A quantitative study on the impact of geopolitical risk on firm's capital structure

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ABSTRACT,
In an economy where globalization is an increasing trend, companies are exposed to a growing number of geopolitical risks. Because those risks heighten uncertainty for companies, firms need to take them into account when making decisions. A timely example that highlights the importance of considering geopolitical risks is U.S. President Donald Trump's increase in tariffs, which has a significant impact on its trading its partners, such as China. This research examines the impact of geopolitical risks on financial decision-making by investigating how geopolitical risks influence firms' leverage. The research uses a quantitative approach by performing a regression analysis with a sample of 520 US-based firms over the last decade, a period characterized by a global pandemic, trade conflicts and regional wars. The results indicate that geopolitical risk has no statistically significant effect on the leverage of firms. Furthermore, this study shows that industry is a key determinant that influences capital structure decisions of firms. Companies operating in the U.S. do not restructure their capital structure in response to geopolitical risk but rather use other adjustments. This study demonstrates that geopolitical risks' influence on leverage may be overstated in existing capital structure research and that the influence of geopolitical risks on leverage is context-based.

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Geopolitical risk, capital structure, financing policy, leverage, industry

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1. INTRODUCTION

Recently, U.S. President Donald Trump introduced an increase in tariffs, meaning taxes for imported goods, with a baseline of 10 percent for all countries and even higher rates of up to 60 percent for its biggest trading partners (e.g., China, Mexico). This development does not only have an influence on companies located in the US, but it also deeply impacts companies that operate in other countries. A recent example is the company e.l.f. Beauty known for producing cosmetic products. Due to the tariff increase imposed by President Donald Trump, it faces much higher import costs, since the US-based company sources around 75% of its products from China. Therefore, e.l.f. decided to increase the price of every product by one US dollar to cope with the increasing costs (Trangle, 2025). The company also started to diversify its business by acquiring the company Rhode, known for skincare products. Additionally, e.l.f. is working on optimizing its supply chain to cope with the risk of relying on China's imports (Neves, 2025). Caldara and Lacoviello (2022) created a definition of geopolitical risk, describing it as "the risk associated with wars, terrorist acts, and tensions between states that affect the normal and peaceful course of international relations". The topic of geopolitical risk is gaining importance for companies, especially for those operating in a global environment. In an increasingly globalized world, geopolitical developments are a key factor that influence the environment companies are acting in and therefore shape company needs and actions. Furthermore, geopolitical developments play a crucial role in companies corporate decision-making. Firms should consider the risk of geopolitical events when deciding on financial strategies, such as the organization of their capital structure.

According to Brealey, Myers, and Allen (2011), capital structure can be defined as the mix of a firm's debt and equity that is used to finance its operations. They argue that the mix of debt and equity plays an important role in determining firms' value. Capital structure is expected to have an impact on the financial risk and bankruptcy cost of a company. The argument is that the higher the debt, the higher the financial risk and risk of bankruptcy. Therefore, companies must decide carefully on their capital structure and design the structure to meet their company's current needs.

Previous research has already studied the topic of geopolitical risk on firms' capital structure and provided insights on the negative impact that geopolitical risk has on the leverage of firms (Chowdhury, Aram, Javadi, and Nejadmalayeri, 2025). However, this study provides more insights on the impact of recent geopolitical developments, for instance the US tariff war, as well as further research on moderating variables such as firm size and the industries of the companies. This research also focuses only on companies that have their headquarters located in the US, providing country-specific knowledge. The dataset uses recent data, providing better insights into the developments of the past few years. This is a novel approach, since the dataset only includes a relatively short time frame of the past decade. This is useful to provide insights on recent developments such as the COVID-19 pandemic, the Trump tariff war, and the Russia-Ukraine conflict, while excluding extreme shocks such as the 9/11 attacks. Therefore, this study provides new insights by examining the impact of geopolitical risk on leverage in a stable period with moderate geopolitical risk. This is a novel approach, since existing studies on this topic usually include periods that started in the 1990s. This study helps to fill the knowledge gap on how firm-specific characteristics such as size and industry affect the impact of geopolitical risk on the capital structure of US-based firms.

There is a pressing need for companies located in the US to understand how to organize their capital structure in an efficient way, since many companies operating globally and sourcing from other countries have been affected by recent geopolitical developments. This research aims to help those companies to gain knowledge about how to organize their capital structure best according to their characteristics. Since this research uses Orbis balance-sheet data from the last decade paired with GPR data from Caldara and Lacoviello (2022), it offers the most up-to-date data on how firms based in the US respond to geopolitical developments, which can help managers to navigate their corporate structure in an efficient and timely manner.

1.1 Research objective/ Research question

The aim of this study is to examine the impact of geopolitical risks on the capital structure of firms that operate across different industries in the US. Since there is not enough research on this topic, understanding the relationship between these two can potentially help companies to better navigate their decision-making processes. The goal is to gather data that provides more insight into whether and how companies facing high geopolitical risks can navigate their financing policy to mitigate potential negative effects. Researching this topic can help to develop a framework for firms on how to act and how to prevent an inefficient corporate structure.

The research question chosen for this study is:

How do geopolitical risks influence the capital structure of multinational firms across various industries?

This research question is considered relevant, because it allows research on a relatively unexplored topic. It not only creates new insights into academic research, but it also helps companies to make informed and empirically backed decisions on their capital structure. Furthermore, it allows a comparison between different industries and sizes, allowing firms to make decisions based on firm-specific characteristics.

