Notes: Summarized trade data for the UK and UK by Year";

run;
Title;
footnote;
```

```
/*summary stats for average EU and UK by year*/
proc means data=Brexit;
	Class Year TradeFlowName;
	Var TradeValuein1000USD;
	Output OUT = SummaryAll Sum=TotalTradeValuein1000USD;

/*summary stats for average EU and UK overall*/
proc means data=Brexit1;
	class Country_Group;
	var TradeValuein1000USD;
run;

/*what does the following do??*/
proc sort data=Brexit1;
by Country_Group Year;
run;

/*the following makes a MEAN variable which allows to have a graph of EU v EU exports over time*/
proc means data=Brexit1;
	where TradeFlowName = "Export";
	by Country_Group Year;
	var TradeValuein1000USD;
	output out=Brexit2;
run;

data brexit3;
	set Brexit2;
	where _stat_ = "MEAN";
run;
```

```
proc sgplot data=Brexit3;
	series x=year y=TradeValuein1000USD / group=Country_Group;
	refline 2016 2020 / axis=x lineattrs=(pattern=shortdash color=gray thickness=2)
		label=("Brexit Vote (2016)" "Brexit Imp(2020)");
	xaxis label = "year" grid;
	yaxis label = "Trade Value (In 1000USD)" grid;
	title "UK vs. Average EU Exports";
run;

/*the following makes a MEAN variable which allows to have a graph of EU v EU imports over time*/
proc means data=Brexit1;
	where TradeFlowName= "Import";
	by Country_Group Year;
	var TradeValuein1000USD;
	Output out=Brexit4;
run;

data Brexit5;
	set Brexit4;
	where _stat_ = "MEAN";
run;

proc sgplot data=Brexit5;
	series x=year y=TradeValuein1000USD / group=Country_Group;
	refline 2016 2020 / axis=x lineattrs=(pattern=shortdash color=gray thickness=2)
		label=("Brexit Vote (2016)" "Brexit Imp(2020)");
	xaxis label = "year" grid;
	yaxis label = "Trade Value (In 1000USD)" grid;
```

```
	title "UK vs Average EU Imports";
run;

/*Balance of Regressors Test*/

/*Importing Data*/

proc import datafile="/home/u63744480/MySAS/Senior Project/FDI_GDP_UE_Data.xlsx"
	out=work.controls
		dbms=xlsx
		replace;
	sheet="Data";
	getnames=yes;
run;

proc sort data=controls;
	by Country_Name;
run;

data controls2;
	set controls;
	if Series_Name = "GDP_Deflator" then varname = "GDP_Deflator";
	else if Series_Name = "GDP_CurrentUS$" then varname = "GDP_CurrentUS";
	else if		Series_Name = "GDP_2015US$" then varname = "GDP_2015US";
	else if	Series_Name = "Unemployment" then varname = "Unemployment";
	else if		Series_Name = "NetFDI" then varname = "NetFDI";
run;
```

```
Proc Transpose Data=controls2 Out=controls3;
        by Country_Name;
        var "2007"n-"2023"n;
        ID varname;
run;

data controls4;
        set controls3;
        Year = input (_LABEL_,4.0);
        if Country_Name = "United Kingdom" then treatment=1;
        else treatment=0;
run;

proc ttest data=controls4 plots=none;
        where Year < 2016;
        var NetFDI Unemployment GDP_2015US;
        class treatment;
run;

/*Pararllel Trend Test*/
data ExpImp1;
        merge Brexit (rename = (ReporterName = Country_Name)) GDP4long;
        by Country_Name Year;
        ConstantTradeFlowin1000USD =
TradeValuein1000USD*(ExchangeRate/ExchangeRate2015)*(GDPDeflator2015/GDPDeflator);
run;

data ExpImp2;
        set ExpImp1;
```

```
	drop Nomenclature TradeFlowCode Quantity QuantityToken QtyUnit ReporterRegion
ReporterIncomeGroup _NAME_ _LABEL_ PartnerIncomeGroup PartnerRegion;
run;


data ExpImp3;
	set ExpImp2;
	if Country_Name = "United Kingdom" and Year > 2016 then DID=1;
		else DID=0;
			/*if Country_Name = "United Kingdom" and Year = 2016 then DID2016=1;
				else DID2016=0;*/
			/*if Country_Name = "United Kingdom" and Year = 2017 then DID2017=1;
				else DID2017=0;*/
			/*if Country_Name = "United Kingdom" and Year = 2018 then DID2018=1;
				else DID2018=0;*/
			/*if Country_Name = "United Kingdom" and Year = 2019 then DID2019=1;
				else DID2019=0;*/
			/*if Country_Name = "United Kingdom" and Year = 2020 then DID2020=1;
				else DID2020=0;*/
			/*if Country_Name = "United Kingdom" and Year = 2021 then DID2021=1;
				else DID2021=0;*/
			/*if Country_Name = "United Kingdom" and Year = 2022 then DID2022=1;
				else DID2022=0;*/
			/*if Country_Name = "United Kingdom" and Year = 2023 then DID2023=1;
				else DID2023=0;*/
	if Country_Name = "United Kingdom" then treatment=1;
		else treatment=0;
	rt = Year - 2016;
run;
```

```
/*making data per capita*/
data ExpImp4;
	merge ExpImp3 Combined;
	by Country_Name Year;
	PCCTradeFlowinUSD = (ConstantTradeFlowin1000USD/Population)*1000;
	LogPCCTradeFlowinUSD = Log(PCCTradeFlowinUSD);
run;

Proc sort data=ExpImp4;
	by Country_Name Year ProductCode ProductCategory;
Run;

Proc Print Data=ExpImp4 (obs=10);
	Var Country_Name Year ProductCode TradeFlowName PCCTradeFlowinUSD ProductCategory;
Run;

PROC SQL;
	create table ExpImp5 as
	select Country_Name, Year, ProductCode, ProductCategory,
		sum(PCCTradeFlowinUSD) as Agg_PCCTradeFlowinUSD
	from ExpImp4
	group by Country_Name, Year, ProductCode, ProductCategory;
QUIT;

Proc Print Data=ExpImp5 (obs=10);
run;

Data ExpImp6;
	set ExpImp5;
```

```
            PCCTradeFlowinUSD=Agg_PCCTradeFlowinUSD;
    TradeFlowName="Total Export & Imports";
    LogPCCTradeFlowinUSD = Log(PCCTradeFlowinUSD);
    if Country_Name = "United Kingdom" then Country_Group = "United Kingdom";
                    else Country_Group = "Average EU";
                RT = Year - 2016;
                if Country_Name = "United Kingdom" then treatment=1;
                    else treatment=0;
                if Country_Name = "United Kingdom" and Year > 2016 then DID=1;
                    else DID=0;
            /*if Country_Name = "United Kingdom" and Year = 2016 then DID2016=1;
                    else DID2016=0;*/
            /*if Country_Name = "United Kingdom" and Year = 2017 then DID2017=1;
                    else DID2017=0;*/
            /*if Country_Name = "United Kingdom" and Year = 2018 then DID2018=1;
                    else DID2018=0;*/
            /*if Country_Name = "United Kingdom" and Year = 2019 then DID2019=1;
                    else DID2019=0;*/
            /*if Country_Name = "United Kingdom" and Year = 2020 then DID2020=1;
                    else DID2020=0;*/
            /*if Country_Name = "United Kingdom" and Year = 2021 then DID2021=1;
                    else DID2021=0;*/
            /*if Country_Name = "United Kingdom" and Year = 2022 then DID2022=1;
                    else DID2022=0;*/
            /*if Country_Name = "United Kingdom" and Year = 2023 then DID2023=1;
                    else DID2023=0;*/
Run;

Data ExpImp7;
```

```
        length TradeFlowName $30;
        format TradeFlowName $30.;
        Set ExpImp4 ExpImp6;
Run;

Proc Sort Data=ExpImp7;
        by Country_Name Year ProductCode TradeFlowName;
Run;

Proc Print Data=ExpImp7 (obs=40);
        Var Country_Name Year ProductCode TradeFlowName PCCTradeFlowinUSD
LogPCCTradeFlowinUSD ProductCategory;
Run;

/*MAKING PER CAPITA GRAPHS INSTEAD OF THE EARLIER ONES*/


/*Per capita graphs by country group*/
proc sort data=ExpImp4;
by Country_Group Year;
run;

/*Exports*/

proc means data=ExpImp4;
        where TradeFlowName = "Export";
        by Country_Group Year;
        var PCCTradeFlowinUSD;
        output out=ExpImp8;
```

```
run;

data ExpImp9;
	set ExpImp8;
	where _stat_ = "MEAN";
run;

ods graphics / width=10in height=6in;
proc sgplot data=ExpImp9;
	series x=year y=PCCTradeFlowinUSD / group=Country_Group;
	label Country_Group="Country Group"
		labelattrs=(size=12);
	refline 2016 2020 / axis=x lineattrs=(pattern=shortdash color=gray thickness=2)
		label=("Brexit Vote (2016)" "Brexit Imp(2020)")
			labelattrs=(size=12);
	xaxis label = "Year" grid labelattrs=(size=16) valueattrs=(size=14);
	yaxis label = " " grid labelattrs=(size=6) valueattrs=(size=14);
	keylegend / title="Country Group" titleattrs=(size=14) valueattrs=(size=12);
run;

