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The impact of international sanctions on the equity risk premium in Russia: A comparative analysis with other emerging markets

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ABSTRACT (GERMAN)

Diese Masterarbeit untersucht die Auswirkungen der im Jahr 2014 von der Europäischen Union und den Vereinigten Staaten verhängten Sanktionen auf das Equity Risk Premium (ERP) in Russland. Auf Basis einer Rolling-Window-CAPM-Regression wird ein Vergleich zwischen Russland und anderen wichtigen Schwellenländern vorgenommen, ergänzt durch eine Ereignisstudie zu drei wesentlichen Sanktionspaketen im Juli und September 2014. Damit werden sowohl langfristige als auch kurzfristige Effekte erfasst. Die Ergebnisse zeigen eine unterschiedliche Entwicklung. Während das ERP in anderen Schwellenländern nach der Annexion der Krim anstieg, verringerte es sich in Russland leicht. Gleichzeitig ergibt die Analyse auf Markt- und Unternehmensebene keinen statistisch signifikanten Anstieg des ERP im Zusammenhang mit den Sanktionsereignissen. Diese Ergebnisse deuten darauf hin, dass die Sanktionen von 2014 von internationalen Investoren nicht als wesentliche Erhöhung des Risikos im russischen Aktienmarkt wahrgenommen wurden, trotz ihres Umfangs und der gezielten Maßnahmen.

ABSTRACT (ENGLISH)

This thesis examines the effect of the economic sanctions imposed by the European Union and the United States in 2014 on the Equity Risk Premium (ERP) in Russia. Employing a rolling-window CAPM regression for a comparative analysis of Russia and other major emerging markets, as well as an event study focusing on three key sanction packages in July and September 2014, the study evaluates both long-term and short-term impacts. The results indicate a divergence in trends. While the ERP in other emerging markets increased after the annexation of Crimea, the ERP in Russia showed a slight decline. At the same time, the market-wide and firm-level event study reveals no statistically significant increase in ERP following the sanction announcements. These findings suggest that the sanctions of 2014 were not perceived by international investors as a substantial escalation of risk in Russian equity markets, despite their scope and targeted nature.

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1. INTRODUCTION

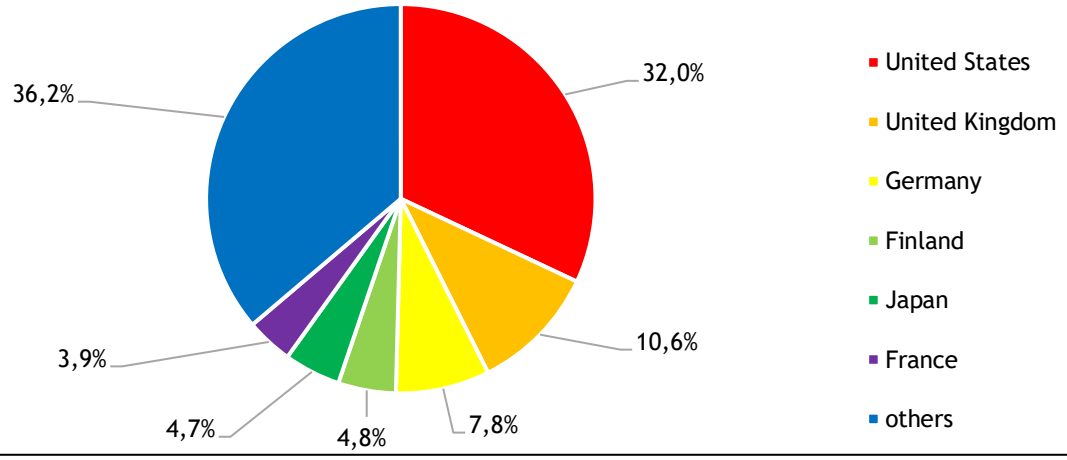
1.1. Motivation

On 24 February 2022, the Russian Federation launched a full-scale invasion of Ukraine, marking a major escalation of a conflict that began with the annexation of Crimea in 2014, widely regarded as a violation of international law. In response, Russia has been dealing with waves of serious economic sanctions imposed by the European Union (EU), the United States (US) and other international entities. These measures were drawn to put substantial economic and financial pressure on Vladimir Putin with the strategic aim of objective of weakening their economic foundations and limiting Russia's ability to wage war in Ukraine.

Since the introduction of the first economic sanction packages in 2014, the Russian Federation has represented the largest and most globally integrated economy ever targeted by Western sanctions, with some of the targeted companies being among the largest in the world (Stone, 2017). These sanctions include embargos on specific Russian exports, bans on import of key Russian products, the exclusion of financial institutions from international payment networks as well as asset freezes of entities and individuals closely connected to the Russian government (Balyuk and Fedyk, 2023). Although Western companies were not legally prohibited from operating in Russia, many chose to withdraw from the Russian market following the invasion of Ukraine in 2022. According to the Yale Chief Executive Leadership Institute, many Western companies had fully ceased their operations in Russia as of July 2023. As illustrated in Figure 1, most companies that exited the Russian market originated from some of the world's largest economies, including the United States (36.2%), Germany (32.0%), and the United Kingdom (10.6%).

Figure 1: Origin of Western companies that exited the Russian market

Source: Yale Chief Executive Leadership, 2023



Consequently, many Western companies either wrote off their Russian assets or sold them to local individuals and entities under unfavourable terms (Onopriienko et al., 2023). The fact that many assets were sold off at unfavourable terms could potentially hint at a high cost of equity, which in turn would imply a higher equity risk premium (ERP) demanded by the buyers of these assets as compensation for the additional risks created by sanctions. In theory, the ERP represents the difference between the expected return on equities (e.g., company stocks) and the guaranteed return on a risk-free asset (e.g., government bonds). In essence, it represents the compensation investors require for taking on additional risk by choosing a more volatile equity investment over a safer, risk-free alternative (Goetzmann and Ibbotson, 2006). The ERP can be formally expressed as

$$ERP_{i,t} = R_{i,t} - R_{f,t}$$

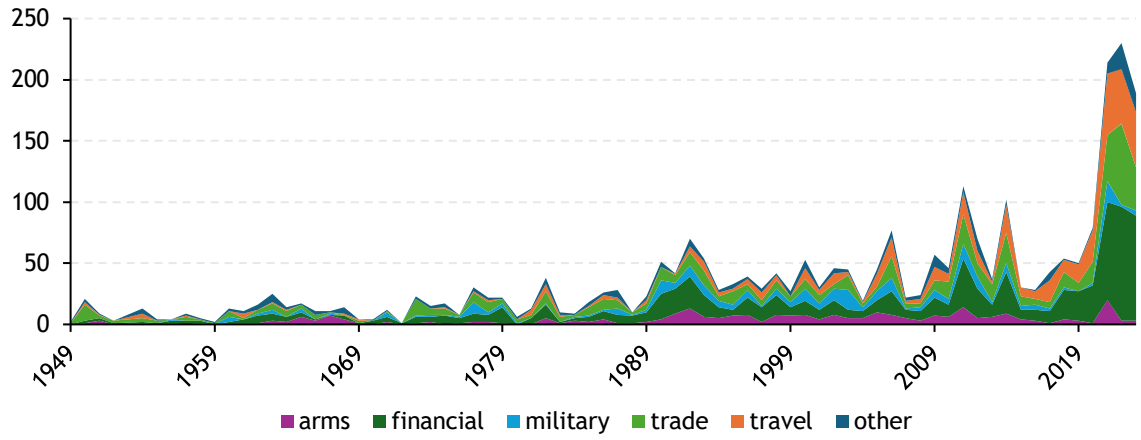
As Goetzmann and Ibbotson (2006) stated, the ERP plays a central role in the financial world as it is commonly used to project long-term investment growth of portfolios, to estimate the cost of capital in valuation of companies and to determine the expected return on stocks.

1.2. Research Question and Hypothesis Development

In an increasingly globalized and integrated global economy, emerging markets have become a vital market for Western companies. The growing relevance of emerging markets to the global economy are reflected in the increase of foreign direct investment, which surged from $551 billion in 1980 to $15,602 billion in 2007 (Jones, 2007). However, despite their opportunities, emerging markets exhibit significant risks, particularly when it comes to the uncertainty surrounding potential military conflicts. In recent years, global headlines have been dominated by the war in Ukraine and, most recently, by tensions and armed clashes between India and Pakistan. Another growing geopolitical concern is China's aspiration to annex Taiwan, which is a scenario that could potentially destabilize regional and global markets. These potential conflicts trigger the imposition of international sanctions, which have become an increasingly common political tool to punish aggressors. According to data from the Global Sanctions Database, the number of newly introduced

sanctions per year has risen sharply from just 2 in 1949 to 189 in 2023 (see also Figure 2).

Figure 2: Introduction of sanctions p.a.



Source: Global Sanctions Database, 2025

Generally, emerging markets are characterized by a higher equity ERP than developed economies, reflecting weaker institutions, lower levels of transparency, and greater exposure to external shocks (Salomons and Grootveld, 2003). Sanctions, by design, replicate these vulnerabilities. Specifically, they restrict companies' access to foreign financing, raise transaction costs, and heighten concerns about governance and political stability. In theory, such developments should translate into a higher ERP. Therefore, this master thesis seeks to contribute to a more comprehensive understanding of the impact of sanctions on the ERP in emerging markets. The findings aim to enrich academic debates on the determinants of ERP in emerging markets, while also offering practical insights for investors, multinational corporations, and policymakers. Russia represents a particularly compelling case for this analysis. As a large emerging economy, heavily dependent on natural resources and previously well integrated into global financial markets, it provides a unique opportunity to study the intersection of international conflict and financial risk assessment.

Therefore, the central research question of this master thesis is whether the economic sanctions introduced against the Russian Federation by the EU and the US in 2014 significantly increased the ERP in this country. This question is approached through two complementary perspectives. The first is a perspective of comparative

nature, setting ERP in Russia in relation to other emerging economies before and after the annexation of Crimea, to identify whether sanctions contributed to a divergence in trends. The second is an event study analysis, investigating the short-term impact of the sanction events from 16 July 2014, 30 July 2014 and 12 September 2014, to test whether these measures produced measurable shifts in ERP.

