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Should I stay or should I go? Stock market reactions to companies' decisions in the wake of the Russia-Ukraine conflict[☆]

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ABSTRACT

We examine the share price reaction of 1281 firms with Russian operations when they announce their decision to leave or stay in the Russian market following the outbreak of the armed conflict between Russia and Ukraine on February 24, 2022. We observe positive stock returns to leave decisions (+0.67 % during the three days surrounding the announcement), but do not find any significant reaction for stay decisions. We provide evidence that leave decisions are announced earlier if the initial share price reaction to the outbreak of the armed conflict was more pronounced, indicating that investors may appreciate a clear commitment to exit the Russian market. The results do not indicate that firm decisions (leave or stay) are based on previous stock returns, but we find that firms with larger negative returns at the beginning of the conflict obtain more positive returns around the firms' decision announcements. Finally, we show that firms that change their initial decision are more likely to opt to leave the Russian market than to stay.

1. Introduction

On February 24, 2022, Russian armed forces entered Ukraine, marking the transition of the Russia-Ukraine conflict into a full-scale military one. World leaders called this event a “turning point in the history of Europe” and an “attack on the world order”,¹ leading to a significant increase in the geopolitical tension between NATO member states and Russia. The escalation of the Russia-Ukraine conflict surprised most politicians and corporate managers. Foreign firms that operate in Russia were suddenly confronted with a new set of challenges due to the conflict, made even more complex by policymakers announcing unprecedented sanctions on the Russian economy. Simultaneously, customers were expecting a reaction with respect to a firm's Russian operations, the general expectation being to show no support for the conflict by immediately exiting the Russian market.

In this paper, we study when and how foreign firms operating in Russia responded to this exogenous shock and how they address the potential business risk arising from their Russian operations. We further examine the relationship between a firm's strategic decision and how investors reacted to these decisions by analyzing how a firm's stock price responded to “leave” and “stay” decisions of

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¹ See <https://www.cbsnews.com/news/world-leaders-condemn-russian-invasion-ukraine-turning-point-history-of-europe/>. European Council President Charles Michel similarly stated that “This unprovoked and unjustified attack is unlike anything on European soil since the end of the Second World War”, expressing that this view is not only taken by one country but the entire European Union. See <https://europa.eu/!6F76mg>.

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international firms with Russian operations. This paper therefore provides new evidence on how firms' individual business decisions are perceived from the perspective of their shareholders. We use a comprehensive list of corporate actions published weekly by the Kyiv School of Economics (KSE) Institute which covers more than 3150 unique international firms operating in Russia and their strategic decisions regarding their Russian business.² 1281 of these firms are traded on international stock exchanges which allows us to calculate different stock return measures since the escalation of the Russia-Ukraine conflict. We first examine the share price reactions, using abnormal stock returns, around the outbreak of the war and analyze whether this initial market reaction has an impact on the firm's timing or decision to leave or stay in the Russian market. We then focus on the strategic response by these companies and examine how investors respond to the decision announced by the firm. Our sample covers decisions during the first year following the start of Russia-Ukraine armed conflict, from February 2022 to January 2023, and we explore the cross-variation in the abnormal returns around firms' decision announcements. Finally, we provide new evidence of which factors potentially lead a firm to reconsider its initial decision. Firms are monitored on a weekly basis by the KSE Institute which enables us to determine when firms are diverging from their originally announced strategy (e.g., from stay to leave or vice versa).

We interpret our empirical results through the lens of five different hypotheses to explore why firm decisions and share price reactions vary in the cross-section. The first hypothesis is termed the *market feedback hypothesis*, which asserts that firms' responses depend on the stock market reaction at the outbreak of the military conflict between Russia and Ukraine. We test this by examining whether firm decisions are affected by the abnormal stock returns at the beginning of the war. We also investigate the *market timing hypothesis* which argues that firms announce their decision faster when the stock market reaction at the beginning of the Russia-Ukraine military conflict is more pronounced. The *early leave decision hypothesis* postulates that firms that announced their decision early opt to leave the Russian market to avoid being targeted by sanctions, customer boycotts, or turmoil in the Russian market. We then examine how investors value a firm's strategic response to the escalation of the Russia-Ukraine conflict. The stock market incorporates investors' future expectations and allows us to draw conclusions regarding the future development of a firm's cashflow. We test our *leave value creation hypothesis*, postulating that investors value the announcement to leave the Russian market as the firm avoids any potential negative impact of sanctions, customer boycotts, or an increasingly difficult economic environment in Russia. Finally, we analyze which firms changed their initially announced decision during our observation period. Our last hypothesis, the *decision reconsideration hypothesis*, asserts that firms which have announced their decision on their Russian operations shortly after the commencement of military operations are more likely to reconsider their decision, as sanctions became increasingly severe and customer sentiment turned more negative towards firms that continued their Russian operations.

Our main findings are as follows. First, we do not find that the initial share price reaction around the outbreak of the war determines whether firms decide to stay in Russia or leave the country. However, we observe that firms make quicker decisions when there is a more pronounced negative share price reaction around the outbreak of the Russia-Ukraine war. We also find evidence that firms announcing their decisions early are more likely to decide to leave the Russian market and that investors react positively to these announcements, while we find abnormal returns close to zero when firms decided to continue their operations or postpone a final decision. However, we do not find that the stock returns around a firm's decision lead to later reconsiderations and changes in firm strategy. But the results show that firms that announced their decisions earlier are more likely to change their decisions later on. In particular, we observe that firms are more likely to change their decision from wait to leave rather than from wait to stay (29.2 % vs 4.5 % of all decisions).

Our findings contribute to the wider literature on stock markets during times of armed conflicts (e.g., Choudhry 2010; Hudson and Urquhart, 2015; Rigobon and Sack, 2005) and to the research on the Russia-Ukraine war in particular (e.g., Cumming, 2022). We further add to the literature on uncertainty due to armed conflicts and firm precautionary behavior (Favara, Gao, and Giannetti, 2021) by demonstrating investors preference for firms discontinuing their Russian operations. We expand this strand of literature by analyzing how stock markets react to different firm strategies that are caused by armed conflicts and when a firm's management has to make decisions that will have a long-term impact on the firm.

The rest of the paper is organized as follows. Section 2 presents international firms' options in response to the Russia-Ukraine armed conflict, while Section 3 reviews the related literature and develops our hypotheses. Section 4 explains the data collection process and our methodology, and Section 5 presents the empirical results. Section 6 concludes the paper.

2. Background on corporate responses to the Russia-Ukraine armed conflict

The outbreak of an armed conflict typically leads to significant increases in geopolitical risk. This, in turn, results in reduced international capital flows, particularly for the countries directly involved in a conflict (Feng et al., 2023). Additionally, it tends to induce heightened levels of volatility within stock markets (Smales, 2021). Firms with operations in regions or countries directly impacted by an armed conflict will similarly need to significantly curtail their operations.

Domestic companies located in a country involved in an armed conflict typically try to continue their operations as they cannot easily relocate or shut down their operations without risking bankruptcy. In contrast, foreign companies and their subsidiaries have a broader range of options. In the context of the Russia-Ukraine armed conflict, the management of foreign firms with operations in Russia has three primary strategic choices. First, a foreign company could continue as before without changing its strategy. This approach may be beneficial as the firm continues to generate cashflows. However, continuing Russian operations could lead to

² We base our results on the version as of January 22, 2023.

increased supply costs, international sanctions, and reputational damages. Furthermore, the Russian currency lost in value, reducing the value of the local currency cashflows, while it is simultaneously becoming increasingly difficult to exchange Russian Rubles to other currencies.

