



**IMPACT OF MACROECONOMIC RISK FACTORS, ADOPTION OF
FINANCIAL DERIVATIVES AND CORPORATE TAX AVOIDANCE ON
WORKING CAPITAL MANAGEMENT, AND FIRM PERFORMANCE**

By

HOSSAIN MOHAMMAD REYAD

**Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia,
in Fulfilment of the Requirements for the Degree of Doctor of Philosophy**

December 2022

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Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Doctor of Philosophy

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December 2022

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Working capital management (WCM) has attracted increasing attention from businesses due to its sensitivity toward a firm's financial efficiency and health. In any business, managing working capital (WC) is a never-ending task, and a constant inflow of funds needs to be ensured to keep the daily operations of the firm motoring along smoothly. To achieve this, firms need to understand which factors affect the investment of working capital. Macroeconomic risk factors draw major attention from businesses due to the inherent risk involved in working capital components, notably for firms in the United States, the United Kingdom, Germany, and China that are heavily involved in international trade.

Therefore, the primary objective of this study is to examine the effect of macroeconomic risk factors on WCM. Subsequently, this study examines how the interaction between financial derivatives, corporate tax avoidance (CTA), and WCM influences the firms' performance amid volatility in macroeconomic risk factors. This research examines non-financial firms from 2006 to 2020, including 7645 firms from the USA, 1107 firms from the UK, 683 firms from Germany, and 4403 firms from China. The regression analysis begins with Ordinary Least Squares regression (OLS) to analyze the research objectives. However, Durbin–Wu–Hausman test indicates that endogeneity is a major issue in this study's OLS model. Hence, the two-step system Generalized method of moments (GMM) estimation technique is employed to examine the research objectives.

This study finds that economic policy uncertainty (EPU) has a significantly negative relationship with CCC for firms in the USA, Germany, and China but a positive relationship for UK firms. On the other hand, foreign exchange risk (FX risk) has a significantly positive effect on CCC for firms in the USA, the UK, and China but a

negative effect for firms in Germany. Furthermore, the current study reveals a positive association between the interaction of CCC and CDS on the ROA of all the countries' firms. This may be related to CDS adoption enhancing firms' WC financing, allowing them to maintain a higher CCC level. The adoption of CDS may drive firms to invest more in WC to dominate sales and grab market potential. Therefore, higher investment in WC yields a firm to have a higher ROA.

Similarly, the current research discovers a positive effect of the interaction between CCC and CTA on ROA for all the sample countries' firms. As a kind of operational hedging, tax avoidance may insulate businesses from cash flow uncertainties during increased macroeconomic volatility. Firms may conserve the tax money for better WC management, greater WC investment to boost sales, and a better ROA.

Nonetheless, this research sheds light on the literature demonstrating that firms may increase WC investment to achieve higher profitability when CDS and CTA are present to handle WC financing constraints. The study's most important implication is that financial derivatives should be widely used during periods of macroeconomic instability. Businesses need government-enforced laws to help them avoid paying taxes. As a result, businesses are resilient even under harsh economic conditions.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Doktor Falsafah

KESAN FAKTOR RISIKO MAKROEKONOMI, PENGGUNAAN DERIVATIF KEWANGAN DAN PENGHINDARAN CUKAI KORPORAT TERHADAP PENGURUSAN MODAL KERJA DAN PRESTASI FIRMA

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Pengurusan modal kerja (*WCM*) semakin mendapat perhatian daripada perniagaan disebabkan oleh sensitivitinya terhadap kecekapan dan kesihatan kewangan firma. Dalam mana-mana perniagaan, mengurus modal kerja (*WC*) adalah satu tugas yang tidak pernah berkesudahan, dan aliran masuk dana yang berterusan diperlukan bagi menjamin operasi harian firma berjalan lancar. Bagi mencapai matlamat ini, firma perlu memahami faktor yang mempengaruhi pelaburan modal kerja. Faktor risiko makroekonomi menarik perhatian utama perniagaan kerana risiko yang wujud dalam komponen modal kerja, terutamanya bagi firma di Amerika Syarikat, United Kingdom, Jerman dan China yang banyak terlibat dalam perdagangan antarabangsa.

Oleh itu, objektif utama kajian ini adalah untuk meneliti kesan faktor risiko makroekonomi terhadap *WCM*. Seterusnya, kajian ini menyiasat bagaimana interaksi antara derivatif kewangan, pengelakan cukai korporat (*CTA*) dan *WCM* mempengaruhi prestasi firma dalam keadaan volatiliti dalam faktor risiko makroekonomi. Penyelidikan ini mengambil sampel firma bukan kewangan dari 2006 hingga 2020, termasuk 7645 firma dari AS, 1107 firma dari UK, 683 firma dari Jerman dan 4403 firma dari China. Analisis regresi bermula dengan regresi *Ordinary Least Squares (OLS)* untuk menganalisis objektif kajian. Walau bagaimanapun, ujian Durbin-Wu-Hausman menunjukkan bahawa endogeneiti adalah isu utama dalam model *OLS* kajian ini. Oleh itu, *two-step system Generalized method of moments (GMM)* digunakan untuk memeriksa objektif kajian.

Kajian ini mendapati bahawa ketidakpastian dasar ekonomi (*EPU*) mempunyai hubungan negatif yang signifikan dengan *CCC* untuk firma di AS, Jerman dan China tetapi hubungan positif untuk firma UK. Sebaliknya, risiko pertukaran asing (risiko *FX*) mempunyai kesan positif yang signifikan terhadap *CCC* untuk firma di AS, UK,

dan China tetapi kesan negatif bagi firma di Jerman. Tambahan pula, kajian ini mendedahkan perkaitan positif antara interaksi *CCC* dan *CDS* dengan *ROA* firma-firma semua negara. Ini mungkin berkaitan dengan penerapan *CDS* yang meningkatkan pembiayaan *WC* firma, membolehkan mereka mengekalkan tahap *CCC* yang lebih tinggi. Penggunaan *CDS* mungkin mendorong firma untuk melabur lebih banyak dalam *WC* untuk menguasai jualan dan merebut potensi pasaran. Oleh itu, pelaburan yang lebih tinggi dalam *WC* menghasilkan firma yang mempunyai *ROA* yang lebih tinggi.

Begitu juga, kajian semasa menemui kesan positif interaksi antara *CCC* dan *CTA* terhadap *ROA* untuk semua firma negara sampel. Sebagai sejenis perlindungan nilai operasi, pengelakan cukai mungkin melindungi perniagaan daripada ketidaktentuan aliran tunai semasa volatiliti makroekonomi yang meningkat. Firma boleh menjimatkan wang cukai untuk pengurusan *WC* yang lebih baik, pelaburan *WC* yang lebih besar demi meningkatkan jualan, serta *ROA* yang lebih baik.

Walau bagaimanapun, penyelidikan ini memberi penerangan kepada literatur yang menunjukkan bahawa firma boleh meningkatkan pelaburan *WC* untuk mencapai keuntungan yang lebih tinggi apabila *CDS* dan *CTA* wujud untuk mengendalikan kekangan pembiayaan *WC*. Implikasi penting dalam kajian ini ialah derivatif kewangan harus diguna pakai secara meluas semasa tempoh ketidakstabilan makroekonomi. Perniagaan memerlukan undang-undang yang dikuatkuasakan oleh kerajaan untuk membantu mereka mengelak daripada membayar cukai. Oleh itu, perniagaan akan terus berdaya tahan walaupun dalam keadaan ekonomi yang terjejas teruk.

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TABLE OF CONTENTS

	Page
ABSTRACT	i
ABSTRAK	iii
ACKNOWLEDGEMENTS	v
APPROVAL	vi
DECLARATION	viii
LIST OF TABLES	xiii
LIST OF FIGURES	xiv
LIST OF ABBREVIATIONS	xv
CHAPTER	
1 INTRODUCTION	1
1.1 Introduction	1
1.2 Background of the Study	1
1.3 Economic Policy Uncertainty, Foreign Exchange Risk, and Global Economy	3
1.3.1 EPU, FX Volatility, and WCM in USA	8
1.3.2 EPU, FX Volatility, and WCM in China	8
1.3.3 EPU, FX Volatility, and WCM in UK	11
1.3.4 EPU, FX Volatility, and WCM in Germany	11
1.4 Adoption of Financial Derivatives and Corporate Tax Avoidance	14
1.5 Problem Statements	16
1.6 Research Objectives	18
1.7 Research Questions	20
1.8 Significance of the Study	20
1.9 Structure of the Study	21
1.10 Chapter Summary	22
2 LITERATURE REVIEW	23
2.1 Introduction	23
2.2 Conceptual Literature Review	23
2.2.1 Macroeconomic Risk Factors	23
2.2.2 Working Capital Management	26
2.2.3 Financial Derivatives	27
2.2.4 Corporate Tax Avoidance	29
2.2.5 Firm Performance	29
2.3 Empirical Literature Review	29
2.3.1 Macroeconomic Risk Factors and Working Capital Management	30
2.3.2 Macroeconomic Risk Factors and Firm Performance	36
2.3.3 Working Capital management and Firm performance	41
2.3.4 Financial Derivatives and Working Capital Management	43