Based on these considerations, three hypotheses are derived. The first hypothesis assumes that the annexation of Crimea and the subsequent introduction of sanctions increased the perceived risk of investing in Russian equities relative to other emerging markets. Accordingly, it suggests that since 2014, the ERP in Russia should be significantly higher than that of its peers. The second hypothesis focuses on the immediate effect of sanctions as geopolitical shocks. It posits that the targeted measures adopted by the EU and the US in 2014 led to significant increases in ERP as international investors anticipated reduced long-term profitability of their Russian assets. Table 1 provides an overview of the two hypotheses under investigation.

Table 1: Overview of Hypotheses

H1:	Since the annexation of Crimea in 2014. the ERP in the Russian Federation has been significantly higher than the ERP in other emerging countries.
H2a:	The economic sanctions imposed by the EU and the US led to a significant increase in ERP of publicly listed Russian companies that are part of the RTSI.
H2b:	The economic sanctions imposed by the EU and the US led to a significant increase in ERP of Russian companies that are affected by these measures.

1.3. Structure of the Master Thesis

The remainder of this master thesis begins with a comprehensive overview of the sanctions packages that have been imposed on the Russian Federation by the EU and the US since the beginning of the conflict in Ukraine. This chapter examines the different types of sanctions introduced, identifies companies and industry sectors that are subject to these measures, analyses the evolution of the sanction regimes over time. Ultimately, the second chapter concludes with an analysis of how Western companies have responded to operating in the Russian market under these circumstances. The third chapter will present the results from the systematic literature review on the current state of research on the ERP in emerging markets.

It will highlight different global and regional factors that may explain higher levels of ERP in these economies. Ultimately, the literature review will show that there is a notable research gap concerning the examination of the link between economic sanctions and changes in ERP in developing countries. The fourth chapter addresses the empirical framework, which constitutes the core of this master thesis. It provides a detailed overview of the methodologies applied, beginning with the rolling window CAPM regression in the first part and the event study in the second part. Moreover, this chapter presents the data selection, model specifications and empirical results in a comprehensive manner. Finally, this chapter concludes with robustness checks for both empirical models that underlines the stability and reliability of the obtained findings. Ultimately, this master thesis concludes with a discussion of the key findings in the empirical framework, the implications of the empirical results and the limitations of the applied methodologies.

2. Sanction Programs against Russia

2.1. Sanctions Introduced in Response to Russia's War in Ukraine

In response to the occupation of Crimea by Russian forces at the end of February 2014, former United States (US) President Barack Obama issued Executive Order (EO) 13660, which marked the first sanction package in reference to the conflict of Ukraine. These individual restrictive measures targeted individuals and entities deemed responsible for violating Ukraine's sovereignty and territorial integrity through asset freezes and travel bans. Following the disputed Crimean status referendum on 16 March 2014, President Obama issued EO 13661 on the following day, expanding the list of names subject to asset freezes and travel bans. On the same day, during a meeting of the Foreign Affairs Council, the European Union (EU) announced its first set of individual sanctions targeting 21 Russian and Ukrainian nationals and entities associated with actions threatening Ukraine's territorial integrity. Similarly to the US measures of 6 and 17 March, the initial sanctions by the EU focused on asset freezes and travel bans. As the conflict escalated in the eastern Ukrainian oblasts of Donetsk and Luhansk, the EU progressively expended its sanctions by subjecting additional names of individuals and entities to asset freezes and travel bans on 20 March, 15 April, 12 May and 23 June 2014.

On 14 July 2014, President Obama introduced the first set of economic sanctions under the EO 13662. These measures targeted two banks (Gazprombank and Vnesheconombank) and two energy companies (Novatek and Rosneft) from Russia, prohibiting any US person from transacting in, providing financing for or otherwise dealing in new debt with a maturity longer than 90 days. On 12 September 2014, the US Department of the Treasury expended these sanctions by adding further major companies from the Russian energy and financial sectors (see also Table 2) with the object of increasing economic pressure on the Russian government. In addition, the debt financing restrictions were tightened by reducing the maturity period for new debt from 90 days to 30 days for all sanctioned entities. Furthermore, the second round of U.S. sanctions also prohibited the export of goods, services, and technology in support of exploration or production for Russian deepwater, Arctic offshore and shale projects with the potential to produce oil for the benefit of the sanctioned energy companies.

Table 2: List of US sanctioned Russian companies in 2014

Energy Sector	Financial Sector
- Gazprom	- Bank of Moscow
- Gazprom Neft	- Gazprombank
- Lukoil	- Russian Agricultural Bank
- Novatek	- Sberbank
- Rosneft	- Vnesheconombank
- Surgutneftegas	- VTB Bank
- Transneft	

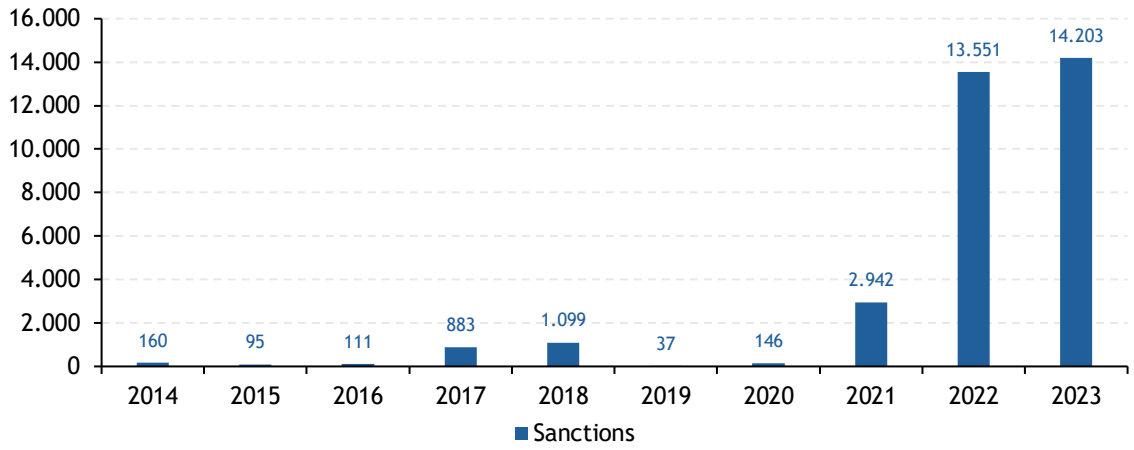
Source: United States Department of the Treasury, 2014

In comparison to the US, the EU introduced its first economic sanctions on 30 July 2014. Unlike the US measures, these sanctions did not directly target specific companies but rather entire financial and energy sectors of the Russian economy. Specifically, the EU prohibited its nationals from transacting in, providing financing for or otherwise dealing in new debt with a maturity longer than 90 days, issued by major Russian banks and their subsidiaries outside of the EU. In the second round of restrictive measures, introduced on 12 September 2014, the maximum maturity period was reduced from 90 to 30 days. Additionally, the EU intensified its sanctions by prohibiting the export of goods, services, and technology supporting the

exploration or production of Russian deepwater, Arctic offshore, and shale oil projects conducted by major Russian energy companies.

After a prolonged period of reduced military actions and relative peace, Vladimir Putin decided to launch a full-scale invasion of the entire Ukraine on 24 February 2022, marking a major escalation of the conflict that began in 2014. In response to Russia's war of aggression, the EU together with the US and other Western allies significantly intensified their economic and political pressure on the Kremlin by exponentially expending the scope and severity of sanctions following the invasion in 2022, compared to those introduced in the early stages of the conflict (see also Figure 3).

Figure 3: Sanctions introduced against Russia over time

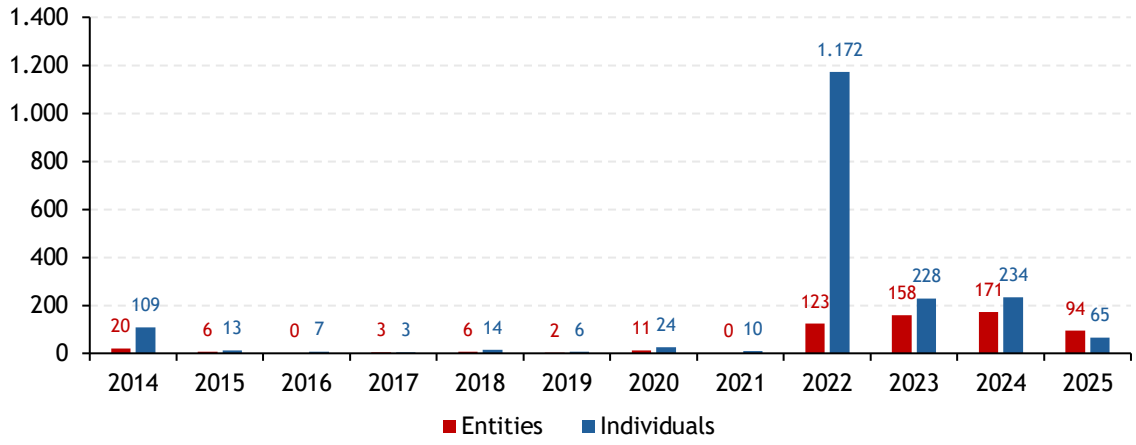


Source: Statista, 2024

As of 18 July 2025, the EU has adopted a total of 18 sanctions packages in response to the invasion and illegal annexations of the Ukrainian oblasts Donetsk, Luhansk, Zaporizhzhia and Kherson in 2022. These measures target over 2,400 Russian individuals and entities deemed responsible for actions undermining Ukraine's sovereignty and territorial integrity. In contrast, only 20 entities and 109 individuals have been subject to EU sanctions in 2014 (see also Figure 4). The scope of sanctions is extensive, targeting the Kremlin, political parties, armed forces, paramilitary groups, media outlets and major corporations across key economic industries such as the finance, trade, energy, transport, technology, and defence sectors. All sanctioned individuals are subject to travel bans prohibiting entry into EU territory. Moreover, the assets of listed individuals and entities within the EU are

frozen. Furthermore, persons and entities from the EU are prohibited from making funds or economic resources available to them.