Second, the management could decide to exit the firm's Russian operations. However, this decision could have severe long-term implications, such as the loss of Russian customers, suppliers, and the access to one of the world's largest economies. Generally, complete withdrawals are not easily reversible, especially for large and established businesses.³ Consequently, it is reasonable to assume that shareholders, who are typically interested in stable and long-term cashflows, may penalize the withdrawal decision by divesting their shares.

Third, managers may decide to defer a final decision in order to buy time and to observe how the geopolitical and economic situation develops. Firms in this category might postpone already planned investments in Russia or scale back their business without committing to either continuing business as usual or a full withdrawal. This last category of deferring a final decision on a company's Russian operations also includes firms that temporarily suspend their operations but keep the option to return in the future.

3. Literature review and hypotheses development

Empirical research on the economic consequences of armed conflicts documents a significant reduction in economic growth (Abadie and Gardeazabal, 2003). This reduction is mirrored in the stock market, with stock prices typically experiencing steep declines during periods of war. This has been observed during the Second World War (Choudhry, 2010; Hudson and Urquhart, 2015; 2022), as well as for later conflicts, such as the Yugoslavian Civil War and the First Gulf War (e.g., Charles and Darné, 2014; Schneider and Troeger, 2006). Even the presence of an increased war risk can have negative effects on firms' equity valuations (Rigobon and Sack, 2005). Moreover, political conflicts, such as the US-China trade war, can negatively affect equity prices as these are likewise associated with downside risks for the global economy (Xu and Lien, 2020).

The academic literature examining the impact of the ongoing Russia-Ukraine armed conflict is still emerging. Several early studies analyzed the national stock market reactions following the start of the armed conflict towards the end of February 2022.⁴ The overarching trend in the findings so far align with the broader literature on armed conflicts that points to a significant decline in share prices at the outbreak of the war. Federle et al. (2022) investigate the stock market reaction of 66 countries and their distance to Ukraine and find that greater proximity to Ukraine leads to lower market returns. Similarly, Boungou and Yatié (2022) document negative returns when examining stock indices from 94 countries, while Yousaf, Patel, and Yaroyaya (2022) find that particularly European and Asian stock markets are negatively affected by the outbreak of the armed conflict between Russia and Ukraine. Ahmed, Hasan, and Kamal (2022) focus on European stocks due to their proximity to Ukraine and confirm the negative stock market reaction and Granát et al. (2023) find evidence that stock markets began factoring in the possibility of an armed conflict between Ukraine and Russia approximately 50 days before its commencement. Other studies, such as Deng et al. (2022), examine the environmental, social, and governance (ESG) aspects of firms and find that ESG ratings do not offer a consistent measure of firms' resilience in the event of a crisis. Korosteleva (2022) highlights the strong dependency of the EU on Russia's energy supplies and argues that the Russia-Ukraine conflict may serve as a catalyst for the European transition to green finance. Basnet, Blomkvist, and Galariotis (2022) also focus on the firms' ESG scores and whether these scores influence firm decisions to stay in or leave Russia. They find that firms with lower ESG scores tend to stay in Russia and have more pronounced negative stock market reactions.

3.1. Market feedback and firm responses

While most prior studies focus on the short-term price reaction of national stock market indices around the outbreak of the armed conflict between Russia and Ukraine, observing large declines (e.g., Boungou and Yatié, 2022; Yousaf et al., 2022), Federle et al. (2022) provide first firm-level evidence. They find that particularly firms that are geographically closer to Ukraine experience more severe share price losses. We aim to examine whether this initial market reaction may help to explain a firm's decision regarding its Russian operations.

There is an established strand of empirical literature examining whether managers base their decisions on stock prices (see e.g., Bond, Edmans, and Goldstein (2012) for a literature review on this topic). The underlying assumption of this research is that stock prices reflect the aggregate information from a large number of investors and may thereby contain some information that managers themselves have not yet been aware of. This information may ultimately help managers to make more informed decisions, ultimately enhancing firm value. Chen, Goldstein, and Jiang (2007) document that managers learn from private information in their company's stock price and base their corporate investment decision on this information. This result is later corroborated by Bakke and Whited (2010) and Pereira da Silva (2021) as they likewise find that managers use information contained within a firm's share price when making investment decisions. Frésard (2012) reports that managers not only learn from their share prices for the purpose of investment

³ See e.g., McDonalds Corp. who announced to sell 850 stores in Russia to a local licensee in which all branding and licensing have been irreversibly changed (<https://www.cbc.ca/news/business/russia-mcdonald-s-logo-1.6389887>).

⁴ Note that there is also literature focusing on the macroeconomic effects of the sanctions on Russia (e.g., Karkowska and Urjasz, 2023; Pesova, Mamonov, and Ongena, 2022; Lindstaedt, Trubek, and Bugaric, 2022), the effect of the conflict on food prices (Saâdaoui, Jabeur, and Goodell, 2022), and investors moving to safe haven assets (Mohamad, 2022). Girardone (2022) also examines the sanctions and the effect on the banking sector. For an overview on the interdisciplinary implications of the Russia-Ukraine war see Cumming (2022).

decisions, but also to help them decide on corporate cash savings.

In the context of the Russia-Ukraine conflict, if a firm's share price fell dramatically when the military conflict commenced on February 24, 2022, managers may view this as new information supplied by investors which may put pressure on them to quickly announce a strategic decision regarding their Russian operations. Additionally, foreign firms with Russian operations from countries that imposed sanctions on Russia may suffer reputational damages and find their trading activities with Russia severely impaired as a result of the sanctions. This gives rise to our *market feedback hypothesis*, which asserts:

Market feedback hypothesis: The more severely a firm's stock price declined in response to the escalation of the Russia-Ukraine conflict, the more likely it is that the firm subsequently decides to exit its Russian operations.

In addition, we assume that not only the decision itself will depend on the initial share price change, but also the timeliness of that decision. We argue that managers will make a *quicker* decision on how to proceed with their Russian operations if the initial share price decline has been more severe. Here, the information contained within the share price may be more obvious to managers, allowing them, or to a certain degree forcing them, to make their decision faster. We therefore propose the *market timing hypothesis*, which states the following:

Market timing hypothesis: Firms announce their decision faster if they experienced more severe share price declines in response to the escalation of the Russia-Ukraine conflict.

3.2. Firm decisions and stock market reactions

As pointed out in Section 2, following the start of the full-scale military conflict between Russia and Ukraine in February 2022, a firm's management had essentially three main choices regarding their Russian operations: continue operations as before, waiting and deferring a final decision by only stopping new investments or temporarily suspending operations, or exit Russia. The prior literature suggests that in the case of armed conflicts (Camacho and Rodriguez, 2013) or economic downturns (Alvarez and Görg, 2009), firms may be discouraged from staying in a market, especially foreign companies. The findings by Camacho and Rodriguez (2013) suggest that firms are more likely to exit a certain region if they operate in geographic proximity to an armed conflict. Under such circumstances, leaving the country appears to be the preferable response for managers. In case of the Russia-Ukraine military conflict, managers of firms that operate in Russia were additionally confronted by unprecedented sanctions on the Russian economy, while the majority of customers expected firms to show no support for the conflict by immediately exiting the Russian market. Given these combined pressures of economic sanctions and an increasing number of customers demanding that firms leave Russia, we postulate the *early leave decision hypothesis*:

Early leave decision hypothesis: A firm's management is more likely to announce to leave Russia rather than to continue its operations at the onset of the conflict between Russia and Ukraine.

While the decision a firm's management makes may be influenced by the information it can glean from its company's stock price movements, the management's ultimate decision is also providing investors with new information, which will likely again elicit a movement in the company's share price. The literature on how investors respond to a firm's decision regarding its Russian operations in the wake of the outbreak of the conflict between Russia and Ukraine is still limited. While Sonnenfeld et al. (2022) argue that leaving Russia is beneficial, Glambosky and Peterburgsky (2022) examine first firm responses released in February to mid-March 2022 and show that firms that announced their intention to withdraw from Russia experience the highest share price reductions. Tosun and Eshraghi (2022) create portfolios of firms staying and leaving the Russian market and find that the portfolio of leaving firms outperforms the one of those remaining in Russia.

