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DECLARATION

I thus certify that the research paper that we have submitted with the title 'Evaluating Brexit's Impact on Supply Chain Resilience among UK SMEs', is based on real and authentic work that I have completed. All materials derived from outside sources or references to the work of other individuals or organizations have been appropriately referenced and cited. I further guarantee that I have adhered to plagiarism guidelines. I also certify that this study complies with the morals standards and directives set out by the university. The essay has not been published elsewhere, nor will it be submitted for publication in the near future.

Signed:

Date 21/08/2024

Acknowledgments/Dedication

Without the contribution and devoted support of a few people, the study would not have been possible. I would like to thank those people for their assistance and cooperation here. I also want to express my sincere thanks to my supervisor for taking the time to review the drafts of my study and offer helpful suggestions so that I may continue to get better at what I do. Without the thoughtful consideration and assistance of my supervisor, my thesis paper would undoubtedly remain unfinished.

I further want to express my gratitude to my classmates and friends. They have supported me emotionally, been by my side throughout the entire time. They also lifted my spirits when I was feeling down due to work-related stress, and helped me come up with creative solutions when faced with particularly difficult problems. A sincere thank you to all of my close companions.

I would also like to thank my parents, who are the most significant individuals in my life. They are the cornerstone and basis of my personality, and without them, I am nothing. My work is dedicated to them because of their unwavering love and confidence in me, which have always motivated and encouraged me to work hard.

Abstract

Introduction

The introduction section includes background, problem statement, research rationale along with search deliverables. The aim of the study is to assess how Brexit has affected UK SMEs supply chain vulnerability. The study also investigates the implications of Brexit on trade policy and possibilities and supply chain management for the UK SMEs. It also evaluates the macro-economic condition of the country after Brexit.

Literature Review

The Literature review section of the study discusses several related research areas like supply chain management in SMEs, SMEs in the UK, overview of Brexit, effect of Brexit in supply chain of SMEs, changes in trade policies and others. The previous literature has identified that the UK SMEs amount to a large number of businesses which is almost 99%. It has also been observed that Brexit has also helped the SMEs in incorporating local raw materials, local labors, and new legal laws.

Methodology

The research has been done using a primary quantitative mono-method in the form of a survey. It has also followed positivism research philosophy and deductive research approach. The participants were selected based on their inclusion and exclusion criteria. Employees from the UK SMEs are only selected for this research. Random sampling method and cross-sectional time horizon is used. The data was collected through a questionnaire based on the research aim and objectives. The gathered data is analysed through the Reliability and validity analysis, Correlation and Descriptive Analysis. No participants were forced while conducting the research and all authors were duly acknowledged throughout the research.

Finding and Analysis

This section elaborates the valid participants for the search that is 57. With the help of correlation descriptive analysis and reliability and validity analysis, it has been identified that Brexit has also made a significant impact on the macroeconomic condition of the UK. However, Brexit has also improved the supply chain process of the many UK SMEs.

Conclusion

The conclusion chapter includes the summary of the study along with the main findings of the research. The relationship between the study findings and objectives, research questions and hypothesis is constructed here. This chapter also provides recommendations for SMEs to incorporate and some insights for future work on this research area. Some limitations are also described in this chapter.

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Chapter 1: Introduction

1.1 Background of the Research

SMEs make up to 99% of all businesses and 60% of all jobs in the private sector, making them an essential component for the UK economy (Aquilante, 2022). SMEs may find it challenging to carry out the kinds of emergency planning necessary to appropriately handle unanticipated scenarios like Brexit due to financial and human resource constraints. According to Fawzy (2021), the separation among the UK and the EU is known as Brexit. The term 'Brexit' was first coined by Peter Wilding in 2012. On January 31, 2020, the UK formally exited the European Union following a public vote held in 2016 (Fawzy, 2021). Brexit has shaped many new laws and regulations for the UK SMEs. Bailey et al. (2023), suggested that Brexit's consequences on the supply chain are varied with small and medium sized companies. This is consistent with macro-level viewpoints that contend smaller businesses are disproportionately affected by trade barriers. Due to their limited access to intangible resources, these businesses are less able to anticipate and prevent disruptions. As a result, smaller companies have experienced more supply chain categorization and disruptions related to exports as a result of UK-EU trade barriers (Bailey et al., 2023).

The UK held an EU referendum on June 23, 2016, and the outcome indicated that the British people had chosen to withdraw from the European Union. The former prime minister of the United Kingdom, Theresa May, stated that the UK would have to exit the EU Single Market in order to leave the EU (Gysegom et al., 2019; Tetley, 2022). As per the study of Gysegom et al. (2019), proponents of Brexit recognised it as an opportunity to expand trade volumes with different markets in North America. Brexit has created a great deal of uncertainty for UK-based companies' supply chains. It has frequently had greater impact than businesses of all sizes had previously anticipated. Hence, the supply chain networks were in tremendous strains with high levels of ambiguity brought on by worldwide economic trends and severe setbacks by COVID-19 pandemic (Bailey et al., 2023). With over half of all products imports and exports coming from the EU, the UK is the main trade partner. Furthermore, intermediary goods make up a sizable amount of the UK's exports and imports from the EU. ***[Refer to figure 1]***

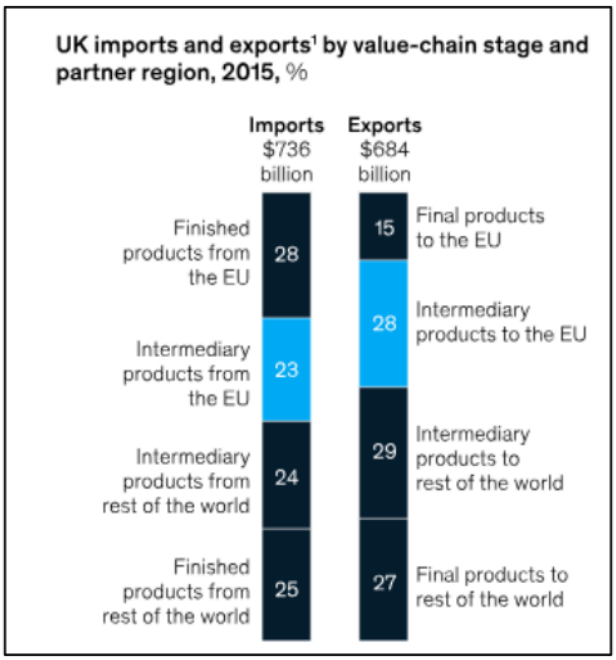

Figure 1: Exported and Imported goods in the UK before Brexit

(Source: Gysegom et al., 2019)

Brexit has caused short-term shortages, price hikes and higher manufacturing costs. Brexit has also resulted in more administrative processes and due research requirements. As per recent studies of Tetley (2022), it was revealed that four out of five UK businesses said that the biggest disruption to the supply chain had been caused by Brexit. Approximately two thirds of businesses reported that they had been fined and experienced negative publicity over the last few years. This is because the items were late due to supply chain disruptions and the delay had resulted in a loss of revenues of about 18% (Gysegom et al., 2019).

Future study objects on the particulars of Brexit and the dangers and uncertainties associated with rearranging supply chain alliances and widely recognised trading structures are crucial. SMEs that use the Just-In-Time method in their supply chain system suffered greatly from Brexit and lacked the power to change dynamics. In order to eliminate and develop strategies to address these effects and thereby support the SMEs, it is imperative to comprehend the difficulties Brexit has presented to the SME's supply chain.

1.2 Problem Statement

Brexit has a major effect on logistics and supply chain operations. The expense of importing and exporting products through the UK-EU border has risen up as a result of the United Kingdom's withdrawal from the EU. Brexit has brought about an array of dangers for small and medium-sized enterprises in the UK, primarily in respect to new trade agreements and market access. According to 70% of small traders surveyed in 2021, the expenses have been increased by additional costs and new policies. The complexity of the new trade restrictions forced 55% of SMEs to delay their shipments, according to a 2022 Institute of Directors survey (Institute of Directors, 2023). On the other hand, the survey stated that the complexity of the new trade restrictions forced 55% of SMEs to delay their shipments (Institute of Directors, 2023). Brexit has been the biggest disruption to the UK's supply chain, mostly because of the regulatory hurdles and delays that followed the 2021 Trade and Cooperation Agreement (TCA). The UK's employment market saw substantial structural changes as a result of the termination of free movement and the implementation of the post-Brexit model. Brexit has also created significant problems for businesses using the Jus-in-Time supply chains.

1.3 Research Rationale

This study rationalises the effect of Brexit on the supply chain resilience among the Small and Medium sized Enterprises within the UK. Brexit brought about predictable disruption, and businesses anticipated problems following the United Kingdom's departure from the European Union. Following Brexit, British laws are no longer superseded by the EU law or the European Court of Justice (Kaloyanova, 2023). The choice to exit the European Union had a detrimental effect on the nation's commercial supply. The purpose of the study is to evaluate the changes in the supply chain process of the UK SMEs. The study is also being conducted to evaluate the possible measures taken by SMEs in the UK to overcome the adverse effect of Brexit. The previous studies on the research area contained limited information about the effect of Brexit on supply chain vulnerability among UK SMEs. Hence, the findings of the study would help in gaining insight on that area.

1.4 Research Aim

The primary aim of this study is to evaluate the impact of Brexit on supply chain vulnerability among UK SMEs.

1.5 Research Objectives

Based on the above mentioned aim of the study, the objectives made to accomplish the aim are:

- To examine the changes in trade policies and opportunities for SMEs of the UK as the effect of Brexit.
- To assess the impact of changes in trade policies and opportunities in the UK SMEs
- To evaluate the measures taken by SMEs to improve SCRM and manage the new trade atmosphere.
- To determine the overall macroeconomic implications of the changes on the UK economy
- To offer recommendations to the managers and policymakers of the UK SMEs based on the research findings

1.6 Research Questions

- What changes are made in trade policies and opportunities for SMEs of the UK as the effect of Brexit?
- How have the changes affected the trade policies and opportunities in the UK SMEs?
- What measures have been taken by SMEs to improve SCRM and manage the new trade atmosphere in the UK?
- How the macroeconomic structure of the UK is transformed by the possible changes?
- What recommendations can be suggested to the managers and policymakers of the UK SMEs?

1.7 Research Deliverables

This dissertation intends to evaluate the impact of Brexit on the supply chain vulnerability among the UK based SMEs. The Brexit event has heavily affected the SMEs in the UK since the trade policies, agreement with the suppliers, shipping costs all were changed. The research also intends to investigate the measures taken by SMEs to cope up with Brexit and improve their SCRM. The result of the possible outcome would help the UK SMEs especially those still struggling with

Brexit to easily manage the crisis. Additionally, the recommendations based on the research outcome would help the UK SMEs to assess alternatives in order to simplify their supply chain management vulnerabilities.

1.8 Outline of Methodology

This research will use ***primary quantitative research*** method in order to evaluate the effect of vulnerability in the affected supply chains among the SMEs in the UK due to Brexit. The primary quantitative method would be a survey. The study would also follow positivism research philosophy along with deductive approach. The target audience for the survey will be the owners and managers of the UK based SMEs. The sample size will be selected through a random sampling method to ensure that a major population is surveyed. The questions of the survey would include about the changes in trade legislation costs, delay and supply chain management following Brexit. The questionnaire will be self-structured with a minimum of 10-15 questions based on research topics.

1.9 Research Structure

Introduction: The introduction chapter aids in comprehending the topic's background by outlining the main goal of the research as well as the objectives.

Literature Review: By presenting details from earlier literary works on the specific subject, this chapter imparts vast knowledge. In addition, it aids in identifying the gaps in the earlier literary works.

Methodology: The third chapter assists in guiding the entire study in the proper path so that the research objectives and questions are addressed properly.

Data Collection and Analysis: This section assists in gathering and evaluating the collected data in a methodical manner in order to address the research objectives.

Findings and Discussion: This chapter discusses the conclusions reached in the preceding chapters.

Conclusion and Recommendation: This section includes a thorough analysis of the research study's findings as well as further recommendations for future study.

1.10 Summary

This chapter describes the primary aim and objectives of this research topic. It provides a thorough overview on how Brexit has affected the supply chain vulnerability of the UK small and medium sized enterprises. This section outlines the background of the research area along with the justifications for the need of conducting this research. The research questions in this section draw light upon the research gaps in the research area. It also provides a general idea of the methodology that will be used in this research.

Chapter 2: Literature Review

2.1 Introduction

This section is called literature review which is a combination of past literary works within a specific research area. According to the study of Kraus et al. (2022), literature review is a summary of published research in a specific field within a specific time frame. Although a literature review can consist solely of a synopsis of the sources. It typically follows an organised format. In this study, this literature review section would evaluate the previous studies in order to address the Brexit's effect on the UK's supply chain vulnerability of the SMEs based on the UK.

2.2 Supply Chain management in SMEs

Supply chain management (SCM) is a comprehensive strategy that addresses demand, sourcing and acquisition, manufacturing, and logistics. The short term strategic goal of SCM is to increase productivity by cutting cycle times and inventories. The long term goal is to increase profits by gaining market share and satisfying the end consumers. Differentiating between the goals of SMEs reveals that collaborating SMEs rarely have a single, unified approach (Nyquist and HasenfuB , 2022). Furthermore, even when SMEs do have a supply chain management strategy, they do not base their own goals on it. Their focus on core competencies impedes their ability to implement strategy. SMEs work to manage their suppliers and customers effectively while concentrating on developing their special strengths. SMEs also seek better negotiating terms based on their distinct capabilities (Alshahrani and Salam, 2022).

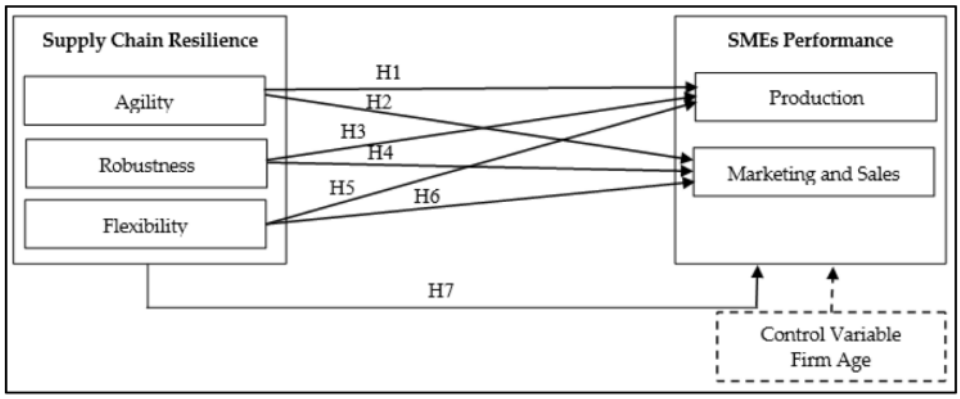

Figure 2: Supply Chain Resilience in SMEs

(Source: Alshahrani and Salam, 2022)

Additionally, SMEs strive to meet certain performance result objectives. The depth of data and product flows are two main areas where SMEs and large companies diverge. Most of the time, SMEs concentrate on their core strengths. As a result, a lot of SMEs anticipate receiving operational support for their daily operations. Since SMEs lack resources, the managers favour basic concepts and processes that require less specialised knowledge. SMEs face several challenges since customer demands are ever-changing, rising competition from online platforms, legal complications are present (IT Convergence, 2021). Hence, SMEs need to maintain the appropriate inventory through a good supply chain management process to thrive and seize expansion possibilities. Any company's reputation can suffer if it is unable to fulfil consumer demand due to inventory shortages and supply interruptions (IT Convergence, 2021). Cloud based software helps SMEs to manage their inventories and make well informed decisions in the supply chain operations.

2.3 Supply chain disruption factors

Both natural and man-made calamities have caused multiple supply chain interruptions. Omotayo et al. (2023) suggested that due to the increasing number of man-made disasters causing such interactions, supply chains are recognized as naturally hazardous. The supply chain is becoming increasingly susceptible to various interruptions as it becomes more efficient. Due to recent globalisation and the lengthening of the supply chain, there are additional risk variables present in every supply chain (Karmaker et al., 2022). Issues with data quality frequently cripple small and medium sized firms, impeding their ability to handle supply chains. On the other hand, SMEs also face difficulties in managing the supply chain due to rapid market shifts, interruptions in supply and shortages of resources. Due to the limited IT budgets, SMEs find it difficult to achieve a comprehensive supply chain like large companies. As per Ramanathan, Aluko and Ramanathan (2021), in matters like invoicing, delayed shipments, shipping quality, small companies have the minimal negotiation power over the suppliers. All these heavily impact the supply chain process of the SMEs in any country.

2.4 SMEs in the UK

SMEs constitute the backbone of the UK economy though the businesses face difficulty of low negotiating power. SMEs make up to 99% of all enterprises in the UK until 2023 with a total number of 5.5 million (Clark, 2022). These small companies are essential for stimulating innovation, economic expansion, and job development within the younger population. Businesses with less than 250 employees and yearly revenue among 50 million euro are classified as SMEs (Buckley, 2023). It has been observed that 96% of UK based SMEs are micro in nature with 0-9 workers (Buckley, 2023). The other 3% are small businesses with 10-49 employees and the last 1% are medium sized companies with 50-249 people (Buckley, 2023). SMEs contribute to 60% of total employment in the UK with revenue of 2.3 trillion euro annually. Almost 16.7 million employees are employed in the SME sector in the UK (FSB, 2024). This demonstrates the economic influence of small enterprises which is more inventive, adaptable and sensitive. The UK SMEs are focused on different sectors like construction, retail, and professional services. Small enterprises are spread throughout the entire nation; however, London and the South East are two major hubs for the SMEs.