1.2 Contributions

There are various reasons why this topic is academically and practically relevant and why it contributes new insights to the already existing research in this field.

Firstly, this research fills the existing knowledge gap by empirically testing the relationship between geopolitical risk and corporate financing policies. As mentioned, there have been similar studies to this topic, such as Chowdhury, Aram, Javadi, and Nejadmalayeri (2025). This study is still significant, since it creates important insights into Geopolitical risks and their impact on the corporate structure of firms operating in the US while considering moderating factors like firm size and industry. Other studies have mainly focused on a global context, therefore focusing on the US can create important country-specific insights and show differences between global and country-specific data.
Secondly, this study uses traditional theories of capital structure such as trade-off theory and pecking order theory and tests them together with geopolitical risk. This allows us to see if those theories can withstand real-life application, when risks are high and the environment is uncertain. This helps us to understand these theories better and additionally contributes to those existing theories by testing them.

Lastly, the topic of this research is also practically relevant, since understanding the effects of geopolitical risk on financing

policies can help companies and managers develop financial strategies that can mitigate risks. Furthermore, new insights may help to create practical advice on how to deal with the uncertainty. In today's world geopolitical risk significantly affects companies, since their actions and the regulations they must follow often depend on and change in response to geopolitical events. Examples are the implications of Trump's tariffs on companies in China, that import large amounts of goods into the US and need to pay 60 percent tariffs as to the new regulation. According to Vanzetti (2025) this affects the entire financing of these companies, since it affects their exports, revenue and prices.

2. LITERATURE REVIEW/ THEORETICAL FRAMEWORK

This section defines the concepts of capital structure and geopolitical risk. It explores the theoretical frameworks that help to explain the relationship between these two variables, which are crucial for answering the research question and gather sufficient data on this topic.

2.1 Capital structure

Brealey, Myers & Allen (2011) define capital structure as the mix of debt and equity sources that are used by a company to finance its ongoing operations and future growth. The capital structure has important implications for a firm. Researchers have identified the following three key factors that are influenced by capital structure.

2.1.1 Risk profile

Brealey, Myers & Allen (2011) propose that the mix of debt and equity of a firm has important implications for its risk profile, since a high level of debt causes higher financial risk. Having high levels of debt creates obligations (e.g., back payments, interest payments) which can be disadvantageous in situations with high risk. Not having the right mix of debt and equity in environments with high geopolitical risk can even further increase risk for the company.

2.1.2 Cost of Capital

The cost of capital is the weighted average of debt and equity that is used to finance the firm. The capital structure needs to have the right mix of debt and equity to achieve an efficient cost of capital according to Modigliani & Miller (1963). Their explanation is that debt increases tax benefits, while equity decreases risk.

2.1.3 Financial flexibility

Research by Graham & Harvey (2001) discovered that capital structure has an important influence on a firm's ability to raise funds in situations of unexpected events. A company's flexibility is higher if it has lower levels of debt, while it is more difficult for the company to be flexible and raise funds if it already has high levels of debt. In the context of this research, it could mean that it is more difficult for firms to adapt to geopolitical risk if they have high levels of debt.

2.2 Capital structure theories

There has been a lot of research on capital structure and many theories have been developed that try to explain how companies can create an optimal capital structure. The main theories identified that will be used in this research are the Modigliani and Miller theory (Modigliani & Miller, 1958), the market timing theory by Baker and Wurgler (2002), the Pecking order theory by Myers and Majluf (1984), and, lastly, the Trade-off theory by Modigliani and Miller (1963).

2.2.1 Modigliani and Miller theory

Modigliani and Miller theory is a concept that examines the impact of capital structure on the value of a firm. The main argument of this theory is that if companies operated in a perfect market, the capital structure of those firms would be irrelevant, and it would have no impact on the value of the firm (Modigliani & Miller, 1958). Furthermore, the theory proposes that the cost of capital for the firms remains the same no matter what debt and equity mix they use. They argue that when a company increases its use of debt financing, the cost of equity automatically increases to offset the lower cost of the debt. Therefore, according to Modigliani and Miller (1958) the proportion of debt and equity financing is irrelevant for the cost of capital. In their later paper, Modigliani and Miller included tax as a variable in their research. This paper proposes that if taxes are considered, debt financing becomes more attractive for companies, since their interest payments on the debt are tax deductible (Modigliani & Miller, 1963). Therefore, according to them, having a higher debt financing can increase firm value to some extent.

This theory is relevant to this research, since geopolitical risk is a factor that exists in the real world. The MM theory assumes that companies are operating in a 'perfect capital market', which is not the case in the real-world. Therefore, geopolitical risk disrupts the vision of a perfect market and introduces uncertainty, possible higher cost of debt or less access to equity financing resources. Furthermore, this study argues that geopolitical risk makes capital structure a central topic in strategic financial decision-making for companies.

This study tests if geopolitical risk has a significant impact on leverage. Leverage is used as the measure to investigate capital structure. If the findings show that it significantly affects leverage, it will challenge the theory and proof that the assumption of capital structure irrelevance is incorrect.

2.2.2 Market timing theory

Baker & Wurgler (2002) created the Market timing theory, which states that the capital structure of companies is the outcome of their past attempts to time the market. Timing the market means that companies strategically time when they issue and when they repurchase equity. Past research has shown that firms tend to issue equity when the market values are high, and they tend to repurchase equity/ issue debt when the market values are low. According to this theory, the timing of the market has a long-term impact on the capital structure of the firm. Furthermore, it argues that capital structure is not a specifically targeted ratio but rather the outcome of constantly trying to time the market.