The empirical evidence so far is therefore ambiguous, albeit with a slight tendency towards positive returns in case of leave decisions. In order to address this issue further, we focus on the stock returns around a firm's announcement regarding its Russian operations, specifically whether the firm will leave Russia, continue operations, or is trying to postpone a decision (i.e., wait). We anticipate negative (or at least non-significant) stock price reactions for firms that announce plans to continue operations in Russia or try to postpone their decision. In contrast, we expect positive stock price reactions for firms that announce to exit the Russian market. We summarize these expectations in the *leave value creation hypothesis*:

Leave value creation hypothesis: The announcement of a firm's decision to exit its Russian operations is associated with a positive share price reaction.

3.3. Reversals of firm strategies

The commencement of military activities between Russia and Ukraine was a large shock for foreign firms operating in Russia, prompting many companies to announce a decision regarding their Russian operations within the first couple of weeks of the military operations (see also Fig. 2 for a timeline of firm announcements). However, it is possible that some of these firms may reverse their initial decision at a later point in time. Firms that announced to stay may bow to public pressure and decide to leave, while companies that initially announced to exit their Russian operations may not follow through on their commitment and continue to operate in Russia. Especially companies that made their initial decision quickly following the outbreak of the armed conflict may be more likely to reverse that decision. To the best of our knowledge, no empirical study has yet examined how investors react to firms reversing their

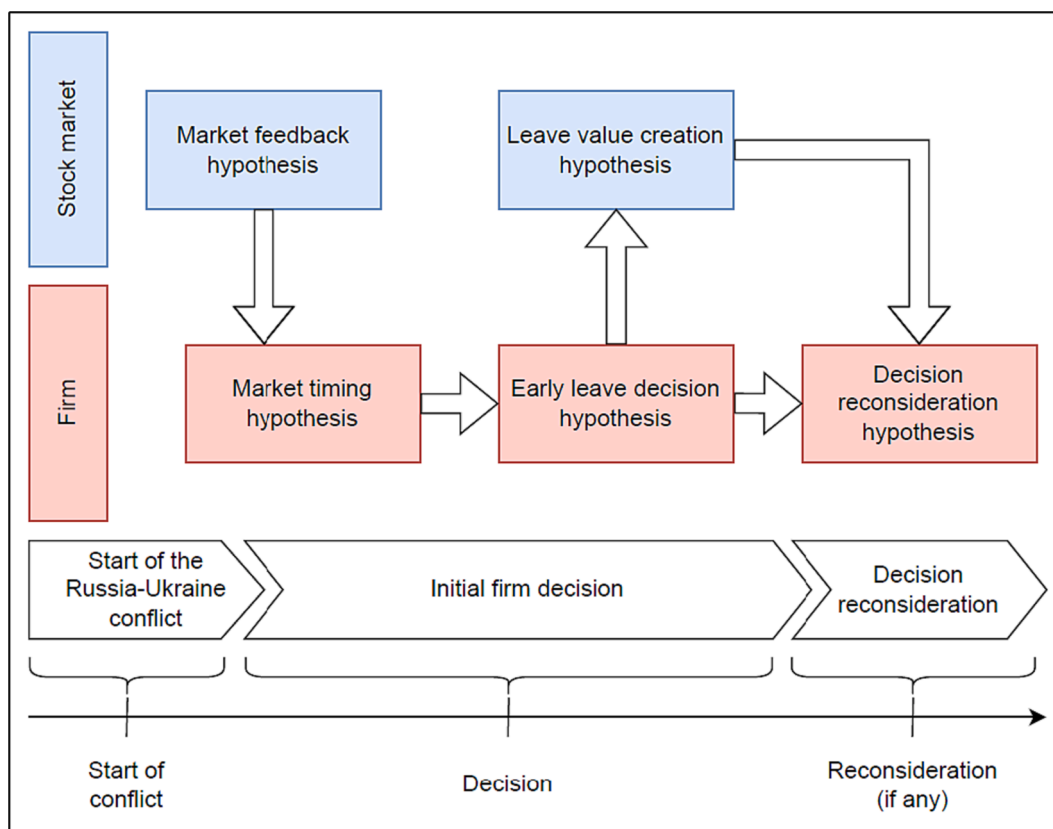


Fig. 1. Illustration of testable hypotheses. This figure shows how our five different hypotheses relate to each other and to which point in time they relate in the context of the military conflict between Russia and Ukraine. Hypotheses related to the stock market are shown in blue, while those related to firm decisions are shown in red. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

decision. We assume that firms that initially announced that they would continue operating in Russia or postpone their decision may reverse this decision. This may be due to increased reputational risk due to a combination of customer pressure and sanctions but may also be driven through management observing the share price response of other firms that decided to leave rather than stay. We therefore postulate our *decision reconsideration hypothesis*:

Decision reconsideration hypothesis: Firms that promptly decided to either continue their Russian operations or to postpone a final decision are more likely to subsequently reverse that decision and instead exit the Russian market.

3.4. Relationship among hypotheses

The five hypotheses we developed in Sections 3.1 through 3.3 build on each other and form the foundation of our empirical examination into firms' decisions regarding their Russian operations in the wake of the military conflict between Russia and Ukraine. Fig. 1 illustrates both the relationship between the five hypotheses and their chronological alignment relative to the start of the armed conflict in early 2022.

The *market feedback hypothesis* examines how investor reactions at the onset of the armed conflict on February 24, 2022, influenced firms' subsequent decision on its Russian operations. Building on this, the *market timing hypothesis* relates to the speed with which managers arrive at a decision, partially driven by the severity of the drop in share price when the armed conflict began. The *early leave decision hypothesis* states that a firm's decision is more likely to leave Russia than to continue operations, while the *leave value creation hypothesis* complements the *early leave decision hypothesis* by assuming that an exit decision will elicit a positive investor response, resulting in rising share prices. Finally, the *decision reconsideration hypothesis* anticipates that companies may revise their initial decisions, particularly if the management's initial choice was to continue their Russian operations or delay a final decision. With these five hypotheses, we add to the literature by exploring the complex relationship between share price reactions to armed conflict, subsequent management decisions, and their potential impact on share prices, as well as potential changes to the initial decision.