2.3.5	Corporate Tax Avoidance and Working Capital Management	46
2.3.6	Financial Derivatives and Firm Performance	48
2.3.7	Corporate Tax Avoidance and Firm Performance	51
2.4	Theoretical Literature Review	52
2.4.1	Financial Accelerator Theory	52
2.4.2	Trade-off Theory	53
2.4.3	Hedge Theory	56
2.5	Research Framework and Hypotheses	57
2.6	Chapter Summary	60
3	DATA AND METHODOLOGY	61
3.1	Introduction	61
3.2	Research Design	61
3.3	Population and Sample Selection	62
3.4	Data Collection	63
3.5	Estimation Technique	64
3.6	Empirical Models	66
3.6.1	Model 1 for Objective 1: The Impact of Macroeconomic Risk Factors on WCM	67
3.6.2	Model 2 for Objective 2: The Impact of the Interaction between Financial Derivatives and WCM on Firm Performance	71
3.6.3	Model 3 for Objective 3: The Impact of the Interaction between Corporate Tax Avoidance and WCM on Firm Performance	73
3.7	Chapter Summary	74
4	RESULTS AND DISCUSSIONS	75
4.1	Introduction	75
4.2	Descriptive Statistics	75
4.2.1	Descriptive Statistics for the USA	75
4.2.2	Descriptive Statistics for the UK	77
4.2.3	Descriptive Statistics for Germany	78
4.2.4	Descriptive Statistics for China	79
4.3	Correlation Matrix	81
4.3.1	Correlation Matrix for the USA	81
4.3.2	Correlation Matrix for the UK	81
4.3.3	Correlation Matrix for Germany	82
4.3.4	Correlation Matrix for China	83
4.4	Regression Analysis	83
4.4.1	Baseline Regression Analysis (OLS)	83
4.4.2	Two-step System GMM Analysis	85
4.5	Chapter Summary	94
5	CONCLUSION	96
5.1	Introduction	96
5.2	Summary of the Research	96
5.3	Major Findings of the Study	97
5.4	Practical Implications	99

5.5	Theoretical Implications	101
5.6	Limitations and Recommendations for Future Research	102
5.7	Chapter Summary	102

REFERENCES	103
BIODATA OF STUDENT	132
LIST OF PUBLICATIONS	133



LIST OF TABLES

Table		Page
2.1	Research Hypotheses	60
3.1	Summary of the Variables	74
4.1	Descriptive Statistics for the USA	77
4.2	Descriptive Statistics for the UK	78
4.3	Descriptive Statistics for Germany	79
4.4	Descriptive Statistics for China	80
4.5	Correlation Matrix for the USA	81
4.6	Correlation Matrix for the UK	82
4.7	Correlation Matrix for Germany	82
4.8	Correlation Matrix for China	83
4.9	OLS Regression Analysis for Model 1	84
4.10	GMM Results for Model 1	87
4.11	GMM Results for Model 2	89
4.12	GMM Results for Model 3	92

LIST OF FIGURES

Figure		Page
1.1	World Economic Policy Uncertainty	4
1.2	Number of Harmful Commercial Policy Interventions	4
1.3	Global Volatility and GDP	6
1.4	World's Leading Traders of Goods and Commercial Services	6
1.5	Top Trading Partners of USA	7
1.6	Top Trading Partners of UK	7
1.7	EPU, FX Volatility, and WCM in USA	9
1.8	EPU, FX Volatility, and WCM in China	10
1.9	EPU, FX Volatility, and WCM in UK	12
1.10	EPU, FX Volatility, and WCM in Germany	13
1.11	Volume of Exchange-traded Derivatives Contracts	15
2.1	Research Framework	59

LIST OF ABBREVIATIONS

BPS	Basis Points
CCC	Cash Conversion Cycle
COGS	Cost of Goods Sold
CDS	Credit Default Swap
DIO	Daily Inventory Outstanding
DPO	Daily Payable Outstanding
DSO	Daily Sales Outstanding
EPU	Economic Policy Uncertainty
EU	Economic Uncertainty
EU	European Union
FE	Fixed Effect
FIN DERIV	Financial Derivatives
FX	Foreign Exchange
GMM	Generalized Method of Moments
GFC	Global Financial Crisis
GDP	Gross Domestic Product
ITC	International Trade Centre
LEV	Leverage
LCU	Local Currency Units
OLS	Ordinary Least Squares
ONS	Office for National Statistics
PBOC	People's Bank of China
RE	Random Effect

ROA	Return on Assets
ROE	Return on Equity
SG	Sales Growth
SCMP	South China Morning Post
TQ	Tobin's Q
TARP	Troubled Asset Relief Program
UK	United Kingdom
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
UNSD	United Nations Statistics Division
USA	United States of America
WACC	Weighted Average Cost of Capital
WC	Working Capital
WCM	Working Capital Management
WTO	World Trade Organization

CHAPTER 1

INTRODUCTION

1.1 Introduction

The introductory chapter begins with an overview of the study's context in terms of the influence of macroeconomic risk factors on working capital management and, eventually, firm performance. In addition, it emphasizes the significance of financial derivatives and corporate tax avoidance for effective working capital management. After that, the next sections of this chapter focus on the problem statement that the research endeavours to investigate. Following this, the research questions and objectives, as well as the significance of the study and the structure of the thesis, will be outlined.

1.2 Background of the Study

Working capital management (WCM) has attracted increasing attention for businesses due to its sensitivity toward a firm's financial efficiency and health (Magni & Marchioni, 2020; Wetzel & Hofmann, 2019). WCM refers to an approach that perpetuates operating liquidity to run a business and facilitates the ability of a firm to continue its operations while indulging its operational expenses and short-term debts (Semaa et al. 2020). In other words, working capital management deals with managing current assets and liabilities of a firm (Pestonji & Wichitsathian, 2019). It is important for firms to manage their current assets and liabilities in order to ensure that they are not in a state of financial constraint. Furthermore, firms focus on working capital management intensively because of its relativity to firms' profitability, risk, and value (De Almeida & Eid, 2014). Current assets that do not contribute to the return on assets hinder the performance of the firm. In light of this, it is imperative that all businesses practice efficient management of their working capital, which increases profitability.

Efficient working capital management embodies effective management of its components, such as inventory, account receivables, and account payables. It is devastating for firms when inventories are not saleable, receivables are not collectible, and payables cannot be paid on time. When a firm fails to incorporate all these components efficiently, it directly affects the cash conversion cycle (CCC). By definition, the cash conversion cycle is an indicator of working capital management that measures how long it takes to convert its investment in accounts receivable, inventories, and accounts payable into cash from sales (Mun & Jang, 2015).

The CCC has a strong relationship with the firms' performance metrics (Boisjoly et al., 2020), and a lower CCC is imperative as it denotes the ability of a firm to turn its sales into profit without delay. By reducing days in inventory and account receivables, financial managers add value to the firms. On the contrary, when a firm extends

account payables, it can utilize the funds to finance other business activities in order to boost the firm's profitability.

Nevertheless, working capital management and firm performance are of paramount significance to the world's leading economies. It is observed that the greater financial performance of publicly traded manufacturing enterprises in the United States is correlated with efficient management of working capital (Lyngstadaas, 2020). However, commercial banks in the United States have been hit hard by recent macroeconomic volatility, leading to greater borrowing costs for businesses (Berger et al., 2022). When the cost of financing working capital is high, firms see a decline in profitability (Fernández-López et al., 2020). Additionally, European Union (EU) firms' poor performance was a direct result of the global financial crisis's impact on their liquidity and working capital management (Akgün & Karataş, 2020). Despite this, limited research has been conducted to establish how the working capital of EU countries' firms was impacted during the crisis (Simon et al., 2017).

According to the UK's point of view, the country has always placed a greater emphasis on the use of cash. Historically, the country's working capital levels continue to be more efficient than those of continental Europe. Alarming, according to a PwC report (Windaus et al., 2019), the UK's net working capital days deteriorated at a pace of 6% per year between 2014 and 2018, whilst the EU as a whole saw a decline of 1% per year. This is due to rising demands on working capital, which has been fueled by a 5% annual increase in working capital days in both France and Germany. In terms of operating cash flow performance, the EU27 has now surpassed the United Kingdom. The UK's operating cash flow as a proportion of sales has declined by 2% yearly since 2016. In addition, UK capital expenditures have declined by 5% annually since 2016 and are presently at their lowest level in the last five years. These findings call for a comprehensive examination of the impact that deteriorating WCM has on the profitability of businesses in the UK and the EU.