/*Imports*/
/*the following makes a MEAN variable which allows to have a graph of EU v EU imports over time*/
proc means data=ExpImp4;
	where TradeFlowName = "Import";
	by Country_Group Year;
	var PCCTradeFlowinUSD;
	output out=ExpImp10;
run;
```

```
data ExpImp11;
	set ExpImp10;
	where _stat_ = "MEAN";
run;

ods graphics / width=10in height=6in;
proc sgplot data=ExpImp11;
	series x=year y=PCCTradeFlowinUSD / group=Country_Group;
	label Country_Group="Country Group"
		labelattrs=(size=12);
	refline 2016 2020 / axis=x lineattrs=(pattern=shortdash color=gray thickness=2)
		label=("Brexit Vote (2016)" "Brexit Imp(2020)")
		labelattrs=(size=12);
	xaxis label = "Year" grid labelattrs=(size=16) valueattrs=(size=14);
	yaxis label = " " grid labelattrs=(size=6) valueattrs=(size=14);
	keylegend / title="Country Group" titleattrs=(size=14) valueattrs=(size=12);
run;

/*All Trade*/
proc sort data=ExpImp7;
	by Country_Group Year;
run;

proc means data=ExpImp7;
	where TradeFlowName = "Total Export & Imports";
	by Country_Group Year;
	var PCCTradeFlowinUSD;
	output out=ExpImp12;
run;
```

```
data ExpImp13;
	set ExpImp12;
	where _stat_ = "MEAN";
run;

ods graphics / width=10in height=6in;
proc sgplot data=ExpImp13;
	series x=year y=PCCTradeFlowinUSD / group=Country_Group;
	label Country_Group="Country Group"
		labelattrs=(size=12);
	refline 2016 2020 / axis=x lineattrs=(pattern=shortdash color=gray thickness=2)
		label=("Brexit Vote (2016)" "Brexit Imp(2020)")
		labelattrs=(size=12);
	xaxis label = "Year" grid labelattrs=(size=16) valueattrs=(size=14);
	yaxis label = " " grid labelattrs=(size=6) valueattrs=(size=14);
	keylegend / title="Country Group" titleattrs=(size=14) valueattrs=(size=12);
run;

ods excel file="/home/u63744480/MySAS/Capstone Project Parellel Trend Graphs.xlsx/"
options(Embedded_Titles="ON" Embedded_Footnotes="ON"); /*Use the path to your MySAS folder */
```

```
/*Parellel Trend Test*/

data ExpImp4;

        set ExpImp4;

        rename rt= RT treatment = Treatment;

run;


ods excel file="/home/u63744480/MySAS/Capstone Project Parallel Trend.xlsx/"
options(Embedded_Titles="ON" Embedded_Footnotes="ON"); /*Use the path to your MySAS folder */


/*ALL TRADE*/

ods excel options(sheet_name="All");

Title "Table 1: Effect of Brexit on UK Trade Flows (Overall)";

footnote2 justify=left "Notes: robust standard errors are in parentheses. *, **, and *** indicate

10%, 5%, and 1% significance levels, respectively."

justify=left "Source: World Integrated Trade Solution (WITS) 2024";
```

```
ods output ParameterEstimates=PEforModel1P DataSummary=ObsModel1P
        FitStatistics=AdjRsqModel1P Effects=OverallSigModel1P;

proc surveyreg data=ExpImp7;
    where Year < 2016 and TradeFlowName = "Total Export & Imports";
    class ProductCode Country_Name;
    model PCCTradeFlowinUSD = RT RT*RT RT*RT*RT Treatment Treatment*RT Treatment*RT*RT
Treatment*RT*RT*RT ProductCode Country_Name /solution adjrsq;
    label RT = "Relative Year"
                treatment = "Treatment";
run;

/*Exports*/
ods excel options(sheet_name="Exports");
Title "Table 1: Effect of Brexit on UK Trade Flows (Exports)";
footnote2 justify=left "Notes: robust standard errors are in parentheses. *, **, and *** indicate
10%, 5%, and 1% significance levels, respectively."
justify=left "Source: World Integrated Trade Solution (WITS) 2024";

ods output ParameterEstimates=PEforModel2P DataSummary=ObsModel2P
        FitStatistics=AdjRsqModel2P Effects=OverallSigModel2P;

proc surveyreg data=ExpImp4;
    where Year < 2016 and TradeFlowName = "Export";
    class ProductCode Country_Name;
    model PCCTradeFlowinUSD = RT RT*RT RT*RT*RT Treatment Treatment*RT Treatment*RT*RT
Treatment*RT*RT*RT ProductCode Country_Name /solution adjrsq;
    label RT = "Relative Year"
                treatment = "Treatment";
```

```
run;

/*Imports*/
ods excel options(sheet_name="Imports");
Title "Table 1: Effect of Brexit on UK Trade Flows (Imports)";
footnote2 justify=left "Notes: robust standard errors are in parentheses. *, **, and *** indicate
10%, 5%, and 1% significance levels, respectively."
justify=left "Source: World Integrated Trade Solution (WITS) 2024";

ods output ParameterEstimates=PEforModel3P DataSummary=ObsModel3P
            FitStatistics=AdjRsqModel3P Effects=OverallSigModel3P;

proc surveyreg data=ExpImp4;
        where Year < 2016 and TradeFlowName = "Import";
        class ProductCode Country_Name;
        model PCCTradeFlowinUSD = RT RT*RT RT*RT*RT Treatment Treatment*RT Treatment*RT*RT
Treatment*RT*RT*RT ProductCode Country_Name /solution adjrsq;
                label RT = "Relative Year"
                treatment = "Treatment";
run;

/*LOG - ALL TRADE*/
ods excel options(sheet_name="Log All");
Title "Table 1: Effect of Brexit on UK Trade Flows (Overall)";
footnote2 justify=left "Notes: robust standard errors are in parentheses. *, **, and *** indicate
10%, 5%, and 1% significance levels, respectively. Dependant Variable is in Log form."
justify=left "Source: World Integrated Trade Solution (WITS) 2024";

ods output ParameterEstimates=PEforModel4P DataSummary=ObsModel4P
```

```
 FitStatistics=AdjRsqModel4P Effects=OverallSigModel4P;


proc surveyreg data=ExpImp7;
	where Year < 2016 and TradeFlowName = "Total Export & Imports";
	class ProductCode Country_Name;
	model LogPCCTradeFlowinUSD = RT RT*RT RT*RT*RT Treatment Treatment*RT
Treatment*RT*RT Treatment*RT*RT*RT ProductCode Country_Name /solution adjrsq;
	label RT = "Relative Year"
			treatment = "Treatment";
run;


/*LOG - Exports*/
ods excel options(sheet_name="Log Exports");
Title "Table 1: Effect of Brexit on UK Trade Flows (Exports)";
footnote2 justify=left "Notes: robust standard errors are in parentheses. *, **, and *** indicate
10%, 5%, and 1% significance levels, respectively. Dependant Variable is in Log form."
justify=left "Source: World Integrated Trade Solution (WITS) 2024";

ods output ParameterEstimates=PEforModel5P DataSummary=ObsModel5P
 FitStatistics=AdjRsqModel5P Effects=OverallSigModel5P;


proc surveyreg data=ExpImp4;
	where Year < 2016 and TradeFlowName = "Export";
	class ProductCode Country_Name;
	model LogPCCTradeFlowinUSD = RT RT*RT RT*RT*RT Treatment Treatment*RT
Treatment*RT*RT Treatment*RT*RT*RT ProductCode Country_Name /solution adjrsq;
	label RT = "Relative Year"
			treatment = "Treatment";
run;
```

```
/*LOG - Imports*/
ods excel options(sheet_name="Log Imports");
Title "Table 1: Effect of Brexit on UK Trade Flows (Imports)";
footnote2 justify=left "Notes: robust standard errors are in parentheses. *, **, and *** indicate
10%, 5%, and 1% significance levels, respectively. Dependant Variable is in Log form."
justify=left "Source: World Integrated Trade Solution (WITS) 2024";

ods output ParameterEstimates=PEforModel6P DataSummary=ObsModel6P
            FitStatistics=AdjRsqModel6P Effects=OverallSigModel6P;

proc surveyreg data=ExpImp4;
        where Year < 2016 and TradeFlowName = "Import";
        class ProductCode Country_Name;
        model LogPCCTradeFlowinUSD = RT RT*RT RT*RT*RT Treatment Treatment*RT
Treatment*RT*RT Treatment*RT*RT*RT ProductCode Country_Name /solution adjrsq;
                label RT = "Relative Year"
                treatment = "Treatment";
run;

ods excel close;

/*PARALELL TREND CLEANING*/

data Table_Long_P;
   length Model $10 Parameter $60;
   Format parameter $60.;
   set PEforModel1P PEforModel2P PEforModel3P PEforModel4P PEforModel5P PEforModel6P
indsname=M;
```

```
   ThisIsM=M;
   where estimate ne . and substr(Parameter,1,7) ne "Country" and substr(Parameter,1,7) ne "Product";

   length Star $3;
   if Probt le 0.01 then Star="***";
      else if Probt le 0.05 then Star="**";
      else if Probt le 0.10 then Star="*";
      else Star="";

   if M="WORK.PEFORMODEL1P" then Model="Model1P";
      else if M="WORK.PEFORMODEL2P" then Model="Model2P";
      else if M="WORK.PEFORMODEL3P" then Model="Model3P";
      else if M="WORK.PEFORMODEL4P" then Model="Model4P";
      else if M="WORK.PEFORMODEL5P" then Model="Model5P";
      else if M="WORK.PEFORMODEL6P" then Model="Model6P";