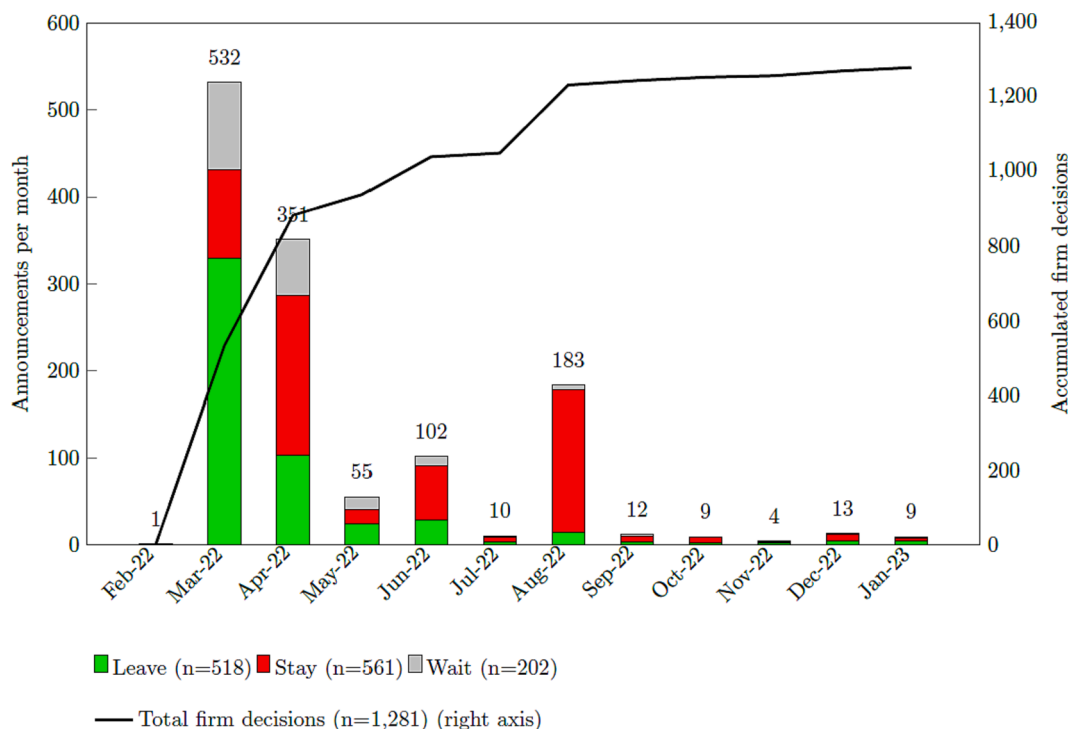


Fig. 2. Initial firm decisions over time. This figure shows the timing of firms' initial decisions on their Russian operation from February 2022 to January 2023. The sample consists of 1281 companies trading on an international stock exchange from the database of company announcements gathered by the KSE Institute (updated as of January 22, 2023). The sample of all firms is further divided into companies that exited their Russian operations (*Leave*, 518 firms), continued their operations (*Stay*, 561 firms), and those that have not yet decided (*Wait*, 202 firms).

4. Sample construction and methodology

4.1. Data

We obtain all firms with Russian operations and their subsequent decisions regarding these operations after the outbreak of the Russia-Ukraine armed conflict from the KSE Institute database. The KSE Institute is part of the Kyiv School of Economics and regularly tracks the operations of foreign companies in Russia.⁵ To the best of our knowledge, this list is the most comprehensive one available and includes more than 3150 global firms (as of January 22, 2023) and how they decided to proceed with their Russian operations.⁶ We restrict our analyses to the 1281 firms traded on an international stock exchange to examine the investors' reactions around specific dates during the Russia-Ukraine conflict and the potential drivers of the observed stock market returns. The list differentiates four main categories: *Exited*, *Leave*, *Wait*, and *Stay*. *Exited* indicates that a company already completed its exit from Russia, typically by either shutting down their operations or selling their operations, *Leave* indicates that a company declared its intention to leave Russia or is in the process of closing down or selling off its Russian assets, *Wait* indicates that a firm has not yet announced a decision on its Russian operations, and *Stay* presents companies that decided to keep their Russian operations going. For the purposes of our study, we combine *Exited* and *Leave* into the *Leave* category, as *Exited* indicates that firms that have previously announced to leave Russia already completed their exit. Accounting and stock price data for all firms are obtained from Refinitiv.

⁵ The methodology on how they track Russian operations is published in Mylovanov et al. (2023) and the entire database can be accessed using this link: <https://docs.google.com/spreadsheets/d/1EFhBQYyvRd5n4U6CY2yomeHEhTqbMKS/edit?pli=1#gid=2139051396>. Onopriienko, Hrybanovskiy, and Shapoval (2023) also refer to this list.

⁶ This list is more comprehensive than the list compiled by the Yale's School of Management (Sonnenfeld et al., 2022), which contained a little less than 1,400 firms as of January 22, 2023. In addition, the list the KSE Institute provides verifiable specific firm announcements for each firm on its list and a methodology of how the data was obtained. The overlap between the list compiled by Sonnenfeld et al. (2022) and the KSE Institute is more than 99%, making the list published of the KSE Institute preferable for our analyses. In addition, it is indicated in the database file that the "KSE Institute database is partly based on the Yale's School of Management and University of St. Gallen databases" which explains the large overlap.

Table 1
Firm industries.

Industry	Leave	Stay	Wait	Total
Agriculture, Forestry and Fishing	2	3	1	6
Construction	6	19	3	28
Finance, Insurance and Real Estate	51	25	35	111
Manufacturing	246	369	106	721
Mining	14	15	7	36
Retail Trade	36	14	6	56
Services	108	54	25	187
Transportation, Communications, Electric, Gas and Sanitary service	46	48	13	107
Wholesale Trade	9	14	6	29
Total	518	561	202	1281

This table shows the industry composition of the 1281 firms with operations in Russia at the outbreak of the armed conflict between Russia and Ukraine. Our sample includes all companies trading on an international stock exchange from the database of company announcements gathered by the KSE Institute (updated as of January 22, 2023). The industry classification is based on the primary Standard Industrial Classification (SIC) code obtained from Refinitiv. The sample of all firms is further divided into companies that exited their Russian operations (Leave), continued their operations (Stay), and those that have not yet decided (Wait).

4.2. Descriptive sample statistics

We first examine how firms responded to the commencement of the Russia-Ukraine military operations on February 24, 2022. Fig. 2 plots the initial firm decisions by month between February 2022 to January 2023. We observe that leave and stay decisions of firms are nearly evenly distributed in our sample, while only some firms announced to postpone their final decision. 561 firms announced to stay (44 %) and 518 announced to leave (40 %), while 202 firms in our sample decided to wait (16 %). However, the announcements of firm decisions are not evenly distributed over time. While only one firm announced its decision already in February 2022 (February 27, 'Rakuten Group Inc. announced to scale back its Russian business'), most of the firms announced their response to the escalation of the Russia-Ukraine conflict in March 2022. In total, 532 of our 1281 firm decisions are from March 2022. Most of the firms taking action in March stated to leave Russia (62 %), while approximately 20 % decided to stay in Russia. The results already show a different picture for April 2022 as most firms made statements that they will continue their Russian operations (52 %) and only 29 % stated their intention to leave the Russian market. Over the following months, we observe that firms decided to stay in Russian rather than to leave. This is most pronounced in August 2022, which is the month with the third highest number of observations during our sample period (183 firm decisions). 90 % (166 firms) of firms that made an announcement in this month decided to continue with their Russian operations. We do not find major events that could explain this finding. This peak in August could simply be due to the fact that six months since the onset of the military actions, it was becoming increasingly obvious that the conflict would not end quickly so that firms ultimately needed to announce a decision on how they wanted to proceed with their Russian operations.

As most related studies examine the announcement effects around the outbreak of the armed conflict (e.g., Federle et al., 2022; Bounou and Yatié, 2022; Yousaf et al., 2022) or the initial firm responses released during February to mid-March 2022 (Glambosky and Peterburgsky, 2022), our sample shows that the distribution of firm decisions is not homogenous over time and therefore worth investigating over longer periods.⁷ Table 1 shows the distribution of the firms' industries based on the Standard Industrial Classification (SIC) code. Most firms in our sample are operating in the manufacturing industry (721 firms, 56 %), followed by services (187 firms, 15 %), and firms from the banking and insurance sector (111 firms, 9 %). We do not find evidence that the decision of leaving or staying is dominated by specific industries. However, we observe that firms in the service industry and in the banking and insurance sector are more likely to decide to leave, while manufacturing firms show a stronger tendency to stay in the Russian market. It might generally be easier for service firms to leave Russia (at least temporarily) as they have fewer tangible assets and therefore higher flexibility than firms with large fixed assets, such as manufacturing firms. This might also explain why manufacturing firms contribute to more than 50 % of our wait sample as these firms cannot easily reverse a decision to either stay or leave.