Figure 4: Entities and individuals sanctioned by the EU over time

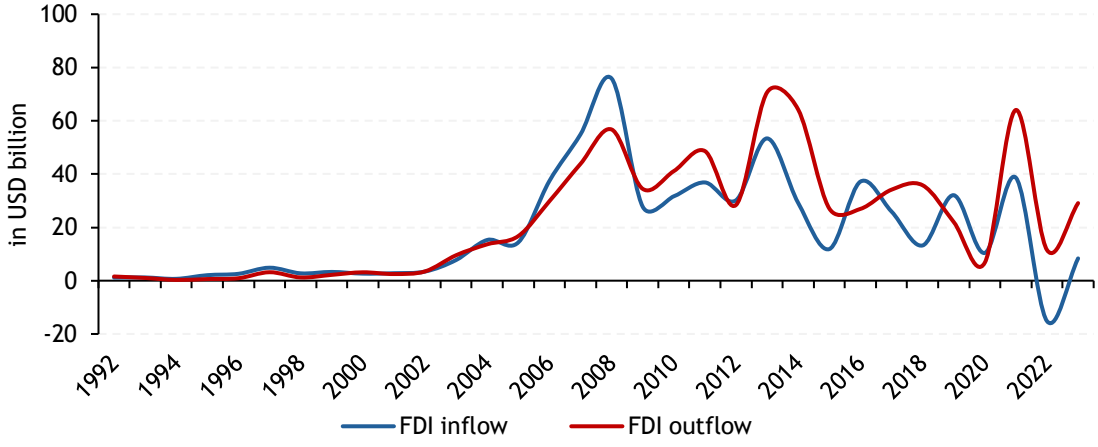


Source: European Uninion, 2025

2.2. Reaction of Western Companies operating in Russia

Since the beginning of the full-scale invasion in 2022, no universal sanction regime has been introduced that mandates foreign companies to cease their operations in the Russian Federation. Consequently, the decision to withdraw from the Russian market has predominantly been the degree of trade-off between benefit and cost. Profit-maximizing firms are more likely to exit the Russian economy if such a move yields more benefits than maintaining their operation in this market. Conversely, if the costs of exit outweigh potential gains, these companies are more inclined to remain in Russia (Pham, 2025). Many Western corporations have made substantial investments in emerging markets such as Russia to establish profitable operations,

Figure 5: Foreign Direct Investments in Russia



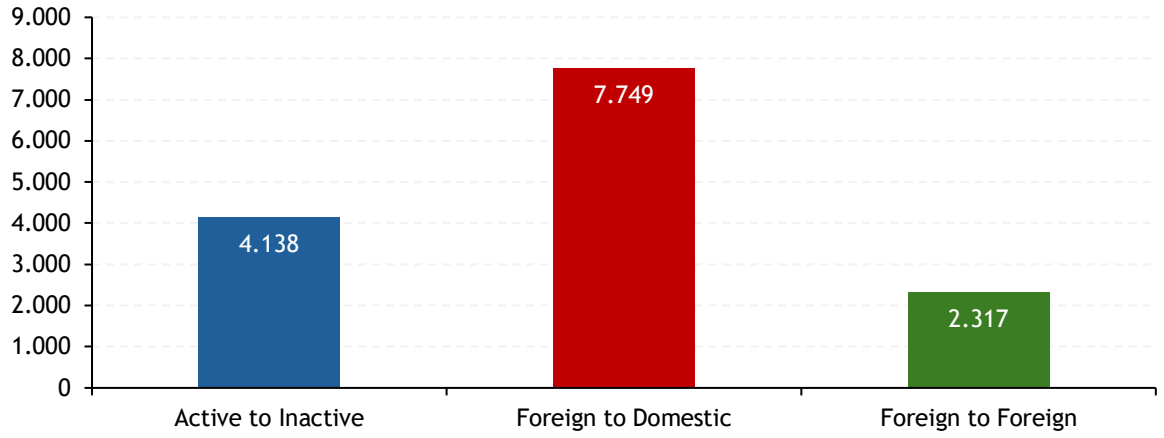
Source: Statista (2025)

despite the geopolitical risk associated with these environments. Consequently, many companies remain reluctant to completely withdraw from Russia even though the geopolitical pressure from the West has been mounting since 2022 (Evenett and Pisani, 2023).

Nevertheless, the war in Ukraine has had consequences for the Russian economy as evidenced by the evolutoin of foreign direct investments (FDI) between 1992 to 2023 (see also Figure 5). According to data from *Statista*, FDI inflows have followed a generally declining trend since 2008 with major year-over year changes in 2008/09 (from USD 75.9 billion to USD 27.8 billion), in 2013/14 (from USD 53.4 billion to USD 29.2 billion) and 2021/22 (from USD 38.4 billion to USD -15.2 billion). While the sharp decline from 2008 to 2009 can be attributed to the global financial crises, the subsequent two downturns correspond to periods of the war in Ukraine with key geopolitical events (i.e., the annexation of Crimea in 2014 as well as the escalating military conflict in Donetsk and Luhansk in 2014 and the full-scale invasion by Russia in 2022). Most notably, the deterioration of Russia's business climate in 2022 was so severe, that the FDI inflow was USD -15.2 billions, reflecting a widespread divestment by foreign companies from the Russian market.

The empirical study by Wellhausen and Zhu (2024) reports that approximately 40,000 multinational corporations of varying sizes were operating within the Russian Federation. However, 18 months into the conflict, roughly one-third of these corporations had exited the Russian market. While a total of 4,138 foreign subcomponents became inactive, most multinational corporations decided to sell their shares in their Russian assets through transactions. Of these exits, 7,749 involved the transfer of shares to Russian buyers, accounting for slightly more than half of all divestments. The remaining 2,317 subsidiaries were acquired by foreign buyers (see also Figure 6).

Figure 6: Subcomponents of the Exit Rate



Source: Wellhausen and Zhu (2024)

3. Literature Review: Equity Risk Premium in Emerging Markets

3.1. Research Methodology

Before delving into the core of this thesis, it is essential to establish a comprehensive overview on the current state of empirical analysis regarding the ERP in emerging markets and its key drivers. This will be accomplished by collecting and synthesizing academic literature by means of a systematic research method. As Snyder (2019) points out, a systematic literature review provides a strong foundation of any research, as it helps scholars to thoroughly summarize existing knowledge and identify research gap that warrant further investigation.

The systematic literature review followed a structured approach to identify relevant studies on the driving factors of ERP in developing economies. The research was conducted using University of Vienna's database *u:search*, employing the key words *emerging markets* and *equity risk premium*. To ensure the relevance and quality of the selected studies, only peer reviewed publications were considered. The initial search yielded 22 articles, however, upon closer examination, twelve articles were excluded due to insufficient relevance and another two due to unavailability, resulting in a final selection of eight academic papers.

3.2. Current State of Research on Equity Risk Premium in Emerging Markets

The ERP in emerging markets has been the subject of extensive empirical and theoretical research, primarily due to its consistently higher levels compared to

those observed in developed markets. Traditionally, the academic focus has centred on broad macroeconomic determinants that might account for this disparity. In recent years, however, scholars have increasingly shifted their attention toward more specific factors that may contribute to the elevated ERP characteristic of emerging economies.

3.2.1. Time-Varying Nature of Equity Risk Premium in Emerging Markets

A considerable number of empirical studies confirm that the ERP exhibits significant time-variation and cyclical behaviour, closely related to broader economic cycles. This relationship is also explored in the research paper by Ameur *et al*. (2013), which analysis the changes in ERP in emerging markets during major global crisis such as the dot-com crash in 2000 and the financial crisis in 2008. Their findings indicate that ERP increases during periods of heightened uncertainty and economic turmoil. This observation is consistent with the prevailing scholarly consensus that ERP generally peaks during market volatility phases and, convergingly, declines as the market recovers. This cyclical behaviour is consistent the empirical findings of Salomons and Grootveld (2003), who confirm the significance of global economic cycles as a key driver of the ERP in emerging markets.

3.2.2. Regional Systematic Risk Component in Emerging Markets

Another important determinant of ERP in emerging markets is the regional risk component, which primarily reflects local events. This factor is also the focus of research in the empirical study by Arouri et al. (2013), in which they analyse the level of market integration across various regions in both emerging and developed economies. In line with the scientific consensus, the authors find a significant discrepancy between the volatility of developing and developed markets, with the former exhibiting much higher risk than the latter. These volatile economies also tend to be more segmented, which is why Arouri *et al*. highlight the significance of the regional risk component of ERP. Conversely, their analysis shows that developed markets are less influenced by regional risk factors due to their higher integration into the global market. Furthermore, Arouri *et al*. observe that financial markets in developing economies have become less segmented in recent years due to market liberalizations and reforms. However, the regional systematic risk is according to

them still a statistically significant key driver of ERP in emerging markets, which cannot be diversified away even with a growing integration into the global financial market.

3.2.3. The Information Environment in Emerging Markets

Another major determinant of the ERP is the quality of information available within a country, which is highly dependent on transparent reporting practices, rigorous disclosure requirements and effective regulatory frameworks. In many developing economies, these elements tend to be less established, thus leading to a greater uncertainty among investors and consequently higher ERP. Empirical research by Lau *et al*. (2025) provides significant evidence on a positive correlation between the quality of the information environment in a country and the volatility of the ERP. Drawing on data from the Asian financial crisis in 1997 and the global financial crisis in 2008, the authors show that countries with stronger disclosure standards and greater transparency in information experienced considerably less volatile ERP during periods of market stress. Based on these findings, they argue that enhancing the quality of information through stricter policies and regulatory improvements can reduce investor uncertainty and ultimately contribute to lower ERP. Similarly, the governance analysis conducted by Donadelli and Persha (2014) supports the same conclusion. Limitations in a country's governance indicators can contribute to higher information barriers. investors face greater difficulty and cost in accessing the information needed for their investment decisions and thus they will require compensation in form of a higher ERP.

