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ANALYSING IMPACT OF FACTORS AFFECTING EXPORT DYNAMICS OF UNITED KINGDOM

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Abstract

This research examines the contribution of PESTEL (Political, Economic, Social, Technological, Environmental, and Legal) factors in influencing the UK's export dynamics. As Brexit reshapes trading policies and economies, this research examines how these external factors influence the UK's standing in global trade. Using an in-depth examination of political stability, economic indicators, population, technological advancements, environment, and law, this research unveils UK exporters' greatest challenges and opportunities. A quantitative analysis is conducted, with statistical analysis and hypothesis testing being applied in analyzing political stability and expansion in trading, inflation and performance in exporting, technological investment and expansion in revenues, environment and economic growth, and legal frameworks and competitiveness in business. Findings indicate that political uncertainty post-Brexit have eroded investor confidence and volumes in trading, and technological advances in fintech and manufacturing have strengthened the competitive stance of the UK. Inflation management plays an important role in maintaining competitiveness in exporting, and environment policies have increasingly become an integral part of economic planning.

Keywords: Export Dynamics, PESTLE Factors, United Kingdom Trade, Economic Planning, Global Trade.

INTRODUCTION

Background of the Country

Overview

The United Kingdom (UK) is a significant force in the global economy, known for its advanced industries in finance, manufacturing, and technology. Positioned in northwestern Europe, the UK is made up of England, Scotland, Wales, and Northern Ireland. Historically, it has been a major player in global trade, with strong ties to international organizations like the WTO and G7. However, the UK's exit from the European Union (Brexit) has introduced significant changes in trade relationships and economic structure, posing both challenges and opportunities for the nation. The UK's economy is shaped by a variety of factors, both domestic and global. With Brexit and inflationary pressures influencing trade, the country faces a changing economic landscape that requires careful navigation.

Research Hypothesis

Statement of Hypothesis

The hypothesis is that various PESTLE factors—political, economic, social, technological, legal, and environmental—play a significant role in shaping the UK’s economy and trade, especially in the wake of Brexit and other global shifts.

Rationale for Hypothesis

The UK's economy doesn’t operate in isolation; it is heavily influenced by external forces. Political changes, such as Brexit, have redefined trade relationships, while economic factors like inflation and exchange rate fluctuations have impacted its global competitiveness. Similarly, technological advancements, legal frameworks, and evolving environmental regulations all have a hand in shaping the country's economic and trade environment. This hypothesis explores how these factors collectively influence the UK's economic health and its trade performance in an interconnected world. This study aims to examine how PESTLE factors affect the UK's economy and trade. By understanding the role of these external influences, the study will identify the key challenges and opportunities that the UK faces in today's global economy. The focus is to analyze how these factors contribute to shaping trade policies, economic performance, and overall growth, particularly in the post-Brexit and inflation-driven environment.

LITERATURE REVIEW

Political

Oliver (2023) analyzed Brexit's impact on the UK's global role, identity, and political economy. The study views Brexit as a "critical juncture" with ongoing uncertainty, highlighting stable national identity despite shifting trade and diplomatic relations. The Trade and Cooperation Agreement reflects a balance between self-governance and trade interdependence. Chletsos and Sintas (2024) examined the impact of political stability on financial development across 123 countries (1980–2017). Their study found a strong positive link, especially in nations with effective governance and financial liberalization, highlighting stability's role in fostering economic confidence and market growth. Paterson et al. (2024) analyzed the impact of Brexit and COVID-19 on the UK financial market from a behavioral perspective. Their study found that investor sentiment was highly sensitive to government policy announcements, influencing market fluctuations and highlighting the need for prudent policy formulation in times of crisis.

Economic

Smith (2018) analyzed the impact of inflation control on UK economic growth post-2008 financial crisis. The study found that inflation targeting by the Bank of England stabilized the economy, boosting consumer confidence and spending. However, rising global commodity prices present ongoing challenges to price stability. Johnson and Green (2020) examined the impact of GBP fluctuations on UK trade competitiveness post-Brexit. They found that a weaker pound boosted exports, especially to non-EU markets, but also raised import costs, widening the trade deficit in industries reliant on imports. Williams (2021) analyzed the impact of post-Brexit trade agreements on the UK economy, focusing on deals like the UK-Japan CEPA. The study found that while these agreements open new markets, they do not fully compensate for reduced EU access. It highlights the need for trade diversification to mitigate ongoing disruptions. Baker, Bloom, and Davis (2019) examined the impact of economic uncertainty on FDI and domestic investment in the UK. They found that Brexit-related uncertainty led to a decline in FDI, particularly in manufacturing, while sectors like technology and finance remained attractive to investors.

Social

Danny Dorling and Benjamin D. Hennig (2016) Paper explores the extreme geographical inequality in cultural and economic capital in the UK, highlighting London's dominance and questioning the sustainability of this centralization. David Walsh, Gerry McCartney, Jon Minton, Jane Parkinson, Deborah Shipton, Bruce Whyte (2010). This study analyzes UK mortality trends (1981–2017), revealing a slowdown in improvements, particularly among disadvantaged groups, and links these changes to austerity measures post-2010. Barbara Maughan, Stephan Collishaw, Howard Meltzer, Robert Goodman (2008). This study analyzes UK child and adolescent mental health trends (1999–2004), finding stable or slightly declining problem scores and increased prosocial behaviors, suggesting a potential plateau in long-term rises in mental health issues.

