



**IMPACT OF WITHDRAWAL FROM RUSSIA ON EUROPEAN COMPANIES'
PERFORMANCE DURING RUSSIA-UKRAINE WAR**

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Examiner: University Lecturer Roman Stepanov

ABSTRACT

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Impact of withdrawal from Russia on European companies' performance during Russia-Ukraine war

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The complex and intense conflict between Russia and Ukraine can be said to begun in 2014 when Russia invaded the Crimean Peninsula, but when Russia's invasion of Ukraine begun on 24 February 2022, the situation escalated and forced many Western authorities to react immediately. The situation caused many Western companies to abolish their operations in Russia, while some refused to withdraw and continued their operations in Russia as before. Focusing on public European companies, this study examines the impacts of withdrawal from Russia on European companies' performance during the Russia-Ukraine war.

The involved companies are separated into four portfolios based on the timing of their withdrawal decision, and the performance of the constructed portfolios during three different events is examined by event study methodology and three different financial ratios. The performance of the portfolios is examined by analysing stock market reactions over three event windows, which cover six trading days before and after the events of interest.

The empirical results of the study indicate that an announcement of withdrawal from Russia has a positive impact on the companies' performance, but the impacts are not relatively significant in a long run. The results support the findings of previous research and provide evidence for the hypothesis that companies that have announced withdrawal from Russia receive less volatile stock market reactions to news about the Russia-Ukraine war.

TIIVISTELMÄ

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Kauppätieteet

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Venäjältä vetäytymisen vaikutukset eurooppalaisten yritysten suoriutumiseen Venäjän-Ukrainan sodan aikana

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Ukrainan ja Venäjän välisen monimutkaisen ja jännitteisen konfliktin voidaan sanoa alkaneen vuonna 2014, kun Venäjä miehitti Krimin niemimaan, mutta Venäjän hyökätessä Ukrainaan 24. Helmikuuta 2022, tilanne eskaloitui ja pakotti monet länsimaiset tahot reagoimaan välittömästi. Tilanteen seurauksena monet länsimaiset yritykset lopettivat toimintansa Venäjällä, samalla kun osa yrityksistä kieltäytyi vetäytymästä ja jatkoi toimintaa Venäjällä kuten tähänkin asti. Tässä tutkimuksessa keskitytään julkisiin eurooppalaisiin yrityksiin, ja tarkastellaan Venäjältä vetäytymisen vaikutuksia eurooppalaisten yritysten suoriutumiseen Venäjän-Ukrainan sodan aikana.

Tutkimukseen valitut yritykset jaetaan neljään salkkuun niiden vetäytymispäätöksen julkistamisen ajankohdan perusteella, ja muodostettujen salkkujen suoriutumista tarkastellaan kolmen eri tapahtuman aikana tapahtumatutkimusmenetelmin ja kolmen taloudellisen tunnusluvun avulla. Salkkujen suorituskykyä tarkastellaan analysoimalla osakemarkkinoiden reaktioita kolmen tapahtumaikkunan aikana, jotka kattavat valittujen tapahtumapäivien lisäksi kuusi kaupankäyntipäivää tapahtumapäiviä ennen ja niiden jälkeen.

Tutkimuksen tulokset osoittavat vetäytymispäätösten vaikuttavan positiivisesti yritysten suoriutumiseen, mutta vaikutukset eivät ole suhteellisesti merkittäviä pitkällä aikavälillä. Tulokset puoltavat aikaisempien tutkimusten tuloksia ja antavat näyttöä hypoteesille, jonka mukaan Venäjän-Ukrainan sotaan liittyvien uutisten aiheuttamat osakemarkkinoiden reaktiot ovat vähemmän voimakkaita koskien yrityksiä, jotka ovat ilmoittaneet vetäytyvänsä Venäjältä.

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1 Introduction

On 24 February 2022, to the utmost tightened conflict between Russia and Ukraine escalated as Russia begun widescale invasion of Ukraine. Since that day, in western media the situation has been reported unequivocally as a war rather than a conflict. The war has had tremendous effects on world economy, and it has caused some western businesses to distance themselves from Russia in various ways. Russia is a state with substantial oil and raw material resources and a large market in terms of the number of consumers, but many companies have decided to withdraw from Russia regardless of the negative impacts the withdrawal may cause (The New York Times 2022). The countries in the European Union, the United States, and the United Kingdom have implemented several sanction packages against Russia, which aim to frustrate Russian economy in a way that would force Russia to withdraw troops and end the invasion. Due to the sanctions and the war, the current global energy crisis became worse, and no rapid facilitation seems to appear in the near future since fossil fuels still have a key role in energy production.

1.1 Background

As the war has caused many Western companies to re-evaluate who they cooperate with, it can be said that at least from the perspective of Western investors, Russian companies are not considered as sustainable option in terms of societal or moral factors as before. Although the conflict between Russia and Ukraine began in 2014, trade volumes between the Western world and Russia indicate that Russian companies were not seen as unreliable before the February's invasion. Since in Western countries it is no longer as socially acceptable to operate with Russia and Russian companies as before (Tosun, Eshraghi 2022), presumably investors react to companies' decisions to continue or abolish operations in Russia. However, the reactions of the Western and the Russian investors may presumably vary significantly since the conflict is considered differently in Russia and in the West. This thesis is based on the prices of European stock markets, and thus the focus is on the reactions of the West, although the identity of the investors cannot be precisely stated based on the market

reactions. The purpose of this thesis is to examine how European companies' decisions to continue or abolish their operations in Russia impact their performance in the stock market. By studying three specific event windows during the war this study also provides information on how important the timing of the withdrawal has been for the companies' performance and reputation. The hypothesis of this study is that companies who withdraw from Russia have less volatile stock market reaction to bad news from the war. Therefore, the study is about market efficiency as the goal is to clarify, how rapidly and consistently the market reacts to news about the war. As this thesis examines how specific events cause market reactions, the study is based on event study methodology. Simplified, event studies can be separated into two categories based on the nature of the event of interest from a company's perspective; studies that focus on internal events and studies that focus on external events. The study in this thesis focuses on external events as the war is not initiated by the included companies, and thus the referenced literature and previous research also focuses on external events.

The existing research supports the hypothesis that geopolitical shocks like the war between Russia and Ukraine do cause reactions in the stock markets. Balcilar et. al. (2018) studied what kind of reactions can be seen in stock markets of the BRICS countries due to geopolitical uncertainty. One of their findings was that especially in Russia and China, the stock markets react sensitively to news about geopolitical tensions regardless of the nature of the shock (Balcilar et al. 2018). Although Europe has been relatively more stable from geopolitical perspective compared to Russia before the Russia-Ukraine war, rapid reactions can also be expected in European stock markets as the war's effects are not limited only to Russia and Ukraine. As stock prices represent investors' beliefs in the companies' upcoming profits, conflicts that impact macroeconomic trends assumably cause reactions in the stock market.

The Russian invasion of Ukraine on 24 February 2022 caused reactions in the stock markets globally. A study done shortly after the invasion by Bounou & Yatié (2022) investigated world stock market returns over the period of 22 January to 24 March 2022. The main finding was that the invasion caused significantly negative impact on the world stock market indices performance (Bounou, Yatié 2022). This supports the assumption that the war causes financial impacts on a global scale, and as the study also found, the effects are heterogeneous since the impacts were significantly stronger in countries that condemned the invasion

(Boungou, Yatié 2022). The heterogeneity of the impacts is one of the reasons why the study in this thesis focuses on the impact on European companies. Examining the local effects of the conflict provides deeper information on the impacts, which could be helpful when preparing and reacting to similar events in the future. From an investor's perspective, understanding the local effects is also helpful for designing effective investing strategies.

Environmental, social, and corporate governance (ESG) investing has gained a lot of attention as an investing strategy in the recent years. This strategy values companies by different sustainability factors, and one of the factors is the social sustainability perspective. Social sustainability or responsibility as a topic is strongly present in this study, since after the invasion operating with or in Russia can be seen as supporting violation of human rights for instance. However, ESG ratings provide an estimation of the companies' operations social responsibility, and recent research on the topic has found that some of these estimations turned out to be unsuccessful after the invasion. An event study done by Kick and Rottmann (2022) focuses on providing new evidence about a hedge effect of high ESG rated companies in times of crisis by examining their performance during the Russia-Ukraine war. The main finding was that relying on ESG scores when seeking protection from any unexpected events is not advisable strategy for investors (Kick, Rottmann 2022). This contributes to the demand of research in this thesis, as there is a need for other ways to measure corporate social responsibility besides ESG ratings. One of the goals of this study is to find out if investing only into companies that decided to withdraw from Russia appeared to be successful strategy during the covered period. If the aforementioned strategy receives support in this study, one could argue that a company's indirect involvement in political conflict is more relevant factor compared to ESG rating in the times of crisis when seeking for protection or profits.

1.2 Research questions and goals

The existing literature on the topic indicates a gap in the research and demand for the study of this thesis. Apart from the beginning of the invasion, the effects of the withdrawal decisions during the Russia-Ukraine war have not been studied precisely on a longer period. Existing research on the topic does not yet thoroughly cover events beyond the beginning of the invasion, so this thesis aims to provide more evidence about the effects of the later events

of the war. Some previous research focuses on the war's effects globally, but this thesis aims to assess the impact within European market. The goal of this study is to explore whether investors in European stock markets prefer companies that have withdrawn from Russia, and how crucial the timing of the withdrawal decision is to the market reaction. The study is based on European market as it is the closest to the war and therefore presumably the most vulnerable market to be impacted by the war. The three events to be studied can be seen as somewhat breakpoints of the war so they are important from investors perspective and hypothetically they all cause a reaction in efficient market. The first event window is scheduled around the February 24, 2022, when Russia attacked Ukraine from several locations. The second window is dated around the beginning of April 2022, since during that time Ukraine had successfully defended Kiev which resulted in Russian troops withdrawal from northern Ukraine. Promptly after that, the events that took place in Bucha under Russian control were investigated and later reported in Western media as "Bucha Massacre". In addition, on April 8, the European Union announced its fifth sanctions package against Russia (European Commission 2022) which may have encouraged some companies to withdraw from Russia or cause the companies to accelerate their decision-making. The third window is based on the events around September 21, 2022, when President Putin declared a partial mobilization (Sauer 2022) intending to change the direction of the war.