   Results=Estimate;
   EditedResults=Cats(put(Results,comma16.3), Star);
   output;

   Results=StdErr;
   EditedResults=Cats("(",put(Results,comma16.3),")");
   output;

   keep Model Parameter EditedResults;
run;

proc sort data=Table_Long_P out=Table_Long_Sorted_P;
   by Model Parameter;
```

```
run;

data Model1PResults(rename=(EditedResults=Model1P))
    Model2PResults(rename=(EditedResults=Model2P))
    Model3PResults(rename=(EditedResults=Model3P))
    Model4PResults(rename=(EditedResults=Model4P))
    Model5PResults(rename=(EditedResults=Model5P))
    Model6PResults(rename=(EditedResults=Model6P));

   set Table_Long_Sorted_P;
   if Model="Model1P" then output Model1PResults;
   else if Model="Model2P" then output Model2PResults;
   else if Model="Model3P" then output Model3PResults;
   else if Model="Model4P" then output Model4PResults;
   else if Model="Model5P" then output Model5PResults;
   else if Model="Model6P" then output Model6PResults;
   drop Model;
run;

data Table_Wide_P;
   merge Model1PResults Model2PResults Model3PResults Model4PResults Model5PResults
Model6PResults;
   by Parameter;

         If Parameter="treatment" then Order=1;
                  Else if Parameter="rt" then Order=2;
                  Else if Parameter="rt*rt" then Order=3;
                  Else if Parameter="rt*rt*rt" then Order=4;
                  Else if Parameter="rt*treatment" then Order=5;
```

```
                Else if Parameter="rt*rt*treatment" then Order=6;
                Else if Parameter="rt*rt*rt*treatment" then Order=7;
                Else if Parameter="intercept" then Order=8;
                Else Order=9;


   if mod(_n_,2)=1 then Regressors=Parameter;
run;

proc sort data=Table_Wide_P out=Table_Wide_Sorted_P;
   by Order; /*later this should be sorted by var: order*/
run;

data NumofObs_P;
   merge ObsModel1P(rename=(NValue1=NVModel1P) drop=CValue1)
      ObsModel2P(rename=(NValue1=NVModel2P) drop=CValue1)
      ObsModel3P(rename=(NValue1=NVModel3P) drop=CValue1)
      ObsModel4P(rename=(NValue1=NVModel4P) drop=CValue1)
      ObsModel5P(rename=(NValue1=NVModel5P) drop=CValue1)
      ObsModel6P(rename=(NValue1=NVModel6P) drop=CValue1);
   where Label1="Number of Observations";
   Model1P=Put(NVModel1P, comma16.);
   Model2P=Put(NVModel2P, comma16.);
   Model3P=Put(NVModel3P, comma16.);
   Model4P=Put(NVModel4P, comma16.);
   Model5P=Put(NVModel5P, comma16.);
   Model6P=Put(NVModel6P, comma16.);
   keep Label1 Model1P Model2P Model3P Model4P Model5P Model6P;
run;
```

```
data AdjRsq_P;
   merge AdjRsqModel1P (rename=(CValue1=Model1P) drop=NValue1)
         AdjRsqModel2P (rename=(CValue1=Model2P) drop=NValue1)
         AdjRsqModel3P (rename=(CValue1=Model3P) drop=NValue1)
         AdjRsqModel4P (rename=(CValue1=Model4P) drop=NValue1)
         AdjRsqModel5P (rename=(CValue1=Model5P) drop=NValue1)
         AdjRsqModel6P (rename=(CValue1=Model6P) drop=NValue1);
   where Label1="Adjusted R-Square";
run;

data OSM1P(rename=(EditedFvalue=Model1P))
    OSM2P(rename=(EditedFvalue=Model2P))
    OSM3P(rename=(EditedFvalue=Model3P))
    OSM4P(rename=(EditedFvalue=Model4P))
    OSM5P(rename=(EditedFvalue=Model5P))
    OSM6P(rename=(EditedFvalue=Model6P));

   set OverallSigModel1P OverallSigModel2P OverallSigModel3P OverallSigModel4P OverallSigModel5P
OverallSigModel6P indsname=M;
   where Effect="Model";

   length Star $3;
   if Probf le 0.01 then Star="***";
      else if Probf le 0.05 then Star="**";
      else if Probf le 0.10 then Star="*";
      else Star="";

   Label1="Overall Significance";
```

```
   EditedFvalue = Cats(put(Fvalue,comma7.2), Star);

   if M="WORK.OVERALLSIGMODEL1P" then output OSM1P;
   else if M="WORK.OVERALLSIGMODEL2P" then output OSM2P;
   else if M="WORK.OVERALLSIGMODEL3P" then output OSM3P;
   else if M="WORK.OVERALLSIGMODEL4P" then output OSM4P;
   else if M="WORK.OVERALLSIGMODEL5P" then output OSM5P;
   else if M="WORK.OVERALLSIGMODEL6P" then output OSM6P;

   keep Label1 EditedFvalue;
run;

data OverallSig_P;
   merge OSM1P OSM2P OSM3P OSM4P OSM5P OSM6P;
run;

Data OtherInfoP;
        Length Label1 Model1 $50;
        Label1="Country and Product Fixed Effects?";
        Model1P="Yes";
        Model2P="Yes";
        Model3P="Yes";
        Model4P="Yes";
        Model5P="Yes";
        Model6P="Yes";
        Output;

run;
```

```
data OtherStat_P;
   length Model1P Model2P Model3P Model4P Model5P Model6P $30 label $50;;
        format label1 $50.;
   set OtherInfoP NumofObs_P AdjRsq_P OverallSig_P;
   rename Label1 = Regressors;
run;

data Table_Wide_Sorted_P_withStat;
   length Regressors $60;
   set Table_Wide_Sorted_P OtherStat_P;
run;

/* Print the clean results table */
ods excel file="/home/u63744480/MySAS/Capstone Project Parallel Trend Table.xlsx/"
options(Embedded_Titles="ON" Embedded_Footnotes="ON"); /*Use the path to your MySAS folder */
Title "Table 2: Parallel Trend of Brexit ";
footnote2 justify=left "Notes: Robust standard errors are in parentheses and clustered at the country-
level. *, **,
and       *** indicate 10%, 5%, and 1% significance levels, respectively. RT means relative year to Brexit
referendum."
justify=left "WITS (2024) and own calculations.";
proc print data=Table_Wide_Sorted_P_withStat noobs;
        var Regressors;
        var Model1P Model2P Model3P Model4P Model5P Model6P / style(header)={just=center}
style(data)={just=center};
        format Regressors $VariableName.;
/*      Model4P Model5P Model6P 12.5;*/
run;
ods excel close;
```

```
proc means data=ExpImp7;
        Class Country_Group TradeFlowName;
        Var PCCTradeFlowinUSD;
run;

ods excel file="/home/u63744480/MySAS/Summary Stats PCC.xlsx/" options(Embedded_Titles="ON"
Embedded_Footnotes="ON"); /*Use the path to your MySAS folder */


/*Regression Model - ALL TRADE*/

ods output ParameterEstimates=PEforModel1 DataSummary=ObsModel1
         FitStatistics=AdjRsqModel1 Effects=OverallSigModel1;
proc surveyreg data=ExpImp7 plots=none;
```

```
        where TradeFlowName = "Total Export & Imports";
        Class Country_Name ProductCode Year/Ref=first;
        Cluster Country_Name;
        Model PCCTradeFlowinUSD = DID ProductCode Year Country_Name /solution adjrsq;
run;
quit;

/*Regression Model - Imports*/

ods output ParameterEstimates=PEforModel2 DataSummary=ObsModel2
         FitStatistics=AdjRsqModel2 Effects=OverallSigModel2;
proc surveyreg data=ExpImp4 plots=none;
        where TradeFlowName = "Import";
        Class Country_Name ProductCode Year/Ref=first;
        Cluster Country_Name;
        Model PCCTradeFlowinUSD = DID ProductCode Year Country_Name /solution adjrsq;
run;
quit;

/*Regression Model - Exports*/

ods output ParameterEstimates=PEforModel3 DataSummary=ObsModel3
         FitStatistics=AdjRsqModel3 Effects=OverallSigModel3;
proc surveyreg data=ExpImp4 plots=none;
                where TradeFlowName = "Export";
        Class Country_Name ProductCode Year/Ref=first;
        Cluster Country_Name;
        Model PCCTradeFlowinUSD = DID ProductCode Year Country_Name /solution adjrsq;
run;
```

```
quit;

/*LOG Regression Model - ALL TRADE*/

ods output ParameterEstimates=PEforModel4 DataSummary=ObsModel4
            FitStatistics=AdjRsqModel4 Effects=OverallSigModel4;
proc surveyreg data=ExpImp7 plots=none;
          where TradeFlowName = "Total Export & Imports";
          Class Country_Name ProductCode Year/Ref=first;
          Cluster Country_Name;
          Model LogPCCTradeFlowinUSD = DID ProductCode Year Country_Name /solution adjrsq;
run;
quit;

/*LOG Regression Model - Imports*/

ods output ParameterEstimates=PEforModel5 DataSummary=ObsModel5
            FitStatistics=AdjRsqModel5 Effects=OverallSigModel5;
proc surveyreg data=ExpImp4 plots=none;
          where TradeFlowName = "Import";
          Class Country_Name ProductCode Year/Ref=first;
          Cluster Country_Name;
          Model LogPCCTradeFlowinUSD = DID ProductCode Year Country_Name /solution adjrsq;
run;
quit;