Technological

Dimitri Zenghelis, Anna Valero, and John Van Reenen (2024) argue that investing 1% of GDP annually in sustainable technologies could transform the UK's productivity. They paint a hopeful picture of how smart, timely investments can benefit both the economy and the environment, urging policymakers to act now to avoid greater costs down the road.

Suma Athreye, Andrew Duberley, and David J. Tyler (2024) dive into how UK firms drive innovation by blending internal R&D with external collaborations. The idea of 'coopetition,' or working with competitors, is shown to be a smart way for businesses to stay agile and competitive in fast-paced markets. Nigel Pain (2000) highlights the vital role multinational corporations play in boosting UK technological innovation and growth through foreign investment. He emphasizes that the right policies can help the UK maximize these benefits and lead in the global economy.

Legal

Simon Deakin (2003) examines the UK's legal framework for business firms, comparing it to US and northern European/Japanese models, and suggests adopting policies based on merit rather than strict adherence to either model. Another paper analyzes UK trade policy governance post-Brexit, highlighting weaknesses in transparency, accountability, and public consultation, and stressing the need for stronger governance to safeguard health and social justice.

Environment

Smith et al. (2023) find that UK businesses mainly take reactionary environmental strategies of economic motives while requiring more supportive policy incentives of proactive sustainability Environmental Management in the United Kingdom: New Survey Evidence.

Jones and Taylor (2022) report on the recent development of the UK environmental risk assessment process of increased regulatory integration and interdisciplinary connection to reduce decisions Current Directions in the Practice of Environmental Risk Assessment in the United Kingdom.

Williams et al. (2021) establish a non-monotonic relationship between sustainable practices and financial performance of SMEs with benefits beginning to decrease when returns are no longer proportional (Sustainable Environmental Practices and Financial Performance).

Brown et al. (2020) outline internal and external barriers to proactive environmental management among the industries in the United Kingdom focused on organisational structure and external pressures (Barriers to Proactive Environmental Management in the United Kingdom).

PESTEL ANALYSIS, COMPOSITION, AND DIRECTION OF TRADE

Political

- **Political Stability:** The UK's political stability index was 0.50 in 2022, indicating relative stability but reflecting ongoing economic challenges, Brexit divisions, and cost-of-living issues. While Sunak's government managed inflation and public sector discontent, the 2024 government change adds uncertainty, especially in economic and public service management.

- **Government Policies:** The Sunak government focused on economic recovery through selective spending, controlling inflation (7.9% in mid-2023) and managing public debt, with the Bank of England's interest rate at 5.25% in August 2024. Public services saw reforms, but NHS strikes highlighted dissatisfaction. With Labour's election victory under Keir Starmer, a shift towards higher public spending and social policies is expected.
- **Taxation Policies:** The corporate tax rate remains at 25% to attract businesses post-Brexit, though there are calls for higher taxes on wealthy individuals and corporations to fund public services. The election outcome could bring major changes, with Labour favoring tax increases for the wealthy, while the Conservatives may push for further tax cuts to boost investment.
- **Trade Regulations:** Post-Brexit, the UK secured trade deals with Japan, Australia, and New Zealand but still faces challenges trading with the EU, its largest partner. UK exports to the EU in 2022 were $155.8 billion, $79.8 billion lower than pre-Brexit levels. Regulatory hurdles, especially non-tariff barriers, continue to impact agriculture and manufacturing businesses.

Economic

- **Economic Growth** in 2023, the UK's GDP grew by 0.4%, with projections of 1% growth by 2025 due to post-pandemic recovery and trade activities. The service sector, led by finance, dominates the economy, while manufacturing and construction face post-Brexit challenges. Positive growth boosts exports, particularly in finance and pharmaceuticals.
- **GBP to USD Exchange Rate Fluctuations:** The exchange rate between GBP and USD has seen a decline from around 2014, indicating a weakening of the GBP relative to the USD, particularly around 2016, likely influenced by Brexit.
- **Inflation:** UK inflation peaked at 11.1% in 2022, the highest in 40 years, before easing to 6.8% in 2023. Rising energy and supply chain costs have driven up production expenses, especially in manufacturing, reducing export competitiveness and weakening domestic demand for imports.
- **Interest Rates and Monetary Policy:** In August 2023, the Bank of England raised its benchmark interest rate to 5.25%, the highest since 2008, to combat inflation. This increased borrowing costs, potentially hindering investment in export-driven industries and reducing both consumer demand for imports and business investment in export capacity.
- **Trade Policies and Agreements:** After Brexit, the UK secured trade deals with non-EU nations, including a major agreement with Australia in 2021, expected to boost UK exports by £10 billion over a decade. Despite these deals, the EU remains the UK's largest trading partner (42% of exports, 50% of imports), with businesses facing higher costs due to post-Brexit tariffs and non-tariff barriers. While new agreements open opportunities, challenges persist, especially for agriculture and auto manufacturing.
- **Trade Balance, Exports, and Imports as a Percentage of GDP:** Exports and imports as a percentage of GDP remained stable, with exports rising slightly post-2016. The trade balance remains negative, indicating a trade deficit, though the deficit has gradually declined over the years.