Based on the abovementioned points, the main research question is:

1. *Do European companies' decisions to continue or abolish operations in Russia affect their performance in the stock market?*

This thesis also aims to answer three sub-questions stated as follows:

2. *Is the timing of the withdrawal decision important in terms of the stock market reaction?*
3. *Do the market reactions differ by the events?*
4. *Do Western investors punish, or reward companies based on the companies' withdrawal decisions?*

1.3 Structure

The remainder of this thesis will be divided into four chapters. The first chapter following the introduction is going to describe the theoretical background of this study, which includes a timeline of pivotal events of the Russia-Ukraine war, and literature review. The literature review provides an insight to previous research on the topic and formulation of research hypotheses based on the existing studies' findings. After that, in the third chapter there is a description about the methodology and data used in this study. The third chapter also describes the chosen event windows and companies and explains why the specific choices have been made. The fourth chapter consists of the empirical part of the study, which includes the results and comparison of the results to the hypotheses. The final chapter has a discussion of the results and conclusions of the study with suggestions for future research.

2 Theoretical background

This chapter compiles the theories on which this study is based. This study investigates how different events during the Russia-Ukraine war cause reactions in the stock markets, and therefore the theoretical framework of this study is mainly affiliated with market efficiency. Efficient market hypothesis is the basis of numerous financial studies, and it is commonly a major fundament especially in event studies, which methodology is applied in this thesis. This chapter also includes a timeline of the Russia-Ukraine war, literature review, and formulation of the hypotheses to be tested.

2.1 Efficient market hypothesis

Efficient market hypothesis is based on an idea that stock prices reflect all relevant information that is available in the market. The concept of efficient capital markets has a long history and one of the most well-known theories about efficient capital markets is Eugene Fama's theory from 1970. Fama (1970) states that in efficient markets stock prices fully reflect all available information at any point in time. This implies that stock price changes are only due to new information, and therefore in efficient market it is not possible to make excess returns based on past information (Fama 1970). This also means that investors do not benefit from awareness of information when it is released, since the investors do not have time to trade on it before the stock prices adjust (Ross, Westerfield & Jaffe 2005, 352).

In order for the market to function effectively, certain underlying fundamentals must be in place. According to Andrei Shleifer (2000, 2-4) the foundations of market efficiency can be divided into three factors. First one is the rationality of investors, which assumes that all investors evaluate each stock rationally based on its risk characteristics and the net present value of future cash flows. As new information comes available, investors re-evaluate each stock according to whether the news is good or bad, leading to an increase or decrease in the prices. This way the stock prices immediately reflect the new net present values of cash flows when new information comes out. The second factor could be defined as unrelated deviations from rationality. If some investors act irrationally, but independent and with

uncorrelated strategies, the stock prices remain on the rationally evaluated level since in the case of high volume of trades, the uncorrelated and independent deviations are likely to cancel each other out. The third condition needed for the markets to be efficient is arbitrage. When some investors evaluate stocks irrationally and by themselves may misplace the prices from efficient levels, rational professionals investing large sums with carefully constructed strategies seek profits by selling the overpriced stocks and buying the underpriced ones. Arbitrage enables risk-free returns by exploiting mispricing of stocks and when it is used, the prices rapidly return to the rationally evaluated level making the market efficient. (Shleifer 2000, 2-4)

The abovementioned three conditions efficient market requires are theoretical and do not purely occur in practice. In addition to these three conditions, Fama (1970) also states that fully efficient market requires free transactions and access to all information, which is not achievable in the real-world markets. Totally efficient market would require all investors to act rationally in all situations, which by itself could be described as inhuman and therefore impossible. Every investor is not able to obtain new information at the same time and act accordingly, so the possibility of mispriced stocks cannot be ignored entirely. Regardless of these notes, capital markets cannot be declared as totally inefficient either. The markets do not always respond to all new information immediately, but some information may cause a more rapid respond than other. The issue can be examined by separating information into three different types: information on past prices, public information, and all information (Ross et al. 2005, 354). Each type of information is reflected in the stock prices in each form of market efficiency, which are weak-form, semistrong-form, and strong-form efficiency (Ross et al. 2005, 355-356).

The markets satisfy weak-form efficiency when only the information on past prices is reflected in the present prices. The information on past prices is the easiest one to acquire, and therefore it's impossible to generate profits by finding patterns in stock price movements in weakly efficient markets. If following found patterns could systematically generate excess returns, every participant in the market would take advantage of it, which would result in the benefits of this strategy to expire. A theory based on the same idea known as random walk suggests that the stock market movements are random and therefore technical analysis is useless in the long run. (Ross et al. 2005, 355)

In a semistrong-form efficient market the prices reflect all publicly available information. This includes company announcements and accounting statements for instance, and therefore in a market of semistrong-form efficient, it's impossible to gain excess returns using publicly available information. The strong-form efficiency requires that all information, public or private, is reflected in the stock prices. In other words, strong-form efficiency means that any information known to at least one investor that is relevant to the stock, is in fact incorporated into the price. This leads to a situation where even private information cannot generate excess returns, so excess returns as themselves are impossible in the long run. (Ross et al. 2005, 356-357)

As the requirements for efficient markets are strict and the strong-form efficiency seems achievable only in a theoretical manner, the efficient market hypothesis has received criticism. According to Malkiel (2003), the assumption that stock prices are not predictable is incorrect as he names three situations where practice suggest otherwise: short-term momentum with investors' underreaction, long-run return reversal, and seasonal or day-of-the-week patterns. Many empirical studies on the behaviour of the past stock prices provide support to reject the efficient market hypothesis since certain market phenomena are repeated (Malkiel 2003). However, the study in this thesis uses event study methodology, and thus the assumption of some degree of market efficiency is necessary. The markets are assumed to be semistrong-form efficient, if hypothetically companies' publicly announced decisions on the continuation of their operations in Russia are reflected in the stock prices.

2.2 Timeline of the Russia-Ukraine war

The conflict between Russia and Ukraine escalated on 24 February 2022, but the tension had been rising for a long period of time. The annexation of Crimea in 2014 can be seen as one of the most pivotal events that led to the current situation (Bigg 2022b). In February 2014, Ukraine's pro-Russian president Viktor Yanukovich's actions caused critical political unrests in Kyiv, the capital of Ukraine. Swiftly after the protests president Putin executed unexpected military exercise near Ukraine's border, and on 27 February armed men in unmarked uniforms took control of Crimean government buildings and two airports the day after. Later in March, a vote was held in Crimea on annexation of Crimea to Russia and the

result was favourable to Russia despite possible corruption. This was followed by Putin signing legislation that officially incorporated Crimea into Russia. (Clinch 2022)

After the annexation of Crimea, the conflict continued in eastern Ukraine between Ukrainian government forces and Russian-backed separatists. The battles took place in Donetsk and Luhansk, two heavily industrialised regions also known as Donbas. Over the period of eight years between 2014 and 2022, the conflict continued as a trench war which devastated the area's viability and economy to a large extent. (Crisis Group 2022)

In March and April 2021, Russia began a large-scale military build-up near Ukraine's eastern border and in Crimea. This did not escalate the conflict yet, but it was reported that Russia had not positioned such a high number of troops near Ukraine's eastern border since 2014. (Reuters Staff 2021) Over nine months later, on 21 February 2022, Putin officially recognised the independence of the two separatist controlled regions in eastern Ukraine. Putin announced this in the end of a long speech of his, where he also described Ukraine as a pro-European oppressor of Russian minorities and therefore as a threat. The recognition violated the Minsk agreements made after the annexation of Crimea and triggered many emergency meetings in the Western world. (Euronews 2022)

Three days after the recognition, the long-lasting tension between Russia and Ukraine escalated when Russia began the invasion on 24 February 2022 by attacking Ukraine from several locations (Bloomberg 2022). According to the Western sources, the attack was expected to be rapid and irresistible since Ukrainian troops were clearly outnumbered, but Ukrainians defended Kyiv successfully for several weeks, which led to Russian troops withdrawing from northern Ukraine (Bigg 2022a). After the Russian forces were pushed out of northern Ukraine and Kyiv's surroundings in the first days of April, Western media reported numerous alleged war crimes against civilians in Bucha, a town near Kyiv seized by Russians for a month. The number of civilians murdered was so high and the treatment so brutal that Western media named the events as the Bucha Massacre. (Shuster 2022) Regardless the other horrors of the war, the Bucha massacre was a shock in the Western world and therefore it's reasonable for the time frame of its reportage to be considered in this study. However, in terms of objectivity, it has to be noted that the Kremlin and Russian authorities consider the events as "special operation" and do not acknowledge any war crimes to be committed as they justify the invasion by suggesting the West is threatening Russia by "expanding" into Ukraine.

Regardless of the successful defence of Kyiv, Russian forces advanced in eastern and southern Ukraine and took over the province of Kherson in March. An example of Ukraine's resistance is Mariupol, a coastal city in the southeast of Ukraine whose inhabitants refused to surrender and did not fall under Russian control until the 18 May. (Bloomberg 2022) Mariupol was under heavy bombardment since the beginning of the invasion until its surrender, and numerous war crimes committed by Russia were reported as the missile attacks killed thousands of civilians (Bigg 2022a). However, the surrender of Mariupol was only a matter of time, and from a large perspective it is not as pivotal event in the war as the ones chosen under analysis for the study.