3.2.4. The Impact of Company Decisions on Investors' Behaviour

While most studies on the ERP in emerging markets focus on macro-level factors and their impact on investors' risk perceptions, a few recent research papers have adopted a more granular approach by examining how firm-level decisions influence the ERP. Mozes (2018) explores this relationship by analysing the signalling power of dividend payout rates in both developed and emerging economies. Overall, his findings indicate that increases in a country's aggregate dividend payout ratio are negatively associated with analysists' expectations for long-term earning growth. This correlation implies that higher dividends are interpreted as by investors as a

signal of diminished reinvestment opportunities, thereby increasing the country's ERP. Notably, the study finds that this pattern holds consistently across both developed and emerging markets, with no significant differences observed between the two.

3.3. Research Gap on the Impact of Sanctions

There has been a growing body of literature on the topic of ERP in emerging markets over the past ten years, reflecting increasing interest in how these markets differ from developed economies and the factors driving those differences. However, none of these articles reviewed specifically addressed the impact of economic sanctions on the ERP. This omission points to a potential research gap in the existing literature. Given the significant role of ERP in modern financial theory as well as recent geopolitical developments, this thesis aims to contribute to the existing body of knowledge. Specifically, it seeks to research the impact of economic sanctions on the ERP in Russia by empirically examining the periods before and after the disputed annexation of Crimea in 2014 as this point in history and the following events in Ukraine led to the introduction of first economic sanction packages against the Russian Federation.

4. Empirical Analysis: Sanction Impact on the Equity Risk Premium

4.1 Comparative Analysis of the Equity Risk Premium in Emerging Markets

4.1.1. Data Sample

To examine the difference of the ERP in the periods before and after the illegal annexation of Crimea in February 2014, this thesis utilizes monthly historical closing prices from the Morgan Stanley Capital International (MSCI) equity indices for seven major emerging economies, namely, Brazil, China, India, Indonesia, Mexico, South Korea and Türkiye. Unfortunately, MSCI decided to remove Russia from its equity indices following the full-scale invasion of 2022, thereby restricting any access to the historical data of the Russian equity index through their platform. Fortunately, the now defunct equity index remains accessible through the third-party financial portal *Investing.com*, which provides monthly prices for the sample period spanning from February 2004 through February 2022. In contrast, the monthly equity index prices of the remaining seven countries were directly obtained from MSCI's database

covering the same sample period. Following standard practice in empirical research, each equity index is denominated in USD as it neutralizes the effects of exchange and inflation rates across each country thus reducing data noise (see Salomons and Grootveld, 2003; Donadelli and Persha; 2014; Curatella *et al.*, 2015). Therefore, the indices retain only the US inflation over the complete sample period between 2004 and 2022.

The monthly MSCI index closing prices of each country are used to derive the historical monthly returns. Formally,

$$R_{i,t} = \frac{P_{i,t}}{P_{i,t-1}} - 1$$

where $R_{i,t}$ denotes the monthly return of country *i* at time *t*, $P_{i,t}$ the closing price of country *i* in the month *t* and $P_{i,t-1}$ the closing price of country *i* a month earlier at *t-1*. Since the objective of the first model is to compare the ERP of Russia with that of other developing economies in the periods before and after the 2014 annexation, an equally weighted emerging market portfolio is constructed. Formally,

$$R_t^{EM} = w_i \times R_{i,t}$$

where R_t^{EM} denotes the monthly return of the emerging market portfolio excluding Russia at time *t*, $w_i = \frac{1}{N}$ and *N* = 7.

Ideally, the most liquid and least default-prone government bond of a given country should be used as the proxy for that country's risk-free rate. However, government bonds issued by developing countries often carry a higher default risk compared to those issued by developed countries. For instance, US Treasury bonds and bills are widely regarded as the safest sovereign bond in the world. Similarly, the German Bund is often considered to be the safest sovereign bond in the European Union. The concern of default risk is particularly relevant in the case of the Russian Federation, which has experienced two sovereign debt defaults since the dissolution of the Soviet Union. The first default occurred in 1998 due to a collapse in oil prices and severe fiscal instability. The latest default happened in 2022 triggered by the international sanctions following the attack on Ukraine. Given the elevated default risk in emerging markets, many empirical studies on ERP tend to use more secure

alternatives as proxies for the risk-free rate. In line with this reasoning, this master thesis relies on the 1-month US Treasury bill (US T-bill) as the proxy for the risk-free rate. The data for the risk-free asset were retrieved from the Federal Reserve Economic Data (FRED) database, maintained by the Federal Reserve Bank of St. Louis.

The market return is represented by the monthly returns of the MSCI Emerging Market Index (MSCI EMI). As a first step, the monthly prices of said index, denominated in USD, were obtained from the MSCI database. Subsequently, these prices were used to derive the corresponding daily returns of the MSCI EMI. Formally,

$$R_t^{WM} = \frac{P_t^{WM}}{P_{t-1}^{WM}} - 1$$

where R_t^{WM} denotes the daily return of the index at time t, P_t^{WM} the closing price of the index at the trading day t and P_{t-1}^{WM} the closing price of the index from the previous trading day t-1. The excess return of the world index over the 1-month US T-bill is referred as the market risk premium (MRP). Formally,

$$MRP_t = R_t^{WM} - R_f = \left(\frac{P_t^{WM}}{P_{t-1}^{WM}} - 1\right) - R_f$$

where P_t^{WM} and P_{t-1}^{WM} represent the closing prices of the MSCI EMI at the end of month t and $t-1$, respectively, R_t^{WM} denotes the market return at time t, and R_f is the 1-month US T-bill rate.

4.1.2. Methodology

For decades, the Capital Asset Pricing Model (CAPM) has served as the methodological foundation for estimating the cost of equity, thereby playing a significant role in determining a firm's cost of capital and, ultimately, the value of a company (Fama and French, 2004). Due to its relevance in the valuation of companies and various transactions, the CAPM will also serve as the foundation of the empirical methodology of this master thesis.

Inspired by the empirical paper from Donadelli and Persha (2014), the first model adopts a dynamic approach by employing a rolling window estimation technique. Specifically, a 60-month rolling window is used to estimate the beta

coefficient, which aligns with standard valuation practice, where a five-year monthly beta is typically applied (Aggrawal et al., 2022). Each month, the regression window shifts forward by one month, resulting in an updated beta coefficient for the corresponding period. This method allows the beta factor to vary over time, thereby reflecting evolving risk exposure around geopolitical events such as the annexation of Crimea more accurately. Accordingly, the empirical model is specified as

$$R_{i,t} - R_{f,t} = a_{i,t} + ß_{i,t} \times (R_{m,t} - R_{f,t}) + \varepsilon_{i,t}$$

where $R_{i,t}$ represents the monthly returns of either the MSCI Russia Index or the equally weighted emerging market portfolio at time t, while $R_{f,t}$ denotes the risk-free rate at the same point in time. The parameter $a_{i,t}$ refers to the Jenson's alpha, which captures the abnormal returns of both portfolios at time t that are not explained by market movements. The coefficient $ß_{i,t}$ indicates the sensitivity of the portfolios' returns to overall market fluctuations and reflects their systematic risk. Lastly, $\varepsilon_{i,t}$ denotes the error term, accounting for the portion of returns that is not explained by the model for each portfolio at time t.

The rolling window CAPM regression is conducted monthly throughout the entire sample period. In the following step, the estimated $ß_{i,t}$ for both the MSCI Russia Index and the emerging market portfolio is multiplied by the MRP at the corresponding point in time, eventually resulting in the monthly ERP for each group. The calculation can be formally expressed as

$$ERP_{i,t} = ß_{i,t} \times (R_{m,t} - R_{f,t})$$

4.1.3. Empirical Results

The rolling window regression was carried out over the period from January 2001 to February 2019 for both the Russian equity index and the emerging market portfolio. February 2014 serves as the cut-off point for the before-and-after analysis, as it marks the beginning of the conflict in Ukraine and the introduction of the initial sanction packages. To ensure a meaningful comparison, the descriptive statistics with respect to the $ERP_{i,t}$ were calculated over equally long periods before and after the cut-off point. Table 3 reports the results of the first empirical model.

Table 3: 60 Month Window Regression - Summary of Empirical Results

	Russia		EM Portfolio	
Period	01/09 - 01/14	02/14 - 02/19	01/09 - 01/14	02/14 - 02/19
Observations	61	61	61	61
Mean	-0.18%	-0.32%	0.38%	0.55%
Standard deviation	1.22%	1.12%	1.25%	0.88%
Skewness	-1.16	0.50	0.21	0.98
Kurtosis	4.09	0.55	0.41	1.89
Median	-0.05%	-0.28%	0.30%	0.37%
Minimum	-4.47%	-2.86%	-2.57%	-1.50%
Maximum	3.08%	2.49%	4.13%	3.66%
Jarque-Bera	16.71	17.71	17.50	12.99
p-value	0.02%	0.01%	0.02%	0.15%

The results of the rolling window regression suggest a small decline in the ERP for the Russian equity market. In the post-annexation period, the mean monthly ERP in Russia decreased from -0.18% to -0.13%. An opposite trend is observed for the other emerging markets, where the ERP increased from 0.38% to 0.55%. Furthermore, a downwards trend is observable for the standard deviation for both groups. For Russia, the standard deviation fell from 1.22% to 1.12%, while the equally weighted EM portfolio saw its standard deviation decrease from 1.25% to 0.88%, suggesting a broad stabilization in risk across both groups. The results are statistically significant given that the p-value for each group and each observation period is smaller than five percent.

The analysis reveals a divergent pattern between the ERP of the Russian equity market and that of other emerging markets. Specifically, following the annexation of Crimea in 2014, the ERP of Russia declined whereas the ERP of other developing economies increased. While the absolute differences between these two groups are marginal, the statistical evidence supports this conclusion at a five percent confidence level. Therefore, H1 is rejected: Since the annexation of Crimea in 2014, the ERP in the Russian Federation has been significantly higher than the ERP in other emerging countries.