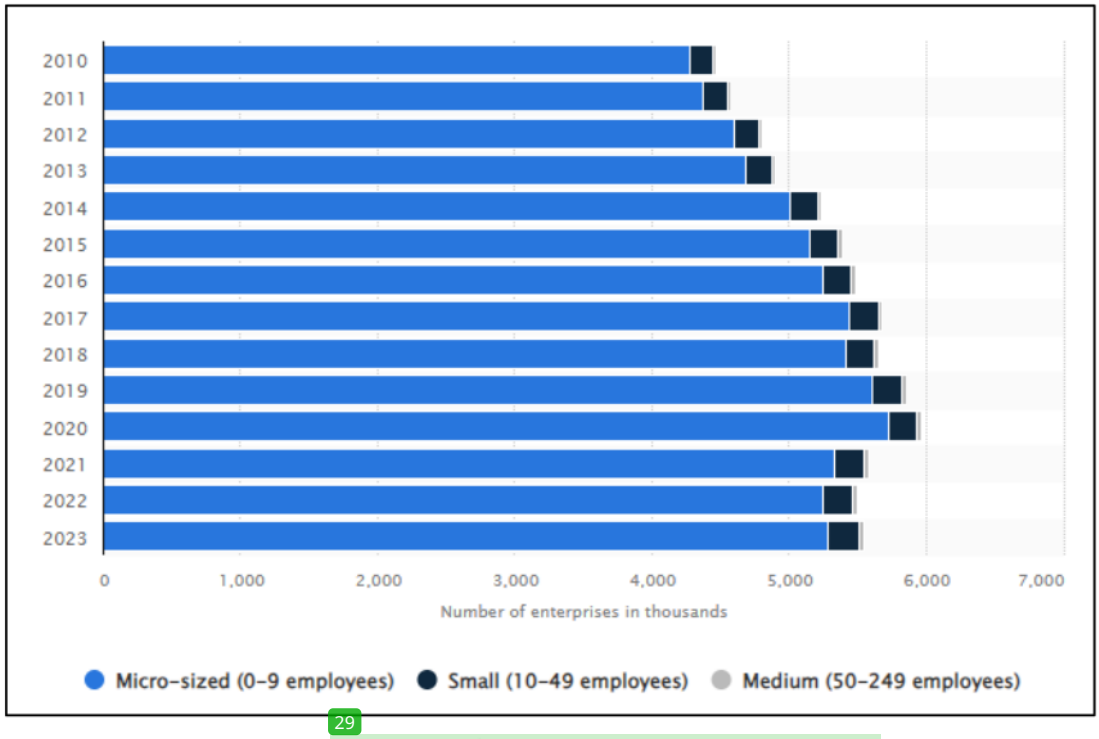

Figure 3: Number of SMEs in the UK from 2010 to 2023

(Source: Clark, 2022)

According to the study of Clark (2024), in the UK, 8.77 million people are employed by micro-sized firms. 4.35 million People are from small businesses and 3.6 million are from medium sized businesses in the year 2023 (Clark, 2024). In order to foster expansion and advancements of small and medium sized companies, the UK government has taken initiatives like business loans, tax reductions and support programs.

2.5 Overview of Brexit

Brexit, often known as the British Exit, is used to describe the UK's decision to exit from the European Union (EU) after a public vote on June 23, 2016. With 51.9% of the voters voting in favour of Brexit, the UK decided to leave the EU (Hunt and Wheeler, 2020). The UK's exit from the EU was a drawn out process that took more than 4 years to finish. In March 2017, the UK government formally informed the EU regarding its withdrawal by invoking Article 50 of the EU Treaty (Hunt and Wheeler, 2020). The terms were negotiated over the course of two years. On 31st January, 2020, the UK finally exited the EU following multiple extensions (New Zealand Foreign Affairs & Trade, 2024). However, the UK entered in an interim phase where it was a member of EU single market and customs union till December, 2020. The EU-UK trade and cooperation agreement is a new trade pact which was effective from January 1, 2021 (New Zealand Foreign Affairs & Trade, 2024). Brexit has both negative and positive output in the UK economy. Some supporters of Brexit said that the UK would be able to pursue independence on both political and economic grounds. On the other hand, some pointed out the economic turmoil and the UK's diminished influence in the international market. The importance of Brexit is still a matter of debate among the World.

2.6 Effect of Brexit in the supply chain of SMEs

The SME supply chains in the UK have been significantly impacted by the UK's exit from the EU. SMEs, which comprise almost 99.9% of all firms in the UK and the backbone of the nation's economy, have encountered several difficulties in adopting the trade environment following Brexit. As opined by Agrawal (2023), one major setback of Brexit is the rising expenses and complexity of international trade. Customs inspections, taxes, legal restrictions for exporting and importing have returned. For numerous SMEs that depend on suppliers and marketplaces in the

EU, the transportation costs have increased with delays and additional paperwork. According to a Federation of Small Businesses report, Brexit has caused 25% of UK SMEs that trade globally to cut back on the amount of EU suppliers (Agrawal, 2023). In a similar context. 24% of the SMEs have witnessed a drop in the number of EU clients (Tetley, 2022). Numerous small businesses have been compelled, frequently at greater expense, to look for new non-EU partners, suppliers and clients (Central Statistics Office, 2021). Brexit has affected not only trade barriers but also the labour pool that SMEs access. Hiring component individuals from only the UK has become more challenging for companies since the UK and the EU no longer enjoy free movement of people (Tetley, 2022). Industries like manufacturing, hospitality and logistics have experienced severe difficulties.

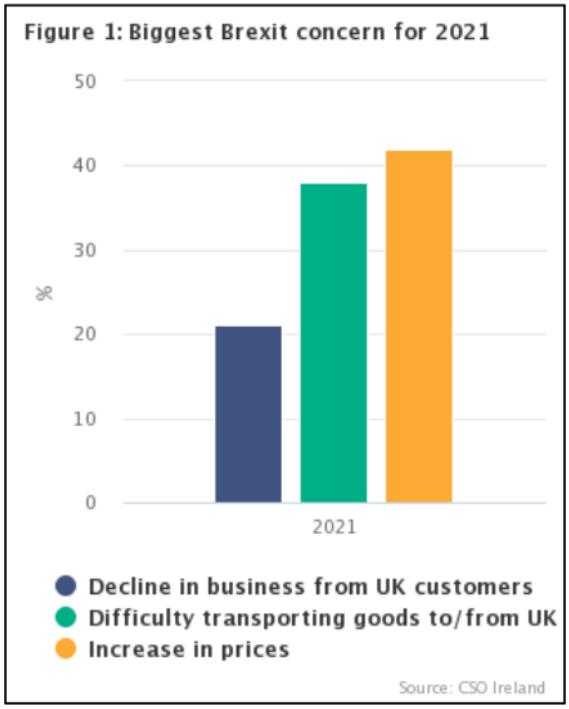

Figure 4: Brexit effects in the UK based SMEs

(Source: Central Statistics Office, 2021)

Moreover, smaller businesses frequently lack the means and negotiating power for the challenging new market. SMEs in the UK now face additional administrative costs related to different new policies, paperwork, sanity inspections. However, the UK government has introduced several initiatives to mitigate those challenges like SME Brexit Support Fund to help in minimising the

supply chain difficulties (Sindakis and Aggarwal, 2022). Nonetheless, large numbers of small company owners have gained more comprehensive support such as simpler custom checks and less shipping costs. However, several SMEs have faced fresh opportunities because of Brexit. Diversification of supply chains, new growth opportunities, switching domestic suppliers, exploring the non-EU are explored by the SMEs (Sindakis and Aggarwal, 2022).

2.7 Changes in trade policies and opportunities as a result of Brexit

The trade environment of the UK has undergone a significant transformation following its exit from the European Union (EU). In the wake of Brexit, the UK has had to rethink its trade agreements and regulations as an earlier member of the EU single market and customs union. The withdrawal of the UK from the EU's single commercial policy is a major change (Kren and Lawless, 2023). The British government can now pursue an autonomous trade agenda and arrange free trade agreements with non-European nations as a consequence of Brexit. The UK has also approved additional free trade agreements (FTAs) with countries like Japan, Australia and Zealand (Du, Satoglu and Shepotylo, 2023). The objectives of these garments are to lower tariffs, lower regulatory obstacles, and increase market share for British companies. A significant Asia-Pacific trade agreement known as the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (International Trade Council, 2023). In addition, significant laws of origin criteria for products moving among the EU and the UK have been crat5ed by the UK-EU Trade and Cooperation Agreement (International Trade Council, 2023).

On the other hand, many businesses now face a substantial administrative cost due to the additional paperwork and risk of supply chain difficulties. But having the freedom to determine their own costs, has also given the UK companies more opportunities to expand into non-EU markets and diversify their trade partnerships (Kren and Lawless, 2023). As suggested by Du, Satoglu and Shepotylo (2023), the UK currently enjoys more freedom to create its own regulations in sectors like data protection, safety and environmental consciousness since it is an independent player operating outside the EU's regulatory framework. This has given SMEs the competitive advantages by allowing them to customise the products to suit specific local tastes. However, some SMEs have faced the risk of trade disruptions especially for businesses whose supply chains are linked across the UK. SMEs with little funding also find it difficult to navigate this changing regulatory environment (Spital and van Aerssen, 2023).

2.8 Measures taken by SMEs to improve the supply chain

Brexit has created substantial concern for UK based companies' supply chains. Companies of all sizes have found the effect to be more than expected. supply networks are under increased pressure due to global socio political and financial instability following the COVID-19 disruptions. Despite the disruption, SMEs in the UK have demonstrated persistence and creativity by utilizing various supply chain techniques and data to plan for any challenges. The small and medium sized businesses in the UK broadened the range of their suppliers to decrease dependency on a single source, particularly if it is based in the EU (Agrawal, 2023). By procuring goods or supplies from various suppliers in different locations, the SMEs have reduced the risks associated with procuring goods from one region. Furthermore, the SMEs are investing heavily in technology and advanced tools and gadgets that enable real-time communication, data exchange and visibility throughout the supply chain. According to the study of Agrawal (2023), many small and medium-sized enterprises have invested in technological advances like supply chain management software, stock monitoring systems and statistical analysis programs to improve their business activities after Brexit. These innovations aid in managing the quantity of stock, boosting accuracy of forecasting, and increasing supply chain transparency and effectiveness.

Additionally, SMEs have concentrated on assuring that they adhere to new norms, processes and paperwork demands following Brexit (Brown, Liñares-Zegarra and Wilson, 2019). Companies are familiarising employees about the new requirements, gaining the requisite certifications, and collaborating directly with customs agents in order to efficiently negotiate the intricacies of the customs clearing procedures. SMEs have also established strong supply chain contingency measures to prepare for any disruptions induced by Brexit-related uncertainty (Sindakis and Aggarwal, 2022). This involves scenario preparation, risk evaluation and establishing emergency procedures to effectively respond to any unexpected events affecting the supply chain. Agrawal (2023) & Bailey et al. (2023), noted that to avoid shortages or surplus inventory after Brexit, SMEs must optimize their inventory management processes. Increasing the turnover of stocks, decreasing storage expenses, and enhancing supply chain flexibility by deploying just-in-time inventory systems, inventory optimization and demand forecasting can be beneficial.

Establishing connections with important vendors is critical for SMEs to guarantee a dependable and robust supply chain after Brexit. Creating mutually beneficial relationships, agreeing advantageous terms and creating direct communication routes with the vendors can all assist to

solve supply chain difficulties efficiently (Brown, Liñares-Zegarra and Wilson, 2019). SMEs make investments in employee education and professional development to help them handle the complexity of the post-Brexit supply chain. This involves instruction on new legislation, customs processes, and guidelines to handle supply chain activities in this ever-changing business world. Adjusting to the evolving trade environment necessitated pre-emptive planning, targeted expenditures and cooperation To guarantee that the supply chain can run smoothly.

2.9 Theoretical Underpinning

When assessing Brexit's influence on supply chain stability within the UK SMEs. numerous theoretical foundations might give a framework for comprehending the process at action. The ***Resource-Based View (RBV)*** is a major theoretical viewpoint that highlights the importance of internal assets and skills in attaining an edge over competitors (Seriki, 2023). In light of Brexit's effect on the supply chain adaptability during Brexit, the RBV recommends that UK SMEs use their particular resources like experience, technology and partnerships, to construct resilient supply chains. As per the theory, the significance of determining and cultivating core competences that will assist SMEs in adapting to changing conditions and mitigating the risks related with Brexit disruptions.

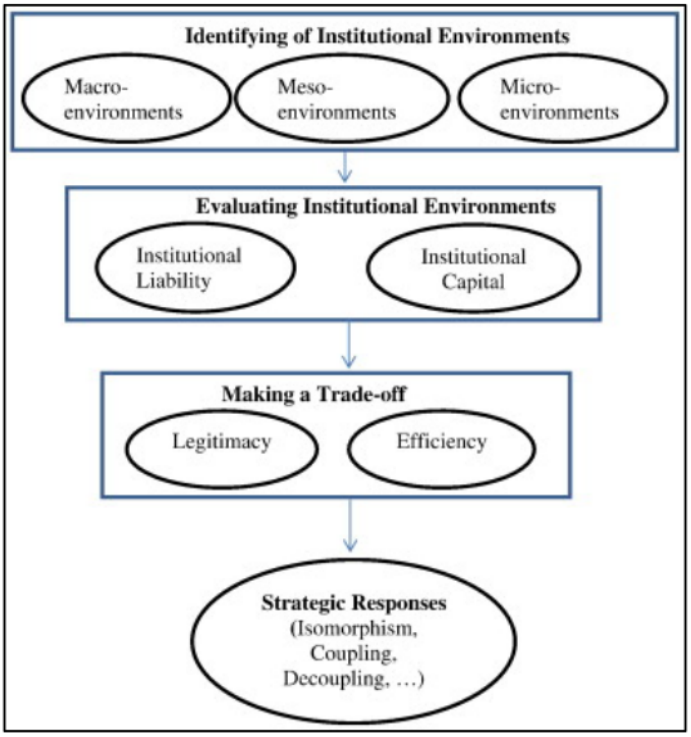

Figure 5: Institutional Theory

(Source: Yang and Su, 2024)

On the contrary, the ***Institutional Theory*** is a different significant theoretical perspective that investigates how the organizations react to external influences and changes in regulation (Yang and Su, 2024). In the context of Brexit, Institutional Theory implies that the UK companies might have to integrate the supply chain processes with new legislation, trade deals, and regulatory processes to guarantee conformity and validity in the post Brexit era. In addition, ***Resilience Theory*** explains how organisations can recover from disturbances and adjust to shifting environments (Van Breda, 2018). UK SMEs can use resilience theory to improve their capacity to foresee, react and rebound from supply chain difficulties after Brexit. A better insight of the underlying mechanism impacting supply chain dynamics in the post Brexit scenario can be acquired by evaluating Brexit's influence on supply networks among UK SMEs using these theories. These theories provide a basis for designing strategies and actions to improve supply chain resilience and reduce the consequences of Brexit on UK SMEs.

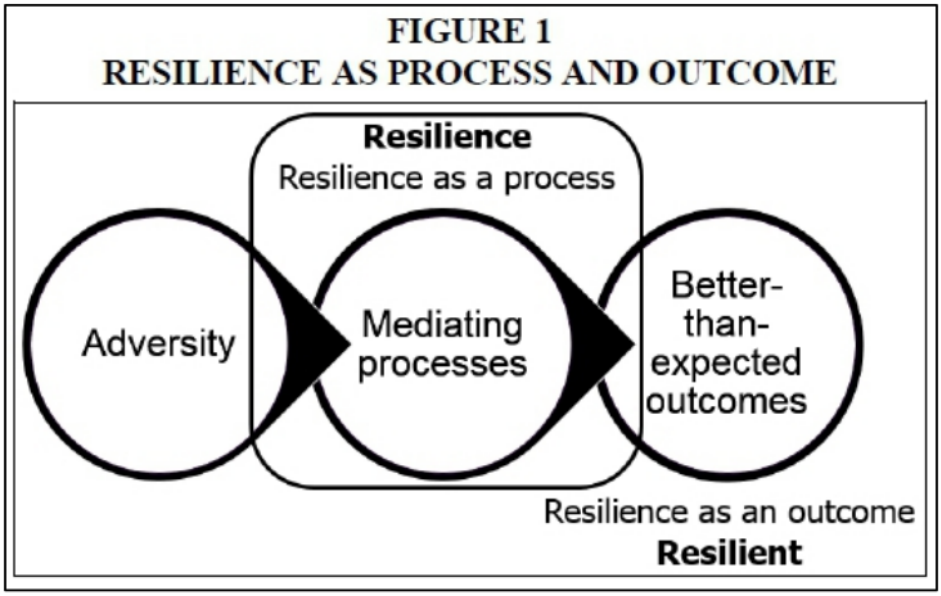

Figure 6: Resilience Theory

(Source: Van Breda, 2018)

2.10 Literature Gap

The above literature has given insights about different topics within the research area. The literature has discussed the process of supply chain management within small and medium-sized businesses around the world. Additionally, the previous literature has critically analysed several supply chain disruption factors along with crucial numbers in the SMEs throughout the UK. The effects of Brexit and changes in trade policies after Brexit were evaluated in past literature. However, there were significant to no insights about the impact of Brexit in supply chain vulnerability of UK SMEs. This insufficient information has created a gap in the literature for the research area. Hence, this study is being conducted to fulfil the created gap by successfully addressing the research aim and objectives.

2.11 Conceptual framework

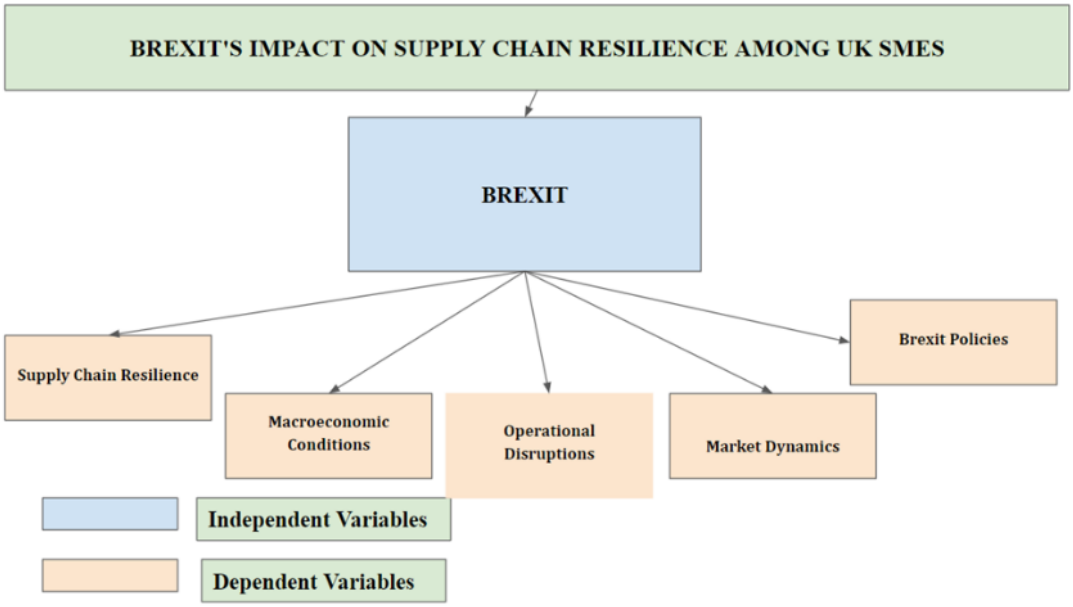

Figure 7: Conceptual Framework

2.12 Hypothesis Testing

H_0: The trade policies and opportunities have not changed for the UK based SMEs as the effect of Brexit.