During the summer of 2022, fierce battles continued in the eastern Ukraine, but the frontlines remained almost stationary due to Ukraine's strong defence and the support from the Western world. In late August, Ukrainians executed a counteroffensive in southern Ukraine after weeks of preparing, which included adapting new western military systems for instance. The Ukraine's counteroffensive succeeded and forced Russians to retreat swiftly from several areas. (Bigg 2022a) As the momentum of the war had clearly shifted, Putin responded to the situation by announcing partial mobilization and threatening west with nuclear retaliation (Sauer 2022). No similar mobilization has been carried out in Russia since the Second World War, so its impact on the course of the war could not have been confidently predicted at the time. Therefore, as the announcement of partial mobilization could have been a turning point in the war it is worth to be examined in this study.

2.3 Literature review

The effects of geopolitical shocks on stock markets are extensively covered in existing research, but since as fierce conflicts as the Russia-Ukraine war have not occurred in decades most of the research focuses on much smaller events such as terrorist attacks. Brounen and Derwall (2010) studied the impacts of terrorist attacks on international stock markets and found that the impacts appear to limit to the immediate surroundings of the attacks. Only the widely known September 11 attacks in 2001 against the United States caused long-term effects on financial markets by increasing the systematic risk of several industries (Brounen, Derwall 2010). Their results indicated that most of the terrorist attacks cause strong reactions in stock markets, but the reactions are temporal and followed by swift recovery. It must be

noted that the study is currently 12 years old and the changes in geopolitical atmosphere and macroeconomic situation have been hectic in the recent years. Balcilar, Bonato, Demirer, and Gupta (2018) studied how geopolitical risks impact stock markets in BRICS countries. Their findings suggest that geopolitical risks affect stock market volatility more than returns, and the resiliency is not harmonious among BRICS countries (Balcilar et al. 2018). Overall, the existing research provides evidence for the assumption that geopolitical shocks impact stock markets strongly, so presumably the effects of the Russia-Ukraine war are also widespread.

The impacts of the Russia-Ukraine war on stock markets have been studied from many perspectives, but as the war is still on-going, new research on the topic is needed continuously. Sun, Song and Zhang (2022) studied how the war's impacts on stock markets differ by country and market sectors. One of their main findings was that over different event windows companies located adjacent to the war have remarkable negative abnormal returns compared to companies away from the battlefield (Sun et al. 2022). This is supported by Bounou's and Yatié's (2022) study as they also discovered that the stock market indices in countries bordering Russia and Ukraine performed weaker than the others. Another interesting observation was that the negative impact of the war on the stock market indices was stronger in countries that demanded Russia to end the attack (Bounou, Yatié 2022). A study by Boubaker, Goodell, Pandey, and Kumari (2022) also investigated the invasion's impacts on stock markets across countries with event study methodology. The results indicated that gross domestic product -scaled trade is negatively correlated with event-day and post-event returns, while there still occurs notable heterogeneity across the highly globalized economies (Boubaker et al. 2022). The found heterogeneous of the war's impacts across countries provides support for further research on the topic.

Since the beginning of the invasion many companies have been forced to decide whether they are willing to continue or close their operations in Russia. Because of the numerous reported war crimes committed by Russia, operating with Russia can be currently seen as supporting violation of human rights and the decision could be fatal to companies' reputation. Environmental, societal, and corporate governance ratings are a way to evaluate the sustainability of companies' operations. Basnet, Blomkvist, and Galariotis (2022) studied how ESG scores can predict companies' decisions to stay or leave the Russian market. Their main findings were that lower ESG rated companies are more likely to stay in

Russia after the invasion compared to higher rated ones, and in the cases of withdrawal, companies with higher ESG score received less negative stock market reactions regardless of the negative impact on cash flow caused by the withdrawal (Basnet et al. 2022). On this basis one could assume that companies are interested in their social responsibility reputation and the state of operations in Russia has an impact on it, since the higher ESG rated companies are more likely to leave Russia. An event study by Berninger, Kiesel, and Kolaric (2022) examined how stock market reactions varied across companies of different industries and companies of different decisions in terms of withdrawal from Russia. According to their results, companies that announced withdrawal from Russia received more negative stock market reactions compared to ones that publicly decided to stay (Berninger et al. 2022). In conflict with some of the previously mentioned studies, they found no evidence to support the hypothesis that companies' geographical location has an impact on the stock market reaction, although they highlight that the reactions differ strongly by industry. However, they observed a difference between companies that announced total withdrawal and those who aimed to conserve an option to return, as the latter ones received significantly greater negative abnormal returns over the event window.

Heilmann (2016) found that politically motivated boycotts can have significantly negative impact on companies' trade relations, although the impacts may be only temporary. The Russia-Ukraine war has provided an opportunity for numerous politically motivated boycotts as operating with Russia could be seen as justified reason for a boycott, at least in the Western world. Therefore, the fear of this kind of boycott can be enough motivation for some companies to abolish their operations in Russia as the opposite decision could be fatal in the worst case. To examine which factors determine these decisions, Lu and Huang (2022) studied the reasons behind companies' decisions to exit Russia during the Russia-Ukraine war. One of their objectives was to investigate if investors reward companies for their decision of withdrawal by paying a "reputation premium" for companies that have publicly withdrawn from Russia. Their results indicate that investors do not appreciate decisions of withdrawal in a monetary form, and the hypothetical "reputation premium" does not exist. Since the decisions do not appear to be driven by economic motivators, potentially social sanctions or long-term outflow from ESG funds could be the factors behind the decisions of withdrawal (Lu, Huang 2022).

Although investors do not pecuniarily reward companies for withdrawal, do the market reactions indicate a punishment for those who chose to stay in Russia? This issue was studied by Tosun and Eshragi (2022) in their event study which covered the period of two weeks after the beginning of the invasion. The results provided evidence for significant market penalty imposed by investors on the companies that decided to continue their operations in Russia (Tosun, Eshraghi 2022). In addition to the two-week time period covered by Tosun's and Eshragi's study, this thesis provides more evidence on the same phenomena by investigating if the market reactions remain the same as the war between Russia and Ukraine continues. Based on the existing research, companies that operate in Russia presumably have more volatile market performance during the chosen event windows since the decision to stay in Russia has been proved to be followed by negative effects on the companies' performance in the stock market. In addition, assumably chosen financial ratios favour companies that have decided to withdraw from Russia if investors impose significant market penalty on the companies that stay in Russia.

Based on the existing research, the research questions of this thesis are in a form that they support previous findings and provide additional information on unknown impacts of the war. The research questions include an assumption of at least weak-form market efficiency but based on the existing research this assumption is justified. Based on the existing literature, the concept of punishment associated with the fourth research question can be considered as a significant decrease in a company's share price, and the concept of rewarding can be considered as positive or as less negative stock market performance relative to a company's peers.

3 Methodology and data

The purpose of this chapter is to introduce the event study methodology used in this study and describe which criteria is used to choose the included companies. The companies' performance is examined by several metrics, which are also represented in this chapter. The metrics used include for instance abnormal returns, return on equity, and a few other financial ratios.

3.1 Event study methodology

Event study methods are broadly used in the fields of finance and economics. According to MacKinlay (1997) the first step of an event study is to define the event of interest and the period which the stock prices are analysed over, which is called the event window. It is common to define the event window to cover multiple days which surround the event of interest. In addition to the event window, an event study also requires defining of an estimation window. The defining of an estimation window allows the calculation of the normal returns, which the returns around the event do not affect. (MacKinlay 1997) Timeline of an event window is demonstrated below in figure 1, as time zero refers to the event of interest.

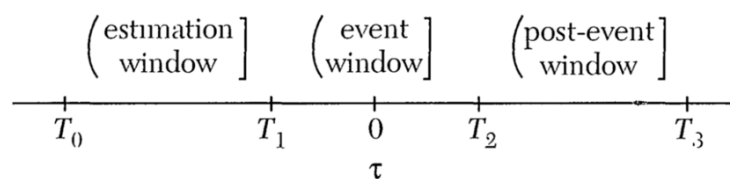


Figure 1. Timeline for an event study (MacKinlay 1997)

3.1.1 Selecting the events of interest

This study covers three different event windows from the Russia-Ukraine war. The first event window is dated around the 24 February 2022, covering six trading days before and

after the event. By defining the event window with equal number of trading days before and after the event day, the event window may cover asymmetrical number of actual days before and after the event day. However, the use of trading days instead of actual days is a common practice in event studies, and therefore trading days are also used in this study. The 24 February 2022 is the exact date when Russia began its invasion of Ukraine. The existing research covers this event by several studies, but to make the results of different events comparable it's appropriate to include this event in this study. The 24 February can be said to be the most significant event in this study, as it is the date of the beginning of the war that is still on-going. The estimation window for the first event covers 408 days before the event, from 4 January 2021 to 15 February 2022. The length of the estimation window is important from theoretical perspective when calculating the normal returns. If necessary, stock market data could be collected for instance from 1000 days before the event window, so the choice of the length of the estimation window represents a period considered as "adequate" for a proper estimation of the normal returns. In this study, it was not considered necessary to collect data over a longer period, since extending the estimation window no longer affected the results prominently.

The second event window is dated around the end of March and the beginning of April covering period of six trading days before and after 1 April 2022. Around this time the Russian forces retreated from the northern Ukraine due to the successful defence of Kyiv. In the first days of April 2022, the events of the Bucha Massacre were investigated and reported broadly. The event day for this window, the 1 April 2022, can be considered as the first day of Western media reporting evidence about the alleged war crimes in Bucha. Since the first event window covers the beginning of the war, the purpose of the second event window is to compare how the events around the first days of April 2022 affect the stock market reactions as the war has already begun over a month before. The estimation window for this study covers period of 4 January 2021 to 23 March 2022, which supports the calculation of the normal returns from theoretical perspective as the period covers over a year's time before the event. Therefore, the returns over the first event window do not cause significant fluctuation to the normal returns since the first event window does not cover a major part of the whole estimation window.