Furthermore, the unique climate in China makes WCM exceptionally vital for Chinese public firms. First, Chinese firms have restricted access to long-term financial markets, indicating that they must depend increasingly on WC reserves (Ren et al., 2019). Second, China encompasses a big country with a wide range of regional institutional environments (IE). The IE, which applies a set of political, legal, and social standards, has a substantial impact on the allocation of financial resources, contractual costs, and hence the financial success of businesses. Thirdly, the cohabitation of state-owned enterprises (SOEs) and non-SOEs characterises the Chinese economy. SOEs and non-SOEs have distinct objectives, management structures, funding capabilities, and operational efficiency.

Regarding the Chinese credit market, the government plays a crucial role in allocating credit assets (Laghari & Chengang, 2019). The government is often the deciding factor in determining which business receives credit. Therefore, the largest number of credits is issued to state-owned corporations (Laghari & Chengang, 2019). Compared to state-owned businesses, it is more difficult for privately held businesses to get financial assistance from banks. Therefore, the role of China's external financial market in

financing and resource allocation is restricted (Guariglia & Yang, 2016). All of these factors may impact the contribution of WCM to a firm's profitability. In addition, there is evidence that numerous Chinese firms, including Giant Group, Sanjiu Group, and Delong Group, went bankrupt due to a lack of funds (Ren et al., 2019). This indicates that effective management of working capital is becoming more crucial for improved financial performance.

Nonetheless, improving and maintaining the performance of working capital management is always challenging for most firms. It becomes more severe when firms are engrossed with so many challenges from endogenous and exogenous factors. Endogenous factors are firm size, growth rates, organizational structures, borrowing, investing, and dividend policy. On the other hand, exogenous factors are macroeconomic risk factors, such as gross domestic product (GDP), inflation, interest rates, exchange rates (Oseifuah, 2016), and economic policy uncertainty.

1.3 Economic Policy Uncertainty, Foreign Exchange Risk, and Global Economy

Economic policy uncertainty (EPU) refers to the uncertainty regarding economic policies such as monetary, fiscal, or regulatory policy. It stems primarily from the uncertainty of whether existing policies will change in the future or if newly formed policies will have unprecedented effects on the economy and the private sector (Baker et al., 2016; Ng et al., 2020). In general terms, economic policy uncertainty is the ambiguity of who will make the economic policy decisions, what economic policy will be undertaken, when policy decisions will be adopted and implemented, and the economic consequences of the policy decisions (Nguyen et al., 2018b).

Apparently, governments design the economic environment in which businesses operate through policy formations and regulations. Governments levy taxes, offer subsidies, enforce laws, regulate competition, and define economic policies. Government economic policy often has indispensable impacts that are largely non-diversifiable. On top of that, economic policy uncertainty has drawn major concern recently (Lin & Bai, 2021) because of its massive political and economic shocks. Figure 1.1 below illustrates that concerns about economic policy uncertainty have intensified and drastically increased following a series of events, including the emergence of COVID-19, the trade war between the United States of America (USA) and China, and the Brexit issues between the United Kingdom (UK) and European Union (EU) countries (Lei & Song, 2022). Solely the COVID-19 pandemic has caused a global economic policy uncertainty shock that is higher than the one caused by the financial crisis of 2007-2009 and more comparable in scale to the increase in uncertainty during the Great Depression (1929–1933) (Baker et al., 2020).

In addition, Brexit-related uncertainty has an effect on the United Kingdom and the other 27 EU members. The effect of supply chain complexity is evident in the impact of Brexit on import and export activity between UK and EU companies (Erken et al., 2018). The world economic policy uncertainty has also been heightened by the 9/11 attacks, the Second Gulf War, the Northern Rock crisis, the global financial crisis

(GFC), the European debt crisis in 2012, and the USA-China trade war. Notably, as the trade war between China and the United States has escalated, both countries' trading partners have felt the effects. Bilateral commerce between China and the United States has taken a hit, and global trade has suffered as a result (Yan et al., 2022).

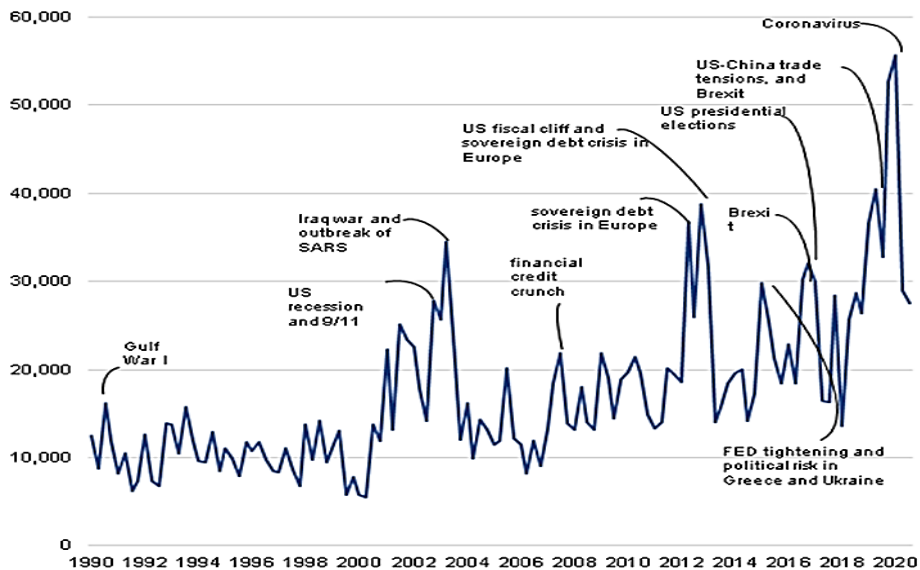


Figure 1.1 : World Economic Policy Uncertainty
(Source : Ahir et al. 2022, “The world uncertainty index”)

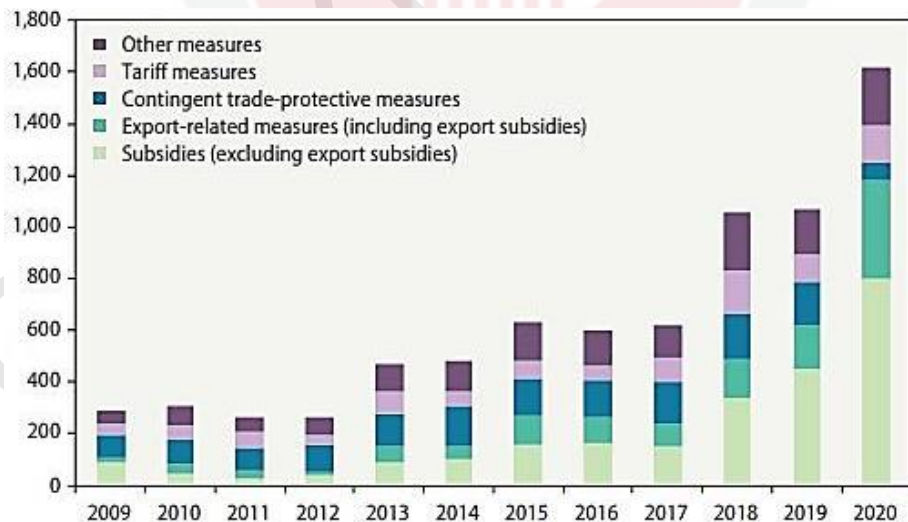


Figure 1.2 : Number of Harmful Commercial Policy Interventions
(Source : Global Trade Alert)

Meanwhile, as shown in Figure 1.2, commercial policy uncertainties are increasing exponentially each year, reaching an all-time high between 2018 and 2020. Several harmful commercial policy interventions in the form of tariff measures, trade-protective measures, export-related measures, and subsidies have heightened tensions in recent years. Unanimity among nations over the degree to which international laws should regulate these activities is one of the causes of ongoing trade disputes. This contributes significantly to global economic policy uncertainty and has possible risks for global trade and business performance. Higher uncertainty matters because it has serious consequences for the economy. Economic policy uncertainty causes recessions in the economy; it reduces investments, squeezes financial sectors, affects demand for goods and services, disrupts supply chains, and lowers the production and productivity of firms (Bloom et al., 2018).

Alongside economic policy uncertainty, foreign exchange risk (FX risk) is another obvious stimulator of macro-economic risk factors. In an increasingly blended global economy, the uncertainty of exchange rates posits a risk to both domestic and multinational firms. It has a significant effect on the firms' competitive positions in the global market and, consequently, on their expected operating cash flows and market value (Sikarwar & Gupta, 2019). The foreign exchange risk arises from volatility in the exchange rates (Bandaly et al., 2018). FX risk is also referred to as the change in the value of assets, liabilities, cash flows, and net profit of the firm due to unexpected changes in exchange rates.

Typically, direct exposure to FX risk is more common among firms that have projected future cash flows in a foreign currency, while firms doing business locally are indirectly affected. Since exchange rate movements, directly and indirectly, affect firms' cash flow and the cost of doing business for both multinational and local firms, exchange rate movements are expected to affect firm performance (Li et al., 2019a). Further, firms' cash flow responds to foreign exchange rates depending on the extent to which they operate global trade, productivity and profitability, the currency denomination of their competition, and the competitiveness of their input and output (Mohapatra, 2019).