H_1: The trade policies and opportunities have changed for the UK based SMEs as the effect of Brexit.

H_0: Brexit has not helped the UK SMEs by improving their supply chain management

H_2: Brexit has helped the UK SMEs by improving their supply chain management

H_0: The macroeconomic condition of the UK economy has not been affected by Brexit.

H_3: The macroeconomic condition of the UK economy has been affected by Brexit.

2.13 Summary

From the above discussion, it can be summarised that the previous literature has highlighted the fact that SMEs face several challenges since they lack resources as compared to large companies. Rapid market shifts, interruptions in supply chain, low negotiation skills with the suppliers, limited

IT budget all are disruptions for the SMEs. The past literary works have also identified that SMEs in the UK have suffered due to legal restriction, custom changes, complexity in international trade, inability to make businesses with the EU suppliers and other causes. Many businesses now face a substantial administrative cost due to the additional paperwork and risk of supply chain difficulty. However, some SMEs have invested in technological advances like supply chain management software, stock monitoring systems and statistical analysis programs to improve their business activities after Brexit. Increasing the turnover of stocks, decreasing storage expenses, and enhancing supply chain flexibility by deploying just-in-time inventory systems, inventory optimization and demand forecasting have been applied by several SMEs to cope up with the post-Brexit situation.

Chapter 3: Methodology

3.1 Introduction

A research methodology offers a precise framework that keeps scientists on the correct path, keeping the procedure effortless, efficient, and manageable. It also lends credibility to the study and produces scientifically solid conclusions. The research will be done using the ***Saunders Research Onion***. Saunders, Lewis and Thornhill (2009), presented the research onion framework that depicts the numerous parts of the research that must be considered and organised to develop a solid research design. In this chapter, the research philosophy, research approach, research strategy, research methods along with the rationale of the chosen procedure will be discussed.

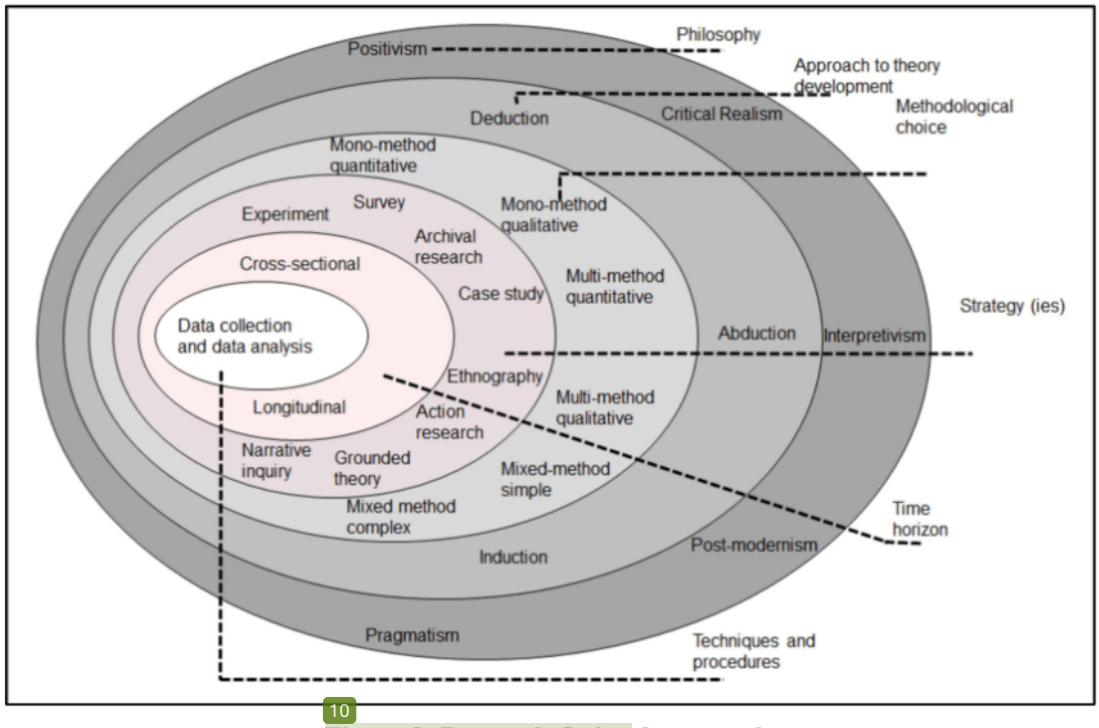

Figure 8: Research Onion framework

(Source: Saunders, Lewis and Thornhill, 2009)

3.2 Research Philosophy with justification

The ***positivism*** research philosophy will be applied in this research study. Positivism frequently uses the application of current concepts to generate hypotheses that are examined throughout the

research phase. Positivism philosophy emphasises only "factual" information obtained by observation, especially measurements that are reliable (Park, Konge and Artino, 2020). In positivist investigations, the researcher's responsibility is confined to collecting and interpreting data objectively. The positivist research philosophy would help in analysing the statistical numeric data gathered from IBM SPSS software.

3.3 Research Approach with justification

The ***deductive*** research approach will be followed in the study. The additional material accessible regarding the subject suggests that the academic style for the current study should mostly be deductive. The decision is informed by certain sensible observations. According to the study of Kim (2021), deductive research reduces broad knowledge of a specific topic down to more particular stages (Dudovskiy, 2019). The deductive technique is commonly connected with scientific study. The deductive approach in this study would help in testing the projected hypothesis with the gathered statistical data.

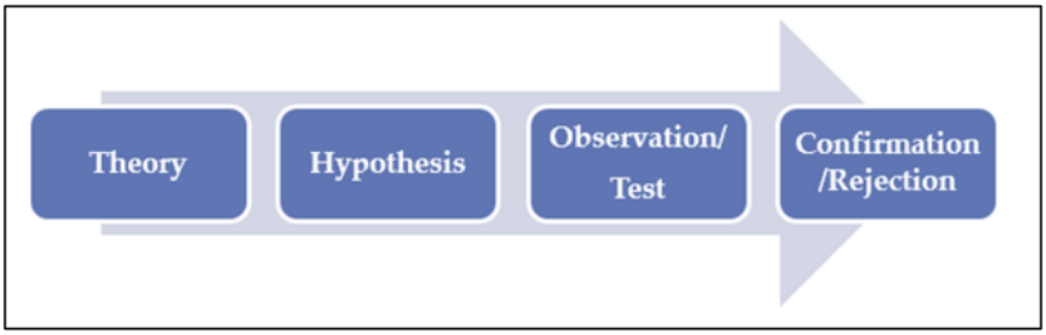

Figure 9: Deductive research approach

(Source: Dudovskiy, 2019)

3.4 Research Strategy with justification

This study will follow a ***primary*** research strategy in the form of a ***survey.*** As stated by Patil (2021), primary research methods provide a focused strategy to market analysis. This enables the research to focus on particular challenges while being totally relevant to the aim and objectives. In this study, the primary research strategies would help in attaining the first hand data from the employees of several UK based SMEs. Furthermore, the survey questionnaire would help in gaining short yet to the point answers to questions.

3.5 Research Method with justification

The research process's methodologies refer to the procedures used to obtain specific data. In this research, a ***quantitative mono-method*** has been followed. Numerous reliable research studies on the identical problem as the current study topic have demonstrated the use of primary data collection for this study. Data analysis with closed-ended questionnaires for surveys as the major instrument for the information collecting procedure. The data collection process for this study would be online through the help of Google Form. Self-structured questionnaire consisting of nineteen questions on the research area is done.

3.6 Research Time Horizon

The time horizon in research onion is the amount of time throughout the research is being conducted. As a result, the time horizon is selected based on research aim and objectives (Matza et al., 2016). In this research, a ***cross-sectional time horizon*** is selected. Cross-sectional time horizon is selected since the research will be done for a short period of time. In the cross-sectional, the data is analysed only one time due to time constraints.

3.7 Research Techniques and Procedures:

3.7.1 Data Collection Methods

This research will deal with primary data gathered from a survey questionnaire of the employees working in the UK based SMEs. The process of data collection will be online through Google Form. The selected participants will be asked to fill up the questionnaire only after taking proper consent for their participation. Due to time and resource constraints, close-ended questionnaires will be structured.

3.7.1.2 Sampling Approach

The researcher would use probability sampling techniques in order to find individuals suitable for the study. From several other probability sampling techniques, a random sampling method will be used for this study. According to Noor, Tajik and Golzar (2022), a random sampling method would make the research results more authentic and unbiased. It can be expected that the sample size

would be between 50 to 100 during the data collecting step. The probability sampling also helps in selecting this large number of participants in an easy manner.

3.7.1.2 Questionnaire Design Table

Factors/Variables	Question Numbers	Sources of Literature
Demographic	1,2	The demographic questions indicate that the participants are solely residents of the UK and their gender. This implies that no other person from another country has been taken for this survey.
Work Experience	2.3,4	The questions related to work experience evaluates the years of experience of the surveyed person in SME of the UK. The job role of the concerned person is also discussed to ensure that only employees and executives from UK based SMEs are taken. Jackson and Tomlinson (2021), stated that employees who work in a company for more than 2 years have strong insight about its operations.
Changes after Brexit within the UK SMEs	5,6,7	According to the study by Brown, Liñares-Zegarra and Wilson (2019), SMEs in the UK have encountered significant obstacles like increased costs, change in trade policies, shipment delays, shortage of skilled laborers and local suppliers and supply chain issues.
Post-Brexit Customs Declarations	8,9,10	Beginning in 2021, the UK government gradually implemented border controls for products imported from the EU. All products that are imported now require customs declaration (UK Parliament, 2023). The Trade and Cooperation Agreement (TCA) between the UK and the EU means that imported or exported goods may benefit from a lower customs Duty rate. Furthermore, Kren and Lawless (2023) stated that even if the products are imported from the EU and are qualified for tax preferences, standard VAT regulations will apply (HM Revenue & Customs, 2021).

Post-Brexit Trade Policies	11,12,13,14	The British government attempted to swiftly substitute and grow the wide range of EU free trade agreements (FTAs) with new contracts with nations like Australia, India, and the United States, as well as the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP), a local truce for nations on both sides of the Pacific (Berg, 2024). As opined by KPMG (2021) after the UK exited the EU's single market and customs union, the "red tape" has grown rapidly, with the development of an extremely restrictive border between the UK and the EU. Any substantial shift frequently results in complication, and the UK-EU border is no exception, as illustrated by recent reports of border disruptions and customs clearance challenges caused by erroneous or insufficient documentation on both ends of the Channel. New inspections have been implemented now that the UK is no longer bound by EU product standards regulations (Edgington, 2021).
Supply Chain Management	15,16	Brexit has caused the delays and red tape associated with the 2021 Trade and Cooperation Agreement (Bailey et al., 2023; Edgington, 2021). The small and medium sized enterprises are turning into localising their supply chain particularly to handle the procurement of raw materials.
Human Resources	17	Brexit also contributed to the UK's significant decline in workforce size, since immigration from the EU struggled to rebound from the COVID-19 outbreak, compounding a decrease in total migration (Portes and Springford, 2023). UK SMEs have also struggled with the shortage of skilled employees from the EU since free movement of workers has been stopped between the UK and EU (Kennedy, 2024).
Government Support	18	As stated by Sindakis and Aggarwal (2022), the UK government has assisted small businesses in many forms like providing business loans, tax reductions and support programs. The British Business Bank has assisted over 90,000 SMEs. The bank has also introduced a credit scheme for the start-ups and provided loans of more than £1 billion (UK Government , 2024).

Table 1: Questionnaire design table

(Source: SELF-CREATED)

3.7.1.3 Close-Ended Surveys

The survey questionnaire includes 19 close-ended questions. Close-ended questionnaires are a set of questions with specified classifications. Hyman and Sierra (2016), stated that close-ended questions save time and money since participants give to-the-point answers. The survey questions are made using dichotomous question format, set of multi option variables and five point Likert scale. Likert scales are the most trustworthy data gathering tool and it performs well with statistical software such as IBM SPSS and Excel.

3.7.2 Data Analysis Methods

This research aims to test the projected hypotheses based on variable relations, correlation tests. With the correct data analysis procedure, this research would use descriptive statistics, internal reliability and validity analysis, and correlations. The results will be analysed with the help of IBM SPSS software and Microsoft Excel in order to do statistical analysis.

3.7.2.1 Descriptive Analysis

Descriptive analysis is associated with the display of the primary characteristics of the obtained data (Cooksey, 2020). This test uses descriptive statistics to approximate the various measurements surrounding the sample data. This study is also supported by graphic presentations such as pie charts.

3.7.2.2 Correlation

A statistical metric called correlation describes how closely two variables are connected to each other linearly, or at a steady pace of change (Kumar and Gautam, 2020). It is a popular method for summarising straightforward connections with establishing cause and effect. The degree of the association between two interval or ratio level variables is measured by the sample correlation coefficient, r. Because of its scaling, the correlation coefficient remains in the range between -1 and +1. The more r deviates from 0 in either a positive or negative direction, the stronger the association among the two variables happens. When r is near 0, this indicates that there is minimal interaction between the variables (Kumar and Gautam, 2020).

3.7.2.3 Reliability and validity analysis

The concepts of reliability and validity refer to the dependability and accuracy of research ,measures. Reliability refers to the regularity and stability of measures, while validity assesses whether a measure accurately captures the variables of the measurements (Kamper, 2019). A review of dependability and validity is crucial in ensuring the accuracy of the information.

3.8 Ethical Considerations

Considering the ethical issues in any research especially in primary research is an essential part of the research. As per the study of Drolet et al. (2022), ethical considerations are a collection of standards that govern the study ideas and methods., When gathering data from individuals, a set of guidelines needs to be followed. In this study, consent from the participants were taken to ensure that the participants were not forced. The questions were designed based on research aims and objectives. This implies that no questions were asked that can hurt the feelings of the participants. Data protection act has been followed to secure the collected personal data of the participants. (Government of UK, 2018). The collected primary data was stored in a password protected folder to reduce the chance of data hacking. The folder was only accessible to the researcher. Throughout the research, the guidelines of the module handbook are thoroughly followed.

3.9 Research Limitations

Despite following the standard academic framework for research methodologies, this study has significant limitations. Online data gathering processes have a substantial tendency to introduce internal bias into the data. The trustworthiness, legitimacy, and internal uniformity of the dataset are further compromised due to an absence of management and oversight during the collection process. On the other hand, time for conducting this research was not enough.

3.10 Chapter Summary

From the above discussion, it can be summarised that the research methodology of this study is solely based on Saunders research onion model. The positivist research philosophy along with deductive research approach has been implemented in this study. This research also includes hypothesis testing hence the quantitative mono-method research strategy is used. The survey questionnaire is made with questions related to the research aim and objectives. Due to time

constraints, a cross-sectional time horizon is applicable. The questionnaire design table demonstrates the factors and its related literature. The data collected through Google form and analysed with the help of IBM SPSS software and Microsoft Excel. The research has used Descriptive Analysis, Linear Regression, Reliability and validity analysis to research the desired outcome. The research has also followed strong ethical points in order to avoid disruption. However, it has been found that the online data gathering process also has a chance to be biased and unreliable.

Chapter 4: Findings, analysis and discussions

4.1 Introduction

This chapter is the fourth chapter of the study that covers the details of the gathered data in particular. In addition to the overall conclusion and data analysis, this chapter emphasizes the data's visual display and offers critical assessment of the findings. The statistical data are interpreted in this chapter to determine the Brexit's effect on the supply chain of the small and medium sized enterprises in the UK. Further, this chapter researcher highlights the hypothesis that was tested at the conclusion of this chapter.

4.2 Overview of the industry

This study 's main focus is on the small and medium sized businesses within the UK. SMEs that make up 99% of all businesses have been heavily impacted by Brexit in the year 2020. The largest impact on the UK supply chain has come from Brexit, primarily as a result of the delays and regulatory obstacles that followed the 2021 Trade and Cooperation Agreement (TCA). In 2023, there were 5.5 million SMEs in the Uk, accounting for 99% of all business. These businesses play a crucial role in fostering innovation, economic growth, and creation of jobs for the youth. However, SMEs, the backbone of the UK economy, have faced a number of challenges in adjusting to the post-Brexit trading climate. Several supply chain issues faced by SMEs in the UK are shortage of suppliers, labour shortages, excessive transformation cost, new rules and regulation throughout the supply chain process.

4.3 Findings and analysis

4.3.1 Internal reliability and validity analysis

Case Processing Summary			
		N	%
Cases	Valid	57	67.9
	Excluded[a]	27	32.1
	Total	84	100.0
a. Listwise deletion based on all variables in the procedure.			

Table 2: Reliability validity analysis table

(Source: Created using SPSS)

According to the Case Processing Summary, 57 (67.9%) of the original 84 instances were projected as valid and 27 (32.1%) had missing data that prevented them from being included in the study. Listwise deletion was used for the exclusion, which means that any instance with missing data for any variable was eliminated completely from the study. This approach guarantees that only whole datasets are examined, but by eliminating a sizable amount of data,it has lowered the sample size.

Reliability Statistics	
Cronbach's Alpha	N of Items
.969	19

Table 3: Reliability analysis statistics

(Source: Created using SPSS)

The 19 items on the scale have a very high degree of internal consistency, as indicated by the Cronbach's Alpha of rating 0.969. This high number indicates that the scale's components have a strong correlation with one another, suggesting that they are accurately assessing the same underlying concept.

4.3.2 Descriptive Statistics Analysis

What is your gender?

Gender					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	57	67.9	67.9	67.9
	Female	27	32.1	32.1	100.0
	Total	84	100.0	100.0	

Statistics		
Gender		
N	Valid	84
	Missing	0
Mean		1.3214
Std. Error of Mean		.05126
Median		1.0000
Mode		1.00
Std. Deviation		.46983
Variance		.221
Range		1.00
Minimum		1.00
Maximum		2.00
Sum		111.00
Percentiles	25	1.0000
	50	1.0000
	75	2.0000

Table 7: Descriptive statistics of the gender

(Source: Created in SPSS)

The gender demographics survey gathered responses from 84 individuals, a dominating gender group is shown by the mean of 1.3214. The standard error .05126 and range 1.00 indicate minimal variability. The mean and median of 1.00 indicate a concentrated trend in gender questions, supporting the overall uniformity of the sample.

Are you a resident of the UK?

Residence					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	67	79.8	79.8	79.8
	No	17	20.2	20.2	100.0
	Total	84	100.0	100.0	

Statistics		
Residence		
N	Valid	84
	Missing	0
Mean		1.2024
Std. Error of Mean		.04410
Median		1.0000
Mode		1.00
Std. Deviation		.40419
Variance		.163
Range		1.00
Minimum		1.00
Maximum		2.00
Sum		101.00
Percentiles	25	1.0000
	50	1.0000
	75	1.0000

Table 7: Descriptive statistics of the residence

(Source: Created using SPSS)

From the table, it is shown that the mean value is 1.2024. This probably translates to a coded number that denotes yes or no in terms of UK residence. Given the mode value is 1.00, the most common answer for UK residence is probably Yes. The dataset can also appear to be biased towards one of the response possibilities as indicated by the median value of 1.0000.