In the context of this research, the theory shows how external market conditions (current value of market) influence capital structure. Geopolitical developments can shape the market conditions and therefore influence the capital structure of companies. During periods where geopolitical risk is high, companies may tend to rely on investments rather than leveraging because market value may drop in those times.

2.2.3 Trade-off Theory

The trade-off theory developed by Modigliani & Miller (1963) proposes that the optimal capital structure of a firm is achieved when the benefits and costs of debt are balanced. The benefit that companies get from debt is tax advantages resulting in overall lower cost of capital, while the costs of the debt are financial distress, meaning higher risk of bankruptcy. Finding the optimal balance between debt and equity increases the value of the company. The optimal balance is when the benefit of the debt tax shield equals the cost of financial distress of debt, and it is called the 'trade-off point'.

This theory can be applied to this research, since the cost of financial distress is perceived higher in environments with high uncertainty, which is caused by geopolitical risk. Therefore, companies may tend to use equity sources instead of issuing debt when they finance their operations, even if they are giving up tax benefits in return. The reason for that can be the higher risk of bankruptcy, which companies want to avoid.

2.2.4 Pecking order theory

The pecking order theory created by Myers and Majluf (1984) is proposing that companies prioritize the sources of funding they use in a specific way. It argues that companies try to minimize information asymmetry and transaction costs by following this order. Companies rank the preferred sources of financing in the following way: Firstly, they prefer to use internal financing as their financing source, meaning that they use the earnings they retained to finance future projects. The second choice of firms is using debt financing like loans or bonds. The last choice that companies use is equity financing such as issuing new shares. The reason why equity financing is not the preferred choice of firms is that debt is less sensitive to asymmetric information and that issuing equity is a negative sign to investors that the company may be overvalued (Myers and Majluf, 1984).

This theory is relevant for this research, since it helps us to understand why companies choose certain methods of financing. In times of high geopolitical risk, companies may lean more towards internal financing to avoid sending negative signals to investors. Another perspective is that in times of high geopolitical risk companies may use debt financing or equity issuance because retained earnings are not sufficient.

Furthermore, this research can provide empirical evidence for the correctness of this theory if the study finds that GPR has a significant influence on the debt/equity issuance of companies, since companies prefer different funding sources in times of high uncertainty.

2.3 Geopolitical risk

Caldara & Lacoviello (2022) define geopolitical risk as 'the risk associated with wars, terrorist acts, and tensions between states that affect the normal and peaceful course of international relations.'

To measure geopolitical risk, Caldara & Lacoviello developed the Geopolitical Risk Index (GPR). This Index uses data from articles and analyzes them for certain keywords that are associated with geopolitical risk. Depending on the number of times these keywords are mentioned in the articles it creates the Risk Index. GPR is not the only existing measure of uncertainty. Similar known measures are the World Uncertainty Index (WUI), which was developed by Ahir, Bloom and Furceri (2022). In contrast to the GPR, it not only measures geopolitical risk, but it has a broader focus on economic and political uncertainty, capturing a wider range of information. Another measure that is also widely known is the Economic Policy Uncertainty Index (EPU) developed by Baker, Bloom and Davis (2016). This measure is also news-based, meaning that it searches for keywords in articles to determine the uncertainty. Since geopolitical risk and economic policy are sometimes overlapping it provides similar information as the GPR.

However, the GPR is the best measure for this research, since it only focuses on geopolitical risk and excludes other uncertainty measures, which allows accurate research on the impact of geopolitical risk on capital structure. Furthermore, it is a very timely measure and is updated monthly, allowing it to include current geopolitical developments in the research. Another reason for using the GPR is that it is widely academically accepted, allowing extensive research on this topic and providing a wide range of data.

Geopolitical risk is a key uncertainty that needs to be considered by companies because of its significant potential impact.

Caldara and Lacoviello (2022) identified that geopolitical risk has a negative impact on firm-level investment and stock returns, significantly affecting the performance of the firm. Another study performed by Pringpong, Maneenop and Jaroenjitrkam (2023) shows that geopolitical risk significantly affects the firm value and that firms exposed to geopolitical risk tend to hold more cash and to use greater leverage. This shows the importance of considering geopolitical risk when making financial decisions and the importance of further researching this topic.

Geopolitical risk can have a significant impact on economics and firm behavior, which can be explained by the different channels of geopolitical risk. First, when geopolitical risk rises it can cause firms to delay or even cancel their investment decisions due to increased uncertainty about the future economic state or future regulations. Secondly, when geopolitical risk rises, firms could tend to issue less debt, since premiums are potentially rising and it becomes more difficult to issue debt because investors are more careful. Lastly, rising geopolitical risk can lead to a higher cost of capital for firms, probably leading them to reduce leverage because of higher cost of debt.

Geopolitical risk is gaining importance, since globalization is a constantly growing trend and increases exposure of companies to geopolitical developments from all over the world.

2.4 Hypothesis

To help answer the research question of this study, the following hypotheses have been developed. Since theories on capital structure differ greatly in whether the effect of uncertainty is expected to be negative or positive and the hypotheses are rooted in theory, there is a hypothesis for each outcome (positive and negative).