Nevertheless, the severity of volatility in economic policy uncertainty and foreign exchange risk varies from country to country. Some countries face extreme reactions, while some face moderate or less. Figure 1.3 **Error! Reference source not found.** Illustrates that the estimated threshold parameter of global volatility for advanced economies is 0.156 per quarter, slightly higher than the estimate of 0.129 obtained for emerging markets. Moreover, the United States and the United Kingdom have the most significant global macroeconomic volatility spill-over effects. The effects are 20% for the USA, whereas the UK-EU contributed 11% to global volatility as of 2020 (Ahir Hites et al., 2021). Therefore, advanced economies are most vulnerable to macro-economic risk factors and emerging economies afterward (Chudik et al., 2020; United Nations, 2021).

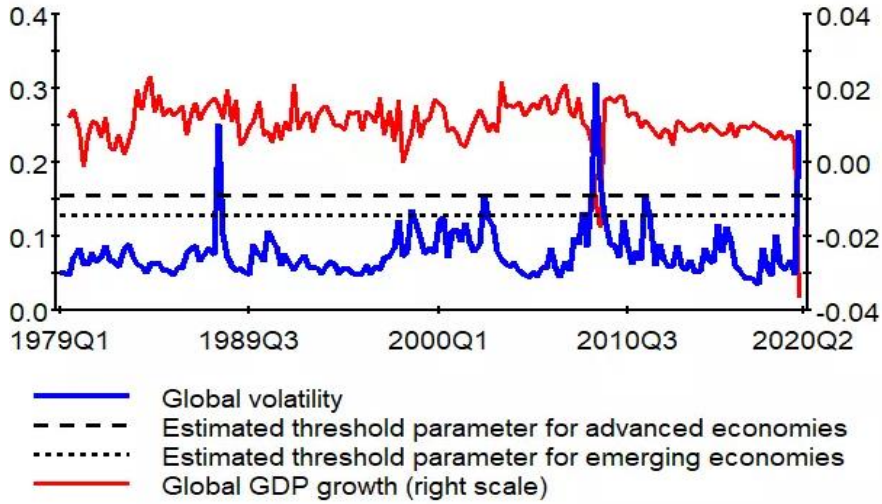


Figure 1.3 : Global Volatility and GDP
 (Source : World Economic Forum, VX EU)

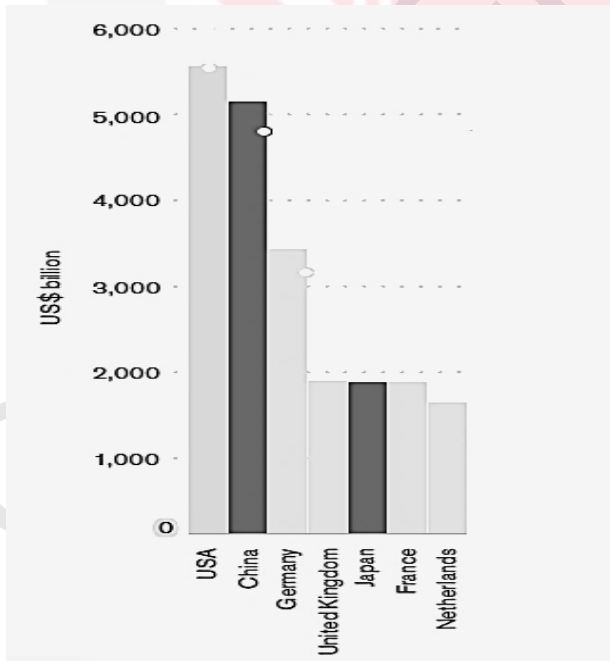


Figure 1.4 : World's Leading Traders of Goods and Commercial Services
 (Source : WTO-UNCTAD in cooperation with ITC and UNSD)

On the other hand, according to Figure 1.4 above, the USA, China, Germany, and the UK are the leading traders of the world's goods and commercial services. Since they are highly involved in international trade, a rise in macro-economic risk factors' volatility certainly affects other countries where their businesses operate. Notably, the top trading partners face paramount or significant repercussions when macro-economic volatility arises in a region (Ongan & Gocer, 2020).

Relatedly, Figure 1.5 below represents that China is one of the most important trading partners of the USA, where their total trade volume accounts for \$332.2 billion and 13.8% of total U.S. trade as of August, 2020. Alarmingly, the trade war between the U.S. and China has triggered a new wave of volatility (Lei & Song, 2022). US firms lost at least \$1.7 trillion in the price of their stocks as a result of U.S. tariffs imposed on imports from China (Amiti et al., 2020). The trade war is likely to have affected the expected profitability of both countries' firms. The adverse impacts of the trade war have affected not only firms that trade with the USA and China but also the USA and Chinese multinationals have likely been affected.

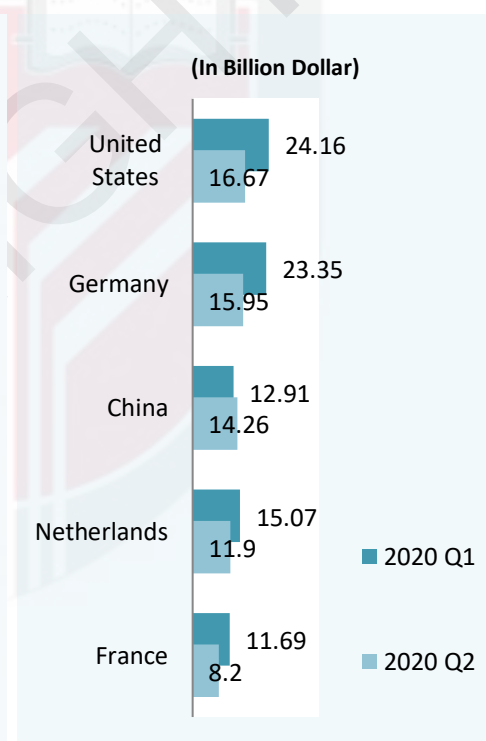
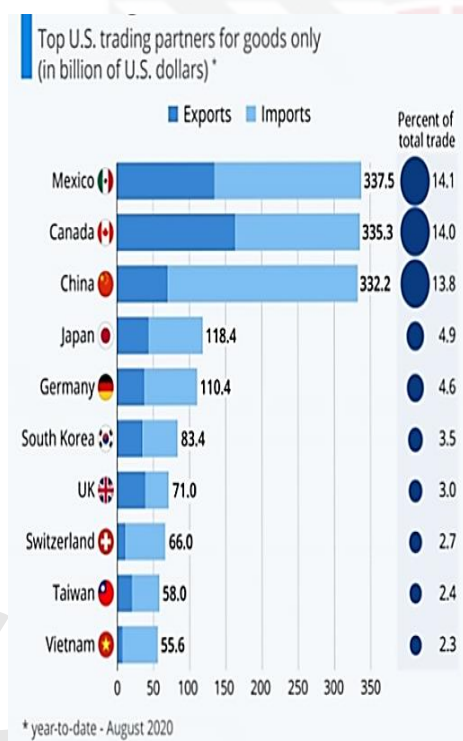


Figure 1.5 : Top Trading Partners of USA
(Source : U.S. Census Bureau)

Figure 1.6 : Top Trading Partners of UK
(Source : Office for National Statistics-UK trade statistics)

On the other hand, Germany, followed by the USA, has been listed as the second largest trading partner of the UK in accordance with Figure 1.6 above. The UK imported more from Germany in the first half of 2020 than from any other trading partner, which represented 12.6% (£24.3 billion) of total goods imported by the UK (ONS, 2020). Brexit, regardless of the figure, makes the UK-Germany trade relationship volatile. Evidently, the Brexit negotiations have escalated 30% of global volatility (Ahir Hites et al., 2021). This uncertainty undoubtedly hampers the business environment of the two countries through a series of channels. Firms may face higher trade tariffs, import and export may be disrupted, productivity may fall, and receivables and payables recovery may be delayed, which may consequently affect the overall performance of the firms.