4.1.4. Robustness

Although a 60-month window is commonly applied to derive the beta factor in the standard CAPM, it remains an open question whether this horizon is truly optimal. Agrrawal et al. (2022) provide empirical evidence that the 60-month beta factor generally produces the most stable results. They also find that shorter estimation windows tend to generate more volatile and less reliable coefficients. Therefore, to ensure the robustness of the results from the first empirical model, the size of the rolling window will be varied. The rolling window CAPM regression is thus recalculated by applying alternative window lengths of 48, 36 and 24 months.

Congruent with the results of the 60-month rolling window regression, the 48-month rolling window regression indicates a decline in ERP of the Russian equity market from -0.49% in the pre-annexation period to -0.89% in the post-annexation period. In contrast, the ERP of the other developing economies increased from 0.24% to 0.57% following the occupation of Crimea by the Russian Federation. The volatility of the ERP in Russia remained relatively stable as the standard deviation went up slightly from 1.73% to 1.77%. The volatility of the ERP in Russia remained relatively stable, with the standard deviation rising only slightly from 1.73% to 1.77%. By comparison, the emerging markets became more stable, as their standard deviation decreased from 1.34% to 0.91%. The empirical results for both groups are statistically significant at the five percent level. Table 4 presents the results of the 48-month rolling window CAPM regression.

Table 4: 48 Month Window Regression - Summary of Empirical Results

	Russia		EM Portfolio	
Period	01/08 - 01/14	02/14 - 02/20	01/08 - 01/14	02/14 - 02/20
Observations	73	73	73	73
Mean	-0.49%	-0.89%	0.24%	0.57%
Standard deviation	1.73%	1.77%	1.34%	0.91%
Skewness	-1.23	-2.19	0.32	0.13
Kurtosis	3.46	10.92	0.94	0.16
Median	-0.11%	-0.60%	0.16%	0.47%
Minimum	-7.31%	-10.45%	-2.73%	-1.60%
Maximum	3.29%	2.47%	4.71%	2.67%
Jarque-Bera	18.96	248.83	14.15	24.73
p-value	0.01%	0.00%	0.08%	0.00%

In the case of the 36-month rolling window CAPM regression, ERP in Russia remained mostly unchanged, moving from -0.97% in the period before the occupation of Crimea to -0.93% in afterwards. The overall ERP for Russia continues to be lower than that of the other emerging markets, where the ERP increased from -0.04% to 0.48%. The volatility of the ERP in Russia also remained relatively stable, with the standard deviation rising only slightly from 2.05% to 2.06%. By contrast, the emerging markets became more stable, as their standard deviation declined from 1.94% to 1.23%. The empirical results for Russia are statistically significant at the five percent level, whereas the post-annexation results for the other emerging markets are statistically insignificant, with a p-value of 16.33%. Table 5 reports the results of the 36-month rolling window CAPM regression.

Table 5: 36 Month Window Regression - Summary of Empirical Results

	Russia		EM Portfolio	
Period	01/07 - 01/14	02/14 - 02/21	01/07 - 01/14	02/14 - 02/21
Observations	85	85	85	85
Mean	-0.97%	-0.93%	-0.04%	0.48%
Standard deviation	2.05%	2.06%	1.94%	1.23%
Skewness	-0.96	-1.01	-0.87	-0.48
Kurtosis	2.68	7.14	3.21	3.31
Median	-0.46%	-0.65%	0.05%	0.43%
Minimum	-9.51%	-10.83%	-7.76%	-3.85%
Maximum	3.67%	6.23%	4.87%	4.33%
Jarque-Bera	13.38	75.29	10.80	3.62
p-value	0.12%	0.00%	0.45%	16.33%

Similar with the results from the 36-month rolling window CAPM regression, the 24-month rolling window CAMP regression reveals a slightly stronger increase in ERP from -1.23% to -1.02% and a slightly stronger decrease in standard deviation from 2.53% to 2.25%. Congruent with the other regressions, the ERP of other emerging markets grew from -0.12% to 0.37% while the volatility declined from 1.89% to 1-34%. Table 6 presents the results of the 24-month rolling window CAPM regression.

Table 6: 24 Month Window Regression - Summary of Empirical Results

	Russia	EM Portfolio

Period	01/06 - 01/14	02/14 - 01/22	01/06 - 01/14	02/14 - 01/22
Observations	96	96	96	96
Mean	-1.23%	-1.02%	-0.12%	0.37%
Standard deviation	2.53%	2.25%	1.89%	1.34%
Skewness	-0.46	-1.44	0.22	-0.12
Kurtosis	1.20	9.90	0.12	1.57
Median	-0.64%	-0.85%	0.00%	0.24%
Minimum	-9.89%	-12.97%	-4.07%	-4.13%
Maximum	5.43%	7.20%	4.66%	4.55%
Jarque-Bera	16.43	223.74	34.06	8.38
p-value	0.03%	0.00%	0.00%	1.51%

In conclusion, varying the window size does not lead to results that differ significantly from those reported in Table 3, which underlines the robustness of the findings from the rolling window CAPM regression. The ERP of the emerging market portfolio remains consistently higher than that of the Russian portfolio, regardless of the period under consideration and the length of the rolling window. Since all results, with exception of the regression outcome for the emerging market portfolio reported in Table 5, are statistically significant, H1 remains rejected.

4.2. Impact Analysis of the 2014 Sanctions on the Equity Risk Premium in Russia

4.2.1. Data Sample

The second model, which aims to empirically assess the impact of economic sanctions on the ERP in the Russian Federation, relies on financial market data from the London Stock Exchange Group (LSEG) Data & Analytics platform. Specifically, it utilizes daily closing prices of the Russian Trading System Index (RTSI) for the entire calendar year of 2014. The RTSI is a free-float capitalization-weighted index that includes 50 publicly listed companies spanning across different Russian industries. However, reliance of on aggregate index data alone inevitably abstracts from heterogeneity across companies and sectors, where sanction effects may be most pronounced. The 2014 sanction measures specifically targeted Russia's largest financial institutions and energy companies. These firms were directly affected by Western sanctions of 2014 through restrictions on debt financing and technology transfers, whereas firms in less exposed sectors may have experienced negligible effects. Therefore, focusing the empirical analysis solely on the RTSI may dilute firm-specific sanction responses. To account for this issue, daily equity data for companies that were directly impacted

by these measures, were collected from Standard & Poor's Capital IQ. These companies are Sberbank, VTB Bank, Novatek, Gazprom, Gazprom Neft, Lukoil, Rosneft, Surgutneftegas, and Transneft. Following the methodological approach in the first model, the financial data used in the second model is denominated in US Dollar as well, thereby minimizing the impact of exchange rate fluctuations and domestic inflation. As a result, the data sample is only exposed to the US inflation and less noisy thus allowing for a more isolated analysis of the sanction events on the ERP.

For the market level input, daily RTSI closing prices are used to derive the historical daily returns. Formally,

$$R_{r,t} = \frac{P_{r,t}}{P_{r,t-1}} - 1$$

where $R_{r,t}$ denotes the daily return of the index at time t, $P_{r,t}$ the closing price of the index at the trading day t and $P_{r,t-1}$ the closing price of the index from the previous trading day *t-1*. The $ERP_{r,t}$ is the excess return of the RTSI over the 1-month US T-bill and can be formally described as

$$ERP_{r,t} = R_{r,t} - R_f = \left(\frac{P_{r,t}}{P_{r,t-1}} - 1\right) - R_f$$

For the firm level input, daily closing prices of the previously mentioned sanctioned companies are used to derive the historical daily returns. Formally,

$$R_{i,t} = \frac{P_{i,t}}{P_{i,t-1}} - 1$$

where $R_{i,t}$ denotes the daily return of the sanctioned firm at time t, $P_{i,t}$ the closing price of the sanctioned firm at the trading day t and $P_{i,t-1}$ the closing price of the sanctioned firm from the previous trading day *t-1*. The $ERP_{i,t}$ is the excess return of the company's stock return over the 1-month US T-bill and can be formally described as

$$ERP_{i,t} = R_{i,t} - R_f = \left(\frac{P_{i,t}}{P_{i,t-1}} - 1\right) - R_f$$

The market return is represented by the daily returns of the MSCI EMI. As a first step, the daily prices of said index over a full calendar year of 2014 were obtained from the MSCI database. Subsequently. these prices were used to derive the corresponding daily returns of the MSCI EMI. Formally,

$$R_{m,t} = \frac{P_{m,t}}{P_{m,t-1}} - 1$$

where $R_{m,t}$ denotes the daily return of the index at time *t*, $P_{m,t}$ the closing price of the index at the trading day *t* and $P_{m,t-1}$ the closing price of the index from the previous trading day *t-1*. The MRP is the excess return of the world index over the 1-month US T-bill and can be formally described as

$$MRP_t = R_{m,t} - R_f = \left(\frac{P_{m,t}}{P_{m,t-1}} - 1\right) - R_f$$

where $P_{m,t}$ and $P_{m,t-1}$ represent the closing prices of the MSCI EMI at the end of month *t* and *t−1*, respectively. $R_{m,t}$ denotes the market return at time *t* and R_f is the 1-month US T-bill rate.

The 1-month US T-bill, downloaded from the FRED database, is once again used as the proxy for the risk-free rate as the US T-bill has been widely regarded as the safest sovereign bond in the world for a long time given the extremely low risk of default. In contrast, the Russian Federation experienced sovereign debt defaults in both 1998 and 2022, which undermines its suitability as a reliable proxy for the risk-free rate. Accordingly, the U.S. T-bill provides a more stable and internationally accepted proxy for risk-free returns in this analysis.

4.2.2. Methodology

The event study methodology is a widely applied tool used to assess the impact of firm-specific or geopolitical events on the value of a company. Originally developed within the field of corporate finance research, this methodology has since been

adopted in different research areas due to its ability to isolate and quantify the effects of specific events (MacKinley, 1997). Therefore, the event study approach provides a robust analytical framework to evaluate the consequences of specific international political measures and will thus serve as the foundation for the second empirical model of this master thesis, which aims to examine the impact of the sanction packages from 16 July 2014, 30 July 2014 and 12 September 2014 on the ERP in Russia. More detailed information on the nature and scope of these three sanction events is provided in subchapter 2.1.