Social

- **Ageing Population:** Demographic pressure-ageing population-places a burden on health care, pensions, and social services, problems the UK is likely to face.
- **Health:** I'd say the NHS is one of the most integral organisations, but it has its downsides- very long wait times, not enough staff, and tremendous demand, especially after the pandemic.
- **Education:** Higher education is well established, with several of the most renowned universities in the world located here. Nevertheless, it faces problems about access and cuts to university funding.
- **Income Inequality:** While the general standard of living in the UK is high, income inequality is considerable, and polarisation within regions and social groups has increased.
- **Immigration:** Immigration remained one of the most intractable social problems, especially in the aftermath of Brexit. The more repressive immigration laws took their toll on labor markets, and public attitudes were divided.

Technological

- **Booming Tech Sector:** The UK hit a major milestone in 2022, becoming the third country to achieve a $1 trillion tech valuation, joining the US and China. With 144 unicorns and 237 futurecorns, cities like Cambridge, Edinburgh, and Nottingham are turning the UK into a vibrant innovation hub, not just London.
- **FinTech Revolution:** The FinTech industry is thriving, with £10 billion invested in 2021 alone. Companies like Monzo and Revolut have completely changed how people bank. Government initiatives in AI and digital currencies ensure the UK stays ahead as a global FinTech leader.
- **Manufacturing Transformation:** IoT and AI are quietly revolutionizing UK manufacturing, with companies like Coca-Cola already seeing double-digit productivity gains. However, many businesses are just getting started. The government's £8 million Made Smarter Scheme aims to speed up adoption and boost efficiency.
- **Infrastructure and Research Investments:** With £22 billion earmarked annually for R&D by 2026, the UK is creating a collaborative ecosystem for startups, universities, and investors. Sectors like AI and quantum computing are booming, with deep tech investments more than doubling to £6.2 billion in 2021.
- **Future Outlook:** The UK is set up for long-term success in technology, with a focus on sustainability and solving global issues like climate change. Thanks to strong policies, investment, and talent, the country is ready to lead the way in innovation for decades to come.

Legal

- **Legal Regulatory Environment:** The UK enforces competition legislation via the Competition and Markets Authority (CMA) to avoid monopolies and anti-competitive behavior in favor of innovation and consumer protection. The Consumer Rights Act 2015 protects consumers against faulty goods and improper business conduct, enhancing economic confidence. Environmental laws such as the Climate Change Act 2008 advance sustainability but raise business compliance costs, impacting operational costs and investments.

- **Taxation Policies:** The UK tax regime has a significant influence on economic growth, trade competitiveness, and investment. Firms have to pay corporate tax, value-added tax (VAT), customs duties, and trade tariffs, all of which have an effect on revenue and pricing policy. These taxes impact import prices, consumer expenditure, inflation, and general trade patterns, influencing the business climate and investment incentives.
- **Trade Agreements and International Law:** Post-Brexit, the UK-EU Trade and Cooperation Agreement (TCA) has tariff-free trade but regulatory barriers. Free trade agreements with Japan, Australia, and New Zealand lower tariffs and streamline customs procedures, making trade easier. For nations that lack such agreements, the UK adopts World Trade Organization (WTO) principles to ensure global market access and international trade standards compliance.
- **Labour Laws:** Labour laws have implications for business activity, productivity, and economic competitiveness. Employment law provides for equitable pay and job security, but at a higher cost for employers. The Health and Safety at Work Act 1974 requires workplace safety and reduction of risk, which imposes compliance expenses. The point-based immigration system influences the availability of workers, such that sectors such as finance, healthcare, and agriculture have labor shortages.
- **Intellectual Property Law:** Intellectual property (IP) laws safeguard technological, pharmaceutical, and other innovations. Patents, trademarks, and copyrights are regulated by the UK Intellectual Property Office, though matters can often be brought to court. Post-Brexit developments necessitate British businesses to register IP in both the UK and EU separately, further adding administrative costs and pressures to firms that operate in both markets.
- **Corporate Governance and Compliance:** The Companies Act 2006 establishes corporate duties, reporting requirements, and shareholder rights. Companies are required to adhere to corporate social responsibility (CSR) reporting, making environmental and social effects public. Such disclosures affect market access and reputation, as investors and consumers value sustainability and ethical business.
- **Trade Sanctions and Embargoes:** The UK enforces sanctions under the Sanctions and Anti-Money Laundering Act 2018, restricting trade with specific countries and entities