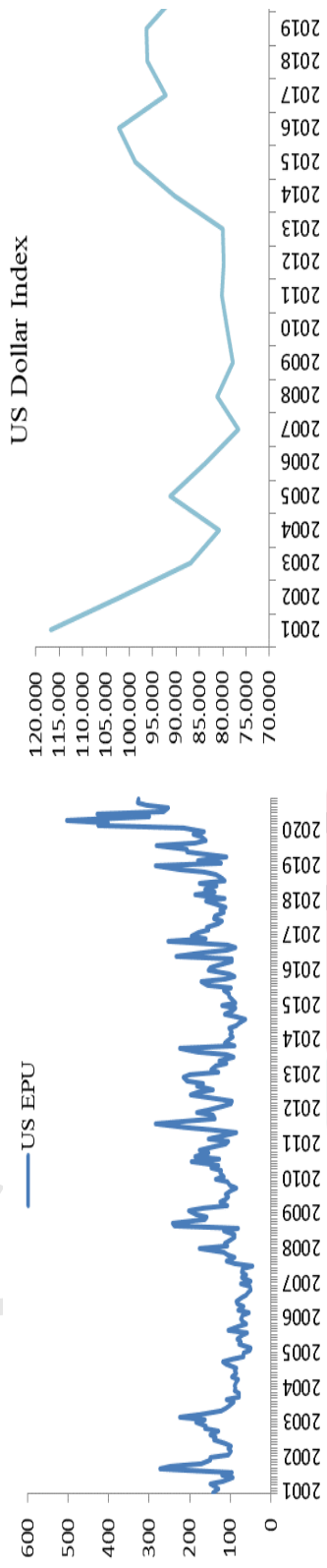
1.3.1 EPU, FX Volatility, and WCM in USA

Economic Policy Uncertainty (EPU) and foreign exchange risk (FX Risk) are the key macro-economic risk factors examined in this study. The United States economic policy uncertainty, foreign exchange volatility, and firms' working capital management scenarios from 2001 to 2020 are shown in Figure 1.7 (page 9) below. According to the figure, the economic policy uncertainty and foreign exchange rate in the USA show significant fluctuations following several major incidents such as the 9/11 terrorist attack, the global financial crisis of 2007-2009, the US-China trade war, the US presidential elections, and the emergence of the COVID-19 Pandemic. The US EPU Index was at an all-time high in 2020, whereas the FX rate was downgraded during that time owing to the COVID-19 Pandemic.

Furthermore, this high volatility in EPU and FX rates exerts significant influence over US firms' daily sales outstanding (DSO), daily inventory outstanding (DIO), and days payable outstanding (DPO). Since the global financial crisis, WCM components like DSO, DIO, and DPO have increased with few exceptions. The growing trend led to the greatest DSO, DIO, and DPO in 2020, which are respectively 37.60, 51.26, and 61.35.

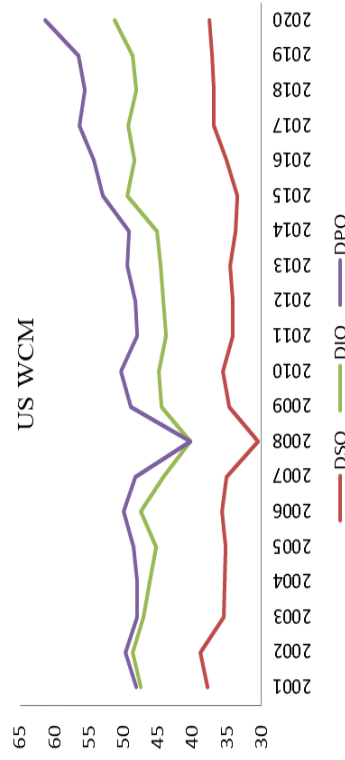
1.3.2 EPU, FX Volatility, and WCM in China

The level of volatility that may be attributed to global macroeconomic risk factors is largely shaped by China. Due to market-oriented reform, the structure of EPU and FX risk in China differs from that in the United States. China's government is insufficiently transparent and scientific in developing specific economic policies (Chi & Li, 2017).



(Source : www.policyuncertainty.com)

(Source : DataStream)



(Source : DataStream)

Figure 1.7 : EPU, FX Volatility, and WCM in USA

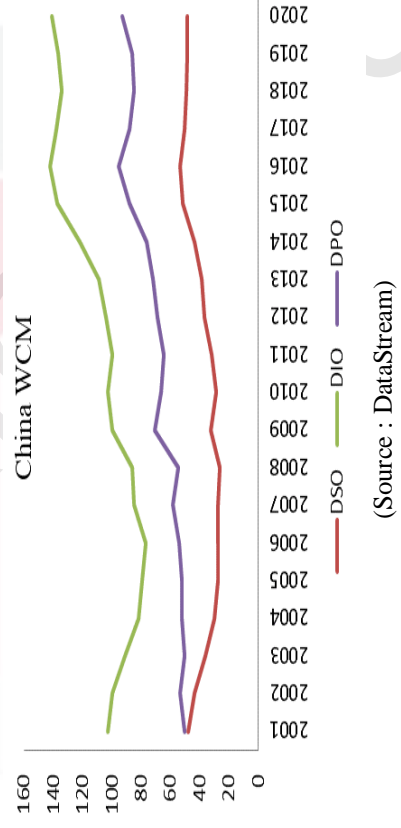
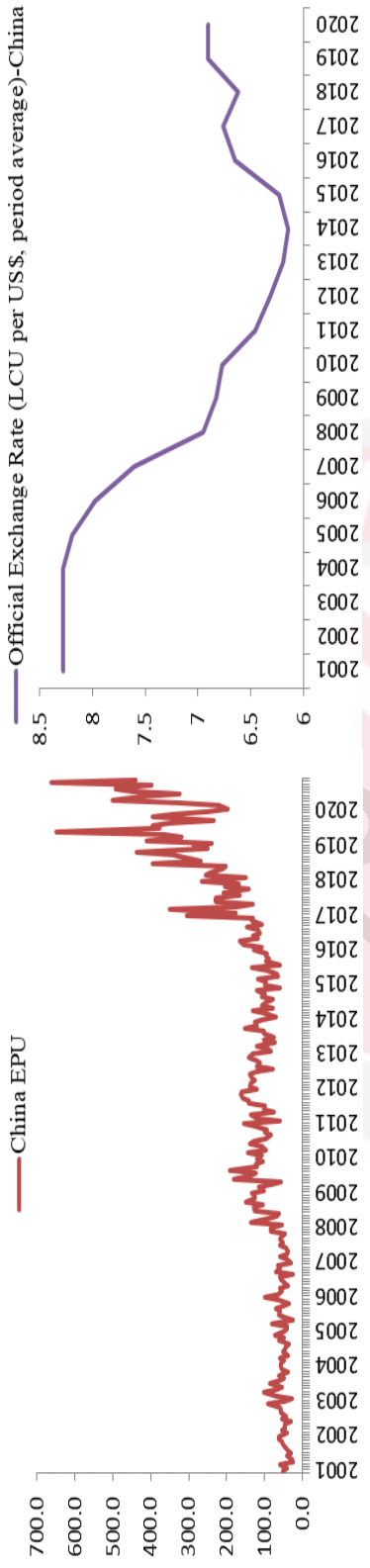


Figure 1.8 : EPU, FX Volatility, and WCM in China

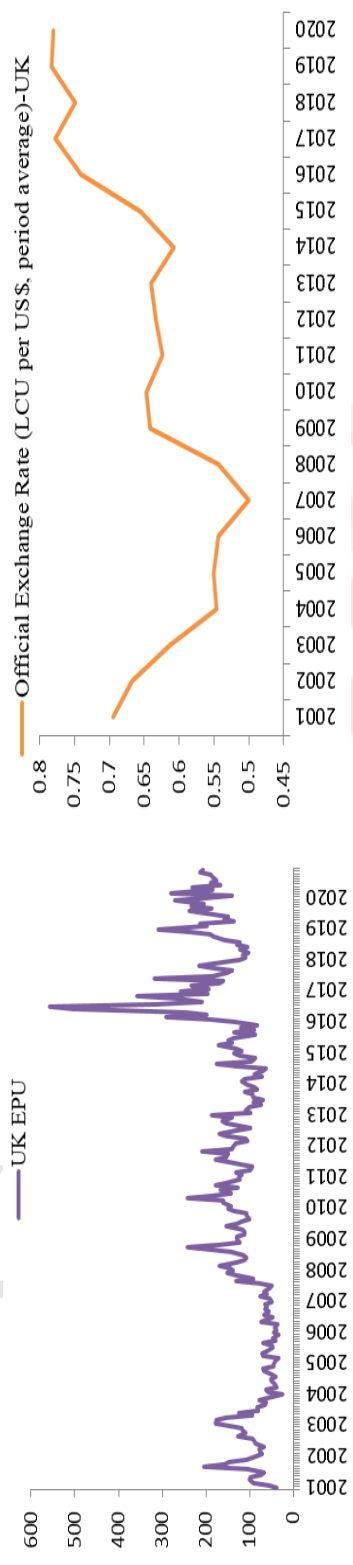
Government economic policies frequently perplex businesses or cause governments to contradict the policy's original intention when implemented owing to their opaqueness, ambiguity, and uncertainty, generating uncertainty shocks. Figure 1.8 above (page 10) depicts China's EPU as more volatile than its FX rate. China's EPU has witnessed an exponential hike concerning the US-China trade war and the COVID-19 Pandemic, whereas its FX rate illustrates a downward movement since the global financial crisis till 2014. Following that, China's foreign exchange rate fluctuates significantly. Meanwhile, Chinese firms' DSO, DIO, and DPO indicate remarkably higher exposure to the global financial crisis of 2007-2009. The average DSO, DIO, and DPO from 2009 to 2020 were 42.72, 122.19, and 79.46, respectively, whereas, before 2009, their averages were 33.25, 87.78, and 53.09, consecutively.