Are you currently working in any SMEs in the UK?

SME Association					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	57	67.9	85.1	85.1
	No	10	11.9	14.9	100.0
	Total	67	79.8	100.0	
Missing	System	17	20.2		
Total		84	100.0		

Statistics		
SME Association		
N	Valid	67
	Missing	17
Mean		1.1493
Std. Error of Mean		.04386
Median		1.0000
Mode		1.00
Std. Deviation		.35903
Variance		.129
Range		1.00
Minimum		1.00
Maximum		2.00
Sum		77.00
Percentiles	25	1.0000
	50	1.0000
	75	1.0000

Table 8: Descriptive statistics of the years of experience

(Source: Created using SPSS)

From the table, it has been identified that the years of experience's mean value is 1.1493. In terms of working in SMEs, this number probably denotes a coded yes or no response. The accuracy of the mean estimate may be seen in the 0.04386 standard error of the mean. After sorting every response, the SME association variable's median value, which stands at 1.0000, indicates the

middle value. The variable range of values is 1.00, indicating that the data only covers two different values.

How many years of experience do you have in the UK based SME?

Professional Experience					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 2 years	42	50.0	73.7	73.7
	2-5 years	7	8.3	12.3	86.0
	More than 5 years	8	9.5	14.0	100.0
	Total	57	67.9	100.0	
Missing	System	27	32.1		
Total		84	100.0		

Statistics		
Professional Experience		
N	Valid	57
	Missing	27
Mean		1.4035
Std. Error of Mean		.09649
Median		1.0000
Mode		1.00
Std. Deviation		.72849
Variance		.531
Range		2.00
Minimum		1.00
Maximum		3.00
Sum		80.00
Percentiles	25	1.0000
	50	1.0000
	75	2.0000

Table 9: Descriptive statistics of professional experience

(Source: Created using SPSS)

From the above table it can be identified that the mean value is 1.4035. This implies that the average professional experience falls between 'less than 2 years' to '2-5 years'. Since the median value is 1.00000, it can be inferred that the middle value falls within the sphere of the 'less than 2 years' group. The mode value of 1.00 indicates that 'less than 2 years' is the most standard experience level of the participants.

Which of the following most accurately describes your role?

Job Role					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Executive role (e.g. CEO, CFO, COO)	3	3.6	5.3	5.3
	Professional	15	17.9	26.3	31.6
	Procurement manager	1	1.2	1.8	33.3
	Operations manager	5	6.0	8.8	42.1
	Technical	9	10.7	15.8	57.9
	Sales	9	10.7	15.8	73.7
	Others	15	17.9	26.3	100.0
	Total	57	67.9	100.0	
Missing	System	27	32.1		
Total		84	100.0		

Statistics		
Job Role		
N	Valid	57
	Missing	27
Mean		4.5614
Std. Error of Mean		.27988
Median		5.0000
Mode		2.00[a]
Std. Deviation		2.11303
Variance		4.465
Range		6.00
Minimum		1.00
Maximum		7.00
Sum		260.00
Percentiles	25	2.0000
	50	5.0000
	75	7.0000
a. Multiple modes exist. The smallest value is shown		

Table 10: Descriptive statistics of job role

(Source: Created using SPSS)

This question is based on the positions that people hold in the SMEs located in the United Kingdom. 57 respondents were surveyed, and the following positions were found: sales (15.8%), procurement managers (1.8%), operations managers (8.8%), executives (5.3%), professionals (26.3%) and other roles (26.3%). With a range of 1 to 7, the mean value is 4.5614.According to the mode, the most prevalent role is Professional (26.3%). The statistics display a wide variety of jobs in the context of SMEs, with professionals constituting the majority of the respondent's group.

Have you witnessed any prominent changes after Brexit in the SME operations?

Brexit Influence					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	30	35.7	52.6	52.6
	No	13	15.5	22.8	75.4
	Maybe	14	16.7	24.6	100.0
	Total	57	67.9	100.0	
Missing	System	27	32.1		
Total		84	100.0		

Statistics		
Brexit Influence		
N	Valid	57
	Missing	27
Mean		1.7193
Std. Error of Mean		.11125
Median		1.0000
Mode		1.00
Std. Deviation		.83995
Variance		.706
Range		2.00
Minimum		1.00
Maximum		3.00
Sum		98.00
Percentiles	25	1.0000
	50	1.0000
	75	2.5000

Table 11: Descriptive statistics of possibilities of changes by Brexit

(Source: Created using SPSS)

Individuals' answers from UK SMEs about how Brexit would affect operations are reflected in the statistics. Of the 57 valid replies, 52.6% said they had seen significant changes since Brexit, while 22.8% said they had not seen any changes at all. 24.6% more people were unsure about the impact. A mean influence level of 1.7193 with a standard deviation of 0.83995 is revealed by the statistical summary. According to the mode value, the most popular answer is ‘yes’. According to the statistics, a considerable proportion of SMEs have seen noticeable changes in their operations after the Brexit event.

Please identify the changes from the following options

Change Identification					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Delays in shipment	8	9.5	14.0	14.0
	Higher transport costs	20	23.8	35.1	49.1
	Changes in trade policies	5	6.0	8.8	57.9
	Difficulty in finding local suppliers in the UK	8	9.5	14.0	71.9
	Shortages of skilled workforce	16	19.0	28.1	100.0
	Total	57	67.9	100.0	
Missing	System	27	32.1		
Total		84	100.0		

Statistics		
Change Identification		
N	Valid	57
	Missing	27
Mean		3.0702
Std. Error of Mean		.19687
Median		3.0000
Mode		2.00
Std. Deviation		1.48636
Variance		2.209
Range		4.00
Minimum		1.00
Maximum		5.00
Sum		175.00
Percentiles	25	2.0000
	50	3.0000
	75	5.0000

Table 12: Descriptive statistics of the changes in SMEs

(Source: Created using SPSS)

This question is based on modification changes that people inside the UK SMEs have seen after Brexit. The primary modifications noted include increased transportation expenses (35.1%), a deficiency of trained labour (28.1%), shipment delays (14.0%), challenges in locating regional vendors in the UK (14.0%) and adjustments to trade regulation (8.8%). The mean change identification level among the 57 valid replies was 3.0702, with the standard deviation value of 1.48636. The most common reaction or mode is 2.00. These findings imply that, in addition to other significant changes in their business practices, SMEs have been disproportionately affected by rising transportation costs and a skilled labor shortage following Brexit.

Do you agree that these changes have complicated the supply chain process of the UK SMEs after Brexit?

Supply Chain Complication					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	18	21.4	31.6	31.6
	Agree	29	34.5	50.9	82.5
	Neutral	7	8.3	12.3	94.7
	Disagree	1	1.2	1.8	96.5
	Strongly Disagree	2	2.4	3.5	100.0
	Total	57	67.9	100.0	
Missing	System	27	32.1		
Total		84	100.0		

Statistics		
Supply Chain Complication		
N	Valid	57
	Missing	27
Mean		1.9474
Std. Error of Mean		.12114
Median		2.0000
Mode		2.00
Std. Deviation		.91459
Variance		.836
Range		4.00
Minimum		1.00
Maximum		5.00
Sum		111.00
Percentiles	25	1.0000
	50	2.0000
	75	2.0000

Table 13: Descriptive statistics of supply chain complication

(Source: Created using SPSS)

Opinions regarding whether Brexit related changes have made the UK SMEs' supply chain operations more difficult to manage are revealed by the data. Of the 57 valid replies, 82.5% agreed that the supply chain has become more complex as a result of these developments. Very few people disagreed and strongly disagreed with the fact. A reasonably constant degree of agreement among respondents was indicated by the mean level of agreement, which was 1.9474, with a standard deviation of 0.91459. The mode answer of 2.00 indicates a widespread consensus with the issues

experienced by the UK SMEs in theri supply chain procedures, as a result of post-Brexit adjustments.

Post-Brexit modifications in customs declaration procedures resulted in delays and additional expenditures.

Customs Declaration					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	20	23.8	35.1	35.1
	Agree	24	28.6	42.1	77.2
	Neutral	9	10.7	15.8	93.0
	Disagree	4	4.8	7.0	100.0
	Total	57	67.9	100.0	
Missing	System	27	32.1		
Total		84	100.0		

Statistics		
Customs Declaration		
N	Valid	57
	Missing	27
Mean		1.9474
Std. Error of Mean		.11853
Median		2.0000
Mode		2.00
Std. Deviation		.89485
Variance		.801
Range		3.00
Minimum		1.00
Maximum		4.00
Sum		111.00
Percentiles	25	1.0000
	50	2.0000
	75	2.0000

Table 14: Descriptive statistics of custom declaration process after Brexit

(Source: Created using SPSS)

This statistics describes the effects on the UK SMEs of changes to customs declaration processes following Brexit. 77.2% of the respondents agreed and 35.1% strongly agreed that the adjustments caused delays and higher costs. A lower percentage expressed no opinion and disagreement with this fact. With a standard deviation of 0.89485 and mean agreement level of 1.9474, the data point to a constant degree of agreement among the participants. With a mode response of 2.0, most people agreed that the changes made to customs declarations after Brexit have undoubtedly resulted in delays and extra costs for UK SMEs.

Do you agree that many UK firms have discontinued trading with EU-based customers due to delays and increased transport costs?

Discontinued EU Trading					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	24	28.6	42.1	42.1
	Agree	10	11.9	17.5	59.6
	Neutral	15	17.9	26.3	86.0
	Disagree	2	2.4	3.5	89.5
	Strongly Disagree	6	7.1	10.5	100.0
	Total	57	67.9	100.0	
Missing	System	27	32.1		
Total		84	100.0		

Statistics		
Discontinued EU Trading		
N	Valid	57
	Missing	27
Mean		2.2281
Std. Error of Mean		.17525
Median		2.0000
Mode		1.00
Std. Deviation		1.32311
Variance		1.751
Range		4.00
Minimum		1.00
Maximum		5.00
Sum		127.00
Percentiles	25	1.0000
	50	2.0000
	75	3.0000

Table 15: Descriptive statistics of discontinued EU trading

(Source: Created using SPSS)

The table illustrates opinions about UK businesses cutting 0ff trade with EU based clients because of post-Brexit hold-ups and higher transportation expenses. Out of 57 valid answers, 59.6% agreed that these discontinuations had happened. While a smaller number disagreed, a large number of people stayed neutral. The mean value is 2.2281 and standard deviation is 1.32311. Thai implies different levels of agreements between respondents. With a mode value of 1.00, this disagreement was evident. This indicated attitudes on the topic differ among respondents, even while a significant percentage believe the UK companies have stopped trade with EU consumers owing to Brexit related problems.

‘How likely are UK SMEs considering building a branch or warehouse in the EU to serve the EU customer base to fix the post Brexit difficulties?

SME Supply Chain Strategy					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Likely	17	20.2	29.8	29.8
	Likely	25	29.8	43.9	73.7
	Neutral	13	15.5	22.8	96.5
	Unlikely	2	2.4	3.5	100.0
	Total	57	67.9	100.0	
Missing	System	27	32.1		
Total		84	100.0		

Statistics		
SME Supply Chain Strategy		
N	Valid	57
	Missing	27
Mean		2.0000
Std. Error of Mean		.10911
Median		2.0000
Mode		2.00
Std. Deviation		.82375
Variance		.679
Range		3.00
Minimum		1.00
Maximum		4.00
Sum		114.00
Percentiles	25	1.0000
	50	2.0000
	75	3.0000

Table 16: Descriptive statistics of SME supply chain strategy

(Source: Created using SPSS)

The table reveals that in order to deal with post-Brexit problems, UK SMEs are thinking about opening branches in the EU but moderately. The mean value among the 57 valid replies was 2.0000 with a standard deviation of 0.82375. There is a moderate bias for this method. The mode value at 2.00 indicated that the most common response was at his likelihood level. According to the dataset, while some UK SMEs are thinking about growing their operations in the EU, many are still deliberating carefully before deciding to open branches there.

Has your company obtained the EORI identification, required for foreign trading in EU markets after Brexit?

Identification					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	31	36.9	54.4	54.4
	No	13	15.5	22.8	77.2
	Maybe	13	15.5	22.8	100.0
	Total	57	67.9	100.0	
Missing	System	27	32.1		
Total		84	100.0		

Statistics		
Identification		
N	Valid	57
	Missing	27
Mean		1.6842
Std. Error of Mean		.10956
Median		1.0000
Mode		1.00
Std. Deviation		.82717
Variance		.684
Range		2.00
Minimum		1.00
Maximum		3.00
Sum		96.00
Percentiles	25	1.0000
	50	1.0000
	75	2.0000

Table 17: Descriptive statistics of EORI identification status

(Source: Created using SPSS)

With a standard deviation of 0.82717, the mean value of EORI identification status for international trading in EU markets following Brexit was 1.6842 among the 57 valid responses. The mean and median both were 1.00m indicating a likelihood to have acquired the required EORI identity. The large percentage of respondents appear to have obtained this, which is essential for trading in EU markets. The value towards compliance with EORI rules is further supported by the small range and constant percentiles, which show that the majority of SMEs in the UK have taken required actions to continue their overseas trade in the EU.

Is your organisation equipped to handle new customs regulations such as import and export management, Certificates of Origin, and Long Term Supplier Declarations?

Customs Regulation Compliance					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	34	40.5	59.6	59.6
	No	10	11.9	17.5	77.2
	Maybe	13	15.5	22.8	100.0
	Total	57	67.9	100.0	
Missing	System	27	32.1		
Total		84	100.0		

Statistics		
Customs Regulation Compliance		
N	Valid	57
	Missing	27
Mean		1.6316
Std. Error of Mean		.11091
Median		1.0000
Mode		1.00
Std. Deviation		.83733
Variance		.701
Range		2.00
Minimum		1.00
Maximum		3.00
Sum		93.00
Percentiles	25	1.0000
	50	1.0000
	75	2.0000

Table 18: Descriptive statistics of custom regulation compliance

(Source: Created using SPSS)

The above data indicates that out of 57 valid responses, the mean value was 1.6316. The replies differed with a standard deviation of .83733 from the mean value. The response;s mean and median value at 1.00 show that most people believe they are prepared to handle these new rules. the small range and seedy percentile highlight an overall feeling or organisation preparedness, For certain companies, there may still be space for improvement when it comes to managing the intricacies of post-Brexit customs responsibilities.

Have your small or medium sized business evaluated the impact of additional costs on cash flow, such as import VAT, duties, capital tie-ups, stock-build overtime, and more warehousing capacity?

Financial Considerations					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	37	44.0	64.9	64.9
	No	11	13.1	19.3	84.2
	Maybe	9	10.7	15.8	100.0
	Total	57	67.9	100.0	
Missing	System	27	32.1		
Total		84	100.0		

Statistics		
Financial Considerations		
N	Valid	57
	Missing	27
Mean		1.5088
Std. Error of Mean		.10051
Median		1.0000
Mode		1.00
Std. Deviation		.75882
Variance		.576
Range		2.00
Minimum		1.00
Maximum		3.00
Sum		86.00
Percentiles	25	1.0000
	50	1.0000
	75	2.0000

Table 19: Descriptive statistics of financial consideration

(Source: Created using SPSS)

The table shows that small and medium-sized enterprises are actively assessing how higher expenses like import VAT, taxes, capital tie ups, expanded warehouse capacity, will affect their cash flow. The data indicates a modest knowledge of the financial consequences, and indicated by mean value of 1.5088 and standard deviation value of .75882. The responses mean and median at 1.00 show that evaluating these expenses is a common concern. It is clear from the narrow range and steady percentiles that many firms are actively assessing and getting ready for the financial crisis poised by Brexit related charges.

Do you agree that UK businesses that rely on re-exporting goods with the EU are facing trade interruptions due to the 'Rules of Origin'?

Rules Of Origin					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	21	25.0	36.8	36.8
	Agree	20	23.8	35.1	71.9
	Neutral	13	15.5	22.8	94.7
	Disagree	2	2.4	3.5	98.2
	Strongly Disagree	1	1.2	1.8	100.0
	Total	57	67.9	100.0	
Missing	System	27	32.1		
Total		84	100.0		

Statistics		
Rules Of Origin		
N	Valid	57
	Missing	27
Mean		1.9825
Std. Error of Mean		.12638
Median		2.0000
Mode		1.00
Std. Deviation		.95415
Variance		.910
Range		4.00
Minimum		1.00
Maximum		5.00
Sum		113.00
Percentiles	25	1.0000
	50	2.0000
	75	3.0000

Table 20: Descriptive statistics of interruptions due to Rules of Origin

(Source: Created using SPSS)

This question is about if the 'Rules of Origin' are causing commercial disruptions for UK firms who depend on re-exporting goods to the EU. These regulations establish a product's country of origin and may have an impact on trade agreements' tariff eligibility. The data presented indicates that different organisations had different experiences, on average mild to moderate interruption is indicated by a mean score of 1.9825. The standard deviation value is .95415 and range 4.00 indicates substantial variation in the impact. Companies that fail to comply with these origin regulations risk tariffs, which would raise expenses, and complicate matters further and impede commerce.

How probable is it that more localisation of UK-based businesses' supply chains, notably on-shoring of raw materials, will help to resolve post-Brexit customs challenges?

Supply Chain Localisation					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Likely	22	26.2	38.6	38.6
	Likely	14	16.7	24.6	63.2
	Neutral	17	20.2	29.8	93.0
	Unlikely	3	3.6	5.3	98.2
	Very Unlikely	1	1.2	1.8	100.0
	Total	57	67.9	100.0	
Missing	System	27	32.1		
Total		84	100.0		

Statistics		
Supply Chain Localisation		
N	Valid	57
	Missing	27
Mean		2.0702
Std. Error of Mean		.13678
Median		2.0000
Mode		1.00
Std. Deviation		1.03267
Variance		1.066
Range		4.00
Minimum		1.00
Maximum		5.00
Sum		118.00
Percentiles	25	1.0000
	50	2.0000
	75	3.0000

Table 21: Descriptive statistics of Supply Chain Localisation

(Source: Created using SPSS)

There is a moderate chance that post-Brexit customs issues will be resolved by further localising the supply chains of UK-based companies, especially through the outsourcing of the raw materials. With a mean score of 2.0702 (more than 2), companies are typically not unduly optimistic, indicating a small chance. The high range 4.00 and standard deviation 1.03267, show differing perspectives about the efficacy of this tactic. The possibilities for overcoming these concerns by localisation alone is limited, While some firms may gain from decreased customs complexity, others still face major obstacles, particularly if local resources are insufficient or more expensive than imported ones.