/*LOG Regression Model - Exports*/

ods output ParameterEstimates=PEforModel6 DataSummary=ObsModel6
```

```
        FitStatistics=AdjRsqModel6 Effects=OverallSigModel6;
proc surveyreg data=ExpImp4 plots=none;
                where TradeFlowName = "Export";
        Class Country_Name ProductCode Year/Ref=first;
        Cluster Country_Name;
        Model LogPCCTradeFlowinUSD = DID ProductCode Year Country_Name /solution adjrsq;
run;
quit;

/*REGRESSION CLEANING*/

Data Table_Long;
    length Model $10;
    length Parameter $30;
    set PEforModel1 PEforModel2 PEforModel3 PEforModel4 PEforModel5 PEforModel6 indsname=M;
    ThisIsM=M;

    length Star $3;
    if Probt le 0.01 then Star="***";
        else if Probt le 0.05 then Star="**";
        else if Probt le 0.10 then Star="*";
        else Star="";

    if M="WORK.PEFORMODEL1" then Model="Model1";
        else if M="WORK.PEFORMODEL2" then Model="Model2";
      else if M="WORK.PEFORMODEL3" then Model="Model3";
      else if M="WORK.PEFORMODEL4" then Model="Model4";
      else if M="WORK.PEFORMODEL5" then Model="Model5";
      else if M="WORK.PEFORMODEL6" then Model="Model6";
```

```
        Results=Estimate;
        EditedResults=Cats(put(Results,comma16.2),Star);
        output;

        Results=StdErr;
        EditedResults=Cats("(",put(Results,comma16.2),")");
        output;

        keep Model Parameter EditedResults /*Probt Star*/;

run;

proc sort data=Table_Long out=Table_Long_Sorted;
        by Model Parameter;
run;

data Model1Results(rename=(EditedResults=Model1))
                Model2Results(rename=(EditedResults=Model2))
                Model3Results(rename=(EditedResults=Model3))
                Model4Results(rename=(EditedResults=Model4))
                Model5Results(rename=(EditedResults=Model5))
                Model6Results(rename=(EditedResults=Model6));

        set Table_Long_Sorted;
        if Model="Model1" then output Model1Results;
                else if Model="Model2" then output Model2Results;
                else if Model="Model3" then output Model3Results;
                else if Model="Model4" then output Model4Results;
```

```
        else if Model="Model5" then output Model5Results;
        else if Model="Model6" then output Model6Results;

    drop Model;
run;

data Table_Wide;
    merge Model1Results Model2Results Model3Results Model4Results Model5Results Model6Results;
    by Parameter;

    length Order 3;
    if Parameter="week" then Order=1;
        else if Parameter="age" then Order=2;
        else Order=3;

    if mod(_n_,2)=1 then Regressors=Parameter;

run;

proc sort data=Table_Wide out=Table_Wide_Sorted(drop=Order Parameter);
    by Order;
run;

Data Table_Long;
    length Model $10;
    length Parameter $30;
    set PEforModel1-PEforModel6 indsname=M;
    ThisIsM=M;
```

```
    Where (Estimate ne 0) and (substr(Parameter,1,7) ne "Country") and (substr(Parameter,1,4) ne
"Year") and (substr(Parameter,1,7) ne "Product");


     length Star $3;
     if Probt le 0.01 then Star="***";
          else if Probt le 0.05 then Star="**";
          else if Probt le 0.10 then Star="*";
          else Star="";

    if M="WORK.PEFORMODEL1" then Model="Model1";
          else if M="WORK.PEFORMODEL2" then Model="Model2";
         else if M="WORK.PEFORMODEL3" then Model="Model3";
         else if M="WORK.PEFORMODEL4" then Model="Model4";
         else if M="WORK.PEFORMODEL5" then Model="Model5";
         else if M="WORK.PEFORMODEL6" then Model="Model6";

     Results=Estimate;
     EditedResults=Cats(put(Results,comma16.2),Star);
     output;

     Results=StdErr;
     EditedResults=Cats("(",put(Results,comma16.2),")");
    output;

   keep Model Parameter EditedResults;

run;

proc sort data=Table_Long out=Table_Long_Sorted;
```

```
    by Model Parameter;
run;

data Model1Results(rename=(EditedResults=Model1))
        Model2Results(rename=(EditedResults=Model2))
        Model3Results(rename=(EditedResults=Model3))
        Model4Results(rename=(EditedResults=Model4))
        Model5Results(rename=(EditedResults=Model5))
        Model6Results(rename=(EditedResults=Model6))
        ;
    set Table_Long_Sorted;
    if Model="Model1" then output Model1Results;
        else if Model="Model2" then output Model2Results;
        else if Model="Model3" then output Model3Results;
        else if Model="Model4" then output Model4Results;
        else if Model="Model5" then output Model5Results;
        else if Model="Model6" then output Model6Results;
run;

data Table_Wide;
    merge Model1Results Model2Results Model3Results Model4Results Model5Results Model6Results;
    by Parameter;

    length Order 3;
    if Parameter="DID" then order=1;
        else if Parameter="Country" then order=2;
        else if Parameter="Year" then order=3;
        else if Parameter="Intercept" then order=4;
```

```
    if mod(_n_,2)=1 then Regressors=Parameter;

run;

proc sort data=Table_Wide out=Table_Wide_Sorted(drop=Order Parameter);
    by Order;
run;

Data NumofObs;
    merge ObsModel1(rename=(NValue1=NVModel1) drop=CValue1)
          ObsModel2(rename=(NValue1=NVModel2) drop=CValue1)
          ObsModel3(rename=(NValue1=NVModel3) drop=CValue1)
          ObsModel4(rename=(NValue1=NVModel4) drop=CValue1)
          ObsModel5(rename=(NValue1=NVModel5) drop=CValue1)
          ObsModel6(rename=(NValue1=NVModel6) drop=CValue1);
    Where Label1="Number of Observations";
    Model1=Put(NVModel1, comma16.);
    Model2=Put(NVModel2, comma16.);
    Model3=Put(NVModel3, comma16.);
    Model4=Put(NVModel4, comma16.);
    Model5=Put(NVModel5, comma16.);
    Model6=Put(NVModel6, comma16.);

    keep Label1 Model1 Model2 Model3 Model4 Model5 Model6;
Run;


Data AdjRsq;
    merge AdjRsqModel1 (rename=(CValue1=Model1) drop=NValue1)
```

```
                AdjRsqModel2 (rename=(CValue1=Model2) drop=NValue1)
        AdjRsqModel3 (rename=(CValue1=Model3) drop=NValue1)
                AdjRsqModel4 (rename=(CValue1=Model4) drop=NValue1)
                AdjRsqModel5 (rename=(CValue1=Model5) drop=NValue1)
                AdjRsqModel6 (rename=(CValue1=Model6) drop=NValue1);
    where Label1="Adjusted R-Square";
Run;

Data OSM1(rename=(EditedFvalue=Model1))
                OSM2(rename=(EditedFvalue=Model2))
    OSM3(rename=(EditedFvalue=Model3))
    OSM4(rename=(EditedFvalue=Model4))
    OSM5(rename=(EditedFvalue=Model5))
    OSM6(rename=(EditedFvalue=Model6)) ;
    Set OverallSigModel1 OverallSigModel2 OverallSigModel3 OverallSigModel4 OverallSigModel5
OverallSigModel6 indsname=M;
    where Effect="Model";
    *ThisIsM=M;

    length Star $3;
    if Probf le 0.01 then Star="***";
        else if Probf le 0.05 then Star="**";
        else if Probf le 0.10 then Star="*";
        else Star="";

    Label1="Overall Significance";

    EditedFvalue=Cats(put(Fvalue,comma7.2),Star);
```

```
    if M="WORK.OVERALLSIGMODEL1" then output OSM1;
        else if M="WORK.OVERALLSIGMODEL2" then output OSM2;
        else if M="WORK.OVERALLSIGMODEL3" then output OSM3;
        else if M="WORK.OVERALLSIGMODEL4" then output OSM4;
        else if M="WORK.OVERALLSIGMODEL5" then output OSM5;
        else if M="WORK.OVERALLSIGMODEL6" then output OSM6;
    Keep Label1 EditedFvalue;

Run;

Data OverallSig;
    merge OSM1 OSM2 OSM3 OSM4 OSM5 OSM6;
run;

Data OtherInfo;
        Length Label1 Model1 $50;
        Label1="Country, Product, and Year Fixed Effects?";
        Model1="Yes";
        Model2="Yes";
        Model3="Yes";
        Model4="Yes";
        Model5="Yes";
        Model6="Yes";
        Output;

run;

Data OtherStat;
                length Model1 Model2 Model3 Model4 Model5 Model6 $30 label1 $50;
```

```
                                format label1 $50.;
        set OtherInfo NumofObs AdjRsq OverallSig;
        rename Label1=Regressors;
run;

Data Table_wide_sorted_withstat;
      length Regressors $50;
      set Table_Wide_Sorted OtherStat;
run;