1.3.3 EPU, FX Volatility, and WCM in UK

The EPU, FX rate, and WCM of the United Kingdom all exhibit high volatility over the period 2001 to 2020, as illustrated in Figure 1.9 below (page 12). Brexit elevated the UK's economic policy uncertainty index to a peak of 558.22 in May 2016, exceeding even the most significant uncertainties, such as the 9/11 attacks, the Second Gulf War, the Northern Rock crisis, the global financial crisis (GFC), the European debt crisis (2012), the Scottish independence vote (2014), and the COVID-19 pandemic. On the contrary, the FX rate of the UK exhibited the lowest at the beginning of the GFC and maintained the highest rate during 2019 and 2020. Commensurate with EPU and FX volatility, the WCM also reflects noticeable fluctuations. The UK's DIO was at an all-time high in 2020 in response to COVID-19. The DIO and DPO show a higher trend from 2016 to 2020, where the DSO was the highest in 2004.

1.3.4 EPU, FX Volatility, and WCM in Germany

As demonstrated in Figure 1.10 below (page 13), Germany has had extreme reactions to global economic turmoil over the period from 2001 to 2020. Notably, Germany's EPU was higher during the European debt crisis, the Brexit referendum, and COVID-19. In the same way, its exchange rate changed over time. During the global financial crisis, it was the lowest it had ever been. Therefore, both macro-economic risk factors induced an enormous threat to the German economy between 2001 and 2020. In turn, their reflection is apparent in the components of working capital management.



(Source : www.policyuncertainty.com)

(Source : www.worldbank.org)

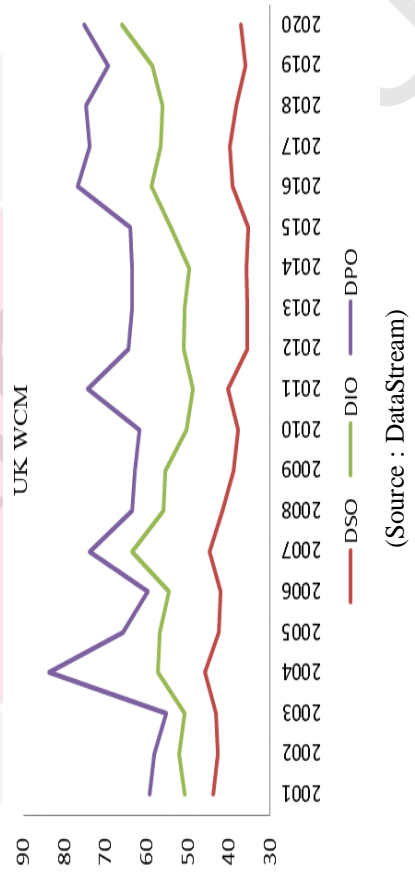
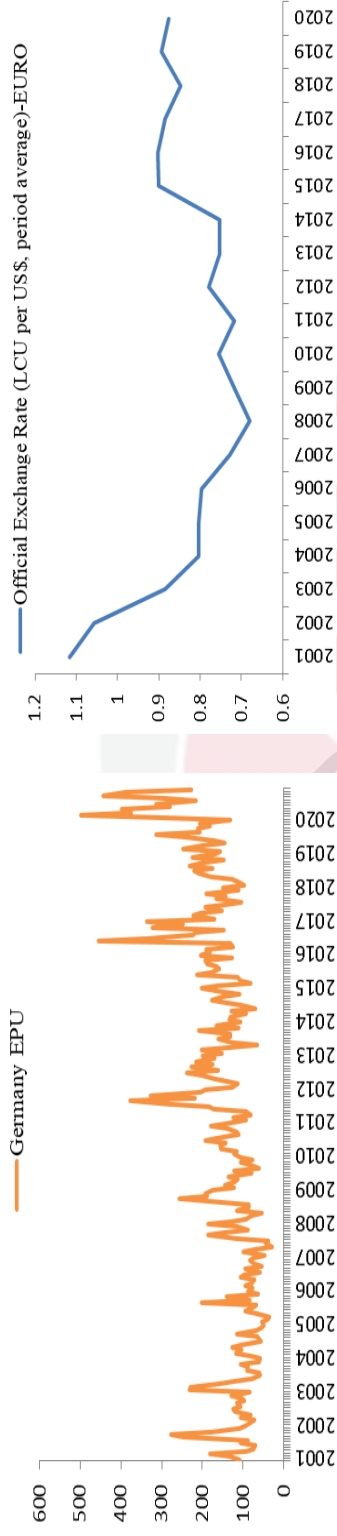
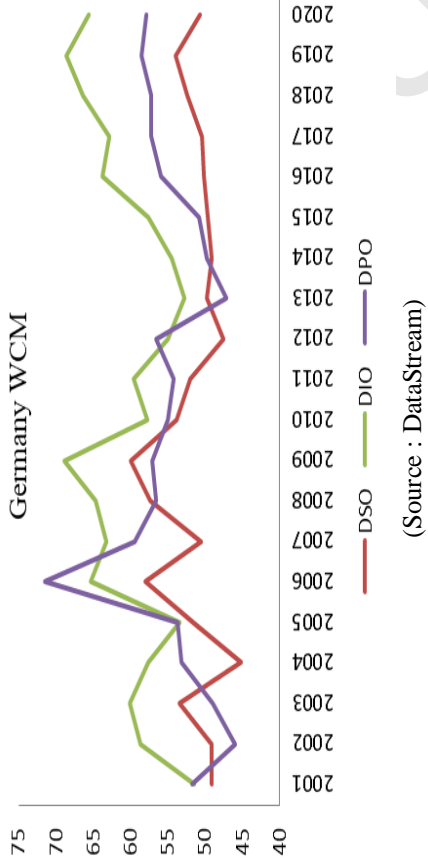


Figure 1.9 : EPU, FX Volatility, and WCM in UK



(Source : www.policyuncertainty.com)

(Source : www.worldbank.org)



(Source : DataStream)

Figure 1.10 : EPU, FX Volatility, and WCM in Germany

The DSO, DIO, and DPO ostensibly demonstrate high fluctuations from 2001 to 2020. In particular, daily sales outstanding were significantly higher, indicating that German firms take longer to convert accounts receivable to cash. As a result, it is clear that the working capital management of German firms is sufficiently vulnerable to macroeconomic risk factors. Overall, when DSO and DIO are high during times of macroeconomic uncertainty, businesses are required to spend more on working capital in order to satisfy their current obligations. This necessitates a reduction in the amount of capital invested in other profitable projects.

In addition, the smaller the DPO, the better the firm's solvency, the less working capital it requires from other firms, and the better the firm's reputation. As a result, it predicts the future profitability of firms. Moreover, holding a substantial volume of inventory may lead to sluggish working capital and costly storage costs, which may reduce a firm's profitability. Hence, with the increased uncertainties in business, the requirement for a risk management strategy is becoming obligatory for business operations as firms cannot take into account fully the future uncertainty level.

1.4 Adoption of Financial Derivatives and Corporate Tax Avoidance

The exposure of a firm to various risks emanating from EPU and FX risk may be hedged using various financial derivative instruments. Financial derivatives are contracts between two or more parties with the aim of protecting participants in the contracts from dreadful movements in the value of the underlying assets (Nguyen et al., 2018).

Notably, financial derivatives are considered to be a widely used approach to deal with cash flow uncertainty. This form of risk management approach may be more valuable and hence more prevalent during market crises. For instance, using credit default swap (CDS) firms doing business in a country of high EPU can protect them from the loss arising from customer default (Wang et al., 2019). If one party is declared as a defaulter, then, under the CDS contract, the CDS seller will reimburse the affected firm. Thus, firms are not at credit risk, which in turn ensures a smooth cash conversion cycle of the firm. Eventually, it improves the firm's financial performance. A lower CCC denotes firms efficiently turning their sales into profits, which results in good financial performance for the firms.

Moreover, Figure 1.11 below demonstrates that the trend of exchange-traded derivatives contracts is mounting globally, mainly in Americans and Asia-Pacific (APAC) countries, whereas, somewhat steady in Europe, the Middle East and Africa (EMEA) region (World Federation of Exchanges, 2020). Following the increasing trend, the world market has witnessed the record highest number of \$32.89 billion equivalent financial derivatives contracts traded globally in 2019. This is because businesses have a growing need for financial derivatives to hedge their exposure to risks as the global economy becomes more vulnerable to a wide variety of macroeconomic shocks.