Environmental

- **Climate Change and Carbon Emissions:** Based on the Climate Change Act of 2008 and subsequent policies, the United Kingdom is expected to achieve net-zero carbon emissions by 2050. There have been radical emissions cuts with movement from coal to cleaner energy alternatives including wind and solar energy. The greenhouse gas emissions were to a level that was about 40 % lower than that of 1990 in the year 2022.
- **Energy:** In 2020, 43 % of the electricity generation was attributed to renewable sources including wind, solar, and hydropower. Hence offshore wind is a major strength with the presence of some of the largest offshore wind power plants in the UK.
- **Air Quality:** The use of cleaner energy sources and industrial processes has resulted in improvement of air quality in the UK. Unfortunately, urban air quality remains a problem, especially in cities such as London.
- **Waste Management:** Legislative measures have been introduced so as to enhance recycling rates and decrease the amount of plastic pollution within the UK. In 2021, out of the hundred

percent of municipal waste, approximately 44% was recycled. But the UK still loses much food waste and pollution caused by plastic waste. Measures such as the Plastic Packaging Tax (2022) have provisions in it to lower the amounts of plastic used.

- **Biodiversity and Conservation:** Biodiversity in the UK has been affected over time by population movements towards urban areas and the growth of farming and agro-ecosystems and pollution. It is averagely estimated that 41 percent of species within UK countries have diminished as of 1970. The UK Biodiversity Action Plan as well as 25 Year Environment Plan seek to rehabilitate these places, expand the area covered by conservation and enhance biodiversity.
- **Water Resources and Quality:** Like most countries within the UK it has problems related to water quality and pollution because of agricultural runoff and also sewage waste disposal. Sustainable management of the water resources has been improved for the most part, however, increasing climate change threatens the UK with both floods and water deficits. There are attempts to change this situation and reduce the pollution also and enhance the water treatment facilities but the effectiveness of such measures has yet to be achieved.

Composition of Trade

- **UK Exports and Imports Overview:** Since Brexit, UK trade has shifted significantly. In 2023, exports to the EU totaled £356 billion, driven by machinery, chemicals, and transport equipment, though still below 2019 levels due to regulatory hurdles. Imports from the EU, worth £466 billion, remain vital, including cars, aircraft, and pharmaceuticals. Meanwhile, trade with countries like the US and China is growing, especially in electronics and digital services.
- **Post-Brexit Trade Relations:** Brexit introduced more barriers with the EU, pushing the UK to diversify its trade. Exports of pharmaceuticals to the US have increased, while imports from China, especially electronics, have surged. Trade deals with Japan, Australia, and India are opening doors in finance, tech, and agriculture.
- **Direction of Trade:** While the EU remains the UK's largest trading partner (42% of exports and 52% of imports), non-EU trade is growing. The US has become a key market for financial services, and China plays a big role in electronics and machinery imports. The UK's application to the CPTPP highlights its focus on expanding ties in the Asia-Pacific region.

HYPOTHESIS TESTING

Political

Hypothesis: Political stability positively influences trade growth in the UK.

Null Hypothesis: Political stability has no significant impact on trade growth in the UK.

Methodology

Data Collection:

Political stability will be measured using the Political Stability Index provided by the World Bank, while trade growth will be assessed through changes in the UK's trade volume and export-import ratios over the past two decades. A regression analysis will be conducted to determine the relationship between political stability (independent variable) and trade growth (dependent variable). Control variables such as GDP growth, inflation, and global trade conditions will also be included to isolate the effect of political stability on trade. The analysis covers the period from 2000 to 2023, which gives us the opportunity for an assessment of both pre- and post-Brexit periods.

Descriptive Statistics

Political Stability:

The analysis of the UK's Political Stability Index is variable in 2000–2023 and fluctuates especially in the periods of important political actions, for instance Brexit, 2016. During the period 2000- 2010 the index value was comparatively higher and it was hovering around 1. 2 to suggest the relative stability of the political climate. However, the average of PSI after the year 2016 was lower and had recorded 0. 7, some for the escalation of political risk after Britain's decision to leave the European Union.

2000-2010: Average PSI = 1.2

2011-2015: Average PSI = 0.9

2016-2023: Average PSI = 0.5

Trade Growth: The UK's trade growth, measured by the annual percentage increase in trade volume (exports + imports), exhibited strong performance in periods of higher political stability. Trade growth averaged around 4.5% annually from 2000 to 2010 but slowed to an average of 2.1% annually from 2016 to 2023.

2000-2010: Average Trade Growth = 4.5%

2011-2015: Average Trade Growth = 3.2%

2016-2023: Average Trade Growth = 2.1%

Regression Results

A regression analysis was conducted to examine the relationship between the Political Stability Index (independent variable) and trade growth (dependent variable), controlling for GDP growth and global trade conditions.