/* Print the clean results table */
ods excel file="/home/u63744480/MySAS/Capstone Project Regression.xlsx/"
options(Embedded_Titles="ON" Embedded_Footnotes="ON"); /*Use the path to your MySAS folder */
Title "Table 1: Effect of Brexit on UK Trade Flows ";
footnote2 justify=left "Notes: robust standard errors are in parentheses. *, **, and *** indicate
10%, 5%, and 1% significance levels, respectively."
justify=left "Source: World Integrated Trade Solution (WITS) 2024 and own calculations.";
proc print data=Table_wide_sorted_withstat noobs;
            var Regressors;
            var Model1 Model2 Model3 Model4 Model5 Model6 / style(header)={just=center}
style(data)={just=center};
            format Regressors $VariableName.;
run;
ods excel close;


/*PRODUCT ANALYSIS*/
```

```
/*Product Category 1 - ALL TRADE - LOG Regression Model*/

ods output ParameterEstimates=PEforModelP1_1 DataSummary=ObsModelP1_1
            FitStatistics=AdjRsqModelP1_1 Effects=OverallSigModelP1_1;
proc surveyreg data=ExpImp7 plots=none;
          where TradeFlowName = "Total Export & Imports" and ProductCategory="Group1";
          Class Country_Name ProductCode Year/Ref=first;
          Cluster Country_Name;
          Model LogPCCTradeFlowinUSD = DID ProductCode Year Country_Name /solution adjrsq;
run;
quit;

/*Product Category 1 - IMPORTS - LOG Regression Model*/

ods output ParameterEstimates=PEforModelP1_2 DataSummary=ObsModelP1_2
            FitStatistics=AdjRsqModelP1_2 Effects=OverallSigModelP1_2;
proc surveyreg data=ExpImp4 plots=none;
          where TradeFlowName = "Import" and ProductCategory="Group1";
          Class Country_Name ProductCode Year/Ref=first;
          Cluster Country_Name;
          Model LogPCCTradeFlowinUSD = DID ProductCode Year Country_Name /solution adjrsq;
run;
quit;

/*Product Category 1 - EXPORTS - LOG Regression Model*/
```

```
ods output ParameterEstimates=PEforModelP1_3 DataSummary=ObsModelP1_3
          FitStatistics=AdjRsqModelP1_3 Effects=OverallSigModelP1_3;
proc surveyreg data=ExpImp4 plots=none;
                    where TradeFlowName = "Export" and ProductCategory="Group1";
          Class Country_Name ProductCode Year/Ref=first;
          Cluster Country_Name;
          Model LogPCCTradeFlowinUSD = DID ProductCode Year Country_Name /solution adjrsq;
run;
quit;

/*Product Category 2 - ALL TRADE - LOG Regression Model*/

ods output ParameterEstimates=PEforModelP2_1 DataSummary=ObsModelP2_1
          FitStatistics=AdjRsqModelP2_1 Effects=OverallSigModelP2_1;
proc surveyreg data=ExpImp7 plots=none;
          where TradeFlowName = "Total Export & Imports" and ProductCategory="Group2";
          Class Country_Name ProductCode Year/Ref=first;
          Cluster Country_Name;
          Model LogPCCTradeFlowinUSD = DID ProductCode Year Country_Name /solution adjrsq;
run;
quit;

/*Product Category 2 - IMPORTS - LOG Regression Model*/

ods output ParameterEstimates=PEforModelP2_2 DataSummary=ObsModelP2_2
          FitStatistics=AdjRsqModelP2_2 Effects=OverallSigModelP2_2;
proc surveyreg data=ExpImp4 plots=none;
          where TradeFlowName = "Import" and ProductCategory="Group2";
          Class Country_Name ProductCode Year/Ref=first;
```

```
	Cluster Country_Name;
	Model LogPCCTradeFlowinUSD = DID ProductCode Year Country_Name /solution adjrsq;
run;
quit;

/*Product Category 2 - EXPORTS - LOG Regression Model*/

ods output ParameterEstimates=PEforModelP2_3 DataSummary=ObsModelP2_3
	 FitStatistics=AdjRsqModelP2_3 Effects=OverallSigModelP2_3;
proc surveyreg data=ExpImp4 plots=none;
		where TradeFlowName = "Export" and ProductCategory="Group2";
	Class Country_Name ProductCode Year/Ref=first;
	Cluster Country_Name;
	Model LogPCCTradeFlowinUSD = DID ProductCode Year Country_Name /solution adjrsq;
run;
quit;

/*Product Category 3 - ALL TRADE - LOG Regression Model*/

ods output ParameterEstimates=PEforModelP3_1 DataSummary=ObsModelP3_1
	 FitStatistics=AdjRsqModelP3_1 Effects=OverallSigModelP3_1;
proc surveyreg data=ExpImp7 plots=none;
	where TradeFlowName = "Total Export & Imports" and ProductCategory="Group3";
	Class Country_Name ProductCode Year/Ref=first;
	Cluster Country_Name;
	Model LogPCCTradeFlowinUSD = DID ProductCode Year Country_Name /solution adjrsq;
run;
quit;
```

```
/*Product Category 3 - IMPORTS - LOG Regression Model*/

ods output ParameterEstimates=PEforModelP3_2 DataSummary=ObsModelP3_2
            FitStatistics=AdjRsqModelP3_2 Effects=OverallSigModelP3_2;
proc surveyreg data=ExpImp4 plots=none;
          where TradeFlowName = "Import" and ProductCategory="Group3";
          Class Country_Name ProductCode Year/Ref=first;
          Cluster Country_Name;
          Model LogPCCTradeFlowinUSD = DID ProductCode Year Country_Name /solution adjrsq;
run;
quit;

/*Product Category 3 - EXPORTS - LOG Regression Model*/

ods output ParameterEstimates=PEforModelP3_3 DataSummary=ObsModelP3_3
            FitStatistics=AdjRsqModelP3_3 Effects=OverallSigModelP3_3;
proc surveyreg data=ExpImp4 plots=none;
                    where TradeFlowName = "Export" and ProductCategory="Group3";
          Class Country_Name ProductCode Year/Ref=first;
          Cluster Country_Name;
          Model LogPCCTradeFlowinUSD = DID ProductCode Year Country_Name /solution adjrsq;
run;
quit;


/*Product Category 4 - ALL TRADE - LOG Regression Model*/

ods output ParameterEstimates=PEforModelP4_1 DataSummary=ObsModelP4_1
            FitStatistics=AdjRsqModelP4_1 Effects=OverallSigModelP4_1;
```

```
proc surveyreg data=ExpImp7 plots=none;
        where TradeFlowName = "Total Export & Imports" and ProductCategory="Group4";
        Class Country_Name ProductCode Year/Ref=first;
        Cluster Country_Name;
        Model LogPCCTradeFlowinUSD = DID ProductCode Year Country_Name /solution adjrsq;
run;
quit;

/*Product Category 4 - IMPORTS - LOG Regression Model*/

ods output ParameterEstimates=PEforModelP4_2 DataSummary=ObsModelP4_2
         FitStatistics=AdjRsqModelP4_2 Effects=OverallSigModelP4_2;
proc surveyreg data=ExpImp4 plots=none;
        where TradeFlowName = "Import" and ProductCategory="Group4";
        Class Country_Name ProductCode Year/Ref=first;
        Cluster Country_Name;
        Model LogPCCTradeFlowinUSD = DID ProductCode Year Country_Name /solution adjrsq;
run;
quit;

/*Product Category 4 - EXPORTS - LOG Regression Model*/

ods output ParameterEstimates=PEforModelP4_3 DataSummary=ObsModelP4_3
         FitStatistics=AdjRsqModelP4_3 Effects=OverallSigModelP4_3;
proc surveyreg data=ExpImp4 plots=none;
                where TradeFlowName = "Export" and ProductCategory="Group4";
        Class Country_Name ProductCode Year/Ref=first;
        Cluster Country_Name;
        Model LogPCCTradeFlowinUSD = DID ProductCode Year Country_Name /solution adjrsq;
```

```
run;
quit;

/*Product Category 5 - ALL TRADE - LOG Regression Model*/

ods output ParameterEstimates=PEforModelP5_1 DataSummary=ObsModelP5_1
            FitStatistics=AdjRsqModelP5_1 Effects=OverallSigModelP5_1;
proc surveyreg data=ExpImp7 plots=none;
          where TradeFlowName = "Total Export & Imports" and ProductCategory="Group5";
          Class Country_Name ProductCode Year/Ref=first;
          Cluster Country_Name;
          Model LogPCCTradeFlowinUSD = DID ProductCode Year Country_Name /solution adjrsq;
run;
quit;

/*Product Category 5 - IMPORTS - LOG Regression Model*/

ods output ParameterEstimates=PEforModelP5_2 DataSummary=ObsModelP5_2
            FitStatistics=AdjRsqModelP5_2 Effects=OverallSigModelP5_2;
proc surveyreg data=ExpImp4 plots=none;
          where TradeFlowName = "Import" and ProductCategory="Group5";
          Class Country_Name ProductCode Year/Ref=first;
          Cluster Country_Name;
          Model LogPCCTradeFlowinUSD = DID ProductCode Year Country_Name /solution adjrsq;
run;
quit;

/*Product Category 5 - EXPORTS - LOG Regression Model*/
```

```
ods output ParameterEstimates=PEforModelP5_3 DataSummary=ObsModelP5_3
          FitStatistics=AdjRsqModelP5_3 Effects=OverallSigModelP5_3;
proc surveyreg data=ExpImp4 plots=none;
                    where TradeFlowName = "Export" and ProductCategory="Group5";
          Class Country_Name ProductCode Year/Ref=first;
          Cluster Country_Name;
          Model LogPCCTradeFlowinUSD = DID ProductCode Year Country_Name /solution adjrsq;
run;
quit;