Have you boosted the amount of inventory for raw materials or completed goods to reduce port disruptions?

Inventory Management					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	37	44.0	64.9	64.9
	No	7	8.3	12.3	77.2
	Maybe	13	15.5	22.8	100.0
	Total	57	67.9	100.0	
Missing	System	27	32.1		
Total		84	100.0		

Statistics		
Inventory Management		
N	Valid	57
	Missing	27
Mean		1.5789
Std. Error of Mean		.11180
Median		1.0000
Mode		1.00
Std. Deviation		.84404
Variance		.712
Range		2.00
Minimum		1.00
Maximum		3.00
Sum		90.00
Percentiles	25	1.0000
	50	1.0000
	75	2.0000

Table 22: Descriptive statistics of inventory management

(Source: Created using SPSS)

Based on the data, it appears that out of 57 valid replies, there is a moderate tendency to increase inventory levels for completed goods or raw materials to reduce port interruptions in the wake of Brexit. With a standard deviation value of .84404 and mean level of 1.5789, there was variation in the answer. In order to prevent port interruptions, it is usual practice to increase inventories as the mean value was 1.00. Showcasing a strategic approach to post-Brexit difficulties, it appears that many organisations are taking preemptive actions by modifying the inventory levels to handle any disruptions efficiently.

Does your company have invested more in its current workforce by providing professional training and courses to enhance the skills of the employees?

HR Development					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	34	40.5	59.6	59.6
	No	14	16.7	24.6	84.2
	Maybe	9	10.7	15.8	100.0
	Total	57	67.9	100.0	
Missing	System	27	32.1		
Total		84	100.0		

Statistics		
HR Development		
N	Valid	57
	Missing	27
Mean		1.5614
Std. Error of Mean		.10018
Median		1.0000
Mode		1.00
Std. Deviation		.75634
Variance		.572
Range		2.00
Minimum		1.00
Maximum		3.00
Sum		89.00
Percentiles	25	1.0000
	50	1.0000
	75	2.0000

Table 23: Descriptive statistics of improvement of employee skills and expertise

(Source: Created using SPSS)

Based on 57 valid responses, there is a noticeable emphasis on investing in the present workforce by offering courses and professional training to improve workers; abilities after Brexit. With a standard deviation of .75634 and mean value of HR development expenditure of 1.5614, the data points to a steady emphasis on staff skill development. The responses' mode and median at 1.00 shows that upskilling the workforce is a widely held commitment. The high range (2.00) and table percentiles highlight a purposeful approach to improve employee skills and performance,

indicating that many organizations are placing a high priority on staff development in order to adjust to the shifting post-Brexit scenario.

21

In the case of a "no-deal" Brexit, what assistance (if any) would you expect from the governing body (local, regional, or national)?

No Deal Brexit					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	16	19.0	28.1	28.1
	Increase regional transportation infrastructure investment	11	13.1	19.3	47.4
	Higher expenditures in national transportation infrastructure, especially ports	6	7.1	10.5	57.9
	Direct funding for small companies	11	13.1	19.3	77.2
	Modification of business fees and taxes	5	6.0	8.8	86.0
	Additional details about specific method	2	2.4	3.5	89.5
	Grants for training for employees to address skills deficiencies	6	7.1	10.5	100.0
	Total	57	67.9	100.0	
Missing	System	27	32.1		
Total		84	100.0		

Statistics		
No Deal Brexit		
N	Valid	57
	Missing	27
Mean		3.1404
Std. Error of Mean		.26186
Median		3.0000
Mode		1.00
Std. Deviation		1.97700
Variance		3.909
Range		6.00
Minimum		1.00
Maximum		7.00
Sum		179.00
Percentiles	25	1.0000
	50	3.0000
	75	4.0000

Table 24: Descriptive statistics of assistance after No-Deal Brexit

(Source: Created using SPSS)

The data shows that there is a large anticipation for support from governmental bodies at the local, regional and national level in the case of 'no-deal' Brexit. A wide range of expectations was shown by the mean level of 3.1404 among the 57 valid respondents with a standard deviation of 1.97700. A range of moderate to high expectations for assistance is shown by the responses mean (1.00) and median (3.0000). It seems that companies expect different levels of support from the government to deal with the difficulties that may arise in the event of a 'no-deal' Brexit.

4.3.3 Correlations analysis

Correlations analysis for Hypothesis 1

Correlations

		Change Identification	Identification	Rules Of Origin	Brexit Influence	Discontinued EU Trading
Change Identification	Pearson Correlation	1	.919**	.870**	.931**	.891**
	Sig. (1-tailed)		.000	.000	.000	.000
	N	57	57	57	57	57
Identification	Pearson Correlation	.919**	1	.853**	.975**	.899**
	Sig. (1-tailed)	.000		.000	.000	.000
	N	57	57	57	57	57
Rules Of Origin	Pearson Correlation	.870**	.853**	1	.863**	.894**
	Sig. (1-tailed)	.000	.000		.000	.000
	N	57	57	57	57	57
Brexit Influence	Pearson Correlation	.931**	.975**	.863**	1	.894**
	Sig. (1-tailed)	.000	.000	.000		.000
	N	57	57	57	57	57
Discontinued EU	Pearson Correlation	.891**	.899**	.894**	.894**	1

Trading	Sig. (1-tailed)	.000	.000	.000	.000	
	N	57	57	57	57	57
**. Correlation is significant at the 0.01 level (1-tailed).						

Table 25: Correlations analysis for hypothesis 1

(Source: Created using SPSS)

Significant correlations between the factors pertaining to Brexit-related trade policy changes and opportunities for UK-based SMEs are revealed by the correlation study. The data specifically reveals the essential correlation for hypothesis 1.

Change Identification (Q7) and Witnessed Prominent Changes (Q6): The respondents' identification of changes in trade policy (Q7) and their acknowledgement of observing significant changes in SME operations following Brexit (Q6) have a 0.919 connection. With a significance level of $p < 0.01$, this robust positive connection suggests that SMEs who saw shifts in trade policies are probably going to have gone through more significant operational changes as a result of Brexit.

Change Identification (Q7) and EORI Identification (Q12): The identification of changes in trade policy (Q7) and the company's acquisition of the EORI identification necessary for trading in EU markets after Brexit (Q12) have a 0.870 ($p < 0.01$) association. This robust association indicates that SMEs were more likely to adjust by obtaining the required EORI identity when they were aware of changes in trade laws, demonstrating a proactive approach to Brexit-related developments.

Change Identification (Q7) and Discontinued EU Trading (Q10): There is a 0.891 (p 0.01) link between recognising changes in trade regulations (Q7) and concurring that many UK businesses have stopped doing business with EU-based clients because of delays and higher transportation costs (Q10). This research emphasises that SMEs who perceive major policy changes are also those that directly experience consequences for their commercial activities with EU partners, indicating that Brexit has created considerable obstacles for global trade.

Rules of Origin (Q15) and Witnessed Prominent Changes (Q6): There is a 0.853 ($p < 0.01$) association between worries about how the "Rules of Origin" may affect re-exporting goods (Q15) and observing more significant changes in SME operations (Q6). This suggests that businesses

that are having more significant operational changes are also the ones who find the Rules of Origin troublesome, maybe as a result of the complexity that new trade laws have brought about.

Rules of Origin (Q15) and Discontinued EU Trading (Q10): The discontinuance of trade with EU consumers (Q10) and problems with the Rules of Origin (Q15) have a substantial connection of 0.894 ($p < 0.01$). This demonstrates how trade operations have decreased in correlation with regulatory reforms, including the Rules of Origin, suggesting that these regulations have posed a significant obstacle for SMEs in the wake of Brexit.

Brexit Influence (Q6) and EORI Identification (Q12): Of all the pairs examined, the correlation between the acquisition of EORI identification (Q12) and the wider impact of Brexit (Q6) is the strongest at 0.975 ($p < 0.01$). This nearly perfect correlation indicates a close relationship between the anticipated post-Brexit changes in the business environment and the obligation to comply with new trade regulations, including the EORI identity.

Correlations analysis for Hypothesis 2

Correlations

		Customs Regulation Compliance	Financial Considerations	Supply Chain Complication	Supply Chain Localisation	Inventory Management
Customs Regulation Compliance	Pearson Correlation	1	.919**	.744**	.856**	.964**
	Sig. (1-tailed)		.000	.000	.000	.000
	N	57	57	57	57	57
Financial Considerations	Pearson Correlation	.919**	1	.785**	.842**	.954**
	Sig. (1-tailed)	.000		.000	.000	.000
	N	57	57	57	57	57
Supply Chain Complication	Pearson Correlation	.744**	.785**	1	.855**	.734**
	Sig. (1-tailed)	.000	.000		.000	.000
	N	57	57	57	57	57
Supply Chain Localisation	Pearson Correlation	.856**	.842**	.855**	1	.834**
	Sig. (1-tailed)	.000	.000	.000		.000

	N	57	57	57	57	57
Inventory Management	Pearson Correlation	.964**	.954**	.734**	.834**	1
	Sig. (1-tailed)	.000	.000	.000	.000	
	N	57	57	57	57	57
**. Correlation is significant at the 0.01 level (1-tailed).						

Table 26: Correlations analysis for hypothesis 2

(Source: Created using SPSS)

The correlation analysis examines the relationship between variables related to customs regulation compliance, financial considerations, and supply chain management for UK-based SMEs following Brexit. This table signifies the outcomes for the hypothesis 2.

Customs Regulation Compliance (Q13) and Supply Chain Complication (Q8): Organisations that believe that these changes have complicated the supply chain process (Q8) and those that are prepared to manage new customs laws (Q13) show a correlation of 0.744 ($p < 0.01$). The positive correlation indicates that even companies adhering to new customs regulations acknowledge the intricacy these modifications entail, compliance in and of itself may not always resolve supply chain complexities.

Customs Regulation Compliance (Q13) and Supply Chain Localisation (Q16): Compliance with customs regulations (Q13) and the possibility of localising supply chains (Q16) have a 0.856 ($p < 0.01$) link. This robust positive link suggests that businesses are more likely to think about localising their supply chains to effectively manage post-Brexit issues if they are better prepared to handle new customs laws. One could argue that localisation is a calculated reaction to lessen the effects of complicated customs procedures.

Customs Regulation Compliance (Q13) and Inventory Management (Q17): There is a 0.964 ($p < 0.01$) association between improving inventory management to minimise port disruptions (Q17) and complying with customs regulations (Q13). This very strong association highlights an adaptive strategy in reaction to Brexit, indicating that SMEs who comply with new customs

requirements are also substantially more likely to modify their inventory management techniques to account for potential delays.

Financial Considerations (Q14) and Supply Chain Complication (Q8): The study found a 0.785 ($p < 0.01$) link between the assessment of financial factors including import VAT, tariffs, and cash flow implications (Q14) and the perceived complexity of the supply chain process (Q8). According to this research, SMEs that carefully evaluate the financial effects are more likely to encounter issues in their supply chains, possibly as a result of the additional financial strain brought on by Brexit-related adjustments.

Financial Considerations (Q14) and Inventory Management (Q17): A substantial association of 0.954 ($p < 0.01$) has been found between inventory management changes (Q17) and financial concerns (Q14). It appears that proactive inventory management is more common among SMEs that prioritise financial planning and management, indicating that financial readiness plays a crucial role in supply chain resilience in the wake of Brexit.

Supply Chain Complication (Q8) and Supply Chain Localisation (Q16): The probability of localising supply chains (Q16) and the perceived complexity of the supply chain (Q8) have a 0.855 ($p < 0.01$) association. This robust link suggests that SMEs with major supply chain issues are more likely to think about localising their supply chains, probably as a calculated strategic move to lessen reliance on intricate international logistics.

The hypothesis H0, which states that "Brexit has not helped the UK SMEs by improving their supply chain management," does not fit the data, according to the correlation analysis. As an alternative, the data lends credence to hypothesis H1, which states that "Brexit has helped the UK SMEs by improving their supply chain management." Brexit has considerably pushed SMEs to improve their supply chain management strategies, as evidenced by the strong correlations found between supply chain localisation (0.856) and inventory management changes (0.964). These gains are especially noticeable in companies that are ready for the new customs laws, indicating that Brexit has, in certain situations, encouraged constructive adjustments. Brexit has encouraged SMEs to adopt more resilient inventory practices, but it has also added financial complexity, according to the strong correlations found between financial concerns and supply chain issues (0.785) and inventory management (0.954). This suggests that SMEs are being proactive in averting any setbacks, which will probably result in a general enhancement in supply chain

management. In order to address the issues presented by Brexit, SMEs may be actively investigating reshoring and other localisation initiatives, as indicated by the association (0.855) between supply chain complications and the possibility of localisation. The idea that Brexit has sparked advancements in supply chain management is further supported by the possibility that this move towards localisation may result in supply chains that are stronger and less susceptible.

Correlations analysis for Hypothesis 3

Correlations					
		Discontinued EU Trading	No Deal Brexit	Customs Declaration	HR Development
Discontinued EU Trading	Pearson Correlation	1	.971**	.900**	.940**
	Sig. (1-tailed)		.000	.000	.000
	N	57	57	57	57
No Deal Brexit	Pearson Correlation	.971**	1	.933**	.926**
	Sig. (1-tailed)	.000		.000	.000
	N	57	57	57	57
Customs Declaration	Pearson Correlation	.900**	.933**	1	.836**
	Sig. (1-tailed)	.000	.000		.000
	N	57	57	57	57
HR Development	Pearson Correlation	.940**	.926**	.836**	1
	Sig. (1-tailed)	.000	.000	.000	
	N	57	57	57	57
**. Correlation is significant at the 0.01 level (1-tailed).					

Table 27: Correlations analysis for hypothesis 3

(Source: Created using SPSS)

The relationship between Brexit-related variables is examined in this analysis, with a special emphasis on the effects on trade with EU consumers, anticipation for a no-deal Brexit, customs declarations, and human resource development. The objective is to ascertain whether Brexit has

had an impact on the macroeconomic circumstances of the UK economy. This table correlates with hypothesis 3.

Discontinuation of EU Trading (Q10) and Post-Brexit Customs Declaration (Q9): The impact of post-Brexit customs declarations on delays and additional expenses (Q9) and the discontinuance of EU business due to delays and increased transport costs (Q10) have a 0.900 ($p < 0.01$) association. This robust positive association suggests a wider economic impact on trade operations by showing that SMEs that are having trouble trading with EU consumers are also having serious problems with customs procedures.

Discontinuation of EU Trading (Q10) and HR Development (Q18): The data indicates a 0.940 ($p < 0.01$) link between the withdrawal of EU trading (Q10) and workforce development spending (Q18). This strong link implies that businesses who have had to stop doing business with EU clients are more likely to make investments in their personnel, either as a tactic to adjust to changing market conditions or as a way to lessen the impact of the loss of EU business by improving staff members' abilities for other chances.

No-Deal Brexit Expectations (Q19) and Post-Brexit Customs Declaration (Q9): Expectations of a no-deal Brexit are correlated with the impact of customs declarations (Q9) and the requirement for governmental help (Q19) by 0.933 ($p < 0.01$). This emphasises the macroeconomic impact of Brexit-related uncertainties even more by showing that businesses who have planned for or anticipate a no-deal Brexit are conscious of the difficulties created by new customs processes.

No-Deal Brexit Expectations (Q19) and HR Development (Q18): There is a 0.926 ($p < 0.01$) link between the anticipation of a no-deal Brexit (Q19) and the investment made in worker training and development (Q18). The robust link seen here indicates that businesses bracing for a no-deal Brexit are also making substantial investments in human capital, presumably to enhance their ability to manage the unpredictable economic landscape and fortify themselves against future market disruptions.

Post-Brexit Customs Declaration (Q9) and HR Development (Q18): The impact of customs declaration procedures following Brexit (Q9) and investment in HR development (Q18) had a 0.836 ($p < 0.01$) link. This association implies that businesses facing difficulty with customs procedures are also more inclined to make staff investments, suggesting a more comprehensive economic approach to address the operational constraints brought on by Brexit.

4.4 Discussions

The study's correlation analysis and literature review are closely related to one another. While the literature gives SMEs a basic understanding of the supply chain management challenges they face, especially in light of Brexit, the correlation analysis shows how these theoretical insights are applied to actual data. According to the literature, SMEs are more susceptible to supply chain disruptions than larger enterprises because they frequently lack the resources and negotiating leverage of the latter, particularly in the wake of momentous events like Brexit. The cited studies (Nyquist and Hasenfuß, 2022; Alshahrani and Salam, 2022) highlight how SMEs' emphasis on core expertise and resource constraints make it challenging for them to integrate their supply chain management strategies with more general business objectives. The research study delineates the distinct obstacles brought about by Brexit, including escalated expenses, postponements, and intricate legal matters (Agrawal, 2023; Tetley, 2022). The outcomes into great detail about the sharp decline in commerce with EU partners and the challenges in managing the supply chain as a result of new trade regulations and Rules of Origin.

The evidence clearly contradicts the hypothesis H0, which states that "The trade policies and opportunities have not changed for the UK-based SMEs as the effect of Brexit," according to the data-driven research. Brexit has undoubtedly resulted in significant changes to trade policies and possibilities for UK SMEs, as evidenced by The considerable positive correlations observed across numerous variables. Businesses had to adjust to new regulatory requirements directly related to Brexit, as evidenced by the high association found between changes in trade policy and the demand for EORI identification. Brexit has significantly altered the commercial climate for SMEs, as evidenced by the noted operational adjustments and the cessation of commerce with EU clients.

The results support accepting the alternative hypothesis (H2) and rejecting the null hypothesis (H0), due to the significant positive correlations observed across key variables. It is true that Brexit has forced UK SMEs to strengthen supply chain management; the reasons for these changes are financial concerns, strategic localisation, and regulatory compliance. These adjustments imply that, in spite of its difficulties, Brexit has positively impacted UK-based SMEs' supply chain management procedures.

The correlation analysis's evidence contradicts hypothesis H0, which holds that "The macroeconomic condition of the UK economy has not been affected by Brexit." The alternative

hypothesis H3, which states that Brexit has had an impact on the macroeconomic situation of the UK economy, is instead supported by the evidence.

Brexit has caused significant disruptions in trade, compelling businesses to adapt their operations and invest in workforce development as a means of navigating the new economic landscape. This is demonstrated by the strong correlation found between the cessation of trading with EU customers and both customs declaration issues (0.900) and HR development (0.940). This implies a demonstrable adverse effect on the macroeconomic circumstances, namely for trade and labour markets. The strong association between customs problems (0.933) and HR investments (0.926) and expectations of a no-deal Brexit highlights the economic pressure brought on by Brexit. Businesses are preparing for the worst-case situation by making big changes. This is a reflection of broader macroeconomic worries, such as the necessity of worker adaptability in a post-Brexit environment and the possibility of higher operational expenses.