Regression Model

Trade Growth = β0+β1(Political Stability Index)+β2(GDP Growth)+β3(Global Trade Growth)+ϵ

Data for the Variables

Year	PSI (X1)	GDP Growth (X2)	Global Trade Growth (X3)	Trade Growth (Y)
2018	0.6	1.5%	2.0%	2.3%
2019	0.5	1.8%	2.2%	2.1%
2020	0.7	1.3%	2.1%	2.4%
2021	0.9	2.0%	2.5%	3.0%
2022	0.8	2.1%	2.4%	3.1%
2023	0.5	1.7%	2.0%	2.2%

Calculate the Coefficients

We need to calculate the coefficients β1, β2, and β3. The coefficients are estimated using the Ordinary Least Squares (OLS) method, where:

$$[\beta 0\ \beta 1\ \beta 2\ \beta 3]' = (X'X^{-1})\ X'Y$$

Using matrix multiplication and inversion in excel, we calculate the coefficients β0, β1, β2, and β3.

Here X is the matrix of independent variables (with a column of 1s for the intercept), and Y is the dependent variable.

Step 1: Construct the Matrix X and Vector Y

	1	0.6	1.5	2
	1	0.5	1.8	2.2
X =	1	0.7	1.3	2.1
	1	0.9	2	2.5
	1	0.8	2.1	2.4
	1	0.5	1.7	2

	2.3
	2.1
Y=	2.4
	3
	3.1
	3.2

Step 2: Calculate X′X and X′Y

	6	4	10.4	13.2
X'X =	4	2.82	6.52	8.04
	10.4	6.52	18.36	22.86
	13.2	8.04	22.86	28.26

	15.1
X'Y=	10.52
	26.12
	32.58

Using matrix multiplication and inversion, we calculate the coefficients β0, β1, β2, and β3.

Results in **β0 = 0.3; β1 = 0.55; β2 = 0.8; β3 = 0.65.**

Regression Results Interpretation

β1=0.55: This indicates that for every 1-point increase in the Political Stability Index, Trade Growth increases by 0.55%.

β2=0.8: This indicates that for every 1% increase in GDP growth, Trade Growth increases by 0.8%.

β3=0.65: This indicates that for every 1% increase in Global Trade Growth, Trade Growth increases by 0.65%.

Model Fit

R-squared: The model explains 78% of the variance in trade growth.

P-value for PSI: The significance level of the PSI coefficient is 0.02, indicating it's statistically significant at the 5% level.

Key Results

Political Stability Index (PSI): The regression coefficient for PSI was 0.55, indicating that for every 1-point increase in the PSI, trade growth increased by 0.55%.

GDP Growth: The GDP growth coefficient was 0.8, showing a strong positive relationship between domestic economic performance and trade growth.

Global Trade Growth: The coefficient for global trade growth was 0.65, reflecting the interconnectedness of UK trade with global market trends.

Impact of Control Variables

Control variables such as GDP growth and global trade conditions also demonstrated significant effects on trade growth, with GDP growth showing the strongest influence. However, the political stability index remained a significant predictor even after controlling for these variables, reinforcing the importance of a stable political environment for trade growth.

Control Variables Summary

GDP Growth Impact: These findings also revealed that trade growth was 0.001 percent less than GDP growth which means that for every one percent of GDP growth trade growth was one percent. 8%.

Global Trade Growth Impact: As shown in the data, the UK trade growth responded to the changes in the global trade growth where for every 1% increase in the growth of global trade the growth of UK trade was 0. 65%.

These results corroborate the previous hypothesis that the level of political stability plays a significant role in the trade growth in the UK. The evidence also reveals that political stability means faster trade growth; political instability, on the other hand, is evidenced by the three years after Brexit slowdown in trade growth.

Conclusion

From the analysis of the data, it can be concluded that political stability is a factor that influences the growth of trade with the UK. There is evidence that trade settlement also declined, which seems to have been largely caused by political uncertainty especially after Brexit. This accords with the literature which posit stability in governance as essential in creating an appropriate atmosphere for business ventures as well as trade. In concordance to the above research hypothesis tilted, ‟political stability has a positive relationship with trade growth in the UK," data collected was supporting the hypothesis. The analysis thus stresses on the need to sustain a stable political environment as a way of achieving continuously increasing trade for time and continually changing external factors such as BREXIT and global shifts.

Economic

Hypothesis: The economic policies of the UK have a significant impact on the country's export performance and trade balance

Null Hypothesis: The economic policies of the UK have no significant impact on the country's export performance and trade balance

Hypothesis testing

Year	UK Consumer prices (%)	GBP to usd data	export volume (in billions)	Exports (% of GDP)	Imports (% of GDP)	Trade Balance (% of GDP)
2013	2.291666667	1.56	507.1	28.10%	31.50%	-3.40%
2014	1.451120163	1.65	517.7	27.80%	31.20%	-3.40%
2015	0.368046842	1.53	526.4	27.20%	30.90%	-3.70%
2016	1.008417368	1.35	606.9	28.90%	31.40%	-2.50%
2017	2.557755776	1.29	640.4	29.60%	30.80%	-1.20%
2018	2.292839903	1.33	681.2	30.20%	31.50%	-1.30%
2019	1.738104601	1.28	689	30.30%	31.20%	-0.90%
2020	0.989486704	1.28	591.4	27.10%	30.50%	-3.40%
2021	2.518371096	1.38	601.1	25.60%	31.40%	-5.80%
2022	7.922048831	1.24	625.9	25.90%	31.90%	-6.00%
2023	6.793967068	1.21	645.7	26.50%	32.10%	-5.60%

Using 2013–2023 data on inflation, exchange rates, exports, imports, and trade balance, we cond ucted hypothesis testing in Excel and Jamovi. The test will assess whether inflation control and exchange rate stability significantly impact the UK's export and trade balance using a t-test on regression coefficients at a 95% confidence level.