Besides a firm's industry, we also examine the firm's country of origin. As several studies provide evidence that the overall short-term stock market reaction is determined by proximity to Ukraine (e.g., Federle et al., 2022), we provide the country statistics of our sample in Table A.1. Our sample includes firms from 56 countries. Firms headquartered in the US represent the largest portion of our dataset, accounting for approximately 30 % of all observations. Out of these US firms, 53 % announced an exit from Russia, while 29 % decided to stay. For China, in contrast, we observe that only four out of the 61 companies in the sample decided to leave Russia (6.6 %), indicative of the close political relationship between these two countries. Japan (132), Germany (91), and the United Kingdom (71) are the countries with the most observations after the US. We also collected sanction data on Russia based on the country in which a firm has its headquarter. 37 out of the 56 countries in our sample announced comparatively comprehensive (economic) sanctions against Russia as of February 2023, while 18 countries did not announce any sanctions. The most severe sanctions were imposed by the US, followed by the European Union and its member states. Given the special position of the US in terms of sanctions, donations of military

⁷ Glambosky and Peterburgsky (2022) examine 293 firm decisions until March 23, 2022. Tosun and Eshraghi (2022) use a sample of 28 firms that decided to remain in Russia until March 8, 2022. Sonnenfeld et al. (2022) examines 600 public firm decisions in the first two months since the outbreak of the Russia-Ukraine armed conflict (March to April 2022).

aid, and sample size, we explicitly control for US firms in our regression analyses.⁸

4.3. Empirical strategy

In this paper, we are particularly interested in the reaction of firms' share prices around individual firm decisions. To test the *leave value creation hypothesis*, postulating that leave decisions are perceived positively by investors, we focus on the short-term share price reaction for multiple reasons. First, the aim of a firm's management is to make decisions that are in the best interest of their shareholders. Shareholder wealth can be directly measured by examining firms' stock returns. As investors immediately react to firm announcements, it is possible to measure the wealth effects without delay (i.e., without the need to wait, for example, for the next quarterly or annual report). Second, the stock market incorporates investors' future expectations and therefore allows us to draw conclusions regarding the expected future development of a firm's cashflow. We calculate abnormal stock returns at the outbreak of the Russia-Ukraine armed conflict and around the day of the firm's strategic decision announcement. We adopt the method employed by Ramelli and Wagner (2020) and analyze the onset of the war between Russia and Ukraine. Ramelli and Wagner (2020) analyze the share price reactions to the 2019 coronavirus pandemic and examine the cross-sectional stock returns during three consecutive periods. In line with their approach, we study abnormal stock returns of firms with Russian operations from January 1, 2022, to April 19, 2022 (day $t = -38$ to $t = +38$ relative to outbreak of the armed conflict between Russia and Ukraine on February 24, 2022, day $t = 0$)⁹ and split the periods in three intervals: The *pre-war period* that ranges from January 1, 2022, to February 18, 2022, the *run-up and war outbreak period* that ranges from February 21, 2022, to March 18, 2022, and the *turning the tide period* that starts on March 21, 2022, and ends on April 19, 2022.¹⁰ We also examine a shorter period, the $[-1; +1]$ event window, that captures the time period immediately surrounding the outbreak of the Russia-Ukraine military conflict on February 24, 2022 ($t_1 = 0$).¹¹ We then use the results obtained from this analysis and test whether the abnormal returns have an impact on the firm's individual decision. For the firm's decision announcement, we rely on the first date recorded by the KSE Institute and set the respective announcement date as our second event date ($t_2 = 0$).

The abnormal return (AR) of stock i at time t is calculated by using the standard market model event study:¹²

$$AR_{it} = R_{it} - (\hat{\alpha}_i + \hat{\beta}_i \times R_{mt}) \quad (1)$$

where R_{it} is the stock return of firm i on day t , R_{mt} is the Datastream total market return index of the firm's home country on day t , $\hat{\alpha}$ and $\hat{\beta}$ are the regression estimates from an ordinary least squares (OLS) regression using an estimation period from January 1, 2021, to December 31, 2021.¹³ The cumulative abnormal return (CAR) for firm i is the sum of all abnormal returns in a given event window. To test whether CARs are significantly different from zero, we use the parametric t -test and the Wilcoxon rank-sum test.

Besides the stock market reaction around the outbreak of the armed conflict and the firm's decision, we are also interested in the factors that influence the time it takes a firm to announce its decision on its Russian operations testing our *market timing hypothesis*. Additionally, we examine how managers decide following the escalation of the Russia-Ukraine armed conflict in February 2022, which relates to the *early leave decision hypothesis*. We explore the determinants of the timing by employing a cross-sectional regression using the time to announcement as the dependent variable:

$$DAYS_i = \alpha + \sum_j \beta_j Y_{ij} + \varepsilon_i \quad (2)$$

where $DAYS$ is the number of trading days between the outbreak of the armed conflict on February 24, 2022, and the firm's first announced decision. Y_{ij} is a vector of firm-specific and country-specific control variables that have been used in the recent literature to examine share price reactions around major economic shocks (e.g., Federle et al. 2022; Ramelli and Wagner, 2020; Hart, Thesmar, and Zingales, 2023; Pajuste and Toniolo, 2022). Our firm-specific factors include the firm's governance score, return on assets (ROA), net sales, property, plant, and equipment (PPE), leverage, and stock market beta (indicating how sensitive the firm's underlying revenues

⁸ Note that the list of country sanctions considerably correlates with the countries that support Ukraine. According to the Ukraine Support Tracker data provided by the Kiel Institute, the US provided most of the military, financial and humanitarian aid to Ukraine, followed by the European Union and its member states (as of February 2023). See <https://www.ifw-kiel.de/topics/war-against-ukraine/ukraine-support-tracker/>.

⁹ We chose a symmetrical event window starting 38 trading days prior to the begin of the military conflict between Russia and Ukraine, as this allows us to capture all stock returns starting from the first trading day of 2022.

¹⁰ A brief timeline of the major events related to the Russia-Ukraine armed conflict is provided in Table A.2, which provides further support of our reasoning of splitting the period into these intervals.

¹¹ While the $[-1; +1]$ event window is commonly used in related studies, we also used as a robustness test the larger $[-2; +2]$ event window, covering five days around the outbreak of the conflict. Results remain qualitatively similar.

¹² This approach is commonly used in the related literature on military conflicts and the impact of stock returns on firm decisions (see e.g., Wiles, Morgan, and Rego, 2012; Giammarino et al., 2004; Boubaker et al., 2022; Guidolin and La Ferrara, 2007). In further robustness tests, we calculated abnormal returns using a multifactor model, a market-adjusted model and a generalized autoregressive conditional heteroskedasticity (GARCH) market model that includes autoregression and moving average (ARMA) terms. The robustness checks indicate that our results are not likely to be influenced by our methodology for measuring abnormal returns. For reasons of brevity, results are not reported but available upon request.

¹³ Using this approach, we keep an individual firm's beta constant in our investigation period. This has the advantage that our estimation of beta is not influenced by the outbreak of the war or by any particular event that occurred later in 2022.

Table 2
Abnormal returns around the outbreak of the Russia-Ukraine armed conflict.