2.4.1 Geopolitical risk on debt in capital structure

Since geopolitical risk creates an uncertain economic environment for companies that are exposed to it (Caldara and Lacoviello, 2022), companies must ensure that their capital structure is organized accordingly. The reason is that by reorganizing their capital structure they try to maintain their flexibility and reduce risk exposure and vulnerability. As already mentioned in the research by Brealey, Myers, and Allen (2011), companies operating in uncertain environments tend to reorganize their capital structure to have less debt to avoid financial distress and the risk of bankruptcy. Therefore, it is expected that geopolitical risk has a negative impact on the debt levels in the capital structure of firms. The hypothesis developed based on this theory is:

Hypothesis: Geopolitical risk has a negative effect on the total amount of debt a company has in its capital structure.

This hypothesis is rooted in the market timing theory, trade-off theory and pecking order theory, since all these theories lead to the assumption that in times of high geopolitical risk firms may prefer to rely on equity financing instead of debt financing. The reason for that is that they may try to time the market and therefore rather rely on equity issuance than on debt in times of high uncertainty (Baker and Wurgler, 2002). Another reason could be that companies try to avoid sending negative signals to investors and therefore decide to rely on equity financing, which is an assumption that is based on the Pecking order theory (Myers and Majluf, 1984). Lastly, reducing leverage could also be a

method to reduce uncertainty risk, which is an assumption based on the trade-off theory (Modigliani and Miller, 1963).

2.5 Conceptual framework

Figure 1 presents the conceptual framework of this research. The independent variable is geopolitical risk, measured as the GPR index. The hypothesis states that geopolitical risk negatively affects the dependent variable capital structure, which is measured by the leverage ratio (Equation 1). The conceptual framework shows how the impact on capital structure is controlled by two variables: firm size and industry. These variables are included in the research to further investigate their impact on capital structure. Altogether, this shows the basic concept of this research and provides a clear graphic.

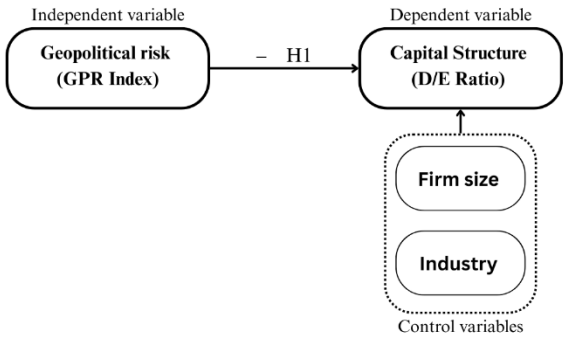

Figure 1 – Conceptual Framework

3. METHODOLOGY

3.1 Research design

This study uses a quantitative research design approach to test the relationship between geopolitical risk and capital structure in US-based firms. The data are stored as a panel, since using a panel data model helps to strengthen internal validity of the results (Hsiao, 2022). The sample includes data from the years 2015-2024, observing developments in geopolitical risk and leverage ratio of firms headquartered in the U.S. of the past 10 years. The hypothesis in this research is that geopolitical risk creates high uncertainty for firms and possibly leads them to turn to safer financing alternatives by reducing debt levels and relying more on equity financing. This theory has been developed based on the trade-off theory (Modigliani and Miller, 1963), the pecking order theory (Myers and Majluf, 1984) and the market timing theory (Baker and Wurgler, 2002) and is an essential part of the research design.

3.2 Data

The analysis is conducted using financial data on the capital structure (leverage) of different firms by using the database Orbis, as well as information on the GPR index from a database that was created by Caldara & Lacoviello (2022) to measure geopolitical risk.

The initial sample that is used consists of 520 firms that are based in the U.S. and operate in different industries to ensure a robust regression analysis. The data collected from this database includes the firm name and the firm identifier code, the total assets and the total debt, as well as the NAICS code that is used to identify the industry that the firms operate. The dataset includes 5200 firm-year rows, where each firm year is assigned to a row, creating ten rows for each firm. For the analysis, the data were cleaned and firm-years with missing values were removed. Since the dataset also included some outliers, the rows where the leverage exceeded 1.5 were also removed from the sample. This resulted in a total sample of 5155 observations. This final sample is the basis for the regression analysis and the correlation matrix, whereas the descriptive statistics are from the original dataset where only the missing values were removed.

The dataset also includes the variable GPR index, which was developed by Caldara and Lacoviello (2022). To stabilize the variance of the GPR, this study uses a natural logarithm of the annual average of the GPR. During the last ten years, there have been relatively stable fluctuations in the GPR, showing an index between 59 and 113. The sample period runs from 2015 to 2024, covering the period of the last ten years. This period marks a relatively stable period in geopolitics, while still including the effects of important events, namely the COVID-19 pandemic, the U.S. - China trade conflict, and the Russia-Ukraine war.

3.3 Variables

3.3.1 Capital structure

The dependent variable in this research is the capital structure of the firms. Brealey, Myers, and Allen (2011) describe capital structure as the mix of debt and equity a company uses to finance its operations and future growth. To measure capital structure, the leverage of the firms is used. The leverage ratio shows the proportion of debt financing that firms use rather than equity financing.