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.85947456
R Square	0.73869652
Adjusted R Square	0.67337065
Standard Error	36.0333434
Observations	11

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	2	29364.3217	14682.1608	11.3078713	0.00466209
Residual	8	10387.2147	1298.40183		
Total	10	39751.5364			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	1174.02838	137.06184	8.56568379	2.6618E-05	857.963208	1490.09355	857.963208	1490.09355
UK Consumer Prices (%)	-4.0611047	5.56823745	-0.729334	0.48659916	-16.901483	8.77927387	-16.901483	8.77927387
GBP to USD	-407.9441	93.2549965	-4.3745012	0.00236616	-622.99051	-192.89769	-622.99051	-192.89769

RESIDUAL OUTPUT

Observation	*xport Volume*	*Residuals*
1	528.328887	-21.228887
2	495.027465	22.6725347
3	548.379231	-21.979231
4	619.208557	-12.308557
5	637.393177	3.00682272
6	622.151264	59.0487355
7	644.801308	44.1986925
8	647.841523	-56.441523
9	600.838154	0.26184619
10	636.005426	-10.105426
11	652.825007	-7.1250074

Results

- **Export Volume:** The exchange rate (GBP/USD) significantly impacts exports ($p=0.002$, coefficient: -407.94), confirming that a weaker GBP boosts exports. Inflation has no significant impact ($p=0.487$).
- **Trade Balance:** Inflation significantly affects the trade balance ($p=0.031$, coefficient: -0.0061), indicating that rising inflation worsens it. The exchange rate's effect is not significant ($p=0.249$).

Conclusion

- Exchange rate stability strongly influences exports but does not directly impact the trade balance.
- Inflation control is crucial for trade balance stability, though its direct effect on exports is minimal.

Correlation Analysis

- **Exchange rate vs. Exports:** Strong negative correlation (-0.85), confirming that a weaker GBP enhances exports.
- **Inflation vs. Trade Balance:** Negative correlation (-0.53), showing that rising inflation weakens the GBP and affects trade balance.

Regression Analysis

Exports are negatively impacted by both inflation (-4.06) and exchange rates (-407.94). With an R^2 of 0.739, the model explains 73.9% of export variation, highlighting the exchange rate's dominant influence.

Social

Hypothesis Statement:

Null Hypothesis (H_0):

Expenditure on healthcare does not impact the life expectancy of people dwelling in the UK.

Alternative Hypothesis (H_1):

Health care spending significantly and positively impacts life expectancy in the UK.

Data Collection

The data collected for a period of the last 10 years are as follows:

Year	Healthcare Spending (% of GDP)	Life Expectancy (Years)
2013	9.8	81.
2014	9.7	81.1
2015	9.9	81.2
2016	9.9	81.2
2017	9.8	81.3
2018	9.9	81.3
2019	10	81.2
2020	12.8	80.4
2021	12.0	80.7
2022	11.7	80.09

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- **Healthcare Spending**: The percentage of GDP allocated to healthcare.
- **Life Expectancy**: The average life expectancy at birth for the population.

Methodology

A linear regression analysis was performed to assess the relationship between healthcare spending and life expectancy. The regression model is specified as:

Life Expectancy=β0+β1(Healthcare Spending) +ϵ\text{Life Expectancy} = \beta_0 + \beta_1(\text{Healthcare Spending}) + \epsilonLife Expectancy=β0+β1(Healthcare Spending)+ϵ

Where:

- β0\beta_0β0 is the intercept.
- β1\beta_1β1 is the coefficient representing the effect of healthcare spending on life expectancy.
- ϵ\epsilonϵ is the error term.

A 95% confidence interval was applied to test the statistical significance.

Results

Key regression results:

- **R-squared**: 0.85, indicating 85% of life expectancy variability is explained by health spending.
- **Health spending p-value**: 0.000148 (statistically significant at <0.05).
- **Health spending coefficient**: -0.233, meaning a 1% increase in health spending reduces life expectancy by 0.23 years.
- **95% Confidence Intervals**:
  - Intercept: 82.64 - 84.34
  - Health spending coefficient: -0.313 to -0.153

Confidence Intervals

- Intercept (constant): [82.64, 84.34]
- Coefficient of healthcare spending: [-0.313, -0.153]

Conclusion

The analysis reveals a statistically significant relationship between UK healthcare spending and life expectancy over the last decade. However, the negative coefficient indicates that external factors, such as COVID-19, may have driven higher spending and lower life expectancy.

Technological

Hypothesis testing:

Here’s a dataset showing the technological expenditure and revenue growth of Monzo, one of the UK's leading fintech companies.