Event window	Mean CAR	Median CAR	t-test (t-value)	Wilcoxon (Z-score)	N
<i>Panel A: All firms</i>					
[−38;+38]	−2.05 %	−2.46 %	−3.29***	−3.85***	1281
Pre-war period	1.33 %	1.18 %	3.272***	3.621***	1281
Run-up and war outbreak	−2.87 %	−2.51 %	−9.894***	−10.612***	1281
[−1;+1]	−0.80 %	−0.63 %	−6.32***	−7.61***	1281
Turning the tide	−0.51 %	−0.40 %	−1.898*	−2.306**	1281
<i>Panel B: Firms announced to leave</i>					
[−38;+38]	−2.73 %	−3.11 %	−2.76***	−3.08***	518
Pre-war period	0.91 %	0.85 %	1.309	1.522	518
Run-up and war outbreak	−2.87 %	−2.42 %	−6.238***	−6.732***	518
[−1;+1]	−0.87 %	−0.74 %	−4.14***	−4.91***	518
Turning the tide	−0.77 %	−0.39 %	−1.935*	−1.869*	518
<i>Panel C: Firms announced to stay</i>					
[−38;+38]	−2.38 %	−3.03 %	−2.52**	−3.11***	561
Pre-war period	0.91 %	0.72 %	1.554	1.759	561
Run-up and war outbreak	−2.73 %	−2.53 %	−6.265***	−6.863***	561
[−1;+1]	−0.66 %	−0.54 %	−3.65***	−4.53***	561
Turning the tide	−0.56 %	−0.80 %	−1.309	−2.179**	561
<i>Panel D: Firms announced to wait</i>					
[−38;+38]	0.63 %	1.83 %	0.42	0.32	202
Pre-war period	3.57 %	2.75 %	3.969***	3.898***	202
Run-up and war outbreak	−3.24 %	−2.51 %	−4.471***	−4.453***	202
[−1;+1]	−0.99 %	−0.61 %	−3.19***	−3.65***	202
Turning the tide	0.30 %	0.44 %	0.456	0.789	202

This table reports the event study results for different time periods prior to the outbreak of the Russia-Ukraine armed conflict and during the first several weeks after the onset of the conflict. Cumulative abnormal returns (CARs) are estimated using a market model event study with an estimation period from January 1, 2021, to December 31, 2021, and using the Datastream national stock index of the country of the firm's headquarter as the benchmark index. The [−38;+38] event window captures the time period from January 1, 2022, to April 19, 2022, while the [−1;+1] event window captures the time period immediately surrounding the outbreak of the Russia-Ukraine armed conflict on February 24, 2022 ($t = 0$). The *pre-war period* ranges from January 1, 2022, to February 18, 2022, the *run-up and war outbreak period* ranges from February 21, 2022, to March 18, 2022, and the *turning the tide period* starts on March 21, 2022, and ends on April 19, 2022. Panel A shows the results for all firms, while Panel B, C, and D show subsamples based on companies that exited their Russian operations (Leave), continued their operations (Stay), and those that have not yet decided (Wait), respectively. Mean and median CARs are tested for statistical significance using the standard *t*-test and the nonparametric Wilcoxon rank-sum test (Wilcoxon), respectively. *, **, and *** indicate statistical significance at the 10 %, 5 %, and 1 % levels, respectively.

and cashflows are to general economic conditions), while our country-specific control variables include the imposition of sanctions by a firm's home country, the geographical distance to Ukraine, and a binary variable for firms headquartered in the US. We also include industry fixed effects (based on SIC codes, see Table 1) to all our models and cluster standard errors by the firm's country of origin.¹⁴

We follow a similar approach for the determinants of a firm's decision as for the time it takes a firm to announce its decision on its Russian operations. As the decision can be either (i) leave, (ii) wait (i.e., buy more time), or (iii) stay and continue operations, we run an ordered logit model:

$$DECISION_i = \alpha + \sum_j \beta_j Y_{ij} + \varepsilon_i \quad (3)$$

where *DECISION* has a value of '1' for leave decisions, '−1' for stay decisions, and the base case of zero if a firm postponed a final decision (i.e., wait). Negative coefficients therefore indicate a tendency towards a decision to stay in Russia and positive coefficients would support a tendency towards a decision to leave Russia. Y_{ij} is again the vector of firm-specific and country-specific control variables. All our dependent and independent variables are defined in Panel A of Table A.3, while Panel B of Table A.3 provides the descriptive statistics for the variables. Note that all accounting variables are obtained for 2021 and therefore available ex-ante and not biased by the Russia-Ukraine armed conflict in 2022.

5. Results

5.1. Share price reaction around the start of the military conflict

We start by analyzing the firms' share price reactions to the outbreak of the Russia-Ukraine military conflict on February 24, 2022. While related papers already provide some evidence that stock markets in general were negatively impacted by the escalation of the

¹⁴ Since abnormal stock returns might be clustered by the firm's home country as shown in previous literature, the *t*-test significance levels would be likely to be overstated. We therefore cluster our standard errors by country of origin.

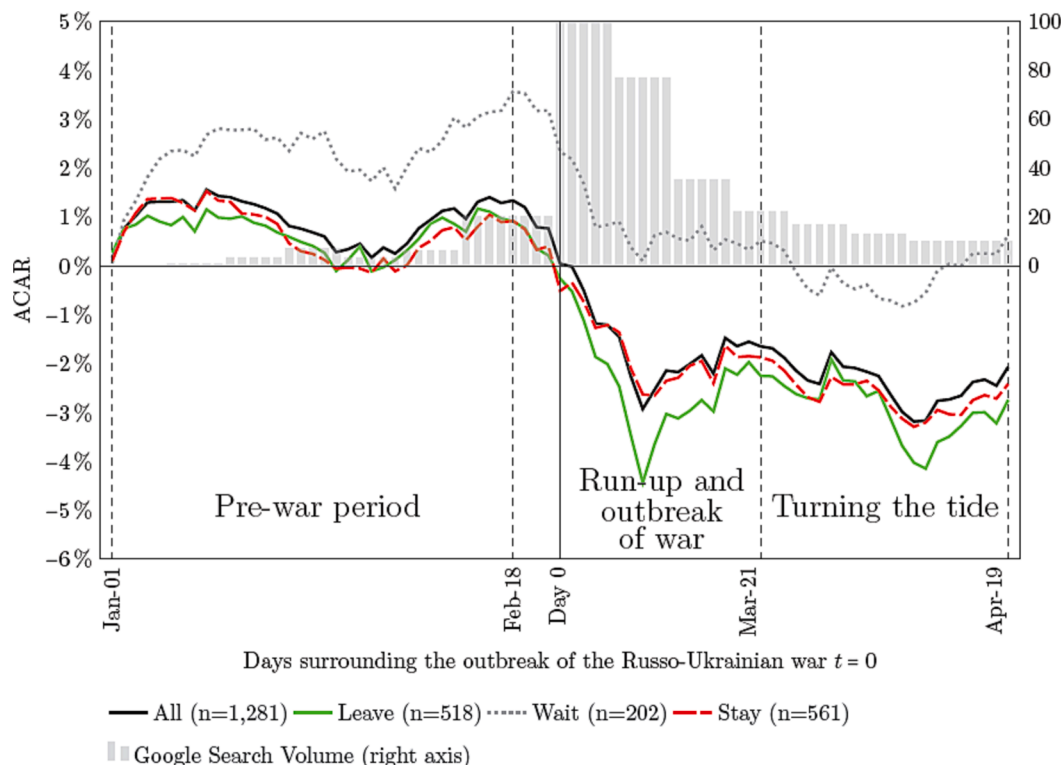


Fig. 3. Stock return development around the outbreak of the Russia-Ukraine armed conflict. This figure shows the stock return development of firms with Russian operations from January 1, 2022, to April 19, 2022 (day $t = -38$ to $t = +38$) relative to the day of the commencement of the Russia-Ukraine armed conflict on February 24, 2022, day $t = 0$) as well as the Google search volume for the term “Russo-Ukrainian War”. The sample consists of 1281 firms that are traded on an international stock exchange from the database of company announcements gathered by the KSE Institute (updated as of January 22, 2023). The stock returns are calculated using a market model event study with an estimation period from January 1, 2021, to December 31, 2021. The Datastream national stock index of the country of the firm’s headquarter is used as the benchmark index. The sample of all firms is further divided into companies that decided to exit their Russian operations (Leave), continued their operations (Stay), and those that have not yet decided (Wait). The Google search volume represents the search interest for the term “Russo-Ukrainian War” relative to the highest point on the chart (i.e., a value of 100 presents the peak popularity, while a value of 50 implies that the term was only half as popular, etc.).