The equation for the leverage ratio that is used in this research is the following:

$$\textbf{Leverage} = \textbf{Total debt/total assets} \qquad (1)$$

3.3.2 Geopolitical risk

The independent variable of the research is Geopolitical risk, which is measured with the Geopolitical risk Index (GPR) created by Caldara& Lacoviello (2022). The index uses data from 10 different newspapers to extract information about geopolitical developments, and it starts in the year 1985. The information is extracted by counting the number of articles that are published each month and contain information about geopolitical developments. Caldara & Lacoviello (2022) compute the Index by dividing the number (N) of articles with terms associated with geopolitical risk (in a certain point of time; t) with the number of total articles at that time and multiplying it with 100 to create an Index. The equation is the following:

$$\textbf{GPR-Index (t)} = \frac{N\ of\ articles\ with\ GPR\ terms\ (t)}{N\ of\ total\ articles\ (t)} \textbf{ x 100} \qquad (2)$$

Third variables can have an influence on research and can lead to biased outcomes if they are not considered. Therefore, two control variables are included, because they are likely to have an impact on the capital structure.

3.3.3 Firm size

Research from Frank & Goyal (2009) on factors that influence capital structure has shown that size plays a crucial role in a firm's capital structure. The reason is that size determines the capacity the firms have for debt (Frank and Goyal, 2009). For this research, size is measured by the natural logarithm of the total assets. This measure is widely accepted in finance research and used in various other studies to measure the size of the companies.

3.3.4 Industry

A study of Mackay and Phillips (2005) researched the impact of the industry on the capital structure. The findings were that the industry explains a significant amount of variation in capital structure, because of factors such as technology and competition that affect decisions on capital structure. In this research the NAICS codes of the firms were used. To avoid categorizing firms in too much detail and creating groups with only a few firm representations, only the first two digits of the NAICS codes were used to allow for broader categorization. These categories are formed into dummy variables. The definition for each NAICS code used in this research can be found in Appendix table 4, where the official classifications of the Office of Management and Budget (2022) were used.

These two control variables are selected because they help to empirically support this study and help to explain parts of the variance in the data. Furthermore, these two variables are consistently available on the database Orbis, making it a reasonable choice for this research. To account for time fixed effects, the year was also transformed into a dummy variable for this research.

3.4 Model

The analysis uses a regression model with the following formula:

$$\textbf{Leverage}_{i,t} = ß0 + ß1\textbf{Log GPR}_t + ß2\textbf{Size}_{it} + \gamma_i^{\text{Industry}} + d_t^{\text{Year}} + \varepsilon_{i,t} \quad (3)$$

Where:

- Leverage $_{i,t}$: Leverage ratio (Equation (1))
- Log GPR$_t$: Natural logarithm of the GPR index by Caldara & Lacoviello (2022)
- Size $_{i,t}$: natural logarithm of the total assets of the firm
- $\gamma_i^{\text{Industry}}$: two-digit NAICS code (table 4)
- d_t^{Year} : Year of documentation
- $\varepsilon_{i,t}$: Error term

3.5 Analysis

To conduct the analysis, the data needs to be prepared first. First, the data needs to be cleaned to remove all missing values, as well as outliers and data that are duplicated. After this, a descriptive statistics table is prepared, which shows the most important information of the data. These statistics showed that there are some extreme values in the leverage, which could bias the outcome. Therefore, values where the leverage is above 1.5 have been excluded (Table 1). To show how the numeric variables are related to each other, a correlation matrix is created. This correlation matrix shows a slightly negative correlation between the GPR and leverage and slightly positive relationships for size and leverage, and size and GPR (Table 2). After the data is cleaned and prepared the baseline regression analysis is performed using a fixed effects regression analysis. For this study I am using the tool R, since it is one of the best tools to perform regression analysis. The results are used to explain the impact of geopolitical risk on firms' capital structure, while including the moderating variable size and fixed firm effects such as industry and considering the specific firm year. Lastly, there is a robustness check included, where the regression is run again, excluding the industry fixed effects.

4. RESULTS

4.1 Descriptive analysis

Table (1) in the appendix shows the full descriptive statistics of the sample. Across all 5.190 data points the mean leverage of the firms is 0.691 with a standard deviation of 0.253. The data is distributed relatively evenly, showing that the average firm has around 70 percent debt financing and around 30 percent equity. These statistics also show some extreme numbers with a maximum leverage of 4.08. Therefore, all results with a leverage ratio higher than 1.5 have been excluded from further analysis to remove extreme outliers that could potentially bias the outcome. For firm size, which is computed by the natural logarithm of the total assets of a company, the mean is 16.680 with a standard deviation of 1.19. As seen in the Appendix Table 1, the minimum firm size in the sample is 3.21 and the maximum is 20.25, showing that companies of small and large sizes are represented in this dataset.

The geopolitical risk index is measured as the natural logarithm of the actual GPR and shows that the mean of the log GPR is 4.41, with a standard deviation of 0.2. This shows that in comparison to the other two variables, GPR is relatively stable and has only slightly changed in the past decade. Appendix Table 1 shows that the minimum GPR is 4.07 and the maximum GPR is 4.72, proving that there is only little variation in this factor.

4.2 Correlation

Table 2 shows the Pearson correlation matrix across the different main variables. This matrix shows a relatively small relationship between leverage and the GPR of -0.022. This slightly negative result shows that, when correlating only these two variables, there is only a small relationship between them. The correlation between leverage and firm size is relatively small as well, with a value of 0.03. Lastly, the geopolitical risk index and size are also positively correlated, with a value of 0.02, which is also considered weak. The overall weak relationships show that geopolitical risk and size may not be the main factors that influence leverage decisions. These results also show that there is no danger of multicollinearity between the variables, meaning that they are not highly correlated to each other.