The third event window is based on events in September 2022, when the war had occurred over half a year. The event day is 21 September 2022, which is the day of Putin's

the form of exports before the Russia-Ukraine war, as that is an inevitable premise in terms of the possibility of a decision to stay or withdraw. Data on the companies' decisions to withdraw or remain have been collected from Yale's CELI list (Yale School of Management 2022), KSE Institute's "Leave-Russia" -project website (KSE Institute 2022) and public announcements by the companies.

In addition to the abovementioned factors, the included companies are separated into four portfolios. The first portfolio consists of companies that made their decision of withdrawal promptly after the beginning of the invasion and no later than the 5 March 2022. The second portfolio includes companies that announced withdrawal between 10 March 2022 and 7 April 2022. This portfolio represents the companies that did not announce their decision on withdrawal immediately but still announced it by the European Union's fifth sanctions package against Russia on 8 April 2022. The third portfolio consists of companies that announced their decision of withdrawal in the summer of 2022, between 1 July and 21 September. Therefore, the third portfolio represents companies that did not act rapidly to the current situation but announced their decision before the partial mobilization in Russia. The fourth portfolio includes companies that still operate in or with Russia regardless of the war that has occurred over half a year. This portfolio is included in the study to examine if investors impose a market penalty on companies that refuse to withdraw or delay the decision.

The abovementioned criteria is not clearly logical relative to the timing of the events of interest. The main idea behind the criteria is to construct portfolios consisting of companies that announced their withdrawal between the chosen events. To examine if the withdrawal announcements would cause rapid reactions, ideally the separation would be done by constructing the portfolios with companies that announced their withdrawal just before the chosen events. However, including companies that would have announced withdrawal before the beginning of the invasion does not serve the purpose of this study, and the number of companies that announced withdrawal approximately simultaneously limits the range of companies to choose from. Therefore, the time ranges of the portfolios in terms of the timing of withdrawal announcement differ and for instance the time range of portfolio 3 is extended to cover nearly the whole summer of 2022. These limitations may cause the criteria of the portfolios to appear illogical, as the criteria is not equal among the portfolios.

The portfolios include companies from a wide range of industries, which may bias the results as the war has different effects on different industries. This would justify adjusting different weights to industries such as energy and finance in the calculation, as presumably those industries are more exposed to the war than healthcare or information technology for instance. To take this into account, several restrictions are placed into the company selection to make the portfolios similar in terms of the distribution of industries of the companies included. Each portfolio has a total of two or three energy and financial companies, and six to eight companies of industrials. Also, the number of consumer staples or discretionary companies is between four and seven in every portfolio. The portfolios can have a maximum of six companies of other industries that were not mentioned above. When the industry distribution of companies in the portfolios is nearly identical, the different exposure of different industries to the war does not cause significant distortions and therefore equal weights can be used to calculate the portfolio returns.

After a company announces its decision to continue or abolish operations in Russia, concrete actions are needed to execute the decision. These actions may take a long time to finish depending on the magnitude of a company's operations in Russia, which leads to another issue to consider in this study. As companies are not required to report all their actions such as closing an office, it is difficult for investors to evaluate companies by their "state of actions" if companies do not report it voluntarily. Companies are indubitably aware of this, and some companies may have announced their withdrawal from Russia to protect their reputation but continue to operate as before regardless of the announcement. For instance, parallel imports are one possible way for companies to hide their operations in Russia since many companies are not willing to withdraw and some countries have not imposed any sanctions against Russia. These aforementioned issues are worth to be noted as the portfolios of this study segregate companies only by the date of their announcements, and not by the actual state of action the companies have accomplished to execute their decision of withdrawal. The companies involved are listed in the appendix 1.

3.1.3 Calculation of the normal returns

Wells (2004) argues that there are several ways to calculate the normal returns, which are the mean-adjusted model, the market-adjusted model, and the market model. The mean-

adjusted model compares the daily mean return from the estimation window to the actual returns from the event window. The market-adjusted model operates the same way as the mean-adjusted model, but by using the market's mean return instead of the mean return of the company or portfolio. The market's return can be measured using a market index such as S&P 500 Index for instance. The market model differs from the previous models by taking the risk of returns into account by considering the company's beta. A beta of one indicates that the stock changes accordingly to the mean return of the markets, whereas beta above one indicates higher risk and beta below one the opposite. The study in this thesis uses the market model, which according to MacKinlay (1997) is:

$$R_{it} = \alpha_{it} + \beta_i R_{mt} + \varepsilon_{it}, \quad (1)$$

$$E(\varepsilon_{it}) = 0,$$

$$\text{var}(\varepsilon_{it}) = \delta_{\varepsilon i}^2,$$

where R_{it} refers to the actual return of i on the period t , R_{mt} to the market return on the period t and ε_{it} represents the error term or the zero mean disturbance term. The error term can be considered as the abnormal return in the model. α_i , β_i , and $\delta_{\varepsilon i}^2$ are the three parameters of the model. As the abnormal return is the subtraction of the actual and normal return, the market model can be led to:

$$E(R_{it}) = \alpha_i + \beta_i R_{mt}, \quad (2)$$

which is the formula used in this study to calculate the normal returns. As MacKinlay (1997) argues, the benefit of the market model is that it removes the markets variance from the abnormal returns, which allows more authentic detection of the effects caused by the event of interest. This study uses logarithmic returns to avoid the distortion of results that the asymmetry of simple returns may possibly create. According to Wells (2004) logarithmic returns are often used in research because simple returns may cause arithmetic anomaly and bias for positive returns. Therefore, logarithmic returns work better in this study since the

returns are aggregated over the event windows. The daily logarithmic returns are calculated in this study with the following formula:

$$r_t = \ln \frac{P_t}{P_{t-1}}, \quad (3)$$

in which P_t is the closing price for day t whereas P_{t-1} is the closing price for the previous day, and r_t represents the percentual logarithmic return for the day t .

3.1.4 Calculation of the abnormal returns

To determine the potential impact of an event on stock prices, the abnormal returns over the event window must be calculated. The abnormal return is calculated by subtracting the normal or expected return from the actual return after the event. (MacKinlay 1997) For company i and event day t , the abnormal returns are:

$$AR_{it} = R_{it} - E(R_{it}|X_t), \quad (4)$$

where AR_{it} is abnormal returns, R_{it} is actual returns, and $E(R_{it}|X_t)$ is normal returns from the period t . As mentioned, this study is based on the market model and therefore the formula of abnormal returns can be derived to a more precise form since the method of determining normal returns is known. Based on the market model, the formula for abnormal returns is:

$$AR_{it} = R_{it} - \alpha_{it} - \beta_i R_{mt}, \quad (5)$$

in which the AR_{it} is the abnormal return for i on the period t . In this study, the abnormal returns are calculated over each event window and for each portfolio to investigate if any

differences occur between the portfolio returns. To construct the actual returns needed in the formula, the daily actual returns for every company stock involved are calculated and then the average of shares' daily returns in each portfolio represents the daily actual return of the portfolio. Therefore, the calculation of the daily returns for each portfolio is based on equal weights for every individual share. The use of equal weights has been justified in the company selection section. In summary, since the companies involved are not considered individually but as a part of a portfolio, in this study the model's R_{it} and AR_{it} refer to the actual and to the abnormal return of portfolio i on the period t .

When the daily abnormal returns of each portfolio are calculated, the abnormal returns can be examined over the event windows. According to MacKinlay (1997), cumulative abnormal returns are the sum of abnormal returns over a specific period. The cumulative abnormal returns allow to examine the total effects of the event of interest when the abnormal returns enable to inspect individual days within the event window. The cumulative abnormal returns are aggregated as follows:

$$CAR_i(t_1, t_2) = \sum_{t=t_1}^{t_2} AR_{it}, \quad (6)$$

where $CAR_i(t_1, t_2)$ is the cumulative abnormal return from the beginning of the event window t_1 up to time t_2 . The sums of CARs over the cross-section of events are called cumulative average abnormal returns, which are also often examined in event studies. Because of the individual examination of the chosen events and the nature of this study, only the cumulative abnormal returns are included in the process.

3.1.5 Statistical significance

This study follows MacKinlay (1997) and Vaihekoski (2004, 233) to test the statistical significance of the abnormal returns over the event windows and event days. The formula for the test statistic is:

$$t = \frac{CAR(t_1, t_2)}{\sqrt{\sigma^2(CAR(t_1, t_2))}} \sim N(0,1), \quad (7)$$

in which N represents the number of events, σ^2 the variance and $CAR(t_1, t_2)$ the cumulative abnormal returns from day t_1 up to day t_2 . The null hypothesis to be tested with the significance test is that the expected cumulative abnormal returns are zero.

3.2 Performance ratios

In addition to the abnormal returns, the involved companies' performance around the event windows is also measured by several financial performance ratios. Ratios used in this study include return on equity, market capitalization, and cost of debt. These ratios are included as presumably they are ones to be affected by the withdrawal decision or the market reaction. The chosen ratios also examine the possible effects from different aspects of performance and thus provide more evidence about the impacts of the war and the withdrawal decisions. In terms of the research questions of this study, the chosen ratios allow to provide more thorough answers to the first and fourth question. The ratios are either directly from Refinitiv Eikon -database, or the data used in the calculations of the ratios is collected from there.

Typically, event studies do not include an analysis of any financial ratios, as event studies rely on the abnormal returns as an indicator of a market reaction. In this thesis, the chosen performance ratios disclose the possible connections between the abnormal returns and the performance ratios and provide more evidence about the importance of the companies' withdrawal decisions. This addition to the ordinary event study methodology is included to strengthen the usability of the results from investor's perspective, and it allows to analyse the results more comprehensively. By including this additional perspective, more in-depth answers to the first, second, and fourth research question can be provided. When the performance of the portfolios is examined for a longer period and from a different point of view, the significance of the abnormal returns over the event windows can be assessed more thoroughly. The chosen performance ratios also illustrate changes in the macroeconomic situation as they are examined on a monthly or a quarterly basis.