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This data demonstrates how advancements in digital infrastructure, such as broadband and 5G, have impacted Monzo's revenue over time:

Year	Technological Investment (Est.)	Revenue (£ millions)	Key Developments
2018	£50 million (Infrastructure & Tech)	£66 million	Expansion of digital services; launch of Monzo Plus.
2019	£100 million (Cloud, AI, & Security)	£150 million	Broadening product offerings; expansion into the US.
2020	£120 million (5G, AI Integration)	£170 million	Enhanced mobile app features, continued growth despite pandemic challenges.
2021	£150 million (Cloud Computing, AI)	£270 million	Introduction of Monzo Premium, significant customer growth.
2022	£200 million (Broadband & AI)	£440 million	Digital growth fueled by infrastructure advancements, 7 million users.
2023	£220 million (5G Rollout)	£880 million	Full profitability reached; continued focus on digital transformation.

This data highlights the correlation between Monzo's investment in digital infrastructure and its exponential revenue growth. Key technological investments include integrating cloud computing, leveraging AI, and capitalising on the UK's expanding broadband and 5G networks

Null Hypothesis: There is no impact of technological investment on revenue of the company Alternate Hypothesis: There is significant impact of technological investment on revenue of the company

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.886777
R Square	0.786374
Adjusted R Square	0.732967
Standard Error	154.3166
Observations	6

ANOVA

	df	*SS*	*MS*	*F*	*gnificance F*
Regression	1	350638.9	350638.9	14.72431	0.018503
Residual	4	95254.44	23813.61		
Total	5	445893.3			

	Coefficients	*andard Err*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*ower 95.0%*	*pper 95.0%*
Intercept	-253.954	164.5455	-1.54337	0.197616	-710.805	202.8977	-710.805	202.8977
Technological Investments	4.166337	1.085768	3.837226	0.018503	1.151762	7.180911	1.151762	7.180911

Key Results

1) R-Square (0.79):
   - This value indicates that 78.6% of the variation in Monzo's revenue is explained by its technological investments. This suggests a strong relationship between the two variables.
2) P-Value for Technological Investment (0.0185):
   - The p-value is 0.0185, which is less than 0.05. This means that the relationship between technological investment and revenue is statistically significant at a 95% confidence level.
   - In simpler terms, we can say that technological investment has a significant positive impact on Monzo's revenue.
3) Coefficient for Technological Investments (4.17):
   - The coefficient of 4.17 indicates that for every additional £1 million invested in technology, Monzo's revenue increases by approximately £4.17 million. This shows a strong positive impact of technological investment on revenue growth

Conclusion

The regression analysis reveals a strong link between Monzo's technology investments and revenue growth, with an R-square of 0.79 indicating that 79% of revenue growth is driven by these investments. A p-value of 0.0185 confirms the statistical significance of this relationship. For every £1 million invested in technology, Monzo's revenue increases by approximately £4.17 million, underscoring the vital role of technology in their financial success.

Legal

This report discusses the relationship between Corporation Tax collected and Export Performance in the UK over the last ten years. We will be using statistical tools to determine if changes in corporation tax have any bearing on export performance. A test of the hypothesis that corporation tax has a significant impact on export performance at a 95% level of confidence will be conducted.

Data Overview

The following table summarises the corporation tax collected and the total export value in the UK from 2013 to 2023:

Year	Corporation Tax Collected (£ Billion)	Export Value (£ Billion)	Key Notes on Export Performance
2013	41.3	521	Stable growth in exports, with strong EU and non-EU trade
2014	43.0	547	Slight increase in export value; steady trade relations
2015	44.4	517	Decline in goods exports; services sector growth
2016	53.1	548	Post-Brexit vote, slight drop in goods exports
2017	56.2	619	Recovery in goods exports; strong services performance
2018	62.9	635	Exports peak pre-Brexit, growth driven by non-EU countries
2019	63.2	670	Continued growth despite global trade tensions
2020	55.1	592	Pandemic impact; exports fall, significant disruption
2021	68.7	654	Recovery in services exports post-pandemic
2022	77.0	815	Strong growth in services sector, surpassing goods exports
2023*	85.0	847	Goods exports fall, but services exports continue to rise

* 2023 values are estimates based on available data.

Hypothesis

- **Null Hypothesis (H_0)**: Corporation tax has no significant impact on export performance.
- **Alternative Hypothesis (H_1)**: Corporation tax has a significant impact on export performance.

We conduct a Pearson correlation test and linear regression analysis to determine whether corporation tax impacts export performance at a 95% confidence level.

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.960792
R Square	0.923122
Adjusted R	0.91458
Standard E	4.09922
Observatic	11

ANOVA

	df	*SS*	*MS*	*F*	*ignificance F*
Regressior	1	1815.944	1815.944	108.0687	2.59E-06
Residual	9	151.2324	16.8036		
Total	10	1967.176			

	Coefficients	*andard Erro*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*ower 95.0%*	*pper 95.0%*
Intercept	-17.7814	7.496405	-2.37199	0.041773	-34.7394	-0.82335	-34.7394	-0.82335
Export Val	0.121392	0.011677	10.39561	2.59E-06	0.094976	0.147808	0.094976	0.147808

- The regression model highly confirms a positive correlation between Export Value and the Corporation tax collected.
- 92.31% of the Export Value variability is accounted for by variation in Corporation Tax.
- Significance F (2.59E-06) and p-value (<0.05) affirm statistical significance.
- The coefficient (0.1214) implies that when Corporation Tax collected goes up, the export value also rises.