	Leverage	Log GPR	Size
Leverage	1	-0,022	0,03
Log GPR	-0,022	1	0,028
Size	0,03	0,028	1

Table 2– Pearson Correlation Matrix

4.3 Baseline regression

Table 3 shows the results of the baseline regression of model (3). The model is a fixed effects regression model in which the relationship between leverage and the log-transformed GPR is tested while controlling firm size, year, and industry. The outcome shows that when leverage is regressed with all those factors, the coefficient of GPR is 0.032. The t-statistic for GPR is 0.12 and the p-value is 0.90. This shows that there is no significant effect of GPR on leverage when accounting for size, year and industry. Size does not show any significant effect on leverage either. The coefficient of size 0.002 with a t-statistic of 0.38 and a p-value of 0.70. Looking at the estimates for the years, it shows that none of the past 10 years were statistically significant on firms' leverage. The only factor that is found to have a significant effect on the leverage ratio is the industry that the firm is operating in. The definition of the industry codes can be found in table Appendix Table 4. The regression analysis shows that most industries have significant positive coefficients, showing that the industry affects the debt levels of firms positively. There is one industry in this sample that shows a

negative coefficient (-0.27), which is sector 92. According to the NAICS two-digit code it is the public administration sector. This is a logical outcome, since the public sector has a limited need for debt financing and usually prefers internal financing. Most other industries show varying coefficients between 0.146 and 0.287, with only some exceptions. Industry 23 (Construction) and industry 81 (other services) have significantly lower coefficients than the others, with 0.041 and 0.089. The industries Transportation & Warehousing, Health care and social assistance, Arts, Entertainment and Recreation and Accommodation and Food services have higher coefficients than the rest of the industries. Industry 49 (Transportation and Warehousing) reaches the highest coefficient of 0.809. This shows a heavy reliance on debt financing in this sector.

term	estimate	std. Error	t-value	p-value
(Intercept)	0,302	1,197	0,252	0,801
Log GPR	0,032	0,262	0,123	0,902
Size	0,002	0,004	0,381	0,703
2016	0,012	0,042	0,289	0,773
2017	0,007	0,037	0,188	0,851
2018	0,019	0,099	0,191	0,849
2019	0,029	0,09	0,316	0,752
2020	0,04	0,104	0,385	0,7
2021	0,029	0,136	0,215	0,83
2022	0,005	0,038	0,132	0,895
2023	-0,002	0,012	-0,16	0,873
Industry 21	0,148	0,021	7,132	0
Industry 22	0,247	0,013	18,751	0
Industry 23	0,041	0,015	2,686	0,007
Industry 31	0,151	0,016	9,466	0
Industry 32	0,17	0,013	12,757	0
Industry 33	0,146	0,013	11,223	0
Industry 42	0,191	0,016	12,289	0
Industry 44	0,284	0,017	16,582	0
Industry 45	0,254	0,017	14,622	0
Industry 48	0,204	0,016	12,988	0
Industry 49	0,809	0,146	5,532	0
Industry 51	0,287	0,034	8,381	0
Industry 52	0,244	0,019	13,147	0
Industry 53	0,215	0,018	11,714	0
Industry 54	0,228	0,017	13,137	0
Industry 56	0,232	0,018	13,178	0
Industry 62	0,321	0,031	10,361	0
Industry 71	0,451	0,03	15,143	0
Industry 72	0,399	0,036	10,949	0
Industry 81	0,089	0,017	5,334	0
Industry 92	-0,271	0,034	-7,906	0

Table 3– Regression Analysis

4.4 Robustness

To reflect the result of the baseline regression and to determine whether the null effect of GPR, size, and year on leverage is only present because of the industry fixed effects, another regression was performed, where industry fixed effects were excluded. When industry is excluded from the analysis, the GPR coefficient becomes significant, showing a positive effect of GPR on leverage. The coefficient in this case is 0.29 with a p-value of 0.032. This indicates that when the heterogeneity of industry is removed, higher geopolitical risk leads to an increase in leverage of firms. The coefficient of size becomes negative in this scenario with a value of -0.022 and a p-value of $p < 0.0001$. This proposes that larger firms tend to have a smaller leverage ratio than smaller firms.

Comparing this to the baseline regression, where industry effects are included, we see that industry fixed effects absorb much of the variation in GPR. This shows that the positive relationship between GPR and leverage is driven by the differences that exist across industries. Since industries have varying exposure to GPR, they also structure their leverage differently. Firms in high-risk exposure industries tend to adopt a structure with greater leverage. But when considering each industry, no specific effect of GPR on leverage is found. The difference in the significance of GPR in both models shows that the GPR effect is industry-specific rather than universal across all firms.

Term	Estimate	Std. Error	t-Statistic	P-value
Log GPR	0,298	0,139	2,141	0,032
Size	-0,022	0,004	-4,881	0.000
Year2016	0,043	0,020	2,107	0,035
Year2017	0,033	0,017	1,904	0,056
Year2018	0,111	0,050	2,208	0,027
Year2019	0,115	0,046	2,494	0,012
Year2020	0,144	0,054	2,660	0,007
Year2021	0,167	0,070	2,362	0,018
Year2022	-0,027	0,020	-1,335	0,181
Year2023	-0,000	0,006	-0,078	0,937

Table 5 - Baseline regression without industry

4.5 Summary of the results

This analysis shows no statistical significance of GPR on leverage in the past decade. This can be seen in the results of the Pearson correlation matrix, where the variables show virtually no correlation, as well as in the baseline regression, where GPR has no significant effect on leverage when the factors size, year and industry are held constant. This does not support the idea that geopolitical risk impacts the way companies organize their capital structure. At least this is the case for companies that are headquartered in the U.S. in the past decade. Furthermore, this research shows that size and year have no significant effect on leverage either. The only variable that has been found to have a strong significant effect on leverage is industry. This is additionally proved by the robustness check, which shows that when industry is excluded, size and GPR become significant. The explanation is that industry absorbs the variation that exists between GPR and leverage. This leads to the assumption that there must be other factors, such as industry, that are more

important to consider than geopolitical risk. All in all, this analysis shows that industry is significant when considering capital structure, while geopolitical risk does not have an impact.