3.2.1 Return on equity

Return on equity is a financial performance metric to measure how efficiently the company can convert its equities into profits. Return on equity is calculated by dividing net income by shareholders' equity, and thus the higher the return on equity is, the more efficient the company is at generating profits. There is no universal benchmark for the return on equity as the amount of assets needed to operate varies significantly between industries, and therefore, it is appropriate to use return on equity to compare companies of the same sector. A company's return on equity can be considered as good, if its return on equity percentage is higher compared to its competitors. (Fernando 2022a) In this thesis, return on equity is used to examine if the Russia-Ukraine war has affected companies' ability to generate profits. As the portfolios of this study contain a similar number of companies from different industries, the return on equity is suitable to compare the portfolios' performance. The return on equity percentages in this study are based on Refinitiv Eikon's data, which includes mean net income and shareholders' equity. Both datasets are statistical averages of all broker estimates determined to be on the majority accounting basis. This needs to be borne in mind when interpreting the results, although the data has been compiled on the same basis for every company involved.

3.2.2 Market capitalization

Market capitalization measures how much a company is worth based on the total value of its shares in the stock market. Market capitalization is calculated by multiplying the company's number of shares outstanding by the current price of its one share. Companies can be categorized by market capitalization as it represents the size of a company. Commonly companies are divided by their market capitalization to large-cap, mid-cap, and small-cap. Various sizes of companies naturally have significantly different market capitalizations, and therefore, as a performance metric, market capitalization is appropriate to use only among companies of similar size. (Fernando 2022b) The portfolios in this thesis include companies of various sizes, which weakens the suitability of market capitalization as a performance metric. Because of that, this study uses average change in market capitalization to measure the companies' performance during the war. However, this does not dispose all the issues of

this metric, but since it is market dependent and straightforward to calculate, the change in market capitalization serves its purpose of representing how the war affects the market values of the involved companies. Market capitalization data for all involved companies was collected directly from the Refinitiv Eikon -database.

3.2.3 Cost of debt

The Russia-Ukraine war has formed a new risk factor for investors to consider since the effects of the war are complex and difficult to predict. Cost of debt can be said to reflect the expected future prospects of a company, because it is the risk premium on the capital invested in the company (CFI Team 2022). One could assume that investors demand higher return for investments in Europe after the beginning of the war, as the war has had macro-economic effects and increased the geopolitical risk of European companies. To find evidence for this assumption, this study uses the cost of debt to examine how the risk premiums have evolved during the war. Refinitiv Eikon -database offers a variable called “WACC Cost of Debt”, which represents the marginal cost to the company of issuing a new debt at present. To identify whether the possible changes in the variable are due to the macro-economic situation, the cost of debt is compared to 12-month Euribor.

4 Results

This chapter includes the empirical results of this study. The results are divided according to the three chosen events, which are considered separately. For all three events, the cumulative abnormal returns are shown by several different time frames of event days depending on the lengths of the event windows. To express the statistical significance of the cumulative abnormal returns, t-values are also presented according to the time frames. The results of the selected performance ratios are in their own section, as the ratios cover the whole of the Russia-Ukraine war until the third quarter of 2022.

When interpreting the cumulative abnormal returns, it must be noted that a positive abnormal return does not directly indicate that the portfolio was profitable because of it. As explained in the third chapter, abnormal returns are the remainder of actual and normal returns, which means that by definition the abnormal returns are abnormal relative to the market index. In a situation that the market index has decreased, the abnormal return is positive if the portfolio's return has decreased less than the normal return based on the market index.

The calculation of abnormal returns is based on the market model as described in the methods section. The market model requires to calculate the alphas and betas for each portfolio to remove the markets variance from the abnormal returns. Table 1 shows the alphas of the portfolios for all three event windows with respective p-values. The alphas are nearly zero and not statistically significant based on the p-values, which is understandable, as the alphas are calculated over a relatively long period and the portfolios are broadly diversified.

Table 1. Portfolio alphas for all three event windows.

	<u>Event 1</u>	<u>P-value</u>	<u>Event 2</u>	<u>P-value</u>	<u>Event 3</u>	<u>P-value</u>
Portfolio 1.	0,0004	0,101	0,0005	0,036*	0,0002	0,381
Portfolio 2.	-0,0003	0,155	-0,0004	0,081	-0,0005	0,054
Portfolio 3.	0,0003	0,251	0,0000	0,974	-0,0001	0,646
Portfolio 4.	0,0002	0,441	0,0000	0,766	-0,0003	0,349

Significance level: *5%.

Table 2 shows the betas of the portfolios with the same layout as in the table 1. The betas are all statistically significant based on the p-values, but the values are still close to one, indicating a strong correlation with the market index. Based on alphas and betas, one would expect minor abnormal returns during the event windows.

Table 2. Portfolio betas for all three event windows.

	<u>Event 1</u>	<u>P-value</u>	<u>Event 2</u>	<u>P-value</u>	<u>Event 3</u>	<u>P-value</u>
Portfolio 1.	0,9889	0,000*	0,9596	0,000*	0,9846	0,000*
Portfolio 2.	1,0250	0,000*	1,0581	0,000*	1,0641	0,000*
Portfolio 3.	1,0344	0,000*	1,0941	0,000*	1,0912	0,000*
Portfolio 4.	0,9075	0,000*	1,0274	0,000*	1,0542	0,000*

Significance level: *5%.

4.1 The first event of 24 February 2022

The beginning of the Russian invasion of Ukraine on 24 February 2022 caused the stock markets to react approximately as expected in terms of cumulative abnormal returns, regardless the fact that in this event window only the first portfolio represents companies that have decided to withdraw from Russia. Table 3 shows the cumulative abnormal returns and respective t-values for different periods within the first event window. The results indicate significant cumulative abnormal returns for all four portfolios over the whole event window. Portfolio 1 was the only portfolio to generated positive cumulative abnormal returns, which supports the hypothesis that companies operating in Russia have more volatile stock market reactions to the news about the war than the companies that have decided to withdraw. From market efficiency perspective, the market reactions do not appear immediate but rather slightly delayed since the cumulative abnormal returns of all portfolios increase significantly few days after the event day. However, portfolio 4 generated significant abnormal return of -3,156% on the event day, which can be seen as evidence of semistrong-form efficiency. Portfolio 4 consist of companies that have not decided to withdraw from Russia by September 2022, but this information was not known during the first event and therefore cannot explain the results. Apart from the portfolio 4, the abnormal returns were

not significant on the event day. However, all portfolios generated significant cumulative abnormal returns three days after the event day at the latest.

Table 3. Cumulative abnormal returns of the first event window.

Cumulative abnormal returns and corresponding t-values for logarithmic returns

Event day	Portfolio 1.		Portfolio 2.		Portfolio 3.		Portfolio 4.	
	CAR	T-value	CAR	T-value	CAR	T-value	CAR	T-value
[-6, 6]	1,288 %	-2,40*	-3,857 %	-6,24*	-9,186 %	-10,77*	-9,779 %	-8,57*
[-3, 3]	0,101 %	0,19	-3,163 %	-5,12*	-7,691 %	-9,01*	-8,558 %	-7,50*
[-1, 1]	0,769 %	1,44	-0,952 %	-1,54	-2,114 %	-2,48*	-3,068 %	-2,69*
[0, 0]	0,424 %	0,79	-0,528 %	-0,85	-0,997 %	-1,17	-3,156 %	-2,77*
[0, 1]	1,246 %	2,33*	-0,398 %	-0,64	-1,116 %	-1,31	-2,828 %	-2,48*
[0, 3]	1,495 %	2,79*	-1,792 %	-2,90*	-5,899 %	-6,91*	-6,337 %	-5,56*
[0, 6]	3,108 %	5,80*	-1,986 %	-3,22*	-6,201 %	-7,27*	-7,341 %	-6,43*

Significance level: *5%.

The results of the first event indicate that the beginning of the invasion caused significant stock market reactions and that these reactions were not based solely on historical prices. The logarithmic returns of the portfolios and STOXX600-index are visualized in the figure 3 below:

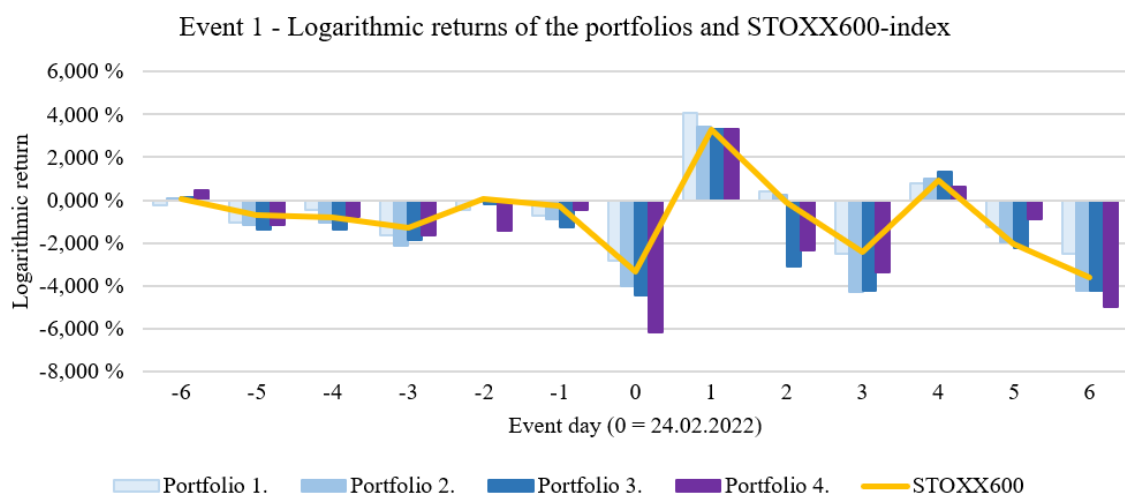


Figure 3. Portfolio and STOXX600-index returns during the first event window

As can be seen in Figure 3, based on the STOXX600-index the beginning of the invasion was also a significant event for the European stock markets as a whole. The returns of the portfolios follow the market index strongly over the first event window, which was expected due to the close to zero alphas and betas close to one. However, some variation occurs between the returns of the portfolios, which indicates that companies' withdrawal decisions may impact the market reactions. This does not prove a causality between volatile market reactions and withdrawal decisions, but the results of the upcoming events may provide further evidence for the issue.