Russia-Ukraine military conflict, we concentrate on firms with Russian operations and their individual decisions following the military actions. We focus not only on short-term reactions but divide the armed conflict into three different periods using an approach similar to Ramelli and Wagner (2020): Our *pre-war period* ranges from January 1, 2022, to February 18, 2022, the *run-up and war outbreak period* ranges from February 21, 2022, to March 18, 2022, and the *turning the tide period* starts on March 21, 2022, and ends on April 19, 2022. We thereby extend the studies of Glambsky and Peterburgsky (2022), Tosun and Eshraghi (2022), and Sonnenfeld et al. (2022).

We first report the results for the overall sample and subsamples conditional on a firm’s management decisions regarding their Russian operations. The results are reported in Table 2. For the overall sample of 1281 firms traded on an international stock exchange with operations in Russia when the armed conflict between Russia and Ukraine started, we find a significant negative average CAR of -2.05% during the $[-38; +38]$ event window, starting from January 1, 2022, to April 19, 2022. While in the *pre-war period* (until February 18, 2022) the stock market was significantly positive, during the *run-up and war outbreak period*, we observe an average CAR of -2.87% (median -2.51%), supporting the findings of earlier studies. Focusing on the *turning the tide period*, we do not observe that the stock market recovered from the large losses but also do not find that the stock market returns are as negative as during the *run-up and war outbreak period*. Splitting the sample conditional on the later decision by the firm, we do not find evidence that the stock market reaction is different between firms that decided to stay or leave. The results indicate that all firms lost significant market value during the *run-up and war outbreak period*, and no subgroup gained significant positive abnormal returns during the post-outbreak period. An unreported t -test between the leave and stay sample also indicates that there is no significant difference between the two samples. Fig. 3 illustrates our findings for the stock return development during the three periods of the Russia-Ukraine armed conflict. We do not find that the stock returns between firms deciding to stay and those announcing to leave differ much. The results only reveal that firms that announced to wait show a less pronounced share price reaction, which is driven by the significant positive abnormal returns in the period prior to the Russia-Ukraine armed conflict.

In order to determine the drivers of the abnormal stock returns, we run a cross-sectional OLS regression on the returns for all three subperiods plus the three-day period $[-1; +1]$ event window) surrounding the outbreak of the Russia-Ukraine armed conflict on

Table 3
Timing of firm decisions.

	Full sample		Leave only	Stay only
	(1)	(2)	(3)	(4)
<i>Firm decision and stock market variables</i>				
initial stock response	0.827*** (0.295)	0.480* (0.283)	0.441 (0.274)	1.169*** (0.426)
stay	31.812*** (4.330)	32.546*** (4.356)		
initial stock response × stay		0.927** (0.447)		
leave	-2.152 (5.071)	-2.074 (5.048)		
pre-war stock return	-10.053* (5.778)	-9.838* (5.796)	-6.471 (14.286)	-29.919 (19.808)
<i>Firm-specific control variables</i>				
netsales	-7.020*** (1.341)	-6.981*** (1.323)	-6.716*** (1.458)	-8.228*** (1.693)
ppe	-14.908*** (5.512)	-15.055*** (5.459)	-11.362 (9.613)	-13.919 (13.680)
roa	-0.045 (0.101)	-0.059 (0.101)	-0.109 (0.140)	0.035 (0.165)
leverage	5.321 (5.382)	4.995 (5.205)	17.227 (10.664)	8.266 (13.600)
beta	1.290 (2.536)	1.386 (2.556)	-5.435** (2.472)	8.347 (5.065)
gscore	-0.010 (0.045)	-0.008 (0.045)	0.131** (0.050)	-0.110 (0.086)
<i>Country-specific control variables</i>				
distance	3.564 (2.244)	3.466 (2.244)	2.553 (2.025)	6.305* (3.705)
usa	-12.018*** (4.155)	-11.704*** (4.156)	-14.764*** (4.978)	-9.954* (5.685)
sanction	-0.460 (6.512)	-0.810 (6.612)	-8.386 (18.954)	0.393 (6.881)
Intercept	133.517*** (31.578)	133.097*** (31.847)	104.009*** (31.231)	170.881*** (54.848)
Industry FE	YES	YES	YES	YES
Observations	1213	1213	485	537
R ²	0.254	0.256	0.183	0.133

This table reports the regression results on the timing of the individual firm decisions. The dependent variable is the number of trading days between the outbreak of the Russia-Ukraine armed conflict on February 24, 2022, and the date of the firm's announcement on its Russian operations (*netdays*). All variables are defined as in Panel A of Table A.3. Standard errors are clustered by country and shown in parentheses. *, **, and *** indicate statistical significance at the 10 %, 5 %, and 1 % levels, respectively.

February 24, 2022. The results are presented in Table A.4. We find that closer proximity to Ukraine is associated with more pronounced negative abnormal returns around the outbreak of the war during the [-1;+1] event window.¹⁵ However, we do not observe similar findings for our *run-up and war outbreak period*, which includes more days [-3;+16] event window). For the latter event window, we instead find that firms having higher net sales are associated with higher abnormal returns. This might indicate that firms with higher cashflows are able to compensate for the closure of their Russian operations with sales from other regions.¹⁶ This is also in line with the finding that firms with higher ROAs do not suffer a sharp drop in their share prices. Finally, the coefficient for leverage is negative and significant, indicating that firms with higher debt levels experience lower abnormal returns. This suggests that firms with more debt may be in greater need of the cashflows generated by their Russian business to meet potential debt obligations. For the *pre-war period*, we observe that firms that later decided to leave already experienced significantly lower returns, which may expedite the decision to revise their approach to their Russian operations. We also observe that firms with more PPE are associated with higher abnormal returns in the *pre-war period* but also during the *turning the tide period* after the outbreak of the war.

¹⁵ Following the approach of Federle et al. (2022), we measure the distance from Ukraine in 1,000 km using the city database of Simplemaps, taking into account the smallest distance between any possible pair of cities across those countries. We also experimented with alternative approaches, measuring the distance from the country's capital to the (i) nearest point in Ukraine or (ii) Kyiv, and find that in both cases the results are consistent with our baseline model. The results are available upon request.

¹⁶ In a robustness check, we alternatively use total assets as a proxy for firm size. We find that larger firms in terms of assets are able to compensate for the closure of their Russian operations. This is in line with the findings reported for net sales.

Table 4
Determinants of firm decisions.

	Ordered logit		Decision to leave		Decision to stay	
	(1)	(2)	(3)	(4)	(5)	(5)
<i>Firm decision and stock market variables</i>						
initial stock response	-0.024 (0.019)	-0.023 (0.020)	-0.026 (0.021)	0.024 (0.018)	0.026 (0.021)	
pre-war stock return	-0.747 (0.554)	-1.001* (0.579)	-1.208* (0.663)	0.708 (0.558)	1.208* (0.663)	
<i>Firm-specific control variables</i>						
netsales	0.084* (0.047)	0.047 (0.043)	0.114** (0.053)	-0.129** (0.053)	-0.114** (0.053)	
ppe	0.362 (0.327)	0.089 (0.396)	0.048 (0.332)	-0.406 (0.345)	-0.048 (0.332)	
roa	0.009 (0.007)	0.010 (0.009)	0.007 (0.011)	-0.004 (0.008)	-0.007 (0.011)	
leverage	0.084 (0.214)	-0.004 (0.232)	0.424 (0.443)	-0.349 (0.432)	-0.424 (0.443)	
beta	0.472*** (0.141)	0.570*** (0.162)	0.579*** (0.175)	-0.371** (0.167)	-0.579*** (0.175)	
gscore	0.003 (0.003)	0.002 (0.003)	0.003 (0.003)	-0.004 (0.003)	-0.003 (0.003)	
<i>Country-specific control variables</i>						
distance	-0.143 (0.111)	-0.106 (0.117)	-0.182 (0.137)	0.188 (0.115)	0.182 (0.137)	
usa	0.639*** (0.210)	0.566*** (0.214)	0.675*** (0.250)	-0.662*** (0.221)	-0.675*** (0.250)	
sanction	1.928*** (0.312)	1.991*** (0.448)	2.335*** (0.449)	-1.999*** (0.342)	-2.335*** (0.449)	
Industry FE	YES	YES	YES	YES	YES	
Observations	1213	1213	1022	1213	1022	
Pseudo R ²	0.088	0.101	0.147	0.130	0.147	