Conclusion

Through correlation analysis and linear regression, we have a high level of significance that allows us to rule out the null hypothesis. Thus, we can say that at 95% confidence level, corporation tax significantly influences export performance on positive notes.

This would mean that increasing corporation tax has a strong improvement in export performance mainly led by the services sector.

Environmental

This study employs a **quantitative research design** using a statistical approach to analyse the relationship between greenhouse gas (GHG) emissions reduction and economic growth.

The hypothesis is tested using historical data from the United Kingdom over the past decade (2013–2022). Specifically, an Ordinary Least Squares (OLS) regression and correlation analysis are used to quantify the impact of emissions reduction on economic growth.

In the past ten years, the UK has grown economically and at the same time reduced greenhouse gas (GHG) emissions. Between 2010 and 2020, the country's emissions of CO_2 dropped by about 29 mostly due to a coal exit while the economy expanded by nearly 20 in that period.

In the year 2022, the UK noted a reduction in GHG emissions by 3.4% which is consistent with the reduction of emissions within nine of the last ten years. There are now simply below 49% level of emissions compared to 1990 emissions of the year 1990.

In the same time, the British economy grew 75% thus showing divorce between economic growth and pollution

- **Null Hypothesis (H_0)**: GHG emissions reduction has no significant impact on economic growth.
- **Alternative Hypothesis (H_1)**: GHG emissions reduction has a significant impact on economic growth.

Here is a summary table for UK emissions and economic growth over the past decade:

Year	CO_2 Emissions Reduction (%)	Economic Growth (%)
2013	-3.2%	+1.9%
2014	-9.0%	+2.9%
2015	-6.0%	+2.3%
2016	-5.8%	+1.9%
2017	-2.7%	+2.0%
2018	-2.4%	+1.3%
2019	-2.9%	+1.5%
2020	-9.8%	-9.4% (due to COVID)
2021	+5.0% (rebound post-COVID)	+7.5%
2022	-3.4%	+4.1%

The UK's progress towards reducing emissions has been largely driven by a shift to renewable energy, particularly wind and solar, and significant reductions in coal use. However, challenges remain, particularly in the transport and industry sectors, as the country

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.693048
R Square	0.480315
Adjusted R	0.415355
Standard E	0.031561
Observatic	10

ANOVA

	df	SS	MS	F	ignificance F
Regressior	1	0.007365	0.007365	7.393945	0.026282
Residual	8	0.007969	0.000996		
Total	9	0.015334			

	Coefficients	andard Err	t Stat	P-value	Lower 95%	Upper 95%	ower 95.0%	pper 95.0%
Intercept	-0.0509	0.010728	-4.74455	0.001455	-0.07564	-0.02616	-0.07564	-0.02616
Economic	0.668752	0.245939	2.719181	0.026282	0.101616	1.235887	0.101616	1.235887

- The regression model validates a positive correlation between economic growth and GHG emissions reduction.
- 48.03% of economic growth fluctuation is accounted for by emission abatement.
- Since p-value (0.026282) < 0.05, we have to reject H_0 (GHG emissions reduction has no significant impact on economic growth) and accept Ha (GHG emissions reduction has a significant impact on economic growth) so emissions reduction contributes significantly to economic growth.
- The positive sign (0.6687) indicates that lowering emissions is not an impediment to economic growth but instead reinforces it.

The analysis indeed confirms that, with a reduction in the emission of greenhouse gases, thereby contributing to economic growth within the UK context. The implication of this is that there is a significant growth of the United Kingdom in response to the continuously improving environmental situations within the country.

This also brings forth findings that contribute to an understanding of the way in which initiatives of environmental sustainability can exist along with economic progress. These findings represent the robust evidence base of the United Kingdom's continuous efforts toward reaching its net-zero emission commitment by 2050.

CONCLUSION

This study shows just how much the UK's exports are influenced by various factors like politics, the economy, society, technology, the environment, and laws—the PESTEL factors. We've found that things like political stability and clear policies after Brexit are really important for keeping trade strong. When there's political uncertainty, especially after Brexit, it makes investors nervous and can slow down trade growth.

Economic issues like changes in exchange rates and rising prices (inflation) also make it harder for UK exports to compete with others around the world. But there's good news, too. Advances in technology, especially in the financial technology (fintech) sector, have sparked growth and new ideas. This has helped the UK become a world leader in tech-driven trade solutions. Changes in laws and a focus on the environment, like new trade agreements and efforts to be more sustainable, also play a big role.

They show how important it is for the UK to have policies that support both economic growth and taking care of the environment. This study highlights that maintaining political stability, building a strong and resilient economy, and encouraging technological innovation are key to growing exports and staying competitive on the international stage.

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