4.2 The second event of 1 April 2022

After about a month since the invasion, the Ukrainians had successfully defended Kiev and pushed the Russian troops out of northern Ukraine. On 1 April, news about the Bucha Massacre began to spread in the Western World, which caused consternation due to cruel treatment of civilians and human rights abuses. Table 4 shows the cumulative abnormal returns of the second event, and as can be seen in the table, all four portfolios generated only negative abnormal returns during the event window. Considering the cumulative abnormal returns only over the whole event window, the results are quite interesting, as portfolio 2 performed the least negatively compared to other portfolios. Portfolio 2 represents companies that announced their withdrawal from Russia by 8 April, so the announcements by companies in portfolio 2 are the latest ones at this time. Based on the results, it could be argued that portfolio 2 performed the least negatively because the announcements of withdrawal are in the recent memory of the investors, since portfolio 1 also performed worse. However, the poor performance of the portfolio 1 could also indicate about negative impacts of the withdrawal on the companies' businesses. For example, some companies may suffer from significant decrease of cash flows due to abolishing operations in such a large market as Russia.

In terms of market efficiency, the second event provides evidence for semistrong-form efficiency as the cumulative abnormal returns are mostly significant. Slight delay still occurs in the market reactions, since all portfolios generate significant cumulative abnormal returns few days after the event day, but the abnormal returns on the event day are not significant.

However, this event is not as precise as to the date of the event as the beginning of the invasion, because new information about the Bucha Massacre was also reported long after the event day and the event window.

Table 4. Cumulative abnormal returns of the second event window.

Cumulative abnormal returns and corresponding t-values for logarithmic returns

Event day	Portfolio 1.		Portfolio 2.		Portfolio 3.		Portfolio 4.	
	CAR	T-value	CAR	T-value	CAR	T-value	CAR	T-value
[-6, 6]	-4,389 %	-7,53*	-2,611 %	-6,77*	-4,709 %	-6,27*	-5,661 %	-6,91*
[-3, 3]	-3,281 %	-5,63*	-2,028 %	-5,26*	-3,653 %	-4,87*	-4,347 %	-5,31*
[-1, 1]	-1,068 %	-1,83	-1,089 %	-2,82*	-2,245 %	-2,99*	-0,925 %	-1,13
[0, 0]	-0,307 %	-0,53	-0,228 %	-0,59	-0,108 %	-0,14	-0,139 %	-0,17
[0, 1]	-1,253 %	-2,15*	-0,745 %	-1,93	-1,219 %	-1,62	-0,929 %	-1,13
[0, 3]	-2,032 %	-3,49*	-1,872 %	-4,85*	-2,951 %	-3,93*	-3,999 %	-4,88*
[0, 6]	-1,917 %	-3,29*	-2,752 %	-7,13*	-3,583 %	-4,77*	-3,298 %	-4,03*

Significance level: *5%.

Figure 4 illustrates the returns of the portfolios and STOXX600-index during the second event window. The figure supports the hypothesis that news about the war cause more volatile market reactions for companies operating in Russia, as portfolios 3 and 4 have the most variation in the returns. This event does not appear significant from a macroeconomic perspective, as the returns of the market index fluctuate significantly between positive and negative after the event day. However, at this point numerous European companies had already announced their withdrawal, so the significant impact of the event on the market index is not as obvious as that of the first event. Given the expected release of the European Union's fifth sanctions package on 8 April, the market index could have been expected to decrease further as many companies' businesses are restricted through the upcoming sanctions.

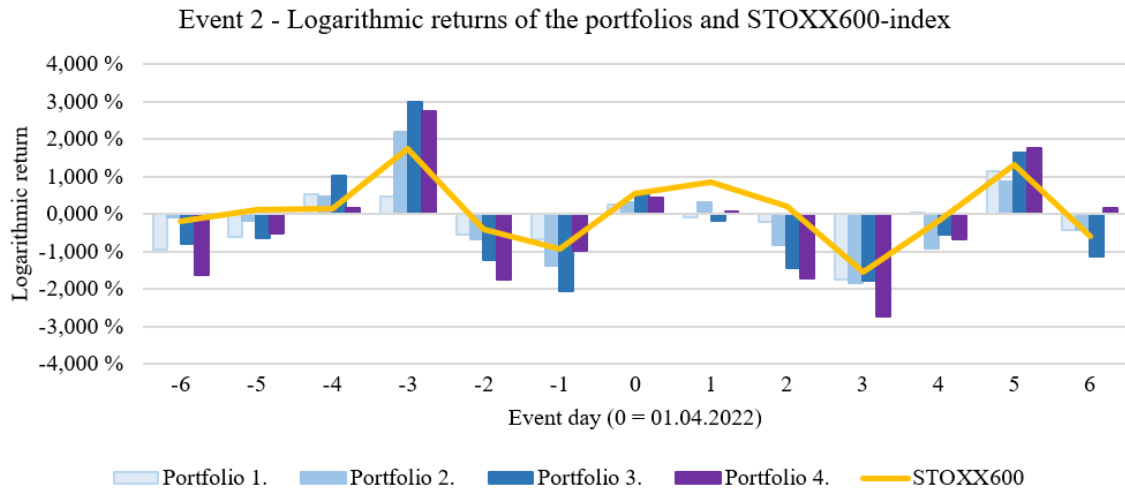


Figure 4. Portfolio and STOXX600-index returns during the second event window

4.3 The third event of 21 September 2022

The Russia-Ukraine war had been going on for more than six months, when Vladimir Putin, the president of the Russian Federation, announced partial mobilization. Mobilization of this scale has not been implemented in Russia since the Second World War, so its impact on the Russia-Ukraine war was difficult to predict. Macroeconomic situation was already uncertain in Europe, so the announcement of mobilization could understandably cause rapid reactions in the stock markets. Table 5 shows the cumulative abnormal returns of the portfolios during the third event window. The results of this event favour the portfolio 3, which represents the companies that announced their withdrawal from Russia during the summer of 2022. Although the cumulative abnormal returns of the portfolio 3 were statistically significant only over the whole event window and six days after the event day, these results are in line with the results of the previous events, since companies that were the latest to announce their decision of withdrawal performed the least negatively. Over the whole event window, portfolios 1 and 4 generated the most negative cumulative abnormal returns. Again, this could be explained, for example, by the short memory of investors or by the damage to companies' businesses caused by the withdrawal, the latter sounding more reasonable. However, portfolio 4 performed relatively bad in all three event windows, which provides evidence for the idea of investors imposing a market penalty on the companies that stay in Russia.

Table 5. Cumulative abnormal returns of the third event window.

Cumulative abnormal returns and corresponding t-values for logarithmic returns

Event day	Portfolio 1.		Portfolio 2.		Portfolio 3.		Portfolio 4.	
	CAR	T-value	CAR	T-value	CAR	T-value	CAR	T-value
[-6, 6]	-4,360 %	-9,24*	-2,668 %	-5,36*	-2,232 %	-3,76*	-3,328 %	-4,66*
[-3, 3]	-1,465 %	-3,10*	-1,561 %	-3,14*	0,435 %	0,73	-0,019 %	-0,03
[-1, 1]	-1,287 %	-2,73*	-1,617 %	-3,25*	-0,509 %	-0,86	-0,974 %	-1,36
[0, 0]	-0,439 %	-0,93	-0,776 %	-1,56	-0,641 %	-1,08	-0,676 %	-0,95
[0, 1]	-0,351 %	-0,74	-0,937 %	-1,88	-0,469 %	-0,79	-0,844 %	-1,18
[0, 3]	-0,305 %	-0,65	-0,815 %	-1,64	0,260 %	0,44	-0,957 %	-1,34
[0, 6]	-1,770 %	-3,75*	-1,448 %	-2,91*	-1,325 %	-2,23*	-1,695 %	-2,37*

Significance level: *5%.

Figure 5 illustrates the returns of the portfolios and the STOXX600-index during the third event window. The figure shows that after the announcement of the partial mobilization, the market index decreased rapidly. The returns of the portfolios follow the market index quite strongly, but some variation occurs. Interestingly portfolio 4 does not have the most volatile stock market reactions after the third event, which contributes to reducing the importance of operating in Russia as a trigger for volatile stock market reactions. Regardless of the rapid decrease of the market index after the event day, most of the cumulative abnormal returns of the portfolios were not significant promptly after the event day. This indicates that the market is somewhat inefficient or that the market reactions are no longer impacted by operating in Russia since the war has been continuing for more than six months. By this time, it could be possible that investors' attention is focused on other issues rather than on the companies' operations in Russia, or that the event is simply not seen as very important for the companies' business.