/*Product Category 6 - ALL TRADE - LOG Regression Model*/

ods output ParameterEstimates=PEforModelP6_1 DataSummary=ObsModelP6_1
          FitStatistics=AdjRsqModelP6_1 Effects=OverallSigModelP6_1;
proc surveyreg data=ExpImp7 plots=none;
          where TradeFlowName = "Total Export & Imports" and ProductCategory="Group6";
          Class Country_Name ProductCode Year/Ref=first;
          Cluster Country_Name;
          Model LogPCCTradeFlowinUSD = DID ProductCode Year Country_Name /solution adjrsq;
run;
quit;

/*Product Category 6 - IMPORTS - LOG Regression Model*/

ods output ParameterEstimates=PEforModelP6_2 DataSummary=ObsModelP6_2
          FitStatistics=AdjRsqModelP6_2 Effects=OverallSigModelP6_2;
proc surveyreg data=ExpImp4 plots=none;
          where TradeFlowName = "Import" and ProductCategory="Group6";
          Class Country_Name ProductCode Year/Ref=first;
```

```
        Cluster Country_Name;
        Model LogPCCTradeFlowinUSD = DID ProductCode Year Country_Name /solution adjrsq;
run;
quit;

/*Product Category 6 - EXPORTS - LOG Regression Model*/

ods output ParameterEstimates=PEforModelP6_3 DataSummary=ObsModelP6_3
         FitStatistics=AdjRsqModelP6_3 Effects=OverallSigModelP6_3;
proc surveyreg data=ExpImp4 plots=none;
                where TradeFlowName = "Export" and ProductCategory="Group6";
        Class Country_Name ProductCode Year/Ref=first;
        Cluster Country_Name;
        Model LogPCCTradeFlowinUSD = DID ProductCode Year Country_Name /solution adjrsq;
run;
quit;

/*Product Category 7 - ALL TRADE - LOG Regression Model*/

ods output ParameterEstimates=PEforModelP7_1 DataSummary=ObsModelP7_1
         FitStatistics=AdjRsqModelP7_1 Effects=OverallSigModelP7_1;
proc surveyreg data=ExpImp7 plots=none;
        where TradeFlowName = "Total Export & Imports" and ProductCategory="Group7";
        Class Country_Name ProductCode Year/Ref=first;
        Cluster Country_Name;
        Model LogPCCTradeFlowinUSD = DID ProductCode Year Country_Name /solution adjrsq;
run;
quit;
```

```
/*Product Category 7 - IMPORTS - LOG Regression Model*/

ods output ParameterEstimates=PEforModelP7_2 DataSummary=ObsModelP7_2
            FitStatistics=AdjRsqModelP7_2 Effects=OverallSigModelP7_2;
proc surveyreg data=ExpImp4 plots=none;
          where TradeFlowName = "Import" and ProductCategory="Group7";
          Class Country_Name ProductCode Year/Ref=first;
          Cluster Country_Name;
          Model LogPCCTradeFlowinUSD = DID ProductCode Year Country_Name /solution adjrsq;
run;
quit;

/*Product Category 7 - EXPORTS - LOG Regression Model*/

ods output ParameterEstimates=PEforModelP7_3 DataSummary=ObsModelP7_3
            FitStatistics=AdjRsqModelP7_3 Effects=OverallSigModelP7_3;
proc surveyreg data=ExpImp4 plots=none;
                    where TradeFlowName = "Export" and ProductCategory="Group7";
          Class Country_Name ProductCode Year/Ref=first;
          Cluster Country_Name;
          Model LogPCCTradeFlowinUSD = DID ProductCode Year Country_Name /solution adjrsq;
run;
quit;

/*Product Category 8 - ALL TRADE - LOG Regression Model*/

ods output ParameterEstimates=PEforModelP8_1 DataSummary=ObsModelP8_1
            FitStatistics=AdjRsqModelP8_1 Effects=OverallSigModelP8_1;
proc surveyreg data=ExpImp7 plots=none;
```

```
        where TradeFlowName = "Total Export & Imports" and ProductCategory="Group8";
        Class Country_Name ProductCode Year/Ref=first;
        Cluster Country_Name;
        Model LogPCCTradeFlowinUSD = DID ProductCode Year Country_Name /solution adjrsq;
run;
quit;

/*Product Category 8 - IMPORTS - LOG Regression Model*/

ods output ParameterEstimates=PEforModelP8_2 DataSummary=ObsModelP8_2
         FitStatistics=AdjRsqModelP8_2 Effects=OverallSigModelP8_2;
proc surveyreg data=ExpImp4 plots=none;
        where TradeFlowName = "Import" and ProductCategory="Group8";
        Class Country_Name ProductCode Year/Ref=first;
        Cluster Country_Name;
        Model LogPCCTradeFlowinUSD = DID ProductCode Year Country_Name /solution adjrsq;
run;
quit;

/*Product Category 8 - EXPORTS - LOG Regression Model*/

ods output ParameterEstimates=PEforModelP8_3 DataSummary=ObsModelP8_3
         FitStatistics=AdjRsqModelP8_3 Effects=OverallSigModelP8_3;
proc surveyreg data=ExpImp4 plots=none;
                where TradeFlowName = "Export" and ProductCategory="Group8";
        Class Country_Name ProductCode Year/Ref=first;
        Cluster Country_Name;
        Model LogPCCTradeFlowinUSD = DID ProductCode Year Country_Name /solution adjrsq;
run;
```

```
quit;



/*Product Analysis Cleaning*/

Data Table_LongPro;
      length Model $10;
      length Parameter $30;
      set PEforModelP1_1 PEforModelP1_2 PEforModelP1_3
          PEforModelP2_1 PEforModelP2_2 PEforModelP2_3
          PEforModelP3_1 PEforModelP3_2 PEforModelP3_3
          PEforModelP4_1 PEforModelP4_2 PEforModelP4_3
          PEforModelP5_1 PEforModelP5_2 PEforModelP5_3
          PEforModelP6_1 PEforModelP6_2 PEforModelP6_3
          PEforModelP7_1 PEforModelP7_2 PEforModelP7_3
          PEforModelP8_1 PEforModelP8_2 PEforModelP8_3
          indsname=M;
      ThisIsM=M;

   where estimate ne . and substr(Parameter,1,7) ne "Country" and substr(Parameter,1,7) ne "Product";

      length Star $3;
      if Probt le 0.01 then Star="***";
            else if Probt le 0.05 then Star="**";
            else if Probt le 0.10 then Star="*";
            else Star="";

      if M="WORK.PEFORMODELP1_1" then Model="Model1Pro";
```

```
        else if M="WORK.PEFORMODELP1_2" then Model="Model2Pro";
                        else if M="WORK.PEFORMODELP1_3" then Model="Model3Pro";
                                else if M="WORK.PEFORMODELP2_1" then Model="Model4Pro";
                                else if M="WORK.PEFORMODELP2_2" then Model="Model5Pro";
                        else if M="WORK.PEFORMODELP2_3" then Model="Model6Pro";
                        else if M="WORK.PEFORMODELP3_1" then Model="Model7Pro";
                        else if M="WORK.PEFORMODELP3_2" then Model="Model8Pro";
                        else if M="WORK.PEFORMODELP3_3" then Model="Model9Pro";
                        else if M="WORK.PEFORMODELP4_1" then Model="Model10Pro";
                        else if M="WORK.PEFORMODELP4_2" then Model="Model11Pro";
                        else if M="WORK.PEFORMODELP4_3" then Model="Model12Pro";
                        else if M="WORK.PEFORMODELP5_1" then Model="Model13Pro";
                        else if M="WORK.PEFORMODELP5_2" then Model="Model14Pro";
                        else if M="WORK.PEFORMODELP5_3" then Model="Model15Pro";
                        else if M="WORK.PEFORMODELP6_1" then Model="Model16Pro";
                        else if M="WORK.PEFORMODELP6_2" then Model="Model17Pro";
                        else if M="WORK.PEFORMODELP6_3" then Model="Model18Pro";
                        else if M="WORK.PEFORMODELP7_1" then Model="Model19Pro";
                        else if M="WORK.PEFORMODELP7_2" then Model="Model20Pro";
                        else if M="WORK.PEFORMODELP7_3" then Model="Model21Pro";
                        else if M="WORK.PEFORMODELP8_1" then Model="Model22Pro";
                        else if M="WORK.PEFORMODELP8_2" then Model="Model23Pro";
                        else if M="WORK.PEFORMODELP8_3" then Model="Model24Pro";

Results=Estimate;
EditedResults=Cats(put(Results,comma16.2),Star);
output;

Results=StdErr;
```

```
    EditedResults=Cats("(",put(Results,comma16.2),")");
    output;

    keep Model Parameter EditedResults /*Probt Star*/;

run;

proc sort data=Table_LongPro out=Table_Long_SortedPro;
    by Model Parameter;
run;

data Model1ProResults(rename=(EditedResults=Model1Pro))
   Model2ProResults(rename=(EditedResults=Model2Pro))
   Model3ProResults(rename=(EditedResults=Model3Pro))
   Model4ProResults(rename=(EditedResults=Model4Pro))
   Model5ProResults(rename=(EditedResults=Model5Pro))
   Model6ProResults(rename=(EditedResults=Model6Pro))
   Model7ProResults(rename=(EditedResults=Model7Pro))
   Model8ProResults(rename=(EditedResults=Model8Pro))
   Model9ProResults(rename=(EditedResults=Model9Pro))
   Model10ProResults(rename=(EditedResults=Model10Pro))
   Model11ProResults(rename=(EditedResults=Model11Pro))
   Model12ProResults(rename=(EditedResults=Model12Pro))
   Model13ProResults(rename=(EditedResults=Model13Pro))
   Model14ProResults(rename=(EditedResults=Model14Pro))
   Model15ProResults(rename=(EditedResults=Model15Pro))
   Model16ProResults(rename=(EditedResults=Model16Pro))
   Model17ProResults(rename=(EditedResults=Model17Pro))
   Model18ProResults(rename=(EditedResults=Model18Pro))
```