The correlation coefficient of 0.836 indicates that the challenges associated with customs declarations and HR development have resulted in greater investments in human capital due to the administrative and financial strains caused by Brexit. This suggests that businesses have changed their strategies to protect themselves from the macroeconomic shocks brought about by Brexit, which lends more credence to the notion that the state of the economy as a whole has suffered. The data-driven analysis shows how Brexit-related difficulties and UK SMEs' strategic actions are significantly interconnected. Strong correlations between important variables show that Brexit has, in fact, had an impact on the macroeconomic state of the UK economy, changing trade patterns, regulatory compliance, and workforce development on a large scale. As a result, the alternative hypothesis (H3) is supported and the null hypothesis (H0) is rejected, demonstrating that Brexit has significantly altered the macroeconomic circumstances of the UK economy.

4.4 Chapter Summary

This chapter evaluates the gathered statistical data from the qualitative survey questionnaire of the employees from the UK based SMEs. In the internal reliability and validity analysis, it has been observed that out of 84 participants, only 57 participants were considered as valid. The statistical data also shows that almost 26.3% of the respondents worked in the professional role in the SMEs. The respondents have also identified that rising transportation cost and labour shortage were two major effects of Brexit. Brexit has also affected the trade policies and possibilities in the UK SMEs.

Also it has been observed that Brexit has also made a significant impact on the macroeconomic condition of the UK. However, Brexit has also improved the supply chain process of the many UK SMEs. This was possible because Brexit has pushed the firm to locally source the raw materials along with a strong inventory management system. The strong correlation between financial concerns and supply chain issues and inventory management and supply chain localisation and inventory management changes confirms the same.

Chapter 5: Conclusion

5.1 Summary

Three main aspects have been studied in this research: changed trade policies and opportunities for the UK based SMEs after Brexit, improvement of supply chain management of the UK SMEs after Brexit, macroeconomic condition of the UK economy after Brexit. Supply chain localisation, custom regulation compliance, supply chain strategy, inventory management, investment on employee training, Government's initiatives in 'No-deal Brexit' all have been discussed in this study.

5.2 Conclusions

Factor 1: Changes in trade policies and opportunities for the UK SMEs after Brexit

SMEs have modified trade alternatives due to the UK's capacity to negotiate autonomous trade agreements which have improved market access. Cross-border trade is now more complicated and expensive since new regulatory frameworks and customs processes have been implemented after Brexit. Regulations and tariff policies affecting SMEs' trade with the EU and other foreign partners have changed. As indicated by the strong positive correlation between EORI identification and trade policy changes, operational modifications and end of business with the EU clients, the hypothesis is tested. This also answers the research questions one and two. Hence, this implies that objective 1 and 2 have been met.

Factor 2: Development in Supply Chain management after Brexit

UK SMEs have seen significant changes in theri supply chain management procedures since Brexit. Numerous companies have improved inventory management, localised sourcing, and broadened theri supplier network in an effort to lessen interruptions. The usage of technology and partnerships in logistics has simplified processes, increasing responsiveness and productivity. After Brexit, risk assessment and backup plans are now crucial for handling difficulties. The positive correlation among customs regulation compliance and supply chain localisation proves the hypothesis. It has also been observed that supply chain management has had to be strengthened by UK SMEs as a result of Brexit; the driving forces behind these modifications include legal compliance, strategic localisation, and financial concerns. This also answers the research question number three and five. Hence, Hence, this implies that objective 3 and 5 have been met.

Factor 3: Transformation of the macroeconomic condition of the UK economy after Brexit

Following Brexit, the macroeconomic environment of the UK economy changed. Uncertainty, currency volatility, and investor hesitation characterized the first phase. The economy changed throughout time as industries including manufacturing, services and finance adapted to the new dynamics of trade. Difficulties included supply chain interruptions, modified marketa access, and regulatory changes. The administration sought international trade deals to counter EU losses, which had an effect on employment and GDP development. The strong correlation among dealing with the EU clients and problems with customs declarations and HR development suggests that Brexit has changed company's operations and made companies to spend money on employee training. Here, the research question number 4 has been answered. Hence, this implies that objective 4 has been met.

5.3 Limitation

Though the study findings have helped in meeting the objectives and answered the research questions, there are several limitations of this study. Since the study is done in an online survey method, there is a chance that the results can be biased. Furthermore, sampling bias might happen if the sample is not representative of the intended audience. There was difficulty in obtaining complicated and complex answers because the questions were close ended. In some questions, the inaccurate language or poor questionnaire format might have caused misinterpretation and inconsistent answers. Also, the time was limited for conducting the research. Moreover, the statistical outcomes can not be standardised as final findings. The study was affected by external variables including time, context and respondent characteristics.

5.4 Direction for Future Work

Lastly, although the present study significantly evaluates the effect of Brexit on supply chain resilience among the UK SMEs, there are possibilities for future research. Using qualitative techniques to explore the raw experiences, difficulties and achievements of UK SMEs in adjusting the supply chain after Brexit in the form of case studies and interviews, can give different results. Also, the study can be done in a longitudinal time horizon to monitor modifications in supply chain techniques and adaptability over a prolonged duration following Brexit. The study work can also

be done with concentrating on certain industries and analysing the differences between the handling of supply chains after Brexit.

Chapter 6: Recommendations

Several recommendations can help UK SMEs handle supply chain risks after Brexit, as per the study findings: It can be recommended to lessen reliance on one marketplace and lower the risk of supply chain disruptions; SMEs should strategically broaden their supplier network. It can also be recommended to reduce potential holdups and volatility associated with cross-border commerce and improves supply chain resilience, emphasise on local sourcing. Furthermore, investing in data analytics, artificial intelligence and the Internet of Things (IoT) in the supply chain to streamline operations, increase visibility and strengthen decision-making can be beneficial. The SMEs can establish strategic alliances with suppliers, logistics, companies and other shareholders to improve supply chain's adaptability and efficiency. Creating a risk management plan by conducting routine risk assessments can minimize any interruptions and guarantee business continuity. Additionally, the SMEs also need to improve the workers' abilities and flexibilities in the post-brexit environment, and offer training programmes on new rules, protocols and technology.

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Appendices

Appendix 1: Ethical Approval Form and consent form

Ethical approval Form.pdf

Appendix 2: Sample Questionnaire

Demographic

1.What is your gender?

Male	Female
57	27

2. Are you a resident of the UK?

Yes	No
67	17

Work Experience

3. Are you currently working in any SMEs in the UK?

Yes	No
57	10

4. How many years of experience do you have in the UK based SME?

Less than 2 years	2-5 years	More than 5 years
42	7	8

5. Which of the following most accurately describes your role?

Executive role (e.g. CEO, CFO, COO)	Professional	Procurement manager	Operations manager	Technical	Sales	Other
3	15	1	5	9	9	15

Changes after Brexit within the UK SMEs

6. Have you witnessed any prominent changes after Brexit in the SME operations?

Yes	No	Maybe
30	13	14

7. Please identify the changes from the following options.

Delays in shipment	Higher transport costs	Changes in trade policies	Difficulty in finding local suppliers in the UK	Shortages of skilled workforce
8	20	5	8	16

8. Do you agree that these changes have complicated the supply chain process of the UK SMEs after Brexit?

Strongly agree	Agree	Neutral	Disagree	Strongly Disagree
18	29	7	1	2

Post-Brexit Customs Declarations

9. Post-Brexit modifications in customs declaration procedures resulted in delays and additional expenditures.

Strongly agree	Agree	Neutral	Disagree	Strongly Disagree
20	24	9	4	0

10. Do you agree that many UK firms have discontinued trading with EU-based customers due to delays and increased transport costs?

Strongly agree	Agree	Neutral	Disagree	Strongly Disagree
24	10	15	2	6

11. 'How likely are UK SMEs considering building a branch or warehouse in the EU to serve the EU customer base to fix the post Brexit difficulties?

Very Likely	Likely	Neutral	Unlikely	Very Unlikely
17	25	13	2	0

Post-Brexit Trade Policies

12. Has your company obtained the EORI identification, required for foreign trading in EU markets after Brexit?

Yes	No	Maybe
31	13	13

13. Is your organisation equipped to handle new customs regulations such as import and export management, Certificates of Origin, and Long Term Supplier Declarations?

Yes	No	Maybe
34	10	13

14. Have your small or medium sized business evaluated the impact of additional costs on cash flow, such as import VAT, duties, capital tie-ups, stock-build overtime, and more warehousing capacity?

Yes	No	Maybe
37	11	9

15. Do you agree that UK businesses that rely on re-exporting goods with the EU are facing trade interruptions due to the 'Rules of Origin'?

Strongly agree	Agree	Neutral	Disagree	Strongly Disagree
21	20	13	2	1

Supply Chain Management

16, How probable is it that more localisation of UK-based businesses' supply chains, notably on-shoring of raw materials, will help to resolve post-Brexit customs challenges?

Very Likely	Likely	Neutral	Unlikely	Very Unlikely
22	14	17	3	1

17. Have you boosted the amount of inventory for raw materials or completed goods to reduce port disruptions?

Yes	No	Maybe
37	7	13

Human Resources

18. Does your company have invested more in its current workforce by providing professional training and courses to enhance the skills of the employees?

Yes	No	Maybe
34	14	9

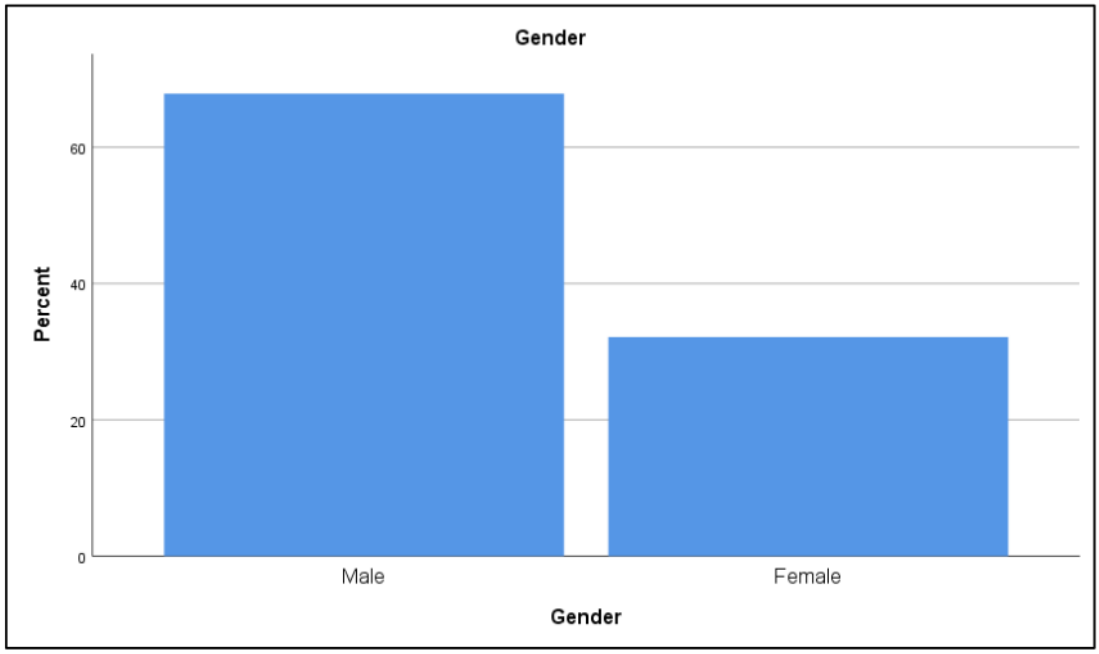
Government Support

19. In the case of a "no-deal" Brexit, what assistance (if any) would you expect from the governing body (local, regional, or national)?

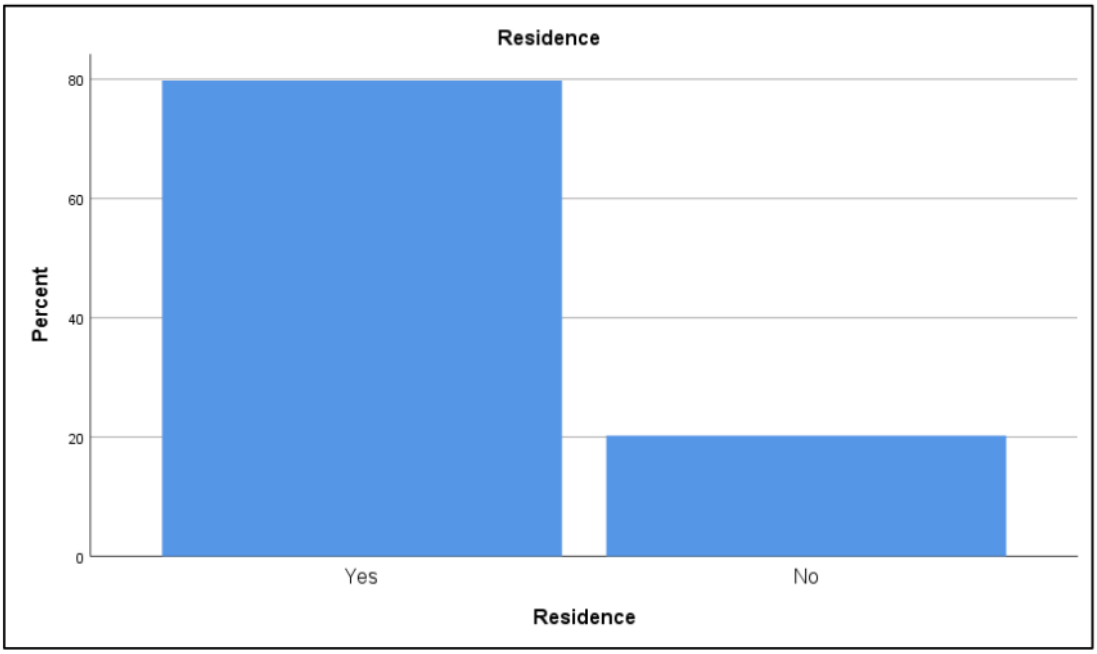
None	Increase regional transportation infrastructure investment	Higher expenditures in national transportation infrastructure, especially ports	Direct funding for small companies	Modification of business fees and taxes	Additional details about specific method	Grants for training for employees to address skills deficiencies
16	11	6	11	5	2	6

Appendix 3: Outputs

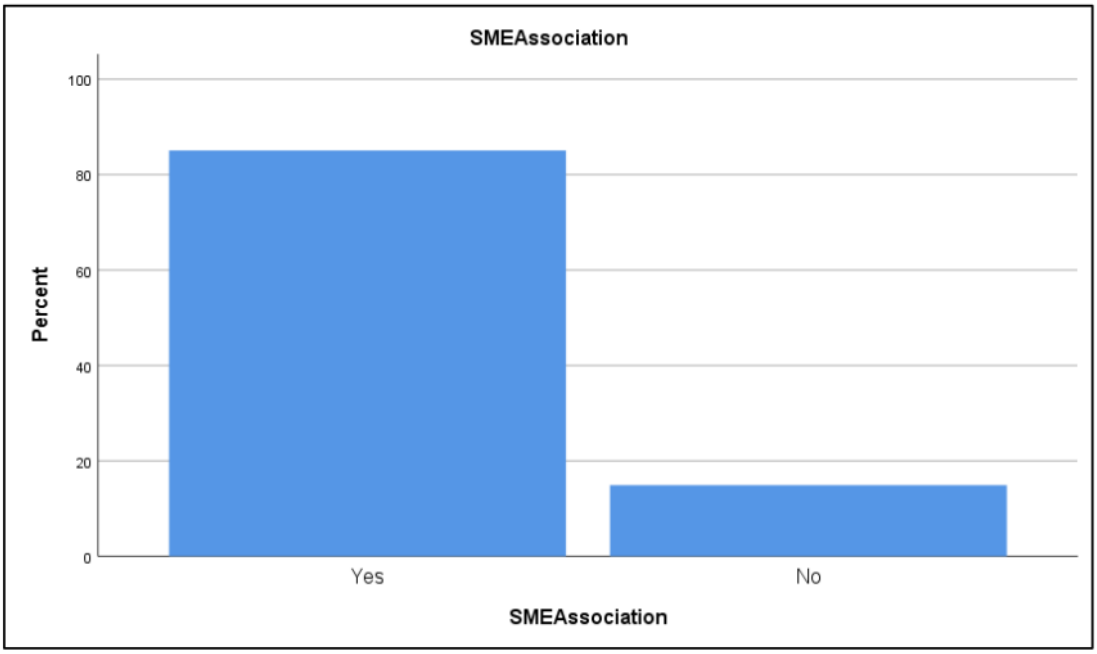
What is your gender?



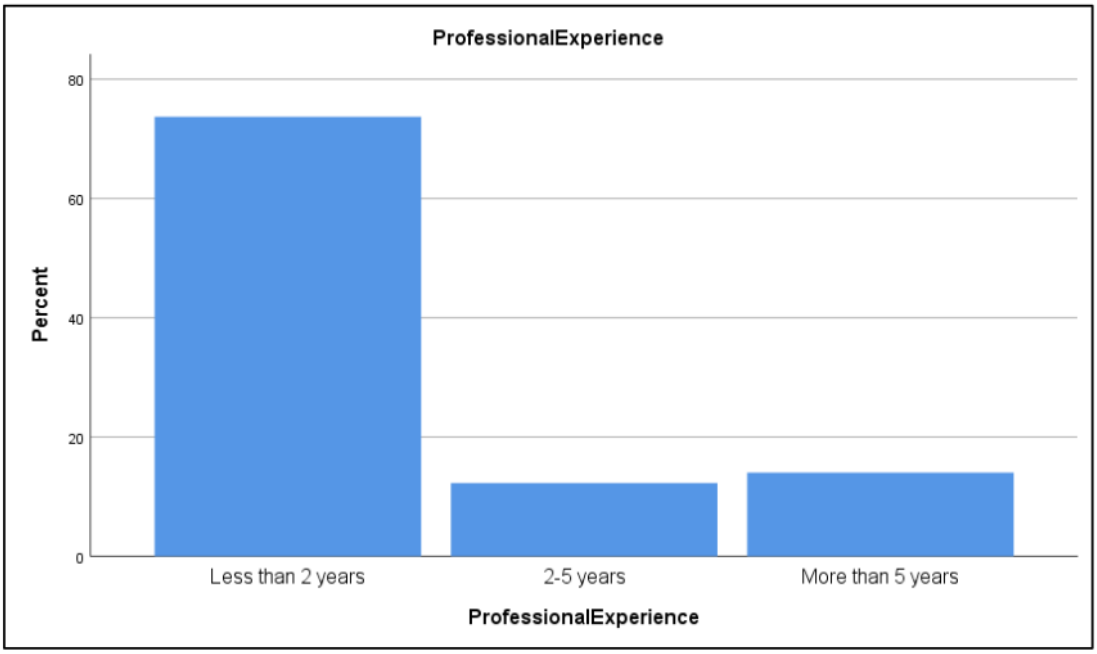
Are you a resident of the UK?