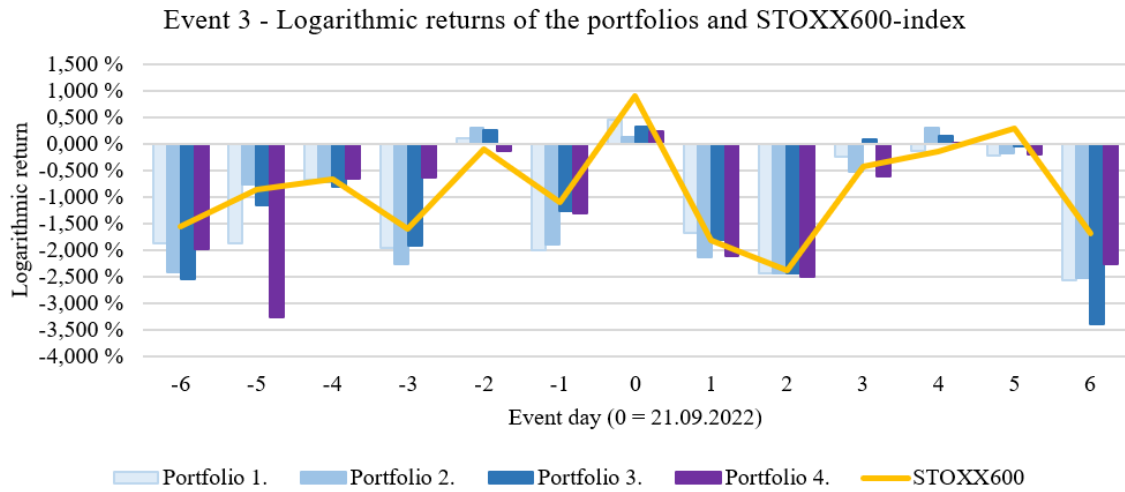


Figure 5. Portfolio and STOXX600-index returns during the third event window

4.4 The development of the chosen performance ratios

In general, investors can be expected to favour companies that perform well, so in a situation where the future of a company looks bleak, the share price of that company will decrease. That would affect the company's market capitalization, since it is the product of the number of the company's shares and its current market price. As the results of the three events have shown, companies operating in Russia have generated significant negative abnormal returns, which suggests that the market capitalization of these companies has decreased. Figure 6 illustrates the quarterly development of average change in the market capitalization of the four portfolios during the Russia-Ukraine war. The average change in market capitalization of each portfolio has clearly decreased during the war, but no significant differences occur between the portfolios.

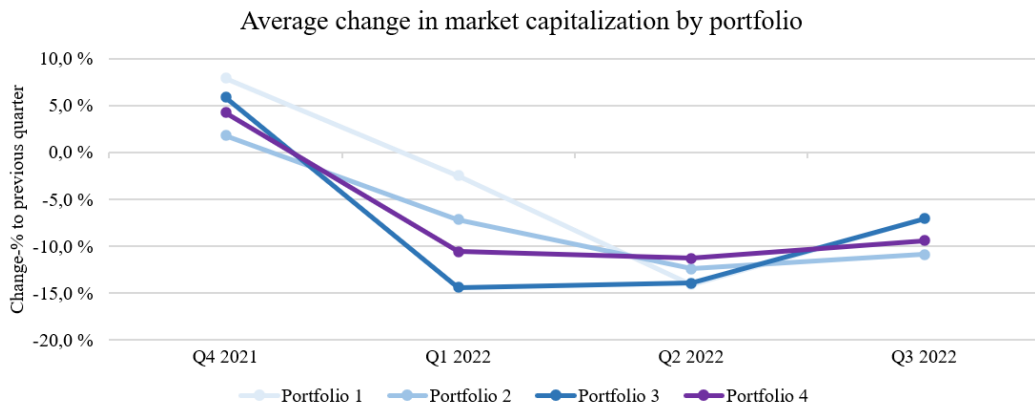


Figure 6. Average change in market capitalization by portfolio

In the first quarter of 2022, the decreases of average market capitalization of the portfolios 1 and 2 were slower than the ones of the portfolios 3 and 4, which indicates that investors imposed a market penalty on companies that delayed their decision of withdrawal after the beginning of the invasion. This suggests that rapid decision-making benefits companies in times of crises such as war when investors react to changing circumstances and reconsider their investments. However, the trend between portfolios is very similar, so no strong conclusions should be drawn from these results.

The development of average return on equity percentage is also similar between the portfolios. Figure 7 shows how the average return on equity percentages of the portfolios have remained at nearly the same level during the war, with portfolio 1 performing the most positively. Thus, no significant changes have occurred in the companies' ability to generate profits during the war, which may be explained by the size of the companies. Listed companies have more resources than smaller companies to survive in times of crisis, although decision-making processes of large companies can be time-consuming.

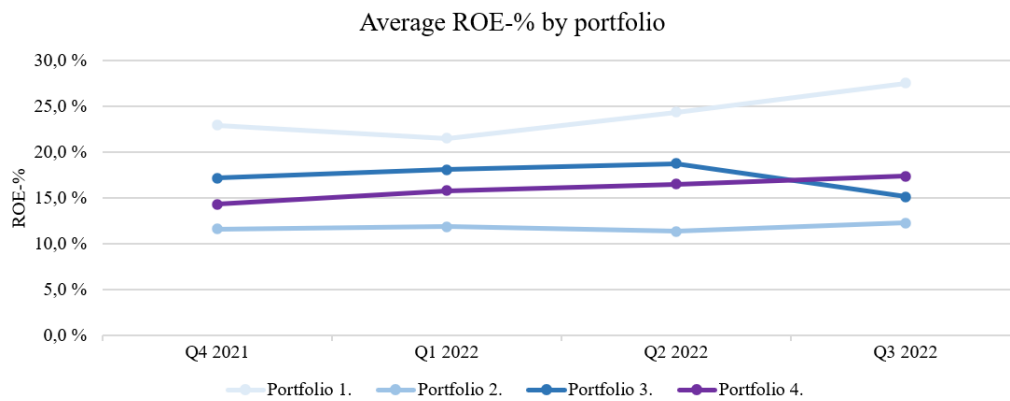


Figure 7. Development of average return on equity percentage of the portfolios

As the stock prices reflect investors' expectations of the companies' future performance, decrease in the prices can lead to increase in the cost of debt, because investors demand higher return for their invested capital. Higher risk leads to higher required rate of return, so presumably the war causes the companies' cost of debt to increase, and operations in Russia could be expected to impact the issue negatively. Companies' cost of debt can also naturally increase when interest rates increase by the macroeconomic situation. Figure 8 shows how 12-month Euribor and the average cost of debt of the portfolios have developed during the war. The average costs of debt of the portfolios follow the changes of 12-month Euribor, suggesting that the increases in the costs of debt are not intrinsically linked to the companies but rather to the macroeconomic situation in Europe. An interesting observation is that portfolio 4 has the lowest cost of debt during the war. The differences between the portfolios are not significant so they could be due to chance, but one possible explanation could also be that if a company decides to stay in Russia, the decision builds trust among investors as the company's business is expected to continue as before. This explanation can be seen as a speculation, but since the results do not support the hypothesis that investors favour companies that have withdrawn from Russia, other possibilities must be considered.

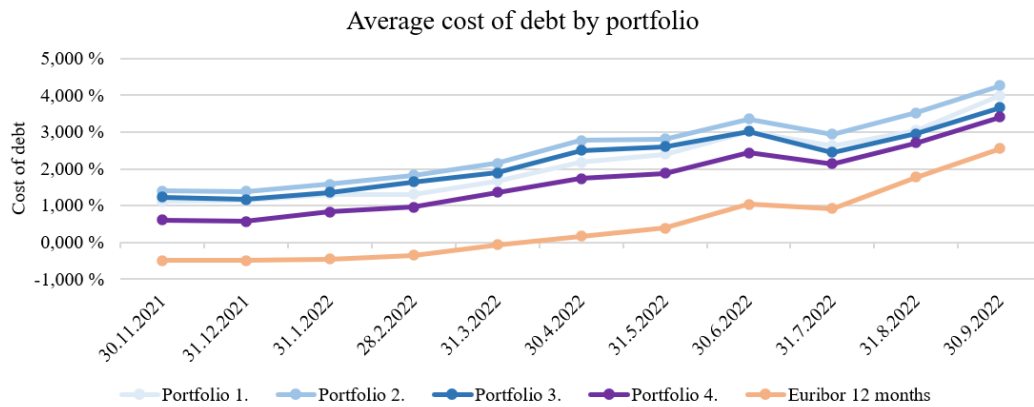


Figure 8. Development of average costs of debt of the portfolios

In summary, the development of the chosen performance ratios does not provide strong evidence to support the hypothesis that a decision of withdrawal from Russia has positive impact on the companies' performance. Based on the lack of significant differences between the portfolios, the performance ratios have developed according to the macroeconomic situation rather than to the companies' individual decisions.

5 Conclusions

This chapter discusses the meaning of the results and answers to the research questions of this study. To draw reasonable conclusions, the results are compared with the findings of the previous research. Furthermore, the significance of the results is evaluated and suggestions for future research are given.

The objective of this study was to examine the impact of withdrawal from Russia on European companies' performance during the Russia-Ukraine war. Previous research on the topic focuses on the beginning of the invasion in February 2022, so this study aims to provide more evidence on the war's effects as the war continues. The study was implemented by forming four portfolios consisting different companies based on their timing of withdrawal. The performance of the portfolios was then examined by event study methodology and several market based financial ratios.

5.1 Answers to the research questions

The main research question was: “*Do European companies' decisions to continue or abolish operations in Russia affect their performance in the stock market?*”. The results showed that portfolios including companies that had announced their withdrawal generated less negative cumulative abnormal returns over the three event windows. This is in line with the results of Tosun and Eshragi (2022), as they found that companies that stayed in Russia after the beginning of the invasion underperformed companies that withdraw. However, the results of this study are not as unambiguous since there occurred variation between the performance of the portfolios during different events.