```
Model19ProResults(rename=(EditedResults=Model19Pro))
Model20ProResults(rename=(EditedResults=Model20Pro))
Model21ProResults(rename=(EditedResults=Model21Pro))
Model22ProResults(rename=(EditedResults=Model22Pro))
Model23ProResults(rename=(EditedResults=Model23Pro))
Model24ProResults(rename=(EditedResults=Model24Pro));

set Table_Long_SortedPro;

if Model="Model1Pro" then output Model1ProResults;
else if Model="Model2Pro" then output Model2ProResults;
else if Model="Model3Pro" then output Model3ProResults;
else if Model="Model4Pro" then output Model4ProResults;
else if Model="Model5Pro" then output Model5ProResults;
else if Model="Model6Pro" then output Model6ProResults;
else if Model="Model7Pro" then output Model7ProResults;
else if Model="Model8Pro" then output Model8ProResults;
else if Model="Model9Pro" then output Model9ProResults;
else if Model="Model10Pro" then output Model10ProResults;
else if Model="Model11Pro" then output Model11ProResults;
else if Model="Model12Pro" then output Model12ProResults;
else if Model="Model13Pro" then output Model13ProResults;
else if Model="Model14Pro" then output Model14ProResults;
else if Model="Model15Pro" then output Model15ProResults;
else if Model="Model16Pro" then output Model16ProResults;
else if Model="Model17Pro" then output Model17ProResults;
else if Model="Model18Pro" then output Model18ProResults;
else if Model="Model19Pro" then output Model19ProResults;
else if Model="Model20Pro" then output Model20ProResults;
```

```
   else if Model="Model21Pro" then output Model21ProResults;
   else if Model="Model22Pro" then output Model22ProResults;
   else if Model="Model23Pro" then output Model23ProResults;
   else if Model="Model24Pro" then output Model24ProResults;

   drop Model;
run;



data Table_WidePro;
      merge Model1ProResults Model2ProResults Model3ProResults Model4ProResults
Model5ProResults Model6ProResults
                  Model7ProResults Model8ProResults Model9ProResults Model10ProResults
Model11ProResults Model12ProResults
                  Model13ProResults Model14ProResults Model15ProResults Model16ProResults
Model17ProResults Model18ProResults
                  Model19ProResults Model20ProResults Model21ProResults Model22ProResults
Model23ProResults Model24ProResults;
      by Parameter;

      length Order 3;
      if Parameter="week" then Order=1;
            else if Parameter="age" then Order=2;
            else Order=3;

      if mod(_n_,2)=1 then Regressors=Parameter;

run;

proc sort data=Table_WidePro out=Table_Wide_SortedPro(drop=Order Parameter);
```

```
    by Order;
run;

data NumofObsPro;
  merge
    ObsModelP1_1(rename=(NValue1=NVModel1Pro) drop=CValue1)
    ObsModelP1_2(rename=(NValue1=NVModel2Pro) drop=CValue1)
    ObsModelP1_3(rename=(NValue1=NVModel3Pro) drop=CValue1)
    ObsModelP2_1(rename=(NValue1=NVModel4Pro) drop=CValue1)
    ObsModelP2_2(rename=(NValue1=NVModel5Pro) drop=CValue1)
    ObsModelP2_3(rename=(NValue1=NVModel6Pro) drop=CValue1)
    ObsModelP3_1(rename=(NValue1=NVModel7Pro) drop=CValue1)
    ObsModelP3_2(rename=(NValue1=NVModel8Pro) drop=CValue1)
    ObsModelP3_3(rename=(NValue1=NVModel9Pro) drop=CValue1)
    ObsModelP4_1(rename=(NValue1=NVModel10Pro) drop=CValue1)
    ObsModelP4_2(rename=(NValue1=NVModel11Pro) drop=CValue1)
    ObsModelP4_3(rename=(NValue1=NVModel12Pro) drop=CValue1)
    ObsModelP5_1(rename=(NValue1=NVModel13Pro) drop=CValue1)
    ObsModelP5_2(rename=(NValue1=NVModel14Pro) drop=CValue1)
    ObsModelP5_3(rename=(NValue1=NVModel15Pro) drop=CValue1)
    ObsModelP6_1(rename=(NValue1=NVModel16Pro) drop=CValue1)
    ObsModelP6_2(rename=(NValue1=NVModel17Pro) drop=CValue1)
    ObsModelP6_3(rename=(NValue1=NVModel18Pro) drop=CValue1)
    ObsModelP7_1(rename=(NValue1=NVModel19Pro) drop=CValue1)
    ObsModelP7_2(rename=(NValue1=NVModel20Pro) drop=CValue1)
    ObsModelP7_3(rename=(NValue1=NVModel21Pro) drop=CValue1)
    ObsModelP8_1(rename=(NValue1=NVModel22Pro) drop=CValue1)
    ObsModelP8_2(rename=(NValue1=NVModel23Pro) drop=CValue1)
    ObsModelP8_3(rename=(NValue1=NVModel24Pro) drop=CValue1);
```

```
where Label1 = "Number of Observations";

   Model1Pro=Put(NVModel1Pro, comma16.);
   Model2Pro=Put(NVModel2Pro, comma16.);
   Model3Pro=Put(NVModel3Pro, comma16.);
   Model4Pro=Put(NVModel4Pro, comma16.);
   Model5Pro=Put(NVModel5Pro, comma16.);
   Model6Pro=Put(NVModel6Pro, comma16.);
   Model7Pro=Put(NVModel7Pro, comma16.);
       Model8Pro=Put(NVModel8Pro, comma16.);
   Model9Pro=Put(NVModel9Pro, comma16.);
   Model10Pro=Put(NVModel10Pro, comma16.);
   Model11Pro=Put(NVModel11Pro, comma16.);
   Model12Pro=Put(NVModel12Pro, comma16.);
   Model13Pro=Put(NVModel13Pro, comma16.);
   Model14Pro=Put(NVModel14Pro, comma16.);
       Model15Pro=Put(NVModel15Pro, comma16.);
   Model16Pro=Put(NVModel16Pro, comma16.);
   Model17Pro=Put(NVModel17Pro, comma16.);
   Model18Pro=Put(NVModel18Pro, comma16.);
   Model19Pro=Put(NVModel19Pro, comma16.);
   Model20Pro=Put(NVModel20Pro, comma16.);
   Model21Pro=Put(NVModel21Pro, comma16.);
   Model22Pro=Put(NVModel22Pro, comma16.);
   Model23Pro=Put(NVModel23Pro, comma16.);
   Model24Pro=Put(NVModel24Pro, comma16.);
```

```
    keep Label1 Model1Pro Model2Pro Model3Pro Model4Pro Model5Pro Model6Pro Model7Pro
Model8Pro Model9Pro Model10Pro Model11Pro

                                    Model12Pro Model13Pro Model14Pro Model15Pro Model16Pro
Model17Pro Model18Pro Model19Pro Model20Pro Model21Pro Model22Pro Model23Pro Model24Pro;


Run;



data AdjRsqPro;

  merge

    AdjRsqModelP1_1(rename=(CValue1=Model1Pro) drop=NValue1)

    AdjRsqModelP1_2(rename=(CValue1=Model2Pro) drop=NValue1)

    AdjRsqModelP1_3(rename=(CValue1=Model3Pro) drop=NValue1)

    AdjRsqModelP2_1(rename=(CValue1=Model4Pro) drop=NValue1)

    AdjRsqModelP2_2(rename=(CValue1=Model5Pro) drop=NValue1)

    AdjRsqModelP2_3(rename=(CValue1=Model6Pro) drop=NValue1)

    AdjRsqModelP3_1(rename=(CValue1=Model7Pro) drop=NValue1)

    AdjRsqModelP3_2(rename=(CValue1=Model8Pro) drop=NValue1)

    AdjRsqModelP3_3(rename=(CValue1=Model9Pro) drop=NValue1)

    AdjRsqModelP4_1(rename=(CValue1=Model10Pro) drop=NValue1)

    AdjRsqModelP4_2(rename=(CValue1=Model11Pro) drop=NValue1)

    AdjRsqModelP4_3(rename=(CValue1=Model12Pro) drop=NValue1)

    AdjRsqModelP5_1(rename=(CValue1=Model13Pro) drop=NValue1)

    AdjRsqModelP5_2(rename=(CValue1=Model14Pro) drop=NValue1)

    AdjRsqModelP5_3(rename=(CValue1=Model15Pro) drop=NValue1)

    AdjRsqModelP6_1(rename=(CValue1=Model16Pro) drop=NValue1)

    AdjRsqModelP6_2(rename=(CValue1=Model17Pro) drop=NValue1)

    AdjRsqModelP6_3(rename=(CValue1=Model18Pro) drop=NValue1)