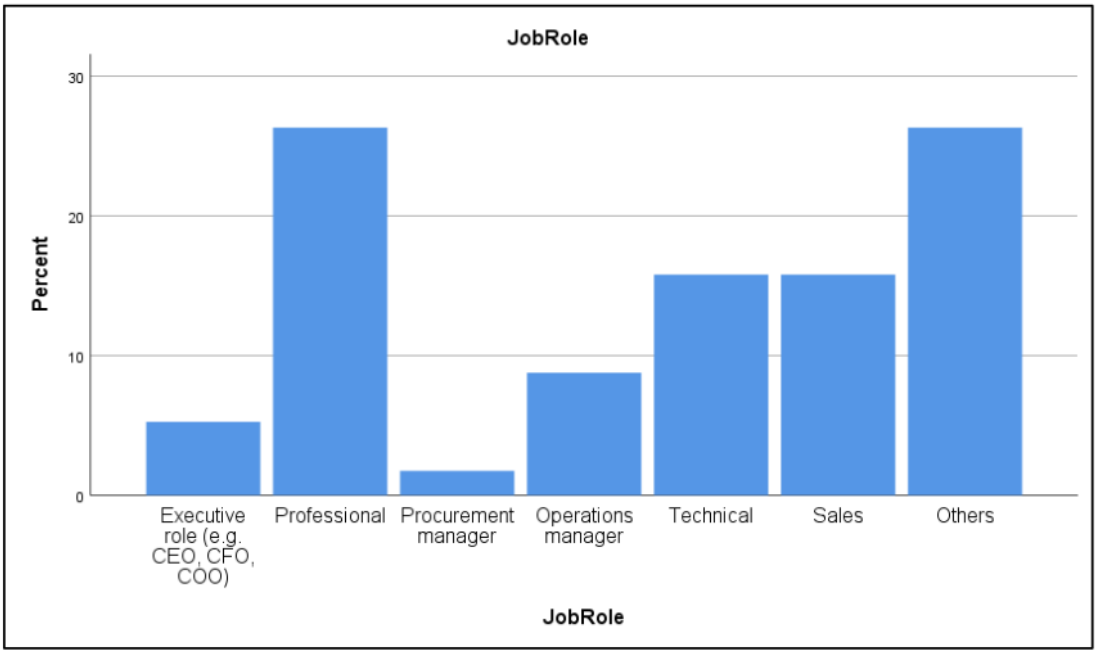
Are you currently working in any SMEs in the UK?



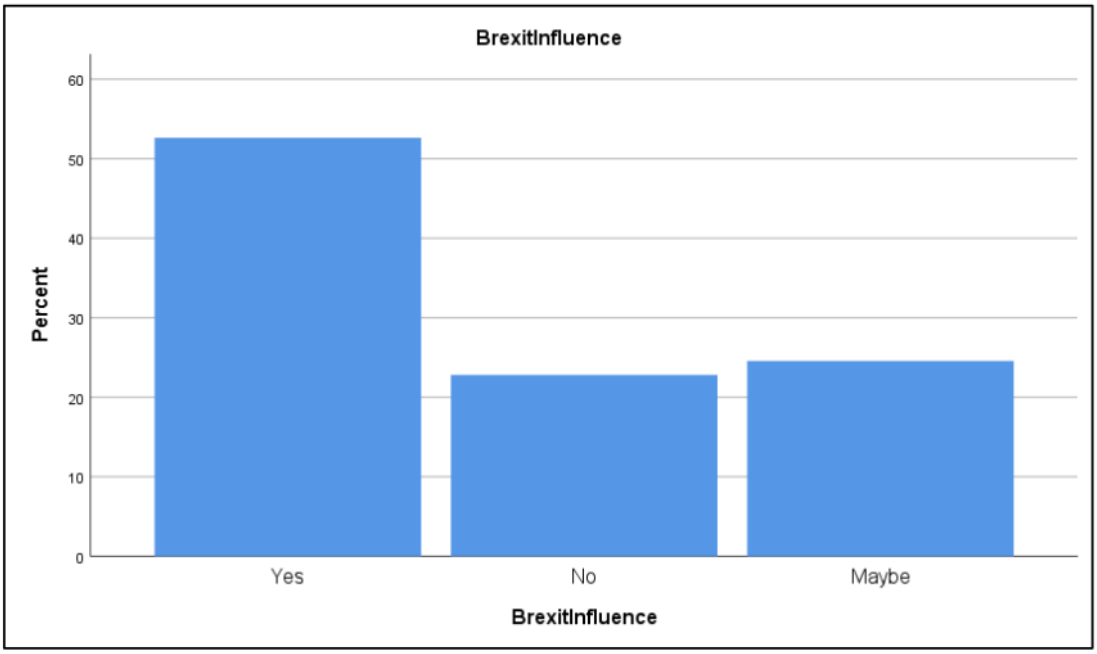
How many years of experience do you have in the UK based SME?



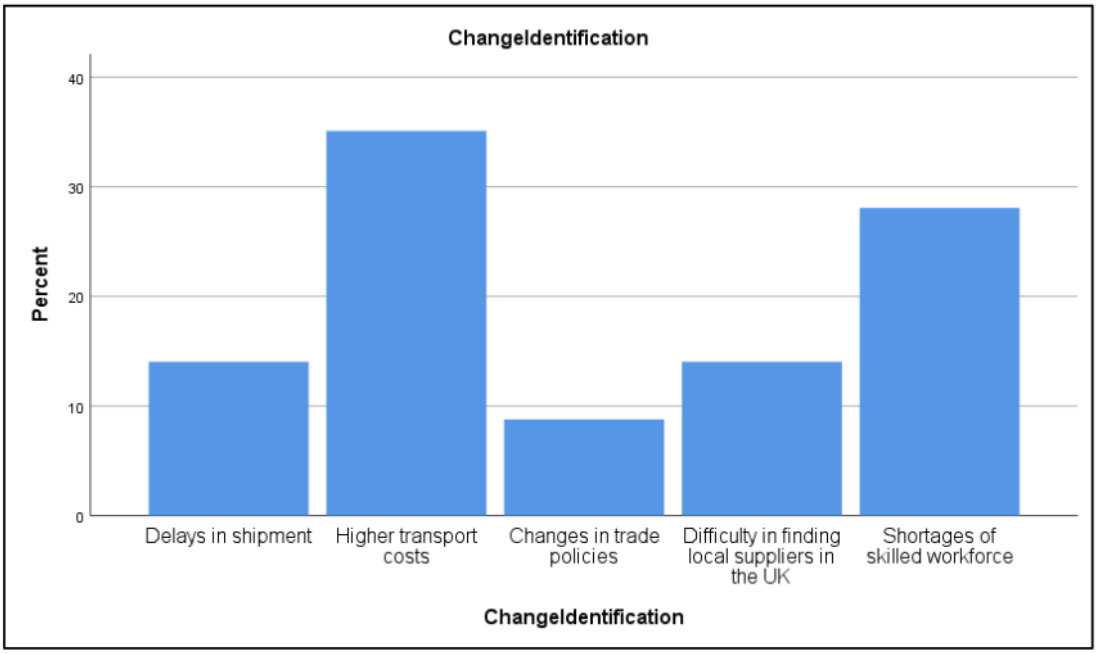
Which of the following most accurately describes your role?



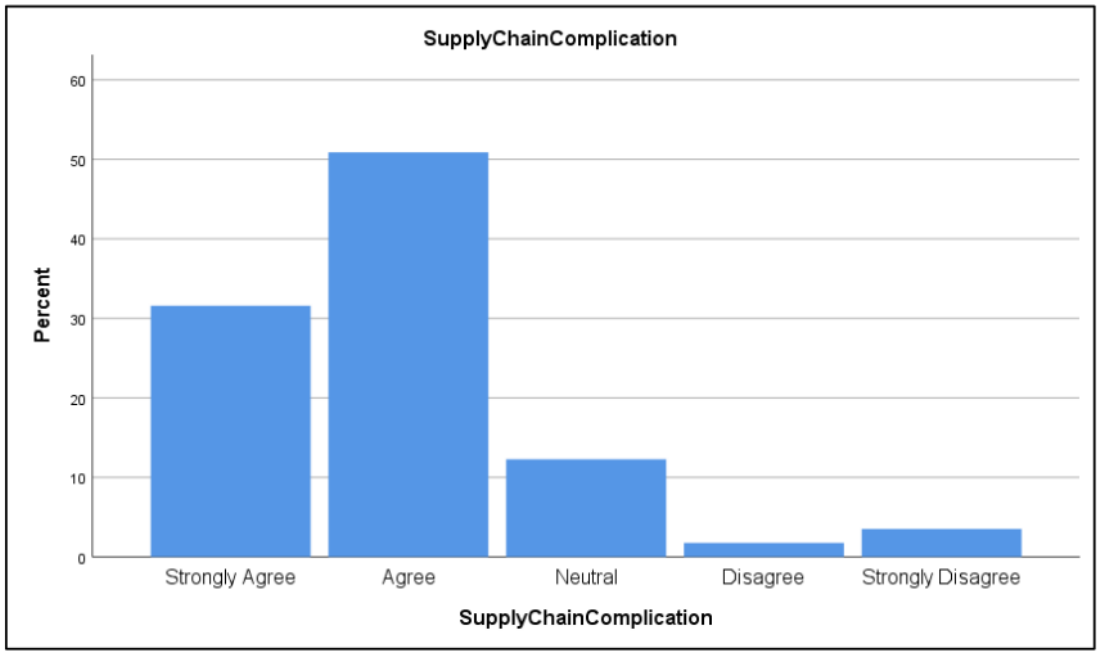
Have you witnessed any prominent changes after Brexit in the SME operations?



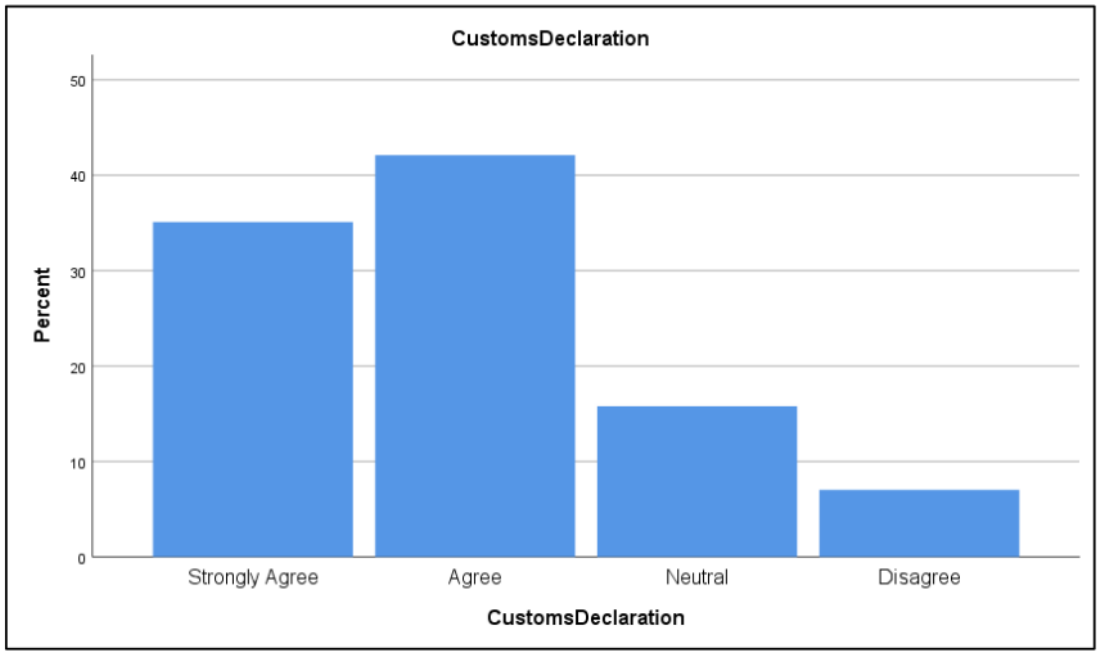
Please identify the changes from the following options



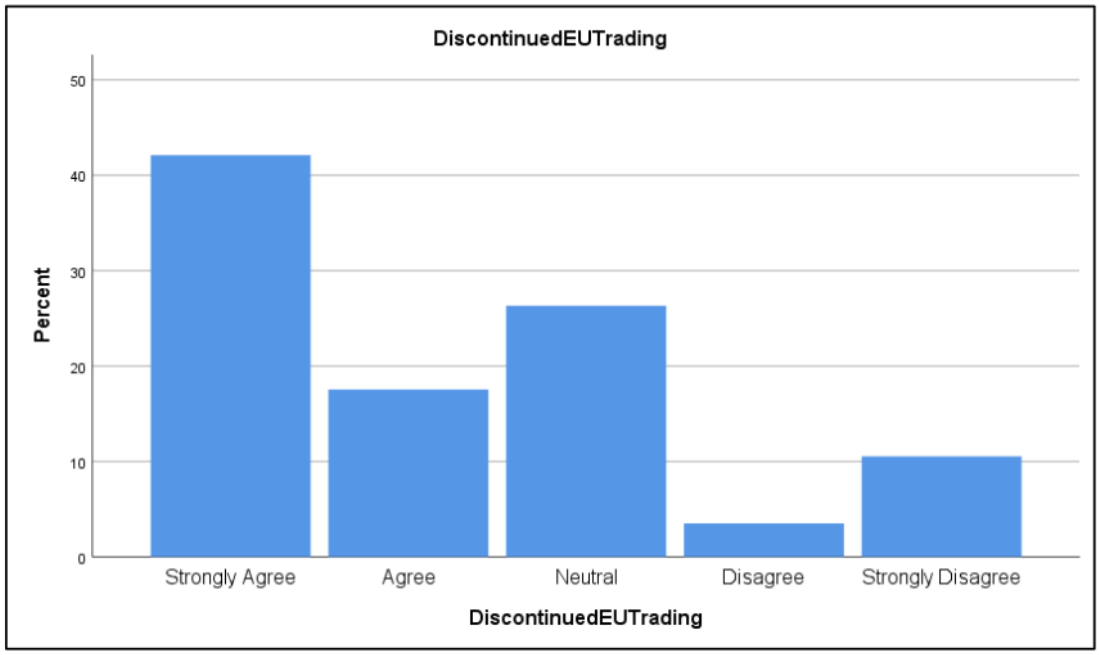
Do you agree that these changes have complicated the supply chain process of the UK SMEs after Brexit?



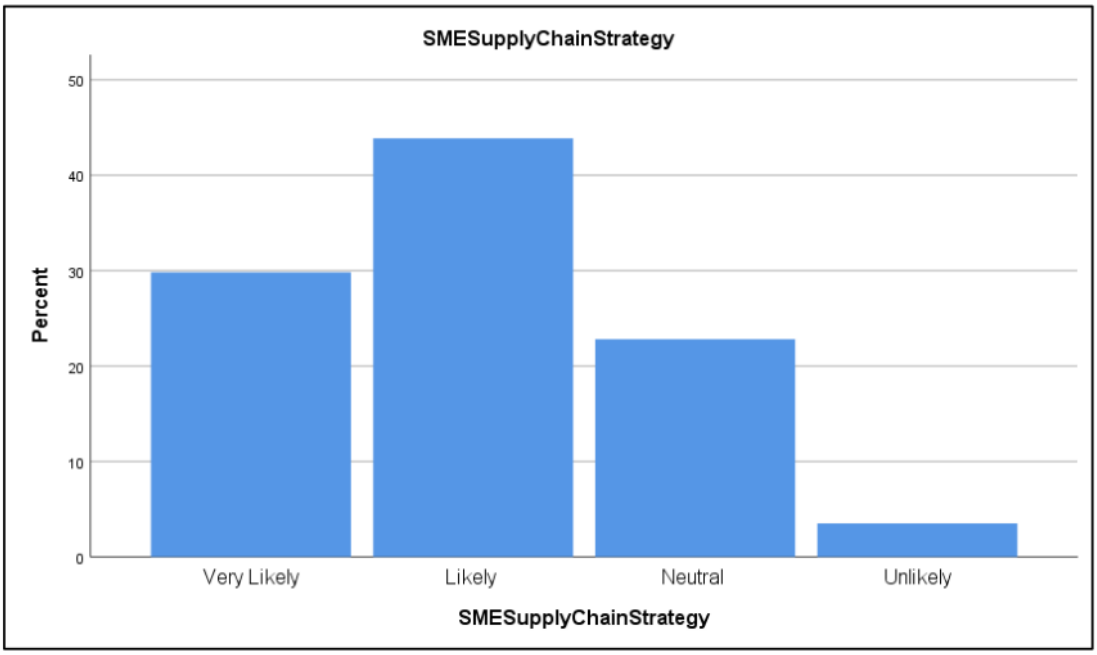
Post-Brexit modifications in customs declaration procedures resulted in delays and additional expenditures.



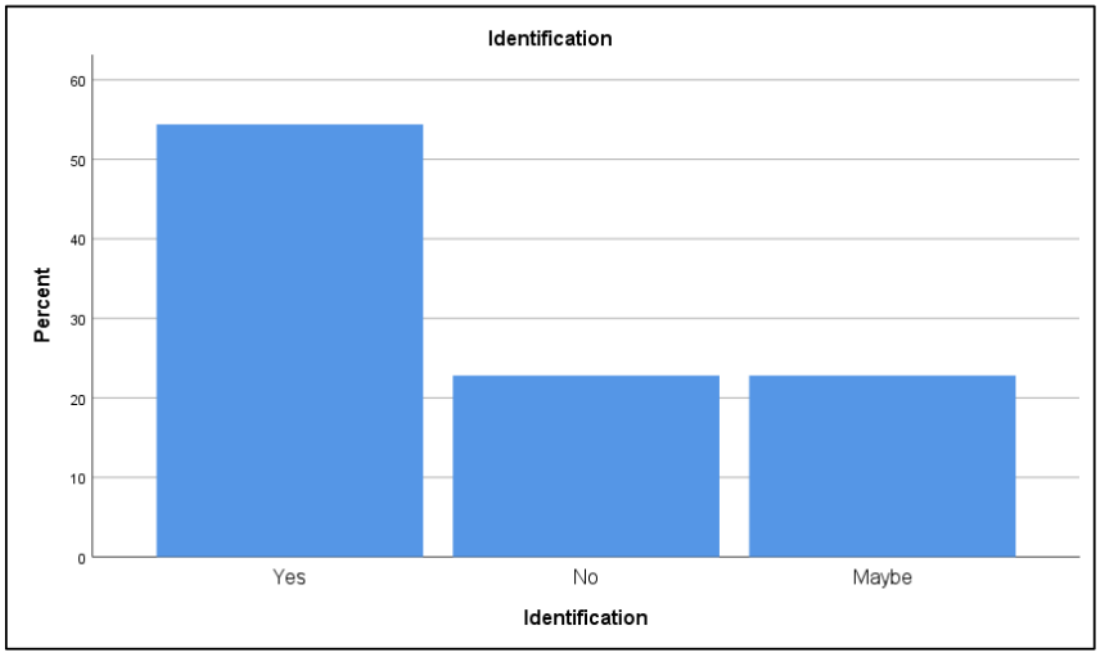
Do you agree that many UK firms have discontinued trading with EU-based customers due to delays and increased transport costs?