Consistent with the first empirical model, the event study methodology employed for this analysis is also based on the CAPM due to its central role in estimating the cost of capital withing various corporate finance transactions. While the CAPM based event study framework proposed by MacKinley (1997) is traditionally designed to assess the impact of specific events on a company's stock return, the following model requires small modifications to better fit the context of this thesis' research objective.

The methodology is applied at two levels. First, the RTSI is examined to capture the market-wide response to sanctions. Second, a complementary firm level event study is conducted for the set of companies that were directly targeted by the 2014 measures. This dual application makes it possible to compare whether sanctions were perceived primarily as systemic shocks affecting the entire Russian market or whether their effects were concentrated among the sanctioned entities themselves. The model is adapted to evaluate changes in the ex-post ERP of the in response to the sanction packages from 16 July 2014, 30 July 2014 and 12 September 2014. The adjusted empirical model is therefore defined as

$$ERP_t = ß_0 + ß_1 \times MRP_t + ß_2 \times Event_t + ß_3 \times Anticipation_3 + ß_4 \times Adjustment_4 + \varepsilon_t$$

where parameter $ß_0$ refers to the Jenson's alpha and the parameter $ß_1$ indicates the sensitivity of returns to overall market fluctuations reflecting systematic risk. For the market level model, the dependent variable is the $ERP_{r,t}$, whereas for the firm level model, it is the $ERP_{i,t}$. The coefficients $ß_2$, $ß_3$ and $ß_4$ capture the impact of the financial and energy sanctions imposed by the EU and the US, both on the event day itself and during the surrounding periods. Specifically, they reflect the impact during the anticipation period preceding the event and the adjustment period

following it. In line with the standard in the finance event literature (MacKinley, 1997), both the anticipation and adjustment periods are set at ten trading days before and after the event day, respectively. Lastly, $\varepsilon_{i,t}$ denotes the error term, accounting for the portion of returns that is not explained by the model for each portfolio at time *t*.

The calendar year 2014 provided available financial data for both the ERP and the MRP for a total of 249 trading days, spanning from 8 January 2014 to 30 December 2014. To assess the impact of the sanction packages introduced on 16 July 2014, 30 July 2014 and 12 September 2014 on the ERP, dummy variables of 0 and 1 were introduced. For each sanction event as well as the ten trading days preceding and following each event, dummy variables with a value of 1 were assigned. All other trading days in the sample were assigned a dummy variable with the value of 0. Based on this assignment, a regression was conducted across the entire observation period of 249 trading days for each of the three sanction packages.

4.2.3. Empirical Results

4.2.3.1. Market Level Event Study Regression

As previously outlined, the regression was carried out over the entire sample period for each of the three sanction events. For each dummy variables were used to mark the event date as well as the anticipation and adjustment periods with a value of 1, while all other trading days were assigned a value of 0. Table 7 reports the results of the market level event study regression.

Table 7: Summary of Empirical Results

Sanctioning Body			Outcome of Sanctions		
EU	US		-10d	16.07.2014	+10d
		r ERP	-0.23%	-0.19%	-1.04%
	X	t-stat	-0.41	-0.11	-1.85
		p-value	68.12%	90.99%	6.64%
Sanctioning Body			**Outcome of Sanctions**		
EU	**US**		**-10d**	**30.07.2014**	**+10d**
		r ERP	-1.21%	1.64%	0.23%
X		t-stat	-2.14	0.95	0.40
		p-value	3.45%	34.22%	69.10%

Sanctioning Body			Outcome of Sanctions		
EU	US		-10d	12.09.2014	+10d
		r ERP	0.35%	0.88%	0.18%
X	X	t-stat	0.72	0.59	0.37
		p-value	46.98%	55.81%	71.13%

The results of the market level event study regression indicate an overall minimal impact of the energy and financial sanctions imposed by the EU and the US on the ERP in the Russian Federation. The first economic sanction package, which was introduced by the US on 16 July 2014, led to a marginal decline of 0.19% in the ERP. However, this impact is statistically insignificant, as reflected by a t-stat of -0.11 and a p-value of 90.99%. Following the EU's introduction of its first economic sanction package against Russia, the ERP increased by 1.64% marking the overall biggest increase in this empirical analysis. Nevertheless, with a t-stat of 0.95 and a p-value of 34.22%, this result also lacks statistical significance. Lastly, the reinforcement of economic measures by both the EU and the US on 12 September 2014 coincide with a modest increase of 0.88% in the ERP. As with previous cases though, the result is statistically insignificant, as indicated by a t-stat of 0.59 and a p-value of 55.81%.

Although the ERP increased slightly following the sanction packages introduced on 30 July 2014 and 12 September 2014, the overall positive impact during the event day as well as in the surrounding anticipation and adjustment periods remains minimal. In some cases, the effect on the ERP is even slightly negative. Furthermore, it should be noted that all results reported in Table 7 are statistically insignificant, with both the t-stat and the p-value falling well outside commonly accepted confidence levels. Therefore, H2a is rejected: The economic sanctions imposed by the EU and the US led to a significant increase in ERP of publicly listed Russian companies that are part of the RTSI.

4.2.3.2. Firm Level Event Study Regression

Congruent with the market level event study regression, the firm level regression was carried out over the entire sample period for each of the three sanction events. In each specification, dummy variables were included to identify the sanction windows. One dummy highlights the event day, another captures the anticipation period and a third reflects the adjustment period. These variables take the value of 1 for the relevant days and 0 for all other trading days. The estimated coefficients

indicate the additional change in the ex-post ERP of the sanctioned firms that can be linked to each stage of the sanction event. Table 8 reports the results of the market level event study regression.

Table 8: Summary of Empirical Results

Sanctioning Body			Outcome of Sanctions		
EU	US	Target	-10d	16.07.2014	+10d
		Sberbank	0.43%	-0.21%	-1.04%
		VTB Bank	0.18%	-0.69%	-0.62%
	X	Novatek	-0.07%	-1.27%	-0.99%
		Gazprom	0.14%	-3.72%	-0.68%
		Gazprom Neft	-0.21%	-1.30%	-0.67%
		Lukoil	0.04%	0.83%	-0.29%
	X	Rosneft	0.02%	0.25%	-0.82%
		Surgutneftegas	0.11%	-0.94%	-0.44%
		Transneft	-0.01%	0.11%	-0.51%

Sanctioning Body			Outcome of Sanctions		
EU	US	Target	-10d	30.07.2014	+10d
X		Sberbank	-1.20%	1.64%	0.90%
X		VTB Bank	-0.60%	-0.89%	0.09%
X		Novatek	-1.40%	3.20%	0.64%
X		Gazprom	-1.27%	2.22%	2.23%
X		Gazprom Neft	-0.87%	1.21%	0.86%
X		Lukoil	-0.41%	2.06%	0.15%
X		Rosneft	-1.00%	2.33%	0.51%
X		Surgutneftegas	-0.55%	0.54%	0.88%
X		Transneft	-0.44%	-0.27%	0.71%

Sanctioning Body			Outcome of Sanctions		
EU	US	Target	-10d	12.09.2014	+10d
X	X	Sberbank	0.62%	1.01%	0.54%
X	X	VTB Bank	0.31%	-0.45%	0.03%
X		Novatek	0.56%	2.12%	0.29%
X	X	Gazprom	0.33%	0.78%	0.09%
X	X	Gazprom Neft	0.18%	1.74%	-0.34%
X	X	Lukoil	0.34%	0.53%	-0.46%
X		Rosneft	0.22%	1.42%	0.13%
X	X	Surgutneftegas	0.43%	0.07%	0.15%
X	X	Transneft	0.14%	1.28%	0.36%

The firm level event study regression results suggest only limited adjustments in the ERP following the introduction of the sanction packages. Consistent with the market level evidence, the sanctions imposed on 30 July 2014 generated the most

pronounced upward shift in the ERP, followed by those introduced on 12 September 2014. In contrast, the sanctions of 16 July 2014 were associated with an overall modest decline in the ERP. These patterns are broadly consistent with the findings from the RTSI analysis. Nevertheless, it is important to emphasize that none of the estimated coefficients achieve statistical significance, thereby limiting the strength of the causal inferences that can be drawn from these results.

Although the ERP shows a modest increase following the sanction packages of 30 July 2014 and 12 September 2014, the overall effects during the event days and across the surrounding anticipation and adjustment periods remain minimal. The sanctions introduced on 16 July 2014 are even associated with a slight decline in the ERP. Furthermore, all the coefficients reported in Table 8 are statistically insignificant as both the t statistics and the p values lie well outside commonly accepted confidence thresholds. Therefore, H2b is rejected: The economic sanctions imposed by the EU and the US led to a significant increase in ERP of Russian companies that are affected by these measures.

4.2.4. Robustness

4.2.4.1. Market Level Event Study Regression

While the length of the anticipation and adjustment periods is generally a free choice of the researcher, the chosen event window can have a material impact on the empirical outcome of an event study model. A window that is too narrow around the event day may not fully capture the market's reaction to a specific event. Conversely, a window that is too long increases the risk of including other non-event related factors, thereby diluting the measured impact on the event itself (Kida 2021). In the event study model of this master thesis, both the anticipation period and adjustment period were set at ten days. To assess the robustness of results reported in Table 6, these periods were systematically varied between one day and 20 days to examine weather changes in window size materially affected the estimated event day coefficients of 16 July 2014, 30 July 2014 and 12 September 2014.

For the sanction package introduced by the US on 16 July 2014, the robustness check reveals only marginal changes in the estimated coefficients for the sanction event, regardless of the number of days in the anticipation and adjustment periods. In all cases, the estimated change in ERP on the day of the sanction introduction is negative and statistically insignificant. Across the different variations, the smallest

estimated coefficient is -0.23% while the largest coefficient is -0.13%. Table 9 reports the results of the sensitivity analysis for the sanctions of 16 July 2014.