5. DISCUSSION

This research aims to investigate the impact of geopolitical risk on capital structure decisions of firms, while controlling for firm size and firm industry. To achieve this, a hypothesis has been developed with the aim of answering the research question.

The hypothesis "*Geopolitical risk has a negative effect on the total amount of debt a company has in their capital structure"* was proven wrong during this research, since the results show that geopolitical risk in fact has no significant impact on the leverage ratio of firms. This challenges the assumption that geopolitical risk has a significant impact on the capital structure of firms.

The Trade-off theory by Modigliani and Miller (1963) assumes that the cost of debt increases when uncertainty, such as geopolitical risk, rises. This possibly leads companies to adopt safer financing options by relying on equity financing. Companies are expected to give up benefits of debt, such as reduced taxes, when uncertainty increases. The reason is that equity financing is considered a safer option that reduces risk of bankruptcy in times of high uncertainty. This assumption has been shown to be wrong for companies based in the US in the past decade, showing that they most likely chose other ways to tackle uncertainty. Reducing leverage for this reason does not seem like an approach that was adopted by those companies.

The pecking order framework of Myers and Majluf (1984) proposes that there is a specific order of preferred financing options for companies when deciding how to finance projects. They are expected to prefer internal financing, then they are expected to turn to debt and finally to equity financing. In the context of this research, companies did not have the need to move to less preferred financing options such as debt. This does not necessarily prove that this theory is incorrect, but it rather shows that internal financing has been sufficient in the past decade.

In the context of the market timing theory (Baker and Wurgler, 2002) companies are expected to issue equity when market valuations are high and they are expected to use debt financing when the market valuations are depressed. This research shows that in the past decades firms either used market timing but instead of issuing debt they decided to wait till the market stabilizes or that their market-timing decisions were only small and did not show up in the final leverage ratio.

Finally, the outcomes of this research can be seen as partial proof of the Modigliani and Miller theory. This theory proposes that in a perfect market without any uncertainty capital structure does not play a role in the value of the firm. While firms are clearly not operating in a perfect market and still must face uncertainty, bankruptcy risks and other factors, the insignificance of geopolitical risk on leverage could be interpreted as partial proof of their theory. The strong effect of industry on leverage on the other hand is contrary to the MM-theory, since it shows that industry specific factors, which are not considered in the MM-theory, are still important for capital structure decisions.

The high significance of industry in this research shows that industry specific factors play an important role in how companies organize their capital structure. This can be also seen in previous research, such as Mackay and Philips (2005). Their research shows that the leverage of firms is dependent on the industry they are operating in. Their study shows that technology, financial structure, and risk are determined by the industry the company operates in.

The results of this study clearly differ from existing research on this topic. The study from Chowdhury, Aram, Javadi and Nejadmalayeri (2025) shows a negative effect of geopolitical risk on leverage, even for firms based in the US. Their study covered the period from 1992-2020, creating a much larger sample. A possible reason for this outcome is that they are using a different time range, which includes many geopolitical shocks, such as the 9/11 attacks. Furthermore, the last decade marks a relatively stable time in geopolitics, while the time between 1992-2020 includes larger geopolitical developments that had a more significant impact.

Still, the outcome of this research is no clear proof that geopolitics is irrelevant in financial decision making. The sample only covers a decade and does not measure the specific risk a company is exposed to. The results should be interpreted carefully: In a relatively mature system with a constantly moderate geopolitical risk over a decade, the average leverage of firms headquartered in the US does not show any sensitivity to geopolitical risk when size, year and industry are considered.

6. CONCLUSION

The research question of this study "*How do geopolitical risks influence the capital structure of multinational firms across various industries?"* showed that there can be no significant effect detected between geopolitical risk and leverage. The variables firm size and year do not show any significant effect on leverage as well. Industry is shown to have a highly significant effect on firms' capital structure. This suggests that firms use other ways to tackle geopolitical developments and that adjustments of capital structure are not one of the preferred options.

To conclude this research the theoretical and practical implications of this study will be investigated as well as the limitations of this research.

6.1 Implications

The result of this study shows that geopolitical risk essentially has no impact on the way companies organize their capital structure as soon as industry is being controlled for. This has important implications for practice and theory.

The practical implications of this research suggest that companies do not need to restructure their balance sheet by changing their capital structure in times of higher geopolitical risk. This can be seen in a positive manner, since restructuring can often be very costly for managers and the money can be used to handle geopolitical risk in other ways, such as restructuring the supply chain. This way, companies can avoid sending negative signals to investors and still help to tackle the risk. Furthermore, managers do not need to adjust their capital structure when risk is considered moderate. The result of this research also shows that companies should pay attention to industry factors when considering restructuring their capital structure. Good considerations are asset tangibility or regulation.

When considering these findings from a policy standpoint, this research shows that leverage is not as sensitive to geopolitical changes as many studies fear. While the companies still should have an eye on the developments, this research shows that managers do not need to treat slight changes in geopolitical risk with a restructuring of their leverage.