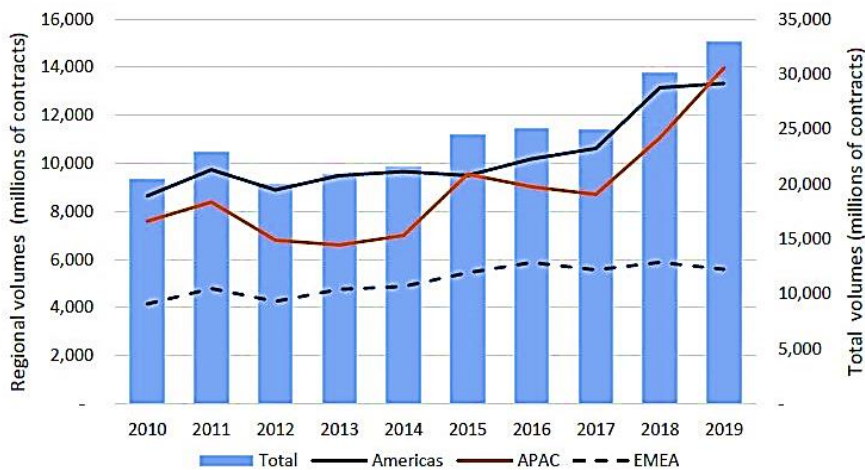


Figure 1.11 : Volume of Exchange-traded Derivatives Contracts
(Source : World Federation of Exchanges, 2020)

Firms may also pursue operational hedging through corporate tax avoidance (CTA). Financially constrained firms may seek to increase their tax avoidance efforts in order to reduce tax cash outflows during economic downturns. Tax avoidance may have direct and indirect effects on a firm's current and future cash flows since it can increase cash flows by lowering tax obligations (Khuong et al., 2020). This means that when a firm has the opportunity to avoid paying taxes, it may invest those tax savings in its operational activities. Consequently, corporate tax avoidance may have several potential economic consequences. These benefits may be immediate, such as enhancing a company's cash flow and reducing its tax burden, or indirect, such as adjusting a company's capital structure (Graham & Tucker, 2006). As a result, avoiding taxes may be a major source of funding for businesses (Minh Ha et al., 2021). Eventually, tax avoidance may be used to satisfy working capital needs.

Importantly, tax evasion strategies vary significantly from country to country. Accordingly, taxes are the second largest expenditure for firms operating in various industries in the United States (Houlder, 2010). Therefore, a US company may aim to reduce its tax burden to keep more of its earnings. This would suggest that minimizing tax obligations is the principal objective of any corporation. Moreover, when tax avoidance is legal, it may drive firms extensively to avoid paying taxes in times of high EPU and FX risk. As such, in the UK, tax avoidance is legal, and several UK tax evasion schemes are available for corporates (Sikka, 2013). In addition, the Chinese government has implemented a series of "tax and fee reduction" measures to reduce the tax burden on domestic firms, promote domestic economic health, and retain market confidence (Han et al., 2021). Therefore, the government program may assist firms in increasing operational cash flow by reducing the need to pay taxes.

Furthermore, Germany has a higher Uncertainty Avoidance score (Ermasova et al., 2019). This high score implies that Germans avoid uncertainty to a greater degree (Ermasova et al., 2018). Consequently, during EPU and FX risk, when German firms have difficulty making financial decisions and defer investments, CTA as an operational hedging strategy may mitigate the risk impact. This means there is potential for the money to be used in appropriate ways by businesses to manage their working capital.

Therefore, the primary objective of the study is to examine the effect of macroeconomic risk (EPU and FX risk) on working capital management. This research will then investigate the interactive role of financial derivatives and corporate tax avoidance on working capital management and firm performance.

1.5 Problem Statements

Working capital management has a significant impact on a firm's financial performance (Boisjoly et al., 2020; Dhole et al., 2019). The goal of working capital management is to keep a firm's level of working capital at a level that strikes a good balance between profit and risk. In any business, managing working capital is a never-ending task, and a constant inflow of funds needs to be ensured to keep the daily operations of the firm motoring along smoothly. In order to achieve this, firms need to understand which factors affect the investment of working capital. The factors that impede the management of working capital can be endogenous or exogenous. Apparently, endogenous factors can be controlled by the management of the firm, whereas firms' management does not have enough control over exogenous factors. Firms' financial managers just attempt to deal with the situation as best they can. Therefore, exogenous factors like macro-economic risk factors draw major attention from businesses due to the inherent risk involved in working capital components, notably for firms in the USA, the UK, Germany, and China that are heavily involved in international trade, as revealed in Figure 1.4 (page 6).

Businesses in these countries were more prone to uncertainty in macro-economic risk factors during the periods of the Global Financial Crisis, the USA-China trade war, Brexit issues between the UK and EU countries, and COVID-19 (Lei & Song, 2022; World Economic Forum, 2019). These kinds of external shocks give rise to EPU and FX risk. Figures 1.7, 1.8, 1.9, and 1.10 ostensibly demonstrate that EPU and FX risk exposures in the USA, the UK, Germany, and China were highly volatile between 2001 and 2020. Simultaneously, the level of working capital management components of these countries' firms was unstable and rising, most likely in response to macroeconomic risk factors. For example, during COVID-19, the UK's DSO, DIO, and DPO rose by 2.86%, 12.72%, and 8.40%, respectively, in 2020 compared to the previous year (Figure 1.9, page 12). Thus, uncertainty in economic policy and exchange rate fluctuations may negatively impact a firm's working capital management, which in turn can impact the firm's operational cash flows. If these conditions persist, the firm's performance will suffer.

Economic policy uncertainty is considered to be one of the significant inhibitors of efficient working capital management and firm performance. Inherently, economic policy uncertainty has a crucial impact on the flow of goods and services in a supply chain, the firm's liquidity position, and, finally, puts pressure on the firm's working capital. When economic policy uncertainty is high, firms will find it more difficult to estimate operating costs, specifically related to inventory demand, leading to an increase in the daily inventory (Dbouk et al., 2020). For instance, Germany's daily inventory outstanding increased by 10.51% in 2016 as a result of the EPU induced by UK-EU Brexit negotiations (Figure 1.10, page 13). A rise in the inventory turnover cycle leads to unreasonable inventory backlog and storage costs and further affects the firm's profitability (Cheng, 2019).

In addition, when EPU surges, banks face high liquidity risk because the banking sector is very susceptible to economic policy decisions, and EPU causes unpredictability and opacity in the economy (Danisman et al., 2021). Furthermore, financially constrained borrowers may not be able to pay off their outstanding loans. As a result, banks tend to limit borrowers' credit and increase the loan price to cover default risk costs (Ashraf & Shen, 2019). Subsequently, it increases the cost of capital and decreases the source of external financing for firms. Thereupon, demand for accounts receivable from financially constrained customers' increases. Notably, daily sales in the UK rose by 10.87% in 2016 due to the EPU triggered by Brexit negotiations (Figure 1.9, page 12).

On the contrary, during high EPU, firms may have very little capability to pay off their account payables due to insufficient cash flows generated from sales, as demonstrated by the fact that China's payables increased by 7.63% in 2020 due to high EPU. Consequently, it leads to a high cash conversion cycle (CCC). As an example, the CCC in the UK increased by 10.51% in 2020 following the COVID-19-induced high EPU. Generally, managing inventory, cash flows, accounts receivable, and accounts payable is a continuous challenge to firms during a period of high EPU since it affects a firm's profitability, risk, and value.

In addition to economic policy uncertainty, foreign exchange rate risk is another macro-economic risk factor that may affect firms' working capital management, which further affects firms' performance. A volatile foreign exchange rate increases the risk and makes a firm's overall performance uncertain. Obviously, foreign exchange risk originates in mismatches between the values of assets and liabilities denominated in different currencies (Demirkılıç, 2021). When the exchange rate changes, the home currency equivalent of the payment or receipt also changes, giving rise to realized foreign currency gains or losses. It can affect a firm's net working capital and composition. For example, following the downgrade of the US dollar in 2020, the United States DSO and DPO increased dramatically by 5.25% and 8.67%, respectively (Figure 1.7, page 9).

Apparently, when firms allow trade credit in international trade, a depreciation of foreign currency decreases the value of the accounts receivables of the firms. Hence, cash flows generated from the trade receivables may not be enough to meet the firms'

short-term obligations and run the day-to-day operations of the business. Further, foreign currency depreciation becomes more crucial when firms need to import raw materials from other countries and sell those products to foreign countries. On the other hand, local currency depreciation increases the net payable to international counterparts, which may also squeeze the working capital of the firm and have unforeseen consequences for its future performance.

Moreover, if firms want to offset the gaps or losses through bank credit, they might have very few chances. This is because weak-currency loans are likely to be of the floating-rate variety if other than very short-term, and future interest rates on such loans are quite simply not forecastable with any degree of reliability (Oberoi, 2018). In these circumstances, firms that are engrossed with a variety of adverse impacts from macro-economic risk factors tend to invest more in working capital to ensure the day-to-day operation of the business (Phan et al., 2019).

Nevertheless, firms may adopt risk management techniques to ensure consistent business performance in the face of volatility in macroeconomic risk factors. This technique may protect firms from unforeseeable adverse impacts originating from economic policy uncertainty and exchange rate risk. Importantly, a higher degree of uncertainty in macroeconomic risk factors encourages firms to use financial derivatives more intensively as a risk management tool to reduce exposure to business risks (Trang, 2018). In addition, firms may pursue tax avoidance techniques amid macroeconomic instability because they lack funds to finance their operations. Tax expenditure normally accounts for a significant part of expenditures on firms' income statements. Therefore, it appears logical that firms have incentives to reduce tax through corporate tax avoidance.