Table 9: Sensitivity Analysis for Sanctions of 16 July 2014

Window	Event	t-stat	p-value
[-1d, +1d]	-0.13%	-0.08	93.90%
[-2d, +2d]	-0.16%	-0.09	92.48%
[-3d, +3d]	-0.18%	-0.10	91.73%
[-4d, +4d]	-0.18%	-0.11	91.44%
[-5d, +5d]	-0.17%	-0.10	92.02%
[-6d, +6d]	-0.17%	-0.10	92.00%
[-7d, +7d]	-0.17%	-0.10	92.18%
[-8d, +8d]	-0.21%	-0.12	90.19%
[-9d, +9d]	-0.21%	-0.13	90.04%
[-10d, +10d]	-0.19%	-0.11	90.99%
[-11d, +11d]	-0.20%	-0.11	90.88%
[-12d, +12d]	-0.21%	-0.12	90.24%
[-13d, +13d]	-0.21%	-0.12	90.38%
[-14d, +14d]	-0.22%	-0.13	89.94%
[-15d, +15d]	-0.23%	-0.14	89.25%
[-16d, +16d]	-0.21%	-0.12	90.49%
[-17d, +17d]	-0.20%	-0.11	90.93%
[-18d, +18d]	-0.20%	-0.11	90.96%
[-19d, +19d]	-0.20%	-0.11	90.89%
[-20d, +20d]	-0.18%	-0.11	91.48%

Similarly, for the sanction package introduced by the EU on 30 July 2014, the robustness test reveals also only minor deviations in the estimated coefficients, irrespective of length of windows around the sanction event. In all cases, the estimated change in ERP on the day of the sanction introduction is positive and statistically insignificant. Overall, the smallest estimated coefficient is 1.61% while the largest coefficient is 1.73%. Table 10 reports the results of the sensitivity analysis for the sanctions of 30 July 2014.

Table 10: Sensitivity Analysis for Sanctions of 30 July 2014

Window	Event	t-stat	p-value
[-1d, +1d]	1,73%	0,99	32,37%
[-2d, +2d]	1,71%	0,98	32,66%
[-3d, +3d]	1,68%	0,97	33,46%
[-4d, +4d]	1,67%	0,96	33,76%
[-5d, +5d]	1,66%	0,95	34,20%

[-6d, +6d]	1,68%	0,96	33,88%
[-7d, +7d]	1,68%	0,97	33,61%
[-8d, +8d]	1,67%	0,96	33,73%
[-9d, +9d]	1,64%	0,95	34,38%
[-10d, +10d]	1,64%	0,95	34,22%
[-11d, +11d]	1,64%	0,95	34,17%
[-12d, +12d]	1,62%	0,95	34,41%
[-13d, +13d]	1,63%	0,95	34,52%
[-14d, +14d]	1,61%	0,94	34,77%
[-15d, +15d]	1,62%	0,94	34,74%
[-16d, +16d]	1,62%	0,94	34,72%
[-17d, +17d]	1,64%	0,95	34,49%
[-18d, +18d]	1,62%	0,94	34,89%
[-19d, +19d]	1,62%	0,94	34,95%
[-20d, +20d]	1,63%	0,94	34,60%

Congruent with the first two sensitivity analysis, the robustness check for the sanction event of 12 September 2014 shows only minimal changes in the estimated coefficients. For each period length of the event window, the change in ERP on the day of the sanction introduction is always slightly positive and statistically insignificant. The smallest estimated coefficient is 0.79% whereas the highest is 0.93%. Table 11 reports the results of the sensitivity analysis for the sanctions of 12 September 2014.

Table 11: Sensitivity Analysis for Sanctions of 12 September 2014

Window	Event	t-stat	p-value
[-1d, +1d]	0,79%	0,53	59,75%
[-2d, +2d]	0,83%	0,55	58,16%
[-3d, +3d]	0,83%	0,56	57,67%
[-4d, +4d]	0,82%	0,55	58,43%
[-5d, +5d]	0,84%	0,56	57,35%
[-6d, +6d]	0,84%	0,56	57,35%
[-7d, +7d]	0,91%	0,62	53,96%
[-8d, +8d]	0,91%	0,64	52,34%
[-9d, +9d]	0,93%	0,63	53,10%
[-10d, +10d]	0,88%	0,59	55,81%
[-11d, +11d]	0,85%	0,57	57,16%
[-12d, +12d]	0,84%	0,56	57,60%
[-13d, +13d]	0,83%	0,55	58,10%
[-14d, +14d]	0,83%	0,56	57,91%
[-15d, +15d]	0,82%	0,55	58,59%
[-16d, +16d]	0,84%	0,56	57,54%
[-17d, +17d]	0,85%	0,57	57,28%
[-18d, +18d]	0,84%	0,56	57,48%
[-19d, +19d]	0,85%	0,57	57,16%
[-20d, +20d]	0,85%	0,57	57,26%

In conclusion, the sensitivity tests for all three sanction events yield stable results underlying the robustness of the results from the second empirical model for all three sanction events. However, as all the results from the robustness tests are statistically insignificant, with t-stat and p-value falling each time outside commonly accepted significance level, H2a remains rejected.

4.2.4.2. Firm Level Event Study Regression

In line with the market level event study regression, the robustness of the firm level analysis was tested by varying the length of the anticipation and adjustment windows. The baseline specification employed ten-day periods, but alternative window lengths from one to twenty days were used to examine whether changes in window size materially affected the estimated event-day coefficients for 16 July 2014, 30 July 2014. and 12 September 2014.

For the sanction package introduced by the US on 16 July 2014, the robustness check shows that the direction of the estimated coefficients remains consistent with the baseline firm level regression. The ERP of Lukoil, Rosneft and Transneft exhibited positive coefficients on the event day irrespective of the length of the anticipation and adjustment windows. The remaining companies, which represented most of the sanctioned firms, displayed negative effects on their ERP. Congruent with the baseline results, all estimated coefficients across firms and window variations were statistically insignificant. Table 12 reports the results of the sensitivity analysis for the sanctions of 16 July 2014.

For the sanction package introduced by the EU and the US on 30 July 2014, the robustness check shows that the direction of the estimated coefficients remains consistent with the baseline firm level regression. All targeted companies except VTB Bank and Transneft exhibited an increase in ERP on the event day irrespective of the length of the anticipation and adjustment windows. The results remain statistically insignificant across firms and window variations. Table 13 reports the results of the sensitivity analysis for the sanctions of 30 July 2014.

For the sanction package introduced by the EU and the US on 12 September 2014, the robustness check indicates that the direction of the estimated coefficients is consistent with the baseline firm level regression. All targeted companies except VTB Bank recorded an increase in ERP on the event day regardless of the length of

the anticipation and adjustment windows. The results remain statistically insignificant across firms and window variations. Table 14 reports the results of the sensitivity analysis for the sanctions of 12 September 2014.

In conclusion, the sensitivity analyses for all three sanction events confirm the stability of the findings, supporting the robustness of the firm-level event study regression model. Since all robustness test results are statistically insignificant, with both t-statistics and p-values falling outside commonly accepted significance levels, H2b remains rejected.

Table 12: Sensitivity Analysis for Sanctions of 16 July 2014

	Outcome of Sanctions on Event Date								
Window	**Sberbank**	**VTB Bank**	**Novatek**	**Gazprom**	**Gazprom Neft**	**Lukoil**	**Rosneft**	**Surgutneftgas**	**Transneft**
[-1d, +1d]	-0.19%	-0.67%	-1.22%	-3.70%	-1.27%	0.85%	0.29%	-0.92%	0.13%
[-2d, +2d]	-0.22%	-0.70%	-1.26%	-3.72%	-1.29%	0.81%	0.25%	-0.96%	0.12%
[-3d, +3d]	-0.23%	-0.70%	-1.26%	-3.73%	-1.29%	0.80%	0.25%	-0.96%	0.12%
[-4d, +4d]	-0.22%	-0.70%	-1.28%	-3.73%	-1.30%	0.81%	0.24%	-0.96%	0.11%
[-5d, +5d]	-0.23%	-0.71%	-1.28%	-3.73%	-1.31%	0.81%	0.23%	-0.95%	0.11%
[-6d, +6d]	-0.22%	-0.71%	-1.29%	-3.72%	-1.30%	0.82%	0.24%	-0.95%	0.11%
[-7d, +7d]	-0.22%	-0.68%	-1.28%	-3.72%	-1.29%	0.83%	0.24%	-0.94%	0.11%
[-8d, +8d]	-0.23%	-0.70%	-1.29%	-3.73%	-1.30%	0.81%	0.23%	-0.95%	0.11%
[-9d, +9d]	-0.23%	-0.70%	-1.29%	-3.74%	-1.31%	0.82%	0.23%	-0.95%	0.10%
[-10d, +10d]	-0.21%	-0.69%	-1.27%	-3.72%	-1.30%	0.83%	0.25%	-0.94%	0.11%
[-11d, +11d]	-0.20%	-0.69%	-1.27%	-3.72%	-1.30%	0.84%	0.26%	-0.93%	0.12%
[-12d, +12d]	-0.21%	-0.70%	-1.27%	-3.72%	-1.29%	0.84%	0.25%	-0.93%	0.12%
[-13d, +13d]	-0.21%	-0.70%	-1.27%	-3.72%	-1.30%	0.83%	0.25%	-0.91%	0.11%
[-14d, +14d]	-0.20%	-0.70%	-1.28%	-3.73%	-1.30%	0.83%	0.26%	-0.92%	0.11%
[-15d, +15d]	-0.22%	-0.73%	-1.29%	-3.74%	-1.31%	0.81%	0.24%	-0.94%	0.09%
[-16d, +16d]	-0.19%	-0.73%	-1.26%	-3.70%	-1.30%	0.83%	0.27%	-0.92%	0.12%
[-17d, +17d]	-0.18%	-0.73%	-1.25%	-3.70%	-1.29%	0.83%	0.27%	-0.91%	0.13%
[-18d, +18d]	-0.17%	-0.73%	-1.25%	-3.70%	-1.29%	0.83%	0.27%	-0.91%	0.12%
[-19d, +19d]	-0.17%	-0.75%	-1.25%	-3.70%	-1.29%	0.82%	0.27%	-0.93%	0.12%
[-20d, +20d]	-0.16%	-0.75%	-1.24%	-3.69%	-1.28%	0.83%	0.28%	-0.91%	0.14%