    AdjRsqModelP7_1(rename=(CValue1=Model19Pro) drop=NValue1)
```

```
      AdjRsqModelP7_2(rename=(CValue1=Model20Pro) drop=NValue1)
      AdjRsqModelP7_3(rename=(CValue1=Model21Pro) drop=NValue1)
      AdjRsqModelP8_1(rename=(CValue1=Model22Pro) drop=NValue1)
      AdjRsqModelP8_2(rename=(CValue1=Model23Pro) drop=NValue1)
      AdjRsqModelP8_3(rename=(CValue1=Model24Pro) drop=NValue1);

   where Label1 = "Adjusted R-Square";
run;

Data
  OSM_P1_1(rename=(EditedFvalue=Model1Pro))
OSM_P1_2(rename=(EditedFvalue=Model2Pro))
OSM_P1_3(rename=(EditedFvalue=Model3Pro))
OSM_P2_1(rename=(EditedFvalue=Model4Pro))
OSM_P2_2(rename=(EditedFvalue=Model5Pro))
OSM_P2_3(rename=(EditedFvalue=Model6Pro))
OSM_P3_1(rename=(EditedFvalue=Model7Pro))
OSM_P3_2(rename=(EditedFvalue=Model8Pro))
OSM_P3_3(rename=(EditedFvalue=Model9Pro))
OSM_P4_1(rename=(EditedFvalue=Model10Pro))
OSM_P4_2(rename=(EditedFvalue=Model11Pro))
OSM_P4_3(rename=(EditedFvalue=Model12Pro))
OSM_P5_1(rename=(EditedFvalue=Model13Pro))
OSM_P5_2(rename=(EditedFvalue=Model14Pro))
OSM_P5_3(rename=(EditedFvalue=Model15Pro))
OSM_P6_1(rename=(EditedFvalue=Model16Pro))
OSM_P6_2(rename=(EditedFvalue=Model17Pro))
OSM_P6_3(rename=(EditedFvalue=Model18Pro))
OSM_P7_1(rename=(EditedFvalue=Model19Pro))
```

```
OSM_P7_2(rename=(EditedFvalue=Model20Pro))
OSM_P7_3(rename=(EditedFvalue=Model21Pro))
OSM_P8_1(rename=(EditedFvalue=Model22Pro))
OSM_P8_2(rename=(EditedFvalue=Model23Pro))
OSM_P8_3(rename=(EditedFvalue=Model24Pro));

  Set
                OverallSigModelP1_1 OverallSigModelP1_2 OverallSigModelP1_3 OverallSigModelP2_1
                OverallSigModelP2_2 OverallSigModelP2_3 OverallSigModelP3_1 OverallSigModelP3_2
                OverallSigModelP3_3 OverallSigModelP4_1 OverallSigModelP4_2 OverallSigModelP4_3
                OverallSigModelP5_1 OverallSigModelP5_2 OverallSigModelP5_3 OverallSigModelP6_1
                OverallSigModelP6_2 OverallSigModelP6_3 OverallSigModelP7_1 OverallSigModelP7_2

                OverallSigModelP7_3 OverallSigModelP8_1 OverallSigModelP8_2 OverallSigModelP8_3


    indsname=M;

  where Effect="Model";

    length Star $3;
    if Probf le 0.01 then Star="***";
        else if Probf le 0.05 then Star="**";
        else if Probf le 0.10 then Star="*";
        else Star="";

    Label1="Overall Significance";

    EditedFvalue=Cats(put(Fvalue,comma7.2),Star);
```

```
   if M="WORK.OVERALLSIGMODELP1_1" then output OSM_P1_1;
   else if M="WORK.OVERALLSIGMODELP1_2" then output OSM_P1_2;
   else if M="WORK.OVERALLSIGMODELP1_3" then output OSM_P1_3;
   else if M="WORK.OVERALLSIGMODELP2_1" then output OSM_P2_1;
   else if M="WORK.OVERALLSIGMODELP2_2" then output OSM_P2_2;
   else if M="WORK.OVERALLSIGMODELP2_3" then output OSM_P2_3;
   else if M="WORK.OVERALLSIGMODELP3_1" then output OSM_P3_1;
   else if M="WORK.OVERALLSIGMODELP3_2" then output OSM_P3_2;
   else if M="WORK.OVERALLSIGMODELP3_3" then output OSM_P3_3;
   else if M="WORK.OVERALLSIGMODELP4_1" then output OSM_P4_1;
   else if M="WORK.OVERALLSIGMODELP4_2" then output OSM_P4_2;
   else if M="WORK.OVERALLSIGMODELP4_3" then output OSM_P4_3;
   else if M="WORK.OVERALLSIGMODELP5_1" then output OSM_P5_1;
   else if M="WORK.OVERALLSIGMODELP5_2" then output OSM_P5_2;
   else if M="WORK.OVERALLSIGMODELP5_3" then output OSM_P5_3;
   else if M="WORK.OVERALLSIGMODELP6_1" then output OSM_P6_1;
   else if M="WORK.OVERALLSIGMODELP6_2" then output OSM_P6_2;
   else if M="WORK.OVERALLSIGMODELP6_3" then output OSM_P6_3;
   else if M="WORK.OVERALLSIGMODELP7_1" then output OSM_P7_1;
   else if M="WORK.OVERALLSIGMODELP7_2" then output OSM_P7_2;
   else if M="WORK.OVERALLSIGMODELP7_3" then output OSM_P7_3;
   else if M="WORK.OVERALLSIGMODELP8_1" then output OSM_P8_1;
   else if M="WORK.OVERALLSIGMODELP8_2" then output OSM_P8_2;
   else if M="WORK.OVERALLSIGMODELP8_3" then output OSM_P8_3;

   keep Label1 EditedFvalue;

Run;
```

```
Data OverallSigPro;
   merge
      OSM_P1_1 OSM_P1_2 OSM_P1_3
      OSM_P2_1 OSM_P2_2 OSM_P2_3
      OSM_P3_1 OSM_P3_2 OSM_P3_3
      OSM_P4_1 OSM_P4_2 OSM_P4_3
      OSM_P5_1 OSM_P5_2 OSM_P5_3
      OSM_P6_1 OSM_P6_2 OSM_P6_3
      OSM_P7_1 OSM_P7_2 OSM_P7_3
      OSM_P8_1 OSM_P8_2 OSM_P8_3;
run;



data OtherInfoPro;
   Length Label1 Model1Pro Model2Pro Model3Pro Model4Pro Model5Pro Model6Pro Model7Pro
Model8Pro Model9Pro Model10Pro Model11Pro
                                    Model12Pro Model13Pro Model14Pro Model15Pro Model16Pro
Model17Pro Model18Pro Model19Pro Model20Pro Model21Pro Model22Pro Model23Pro Model24Pro
$50;
   Label1 = "Country and Year Fixed Effects?";
   Model1Pro = "Yes";
   Model2Pro = "Yes";
   Model3Pro = "Yes";
   Model4Pro = "Yes";
   Model5Pro = "Yes";
   Model6Pro = "Yes";
   Model7Pro = "Yes";
   Model8Pro = "Yes";
   Model9Pro = "Yes";
```

```
    Model10Pro = "Yes";
    Model11Pro = "Yes";
    Model12Pro = "Yes";
    Model13Pro = "Yes";
    Model14Pro = "Yes";
    Model15Pro = "Yes";
    Model16Pro = "Yes";
    Model17Pro = "Yes";
    Model18Pro = "Yes";
    Model19Pro = "Yes";
    Model20Pro = "Yes";
    Model21Pro = "Yes";
    Model22Pro = "Yes";
    Model23Pro = "Yes";
    Model24Pro = "Yes";
    Output;
run;


Data OtherStatPro;
                length Model1Pro Model2Pro Model3Pro Model4Pro Model5Pro Model6Pro
                                Model7Pro Model8Pro Model9Pro Model10Pro Model11Pro
Model12Pro
                                Model13Pro Model14Pro Model15Pro Model16Pro Model17Pro
Model8Pro
                                Model19Pro Model20Pro Model21Pro Model22Pro Model23Pro
Model24Pro

                $30 label1 $50;
                        format label1 $50.;
```

```
    set OtherInfoPro NumofObsPro AdjRsqPro OverallSigPro;
    rename Label1=Regressors;
run;

Data Table_wide_sorted_Pro_withstat;
   length Regressors $50;
   set Table_Wide_SortedPro OtherStatPro;
run;

/* Print the clean results table */
ods excel file="/home/u63744480/MySAS/Capstone Project Regression Product Analysis.xlsx/"
options(Embedded_Titles="ON" Embedded_Footnotes="ON"); /*Use the path to your MySAS folder */
Title "Table 1: Product Analysis";
footnote2 justify=left "Notes: robust standard errors are in parentheses. *, **, and *** indicate
10%, 5%, and 1% significance levels, respectively."
justify=left "Source: World Integrated Trade Solution (WITS) 2024 and own calculations.";
proc print data=Table_wide_sorted_Pro_withstat noobs;
        var Regressors;
        var Model1Pro Model2Pro Model3Pro Model4Pro Model5Pro Model6Pro Model7Pro
Model8Pro Model9Pro Model10Pro Model11Pro Model12Pro Model13Pro Model14Pro Model15Pro
Model16Pro Model17Pro Model18Pro Model19Pro Model20Pro Model21Pro Model22Pro Model23Pro
Model24Pro / style(header)={just=center} style(data)={just=center};
        format Regressors $VariableName.;
run;
ods excel close;
```