One observation was that the cumulative abnormal returns over the whole event windows favoured the portfolio that included companies that were the latest ones to announce their withdrawal by the time of the event. The portfolio including companies that did not withdraw from Russia until September 2022 had the most volatile stock market reactions during the first two events, which supports the hypothesis that withdrawal from Russia impacts companies' performance positively. Based on the results, the positive impact does not appear to be long-lasting, since portfolios 1 and 2 generated the most negative cumulative abnormal

returns over the third event window. This can be seen as an evidence of market fatigue since the volatility of the reactions decreased between the events. Another explanation could be that a withdrawal from Russia causes the sales or cash flows of the companies to decrease, which also decreases the companies' share prices as investors do not value the companies as much as before. These results could also be explained by the findings of Berninger et al. (2022) as their results suggest that industry is the most important factor in terms of the market reactions during the war. The constructed portfolios do not contain exactly the same number of companies from each industry, which may explain some of the variation of the results. New research on this issue would be welcomed, as the impacts of withdrawal from Russia on companies' sales or cash flows are not unambiguous or straightforward.

The results of the performance ratios showed no significant differences between the portfolios. In terms of market capitalization and cost of debt, the portfolios performed nearly equally during the war, which supports the importance of macroeconomic trends rather than the individual decisions of the companies. However, in terms of return on equity percentage, companies that were the first to announce withdrawal from Russia performed better compared to companies that announced their withdrawal later or not at all. Based on this, it could be said that a decision of withdrawal assumably has a positive impact on a company's ability to generate profits, although the evidence is not strong, and the causality cannot be assumed by the correlation.

The second research question of this study was "*Is the timing of the withdrawal decision important in terms of the stock market reaction?*". As the results showed that rapid decision-making benefits the companies' performance at least in the short term, the timing of the decision of withdrawal can be described as important. However, it could also be argued that the timing of the decision is not important because of the lack of benefits in the long run. The development of the included financial ratios did not indicate major differences between the portfolios, which supports the idea that the impact of the macroeconomic situation overrules the individual decisions of the companies.

If investors are aware of the state of the companies' withdrawal, the lack of benefits in the long run could be due to unimplemented actions promised in the withdrawal announcement. To provide evidence for this assumption, more in-depth analysis of the companies' actions would be required, but the idea that investors insist concrete actions to fulfil the announcement of withdrawal is understandable. From the perspective of market efficiency

this assumption would also premise semistrong-form efficiency as the state of withdrawal is reflected in the prices, so no rapid conclusions should be drawn from it. However, this reflects to the findings of Berninger et al. (2022) as they found companies that aimed to conserve an option to return performed worse than those who announced a clear withdrawal.

The third research question was “*Do the market reactions differ by the events?*”. In terms of the cumulative abnormal returns, the first event caused the most significant market reactions. In the first and the second event, portfolios including companies that had not announced withdrawal from Russia received more volatile market reactions than the portfolios of companies that had announced their withdrawal. In the third event the results were not in line with the previous events, as portfolio 4 had less negative market reaction than portfolio 1 in terms of cumulative abnormal returns over the whole event window. One possibility could be that investors do not see Putin’s announcement of partial mobilization as a significant event for the companies’ business, so the market reactions are not consistent with the previous events. This can also be seen as an indication of market fatigue.

The last research question was “*Do Western investors punish, or reward companies based on the companies’ withdrawal decisions?*”. The results provide some support for the assumption that investors impose a market penalty on the companies that continue operating in Russia. However, the market penalty does not appear to be long-lasting, so the macroeconomic situation may be the most significant factor for the companies’ performance. Also, the identity of the investors cannot be stated solely based on the prices, but considering the nature of the situation, presumably Western investors in particular would be the ones to punish companies for staying in Russia. Since the results of this study showed variation between different events, it can also be said that the results support the findings of Lu et al. (2022) suggesting companies that announced withdrawal do not earn a “reputation premium” relative to companies that refuse to withdraw. The performance ratios did not provide any clear signs of investors imposing a market penalty based on the companies’ withdrawal decision, as there were no significant differences between the performance of the portfolios in terms of market capitalization or cost of debt.

In terms of market efficiency, this study provides evidence for stronger than weak-form efficiency in European stock markets. The results did not support the existence of semistrong-form efficiency since the market reactions to the chosen events were not immediate. However, the market reactions were significant within few days after the events,

so the mere fact that the events caused significant reactions indicates that the efficiency of the markets can be said to be more than weak-form efficient. In other words, the significance of the market reactions suggests that the reactions were not based solely on historical data, which means that the markets must be more than weak-form efficient.

5.2 Study limitations

This study has several limitations with the company selection criteria. As this study separates the involved companies by the date of their withdrawal announcement, the actual state of the withdrawal process is not considered. The concept of parallel import and the magnitude of the operations in Russia are not taken into account in the company selection criteria. Therefore, one suggestion for future research would be to examine the market reactions by separating companies by the magnitude of their Russian operations, for instance, in terms of revenue in Russia. Also, the portfolios in this study do not contain the same number of companies from each industry, which may cause some distortion to the results if the distribution of industries is not considered.

This study provided evidence for the hypothesis that investors prefer companies that did not continue operating in Russia after the invasion begun, but the short-term benefits of this can be affected by the sanctions against Russia. The sanctions implemented by many Western countries force many companies out of Russia since their business can be illegal after the sanctions are in effect. This can cause some investors to see the decision of withdrawal of a company as a consequence of the sanctions rather than as an act that represents the company's values, which would be an understandable reason for investors to not reward the company for the withdrawal. Also, while some companies may be forced to withdraw from Russia due to the sanctions, some may be forced to stay because of the resources in Russia that are crucial to their business. Research on this issue would be highly welcomed, as this study did not separate companies based on whether their announcement of withdrawal was due to internal or external motivators.

In the name of objectivity, it must be considered that the events of interest were selected by a Western perspective. For instance, although the war crimes committed by Russian forces in Bucha are still only allegations, the reporting about them is hypothetically assumed to cause reactions in the stock markets. Russian authorities do not confirm any war crimes to

be committed, and they refer to the situation as “special operation” and not as war like most of the Western media. Because of the nature of the situation, pure objectivity is difficult to achieve and thus new research on the subject from different perspectives is welcomed.

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Appendices

Appendix 1. List of the included companies

<u>Portfolio 1.</u>		<u>Portfolio 2.</u>		<u>Portfolio 3.</u>		<u>Portfolio 4.</u>	
Company common name	Share (RIC)	Company common name	Share (RIC)	Company common name	Share (RIC)	Company common name	Share (RIC)
Centrica PLC	CNAL	Deutsche Telekom AG	DTEGn.DE	Abb Ltd	ABBN.S	Anheuser-Busch Inbev SA	ABI.BR
Hapag Lloyd AG	HLAG.DE	Brunel International NV	BRUN.AS	Neste Oyj	NESTE.HE	Krka dd Novo Mesto	KRKGLJ
DWS Group GmbH & Co KgaA	DWSG.DE	Atos SE	ATOS.PA	H & M Hennes & Mauritz AB	HMb.ST	Agrana Beteiligungs AG	AGRV.VI
BNP Paribas SA	BNPP.PA	Publicis Groupe SA	PUBP.PA	Hays PLC	HAYS.L	Fresenius SE & Co KGaA	FREG.DE
Comarch SA	CMR.WA	Kingspan Group PLC	KSP.I	Societe Generale SA	SOGN.PA	TotalEnergies SE	TTEF.PA
Norsk Hydro ASA	NHY.OL	Mercedes Benz Group AG	MBGn.DE	Nokia Oyj	NOKIA.HE	APS Energia SA	APEP.WA
Galp Energia SGPS SA	GALP.LS	Holcim AG	HOLN.S	AP Moeller - Maersk A/S	MAERSKb.CO	Continental AG	CONG.DE
CRH PLC	CRHL	Per Aarsleff Holding A/S	PAALb.CO	Infineon Technologies AG	IFXGn.DE	Legrand SA	LEGD.PA
DSV A/S	DSV.CO	Polskie Gornictwo Naftowe i Gazownictwo SA	PGN.WA	Carlsberg A/S	CARLb.CO	NV Bekaert SA	BEKB.BR
Marks and Spencer Group PLC	MKSL	Ciech SA	CIEP.WA	Savills PLC	SVS.L	Duerr AG	DUEG.DE
Diageo PLC	DGEL	Vestas Wind Systems A/S	VWS.CO	Lindab International AB	LIAB.ST	Fluidra SA	FLUI.MC
Atlas Copco AB	ATCOa.ST	Stellantis NV	STLA.MI	Sandvik AB	SAND.ST	Raiffeisen Bank International AG	RBIV.VI
AAK AB (publ)	AAK.ST	Bang & Olufsen A/S	BO.CO	Volkswagen AG	VOWG_p.DE	Kion Group AG	KGX.DE
Metsa Board Oyj	METSB.HE	Boryszew SA	BORY.WA	Finnair Oyj	FIA1S.HE	Ems Chemie Holding AG	EMSNS
Alfa Laval AB	ALFA.ST	Capgemini SE	CAPP.PA	Electrolux AB	ELUXb.ST	Veolia	VIE.PA
Pernod Ricard SA	PERP.PA	Lanxess AG	LXSG.DE	Equinor ASA	EQNR.OL	Environnement SA	ACX.MC
J Sainsbury PLC	SBRY.L	Safran SA	SAF.PA	Kuehne und Nagel International AG	KNIN.S	Schoeller Bleckmann Oilfield Equipment AG	SBOE.VI
Morgan Advanced Materials PLC	MGAMML	British American Tobacco PLC	BATS.L	Kerry Group PLC	KYGa.I	Societe BIC SA	BICP.PA
Wartsila Oyj Abp	WRT1V.HE	Orkla ASA	ORK.OL	Boreo Oyj	BOREO.HE	Vinci SA	SGEF.PA
Dassault Aviation SA	AM.PA	TUI AG	TUIGn.DE	WPP PLC	WPP.L	Wienerberger AG	WBSV.VI