Table 13: Sensitivity Analysis for Sanctions of 30 July 2014

	Outcome of Sanctions on Event Date								
Window	Sberbank	VTB Bank	Novatek	Gazprom	Gazprom Neft	Lukoil	Rosneft	Surgutneftgas	Transneft
[-1d, +1d]	1.68%	-0.84%	3.27%	2.28%	1.22%	2.10%	2.37%	0.55%	-0.28%
[-2d, +2d]	1.65%	-0.85%	3.25%	2.27%	1.21%	2.09%	2.36%	0.56%	-0.28%
[-3d, +3d]	1.64%	-0.83%	3.25%	2.25%	1.20%	2.07%	2.35%	0.58%	-0.30%
[-4d, +4d]	1.64%	-0.84%	3.22%	2.24%	1.20%	2.07%	2.36%	0.56%	-0.30%
[-5d, +5d]	1.62%	-0.87%	3.22%	2.23%	1.19%	2.07%	2.35%	0.55%	-0.29%
[-6d, +6d]	1.63%	-0.88%	3.24%	2.25%	1.19%	2.08%	2.36%	0.56%	-0.28%
[-7d, +7d]	1.63%	-0.89%	3.23%	2.24%	1.19%	2.07%	2.35%	0.56%	-0.26%
[-8d, +8d]	1.65%	-0.87%	3.23%	2.24%	1.20%	2.07%	2.34%	0.55%	-0.27%
[-9d, +9d]	1.63%	-0.89%	3.21%	2.23%	1.21%	2.06%	2.32%	0.54%	-0.28%
[-10d, +10d]	1.64%	-0.89%	3.20%	2.22%	1.21%	2.06%	2.33%	0.54%	-0.27%
[-11d, +11d]	1.64%	-0.89%	3.22%	2.22%	1.20%	2.07%	2.33%	0.54%	-0.26%
[-12d, +12d]	1.63%	-0.90%	3.22%	2.22%	1.20%	2.05%	2.32%	0.53%	-0.26%
[-13d, +13d]	1.62%	-0.90%	3.21%	2.22%	1.20%	2.05%	2.32%	0.52%	-0.26%
[-14d, +14d]	1.62%	-0.91%	3.20%	2.22%	1.19%	2.06%	2.32%	0.53%	-0.27%
[-15d, +15d]	1.63%	-0.91%	3.20%	2.22%	1.19%	2.06%	2.33%	0.54%	-0.28%
[-16d, +16d]	1.65%	-0.90%	3.21%	2.23%	1.20%	2.07%	2.34%	0.55%	-0.26%
[-17d, +17d]	1.67%	-0.88%	3.21%	2.24%	1.22%	2.09%	2.33%	0.56%	-0.26%
[-18d, +18d]	1.66%	-0.89%	3.21%	2.23%	1.21%	2.08%	2.32%	0.54%	-0.26%
[-19d, +19d]	1.65%	-0.89%	3.19%	2.22%	1.20%	2.07%	2.32%	0.53%	-0.27%
[-20d, +20d]	1.66%	-0.89%	3.19%	2.23%	1.21%	2.08%	2.34%	0.55%	-0.27%

Table 14: Sensitivity Analysis for Sanctions of 12 September 2014

	Outcome of Sanctions on Event Date								
Window	Sberbank	VTB Bank	Novatek	Gazprom	Gazprom Neft	Lukoil	Rosneft	Surgutneftgas	Transneft
[-1d, +1d]	0.94%	-0.48%	2.07%	0.74%	1.73%	0.53%	1.39%	0.04%	1.25%
[-2d, +2d]	0.94%	-0.48%	2.07%	0.74%	1.73%	0.53%	1.40%	0.04%	1.25%
[-3d, +3d]	0.96%	-0.48%	2.06%	0.74%	1.74%	0.53%	1.40%	0.06%	1.24%
[-4d, +4d]	0.95%	-0.49%	2.06%	0.75%	1.73%	0.53%	1.40%	0.05%	1.23%
[-5d, +5d]	0.95%	-0.48%	2.07%	0.75%	1.72%	0.52%	1.40%	0.05%	1.25%
[-6d, +6d]	0.96%	-0.47%	2.07%	0.75%	1.73%	0.52%	1.40%	0.06%	1.25%
[-7d, +7d]	1.02%	-0.43%	2.12%	0.78%	1.75%	0.55%	1.43%	0.09%	1.27%
[-8d, +8d]	1.03%	-0.43%	2.13%	0.79%	1.76%	0.56%	1.43%	0.10%	1.29%
[-9d, +9d]	1.04%	-0.43%	2.15%	0.80%	1.76%	0.55%	1.44%	0.10%	1.30%
[-10d, +10d]	1.01%	-0.45%	2.12%	0.78%	1.74%	0.53%	1.42%	0.07%	1.28%
[-11d, +11d]	0.99%	-0.48%	2.10%	0.76%	1.72%	0.51%	1.41%	0.05%	1.26%
[-12d, +12d]	0.99%	-0.50%	2.11%	0.77%	1.74%	0.52%	1.42%	0.05%	1.26%
[-13d, +13d]	0.99%	-0.50%	2.10%	0.78%	1.74%	0.51%	1.42%	0.05%	1.25%
[-14d, +14d]	0.99%	-0.49%	2.10%	0.77%	1.75%	0.51%	1.42%	0.04%	1.24%
[-15d, +15d]	0.99%	-0.49%	2.09%	0.77%	1.75%	0.51%	1.42%	0.05%	1.24%
[-16d, +16d]	1.02%	-0.47%	2.11%	0.78%	1.76%	0.53%	1.43%	0.06%	1.26%
[-17d, +17d]	1.04%	-0.47%	2.12%	0.79%	1.78%	0.53%	1.45%	0.08%	1.26%
[-18d, +18d]	1.01%	-0.49%	2.10%	0.77%	1.78%	0.52%	1.44%	0.07%	1.25%
[-19d, +19d]	1.03%	-0.48%	2.12%	0.80%	1.78%	0.53%	1.45%	0.08%	1.27%
[-20d, +20d]	1.06%	-0.47%	2.13%	0.81%	1.79%	0.53%	1.44%	0.08%	1.27%

5. Discussion and Conclusion

5.1. Key Findings and Implications of Empirical Results

The main objective of this master thesis was to empirically examine whether the introduction of economic sanctions against the Russian Federation in 2014 had a material impact on the ERP of the country's biggest publicly listed companies. Drawing on a rolling window CAPM regression and an event study on the three major sanction events from 2014, the study produced two key results. First, the first empirical model showed that the ERP in Russia slightly decreased after the annexation of Crimea, while the ERP in other emerging markets increased of the same period. These developments indicates that Russia did not exhibit the expected elevation in equity risk premium that would normally accompany heightened geopolitical risk. Second, the event study of the sanction packages introduced on 16 July 2014, 30 July 2014 and 12 September 2014 revealed that these measures had no statistically significant impact on the ERP of the RTSI nor on that of directly targeted companies. Summing up the results of these two empirical models, these findings suggest that international investors did not perceive the sanctions of 2014 as a major risk factor for the Russian equity markets. Instead, Russia remained relatively stable compared to other emerging markets, where the ERP increased during the same period, reflecting a slight divergence in the risk assessment of Russia from that of its peers. This outcome directly contradicts the initial hypothesis that sanctions would lead to a significant increase in ERP and that Russia would be perceived riskier relative to other emerging markets.

5.2. Limitation of Empirical Framework

One significant limitation of the empirical models employed in this thesis is the specific timeframe under study. Both models focus only on the impact of the illegal annexation of Crimea in 2014 and the subsequently introduced sanction measures on the ERP in Russia. As discussed in Chapter 2 of this master thesis, the sanctions introduced in 2014 were relatively limited and applied to only 20 entities and around 100 individuals. In contrast, the sanctions imposed after Russia's full-scale invasion in 2022 were far broader in scope and targeted more than 2,400 individuals and entities deemed responsible for undermining Ukraine's sovereignty. Due to the substantial difference in the scale and severity of these two sanction events, it is

reasonable to assume that an exclusive focus on the post-2022 sanctions might lead to very different results. Unfortunately, data availability for the later period presented a serious challenge. Following the invasion in February 2022, the Moscow Exchange suspended trading on all markets for nearly a month, which made it impossible to obtain any financial data for this period. During this month, the EU, the US and other Western allies introduced their first major sanction packages. After a month, trading resumed in a very limited amount and with strict restrictions. Among others, foreign investors were barred from selling, short selling was prohibited, trading hours were reduced, and only selected instruments were made available. These extraordinary conditions create a highly unstable environment that makes it extremely difficult to obtain meaningful empirical results from that period.

5.3. Conclusion

In conclusion, the empirical results of this master thesis reveal that the energy and financial sanctions imposed by the EU and the US against the Russian Federation in 2014 had no significant impact on the ERP of the targeted country. In fact, the ERP even declined following the annexation of Crimea and the escalating armed conflict in Eastern Ukraine in the same year thus showing a contrasting development to other emerging markets, where the ERP increased over the same period. This finding suggests that investors did not perceive the sanctions of 2014 as a systemic threat to long-term equity risk and that targeted measures were insufficient to alter financing costs through higher ERP.

Despite the limitations of the empirical models, this master thesis provides valuable results that can contribute both to the existing literature on the effectiveness of sanctions and to the broader understanding of ERP in emerging markets. Furthermore, it is hoped that the link between economic sanctions and ERP will be further researched in the future, particularly with respect to the more severe sanctions against the Russian Federation, which were introduced in response to the attack on Ukraine in the beginning of 2022.

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