The theoretical implications of this study are that the results can help to refine some already existing theoretical frameworks. The arguments of the trade-off theory remain valid, but they show that minor changes in macro risk are not significant enough to provoke a change in capital structure. The pecking order theory remains correct in this research but it seems like internal funds

are sufficient to finance projects, even in times where geopolitical tensions are rising.

These findings suggest that theories need to have sharper boundaries. The trade-off as well as the pecking-order theory assume that risk has a significant effect on the debt levels of companies. The results of the studies on the other hand show that this is not necessarily true. When industry effects are included, the effect of GPR on leverage disappears. This means that theories should model the industry specific level of GPR exposure rather than assuming that all companies are equally exposed to those risks.

All in all, this study shows that if geopolitical shocks are staying in a moderate range and not exceeding a certain point, there is no need for companies to adjust their capital structure to those risks. Recognizing this can help future theorists to design responses to risks that are more proportional and not over generalizing. This can help managers to have more cost-effective responses to geopolitical changes, where industry should be treated as a central factor instead of only a moderating variable.

6.2 Limitations and future research

This research shows a few limitations. The first limitation of this research is that the geopolitical risk index does not distinguish between how much companies are exposed to the risk. Companies partnering with China are obviously much more exposed to the risk of Trump's tariff increase than companies who do not partner with China. That means that the true effect for firms that are highly exposed to geopolitical risk may be much higher, but the research doesn't reflect that. Furthermore, this research only focuses on the total leverage of firms, meaning that other important financial measures are not considered, such as profitability. If those measures changed in response to geopolitical risk, they are not noted in this research. Another limitation of this research is the time frame. 2015-2024 marks a relatively stable time frame, even though there were some important geopolitical events. This research excludes events such as the 9/11 attacks. Since there is an absence of extreme geopolitical developments, this study may understate how firms respond to real stress. Lastly, firms that went bankrupt at that time were excluded and only firms that stayed alive during the past decade were included. Some firms may have faced bankruptcy due to a fragile capital structure and rising geopolitical risks, so the research could be biased.

Future research can address these limitations in multiple ways. First, future researchers may try to include firms' risk-exposure by looking at its supply chain data and the countries it is operating in. This could help to determine whether firms operating in highly exposed environments are significantly affected by geopolitical risk. Furthermore, extending the research to the 1990s could help to truly investigate how firms respond to extreme geopolitical events. Another way to extend the research is to include companies from various countries. Especially data from emerging markets could be helpful to determine the impact of geopolitical risk on their leverage. Lastly, a way to extend this research is to include multiple policies, such as payout ratios or cash buffers, to see how they respond to them even when leverage remains constant.

By pursuing these options future research can convert the limitations of this study into opportunities to dive deeper into the topic of corporate finance and geopolitical risks.

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9. APPENDIX:

Variable	Mean	SD	Min	Q1	Median	Q3	Max	N
Leverage	0,691	0,253	0	0,560	0,678	0,794	4,08342372	5190
Log GPR	4,410	0,206	4,071	4,215	4,435	4,600	4,72682331	5190
Size	16,680	1,194	3,218	15,866	16,628	17,485	20,2530926	5190

Table 1 - Descriptive statistics

NAICS code	Sector title
21	Mining, Quarrying, and Oil & Gas Extraction
22	Utilities
23	Construction
31	Manufacturing (Food Manufacturing, Beverage and Tobacco Product Manufacturing, Textile Mills, Textile Product Mills, Apparel Manufacturing, Leather and Allied Product Manufacturing)
32	Manufacturing (Wood Product Manufacturing, Paper Manufacturing, Printing and Related Support Activities, Petroleum and Coal Products Manufacturing, Chemical Manufacturing, Plastics and Rubber Products Manufacturing)
33	Manufacturing (Primary Metal Manufacturing, Fabricated Metal Product Manufacturing, Machinery Manufacturing, Computer and Electronic Product Manufacturing, Electrical Equipment/Appliance/Component Manufacturing, Transportation Equipment Manufacturing, Furniture and Related Product Manufacturing, Miscellaneous Manufacturing)
42	Wholesale Trade (Merchant Wholesalers (Durable and Nondurable Goods), Wholesale Trade Agents and Brokers)
44	Retail Trade (Motor Vehicle and Parts Dealers, Building Material and Garden Equipment and Supplies Dealers, Food and Beverage Retailers, Furniture, Home Furnishings, Electronics, Appliance Retailers)
45	Retail Trade (General Merchandise Retailers, Health and Personal Care Retailers, Gasoline Stations and Fuel Dealers, Clothing/ Clothing Accessories/ Shoe and Jewelry Retailers, Sporting Goods/ Hobby/ Musical Instrument/ Book and Miscellaneous Retailers)
48	Transportation & Warehousing (Air Transportation, Rail Transportation, Water Transportation, Truck Transportation, Transit and Ground Passenger Transportation, Pipeline Transportation, Scenic and Sightseeing Transportation, Support Activities for Transportation)
49	Transportation & Warehousing (Postal Service, Couriers and Messengers, Warehousing and Storage)
51	Information
52	Finance & Insurance

NAICS code	Sector title
53	Real Estate and Rental & Leasing
54	Professional, Scientific & Technical Services
56	Administrative & Support, Waste Management & Remediation Services
62	Health Care & Social Assistance
71	Arts, Entertainment & Recreation
72	Accommodation & Food Services
81	Other Services (except Public Administration)
92	Public Administration

Table 4 – NAICS industry classification