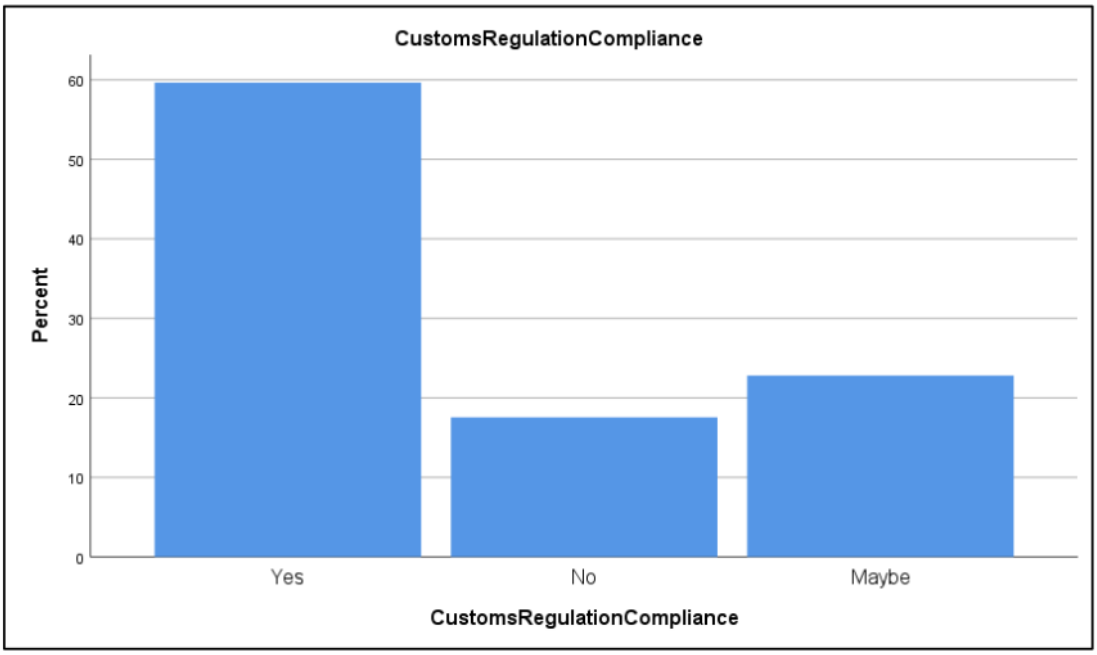
'How likely are UK SMEs considering building a branch or warehouse in the EU to serve the EU customer base to fix the post Brexit difficulties?



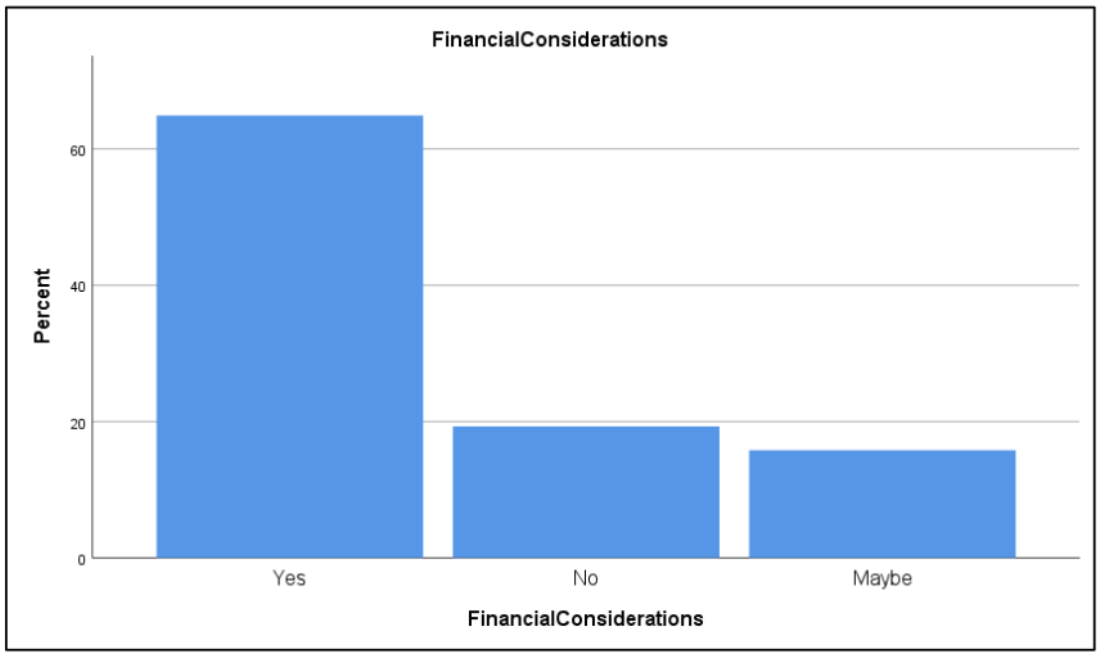
Has your company obtained the EORI identification, required for foreign trading in EU markets after Brexit?



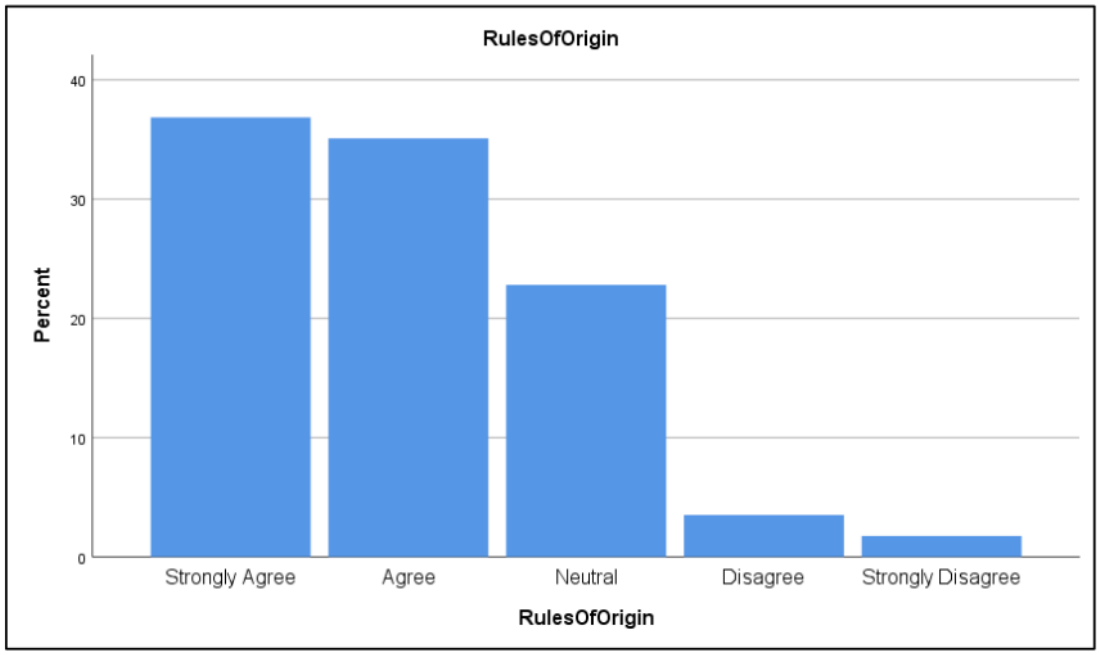
Is your organisation equipped to handle new customs regulations such as import and export management, Certificates of Origin, and Long Term Supplier Declarations?



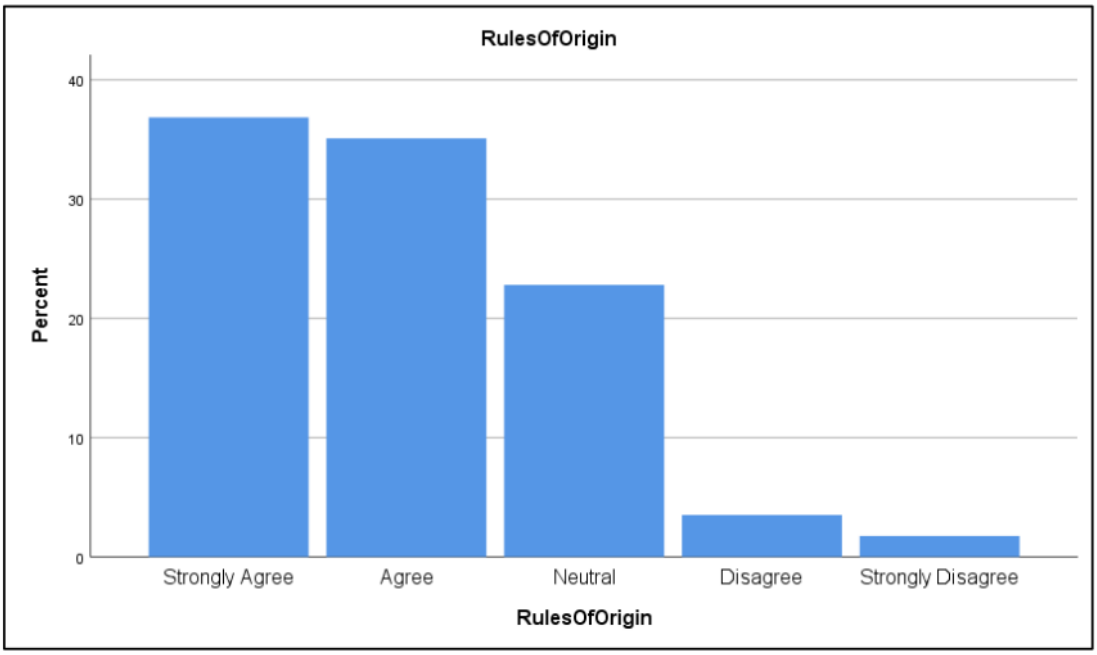
Have your small or medium sized business evaluated the impact of additional costs on cash flow, such as import VAT, duties, capital tie-ups, stock-build overtime, and more warehousing capacity?



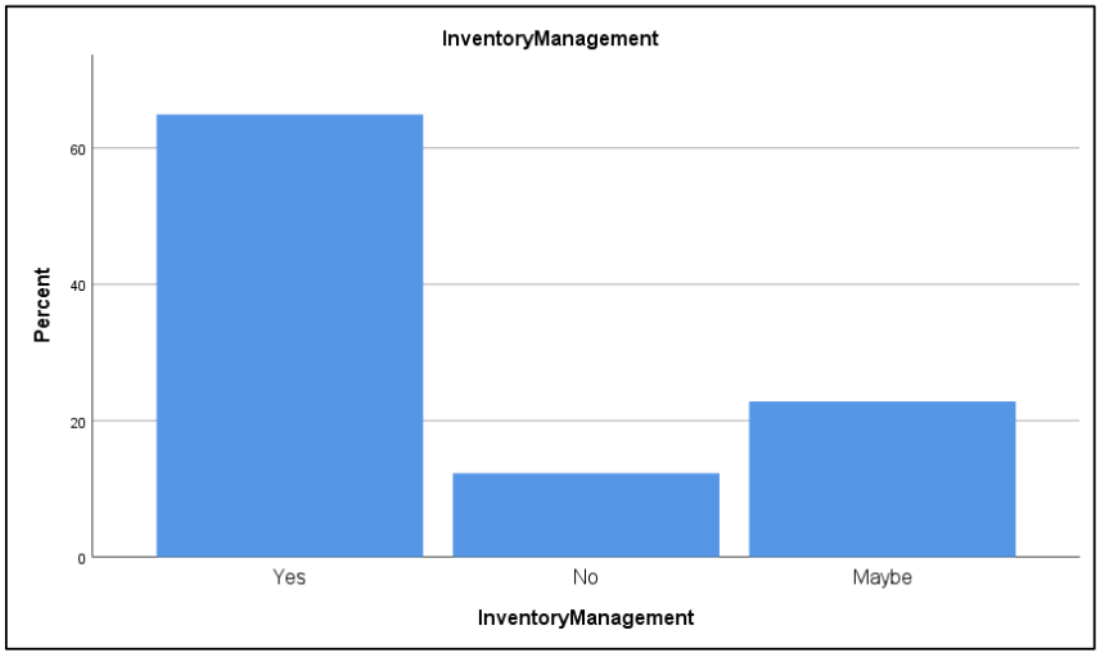
Do you agree that UK businesses that rely on re-exporting goods with the EU are facing trade interruptions due to the 'Rules of Origin'?



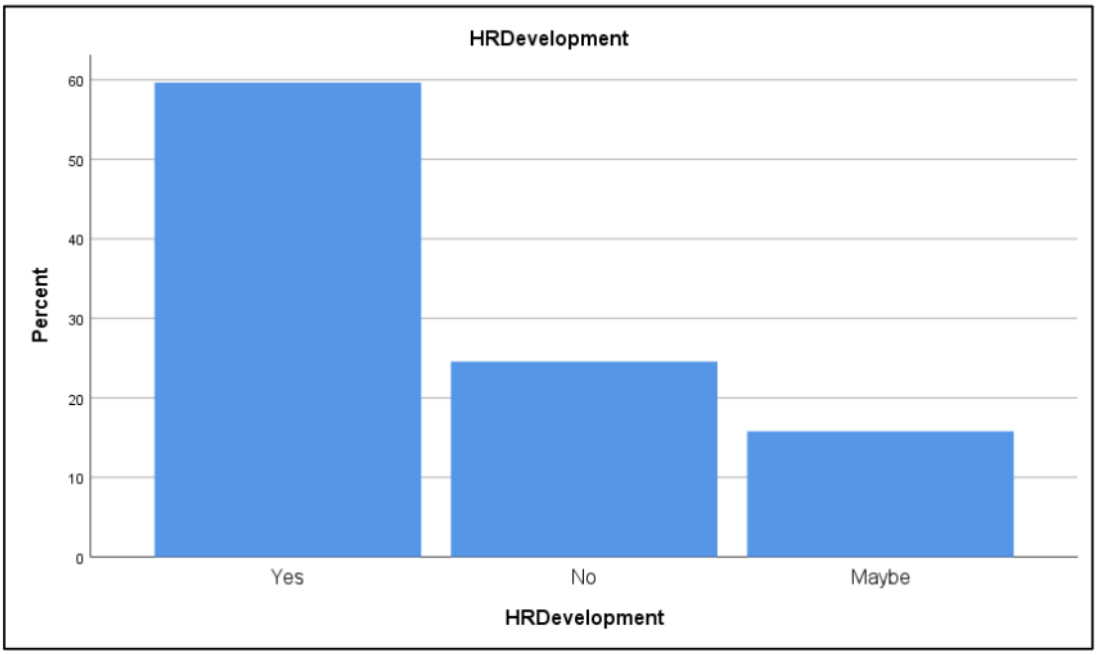
How probable is it that more localisation of UK-based businesses' supply chains, notably on-shoring of raw materials, will help to resolve post-Brexit customs challenges?



Have you boosted the amount of inventory for raw materials or completed goods to reduce port disruptions?

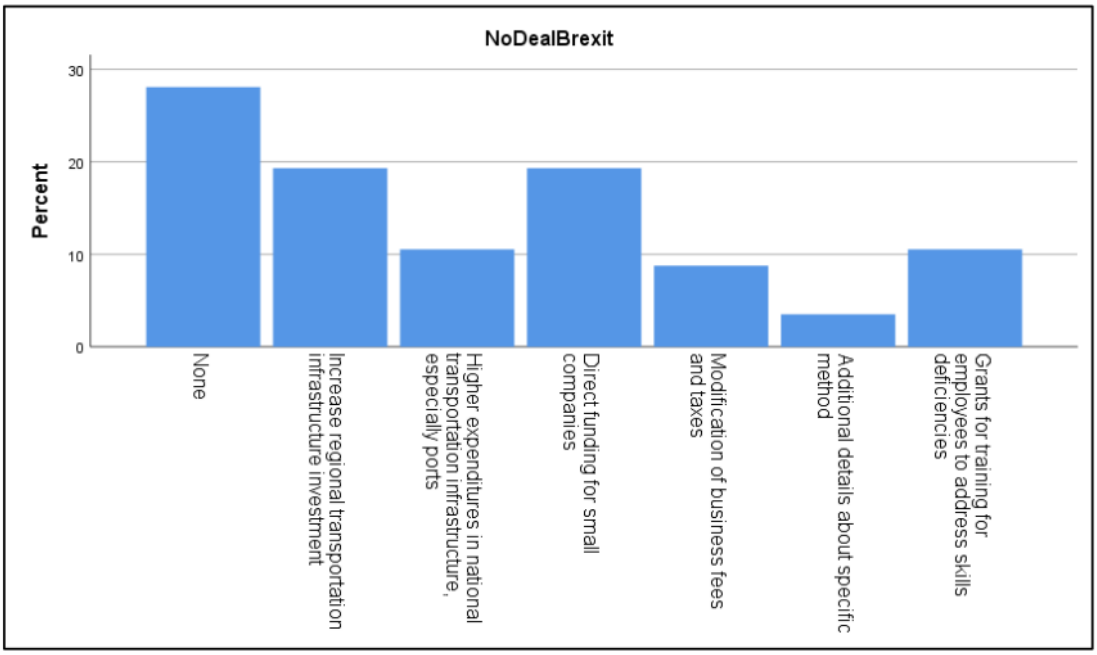


Does your company have invested more in its current workforce by providing professional training and courses to enhance the skills of the employees?



21

In the case of a "no-deal" Brexit, what assistance (if any) would you expect from the governing body (local, regional, or national)?



Appendix 4: Survey link

https://docs.google.com/forms/d/1HVGEi2qap85vceC1zX1JpjK9MrqzePvAz5lFYqlcglM/viewform?edit_requested=true#question=740430874&field=777680978

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