Admittedly, there is a paucity of research on how financial derivatives and corporate tax avoidance influence working capital management. This study aims to bridge the gap by exploring the interactive effects of financial derivatives and corporate tax avoidance on WCM and firm performance. Furthermore, most of the previous studies have been done on the effects of economic policy uncertainty and foreign exchange rate risk on stock returns, oil prices, bank credit, financial markets, interest, inflation, money, and finance (Berger et al., 2022; Ho et al., 2020; Hutson et al., 2019; Lin & Bai, 2021; Shen et al., 2021). Hence, the current study will investigate the impact of economic policy uncertainty and foreign exchange risk on working capital management. This research will focus on the United States, the United Kingdom, Germany, and China, considering top trading partners, the US-China trade war, Brexit concerns, COVID-19, and countries prone to macroeconomic risk factors.

1.6 Research Objectives

The study's primary objective is to examine the effect of macroeconomic risk (EPU and FX risk) on working capital management. Subsequently, this research will examine how the interaction between financial derivatives, corporate tax avoidance, and WCM influences firm performance. Accordingly, the following are the explicit objectives of this research.

1. To investigate the effect of macroeconomic risk factors (EPU and FX risk) on working capital management.
 - To investigate the effect of economic policy uncertainty (EPU) on working capital management.
 - To investigate the effect of foreign exchange risk (FX risk) on working capital management.

This research intends to evaluate how macroeconomic risk factors' volatility affects the working capital management of firms in the USA, the UK, Germany, and China. Working capital management is the dependent variable in this objective. Understanding how macroeconomic risk factors affect working capital management is of utmost importance, given the implications that WC disruptions have on the overall performance of a firm. Economic policy uncertainty and foreign exchange risk are the macroeconomic risk factors examined in this study. Since EPU arises from government regulatory, monetary, and fiscal policy changes, it is considered a significant stimulator of aggregate risk that the world has witnessed during several global crises (Rehman et al., 2021). The reason behind examining FX risk is that when the FX rate changes, it changes the value of the firm's assets, liabilities, cash flows, and net profit (Bandaly et al., 2018).

2. To examine the impact of the interaction between financial derivatives and WCM on firm performance.

One of the essential strategies for risk management is the use of financial derivatives. In the second objective, this study intends to examine how the interaction between financial derivatives and WCM influences the firm performance when the WCM is already affected by the EPU and FX risk in the USA, the UK, Germany, and China. This study postulates that WCM can be adversely affected in the presence of EPU and FX risk. Previous studies show that when WCM is adversely affected, it also affects firm performance (Braumah et al., 2021; Braimah et al., 2021). On the other hand, it has been argued that the use of financial derivatives may manage firms' WC exposure to several risk factors and cash flow uncertainty. Therefore, examining how WCM influences business performance when firms adopt financial derivatives as a risk management technique is critical.

3. To examine the effect of the interaction between corporate tax avoidance and WCM on firm performance.

It is obvious that WCM suffers during periods of macroeconomic volatility due to constrained external finance, decreased investment, and an increase in financial constraints. Firms with limited capital and a poor rate of return frequently want to reduce tax expenditure since they may invest the tax payment in their operations to improve their performance. Additionally, since taxes are often a big part of a firm's operating costs, businesses would try to reduce their tax burdens as much as possible through corporate tax avoidance. As a result, firms can use money from tax avoidance to finance their working capital and, eventually, increase their productivity and

profitability. In light of this, the current study aims to examine the effect of the interaction between corporate tax avoidance and WCM on firm performance in the USA, the UK, Germany, and China.

1.7 Research Questions

The following research questions are designed in order to attain the research objectives;

1. What are the impacts of macroeconomic risk factors (EPU and FX risk) on working capital management (WCM)?
2. What are the impacts of the interaction between financial derivatives and WCM on firm performance?
3. What are the effects of the interaction between corporate tax avoidance and WCM on firm performance?

1.8 Significance of the Study

The current study has great importance in empirical research. Alarmingly, the recent economic downturn and the world's biggest macroeconomic vulnerabilities have hit businesses and global trade. Hence, firms, especially in major economies, suffer a lot as their firm size is big and businesses exist around the world. This impact is very evident in the daily operations of businesses. As a result, financial managers and strategic planners probably find it difficult to manage the components of working capital, including accounts receivables, accounts payables, inventory, and cash conversion cycle. In this study, contemporary macro-economic issues are scrutinized, and their impacts are rationalized in working capital management. Therefore, the study's findings may provide guidance to firms for managing working capital amidst the uncertainty of the macro-economy.

The present study contributes to the literature using financial accelerator theory to show the relationship between macro-economic risk factors and working capital management. Financial accelerator theory implies that macro-economic shocks result in increased interest rates, external financing constraints, eroded cash flows, and thereby affecting firms' investment behaviour (Guizani & Ajmi, 2021). Working capital management and macroeconomic risk factors may not have been the subject of any studies using financial accelerator theory. In this study, the financial accelerator theory is expanded upon in order to comprehend the dynamics of accounts receivable, payable, and inventories in the face of volatility in macroeconomic risk factors.

This study also adds significant empirical evidence to the EPU and FX risk literature related to working capital management. Since investment in working capital is largely dependent on a country's macro-economic environment, there is a timely need to explore the area. Further, by adopting financial derivatives as an interaction variable

with working capital management, this study contributes meaningful empirical evidence to the financial derivatives literature. This is likely the first research to demonstrate the interaction between financial derivatives and working capital management when firms are engrossed with macroeconomic risk factors. Further, in the midst of macroeconomic uncertainty, this research suggests that corporate tax avoidance has a major impact on WCM by demonstrating the interaction between these two variables. During times of heightened market uncertainty, it is hypothesized that businesses may turn to tax evasion funds as a source of working capital rather than risk operating with inadequate funds.

Moreover, during the volatility of macro-economic risk factors, firms' cash flows can possibly be affected tremendously. Keeping this in mind, financial managers should have a strategic plan to offset the gaps of unforeseen outcomes. In this regard, this research has important guidelines for financial managers regarding firm risk and liquidity. When financial managers struggle to manage working capital in the face of macroeconomic risk factors, the overall financial performance of their firms may suffer. This study demonstrates that the use of financial derivatives and corporate tax avoidance to enhance the performance of WCM components may be beneficial in this scenario. Financial derivatives and corporate tax avoidance may enable seamless working capital management, which in turn may influence productivity and revenue for firms by insulating them from unfavourable business risks and avoiding tax liabilities in difficult economic times.

Furthermore, this study has important implications for policymakers regarding the market-wide effects of their policy decisions. This is evident through the study that EPU and FX risk tremendously affect working capital management and, eventually, firms' financial performance. The use of financial derivatives as a risk management tool may be advantageous to offset the risks arising from macro-economic risk factors. Consequently, this initiative will help firms enhance their efficiency in WCM and financial performance. Therefore, policymakers may establish guidelines for firms to use financial derivatives for risk management purposes in their policies.

Nonetheless, this research can also help investors in making investment decisions. Investors may be concerned about losing money if they invest in firms where the EPU and exchange risk are high. When investors know that the firms have used financial derivatives to avoid the risk of EPU and foreign exchange, they may become more confident about making investments in certain firms. This is because reducing risk helps firms better manage their working capital and do better financially. Furthermore, tax avoidance is seen as a strategy to shift money from the government to firms, which should increase firms' value effectively. Investors may be interested in investing more in businesses that maximize shareholder value by minimizing tax obligations.

1.9 Structure of the Study

The structure of the study is comprised of five chapters. An introduction to the research topic and context is provided in the first chapter. It includes background information about the study, problem statements, research questions, research objectives, and

significance of the study. The results of the literature review will be discussed in the second chapter. The literature review will include conceptual literature review, empirical literature review, and theoretical literature review from a wide range of related literature. Then this chapter will discuss the research framework and hypotheses. The third chapter will examine the methodological components of this study, including data collection methods, sample size, data analysis techniques, and model formation. The fourth chapter will discuss empirical results through statistical analysis. The last chapter will summarise the research's findings. In addition, it will provide guidance for future studies.

1.10 Chapter Summary

In conclusion, it must be acknowledged that this study is contemporary and will render a plethora of scopes in finance and economics research. This chapter begins by outlining the study's overall context in terms of macroeconomic risk factors, working capital management, financial derivatives, corporate tax avoidance, and firm performance. Following that, historical trends in macroeconomic risk factors and components of working capital management are illustrated graphically for the United States of America, the United Kingdom, Germany, and China. Afterwards, problem statements of the study are delineated by relating country-wise historical data. Finally, research objectives, research questions, significance, and structure of the study are discussed.

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