This table reports the regression results on a firm's decision to leave Russia, continue its operations (i.e., stay), or to announce to postpone a final decision (i.e., wait). Column (1) reports the results for an ordered logit model in which leave decisions are defined as "1", stay decisions as "-1" and the base case is zero in case a firm postponed a final decision (i.e., wait). Columns (2) through (5) report the results for logit regressions on a firm's decision to leave or stay in Russia. In columns (2) and (3) the dependent variable is a binary variable equal to one if the firm announced to leave, while in column (4) and (5) the dependent variable is a binary variable equal to one if the firm announced to stay, and zero otherwise. The logit models in columns (3) and (5) exclude firms that announced to wait, while they are included in the models in columns (2) and (4). All variables are defined as in Panel A of Table A.3. Standard errors are clustered by country and shown in parentheses. *, **, and *** indicate statistical significance at the 10 %, 5 %, and 1 % levels, respectively.

5.2. Firms' strategic decisions and the stock market

We now focus on firms' individual decisions on how to proceed with their Russian operations. Our previous results indicate that all international firms suffered considerable share price declines in the wake of the Russia-Ukraine armed conflict. We first examine when firms announce their decision, measuring the trading days between the commencement of the Russia-Ukraine military actions on February 24, 2022, and the date of the firm's announcement regarding its Russian operations. The average time to announce a firm decision in our sample is 50 trading days but, as shown in Fig. 2, the first announcements already occurred only a few days following the start of the armed conflict, while some firms took nearly one year (released in January 2023) to communicate their decision. The results of our cross-sectional regression on the days until the firms' initial decisions are reported in Table 3.

We observe that the stock return at the beginning of the armed conflict has a significant impact on the timing of the decision. The lower the abnormal stock returns, the earlier the firm announces its decision, supporting our *market timing hypothesis*. The results also show that stay decisions are made significantly later than wait or leave decisions. This is largely in line with Fig. 2 as later decisions were mostly stay decisions, while we find a mixed picture during the first two months after the outbreak of the war. Our results further indicate that firms with larger net sales decided more quickly. This would be in line with our interpretation of the previous results as these firms can potentially compensate losses from exiting their Russian business operations with cashflows from other regions. We also find that US firms were among the first ones that communicated their decision. Interestingly, we do not find evidence that sanctions have any impact on the timing of a firm's decision. By splitting the sample into firms that only decided to leave or stay, we again find evidence that the stock price reaction around the outbreak of the armed conflict had a significant impact and tended to delay stay decisions.

While we find evidence in support of our *market timing hypothesis*, we now focus on the *market feedback hypothesis* and test whether the initial share price reaction to the escalation of the Russia-Ukraine conflict has an impact on a firm's decision. The results are provided in Table 4. We do not find that the initial stock returns are determinants for the firm's decision, and we therefore have to reject the *market feedback hypothesis*. Neither the stock returns around the outbreak of the war nor the pre-war stock returns determine a firm's decision. However, we find that sanctions (and potentially reduced cashflows due to sanctions) have an impact on a firm's

Table 5
Abnormal returns around the firm's decision.

Event window	Mean CAR	Median CAR	t-test (t-value)	Wilcoxon (Z-score)	N
<i>Panel A: All firms</i>					
[-30;+30]	-0.96 %	-0.81 %	-1.88*	-2.23**	1250
[-10;+10]	-0.26 %	-0.26 %	-0.98	-1.07	1259
[-5;+5]	0.24 %	-0.07 %	1.20	0.49	1259
[-1;+1]	0.31 %	0.04 %	2.33**	0.49	1259
[0;0]	0.00 %	-0.06 %	0.04	-1.18	1266
[-30; -1]	-1.36 %	-1.20 %	-3.86***	-4.13***	1266
<i>Panel B: Firms announced to leave</i>					
[-30;+30]	-1.29 %	-1.33 %	-1.60	-2.18**	508
[-10;+10]	-0.47 %	-0.35 %	-1.15	-1.39	511
[-5;+5]	0.27 %	-0.23 %	0.90	0.21	511
[-1;+1]	0.67 %	0.21 %	2.78***	1.53	511
[0;0]	0.07 %	-0.17 %	0.50	-1.84*	514
[-30; -1]	-1.70 %	-1.33 %	-3.04***	-3.24***	514
<i>Panel C: Firms announced to stay</i>					
[-30;+30]	-1.11 %	-0.78 %	-1.42	-1.47	541
[-10;+10]	-0.15 %	-0.18 %	-0.38	-0.30	547
[-5;+5]	0.11 %	0.15 %	0.37	0.20	547
[-1;+1]	0.13 %	-0.04 %	0.73	-0.43	547
[0;0]	0.04 %	-0.01 %	0.46	0.20	550
[-30; -1]	-1.06 %	-0.77 %	-2.02*	-1.91*	550
<i>Panel D: Firms announced to wait</i>					
[-30;+30]	0.29 %	-0.16 %	0.24	0.32	201
[-10;+10]	0.01 %	-0.09 %	0.02	-0.02	201
[-5;+5]	0.49 %	0.06 %	0.92	0.62	201
[-1;+1]	-0.09 %	-0.13 %	-0.29	-0.64	201
[0;0]	-0.27 %	0.02 %	-1.12	-0.15	202
[-30; -1]	-1.32 %	-2.09 %	-1.44	-2.09**	202

This table reports the event study results for different event windows surrounding a firm's decision on its Russian operations. Reported cumulative abnormal returns (CARs) are estimated using a market model event study with an estimation period from January 1, 2021, to December 31, 2021, and using the Datastream national stock index of the country of the firm's headquarter as the benchmark index. Different event windows are shown around a firm's initial decision on its Russian operations ($t = 0$). Panel A shows the results for all firms, while Panel B, C, and D show subsamples based on companies that exited their Russian operations (*Leave*), continued their operations (*Stay*), and those that have not yet decided (*Wait*), respectively. Mean and median CARs are tested for statistical significance using the standard *t*-test and the nonparametric Wilcoxon rank-sum test (Wilcoxon), respectively. *, **, and *** indicate statistical significance at the 10 %, 5 %, and 1 % levels, respectively.

decision, as sanctions are significantly associated with leave decisions. We again find that US firms are more likely to announce to leave the Russian market. Interestingly, we do not find that the distance to Ukraine has an impact on a firm's decision.¹⁷ This is contrary to earlier findings that show that negative abnormal returns are increasing with firm proximity to Ukraine. It might be that the sanction variable captures certain aspects of the proximity variable, resulting in the actual firm's distance to Ukraine only playing a subordinated role. We also find evidence (at the 10 % level of significance) that firms with higher cashflows are more likely to decide to leave the Russian market, suggesting that they have the possibility to exit and compensate for lost cashflows from other revenue streams. Finally, firms with higher stock market beta are more likely to decide to leave Russia.

Next, we examine how the stock market reacts to a firm's decision on its Russian operations. We postulate that the decision to leave the Russian market should be a positive signal, while we expect negative or non-significant stock market reactions for firms postponing their decision or announcing to stay in the Russian market (as postulated by our *leave value creation hypothesis*). The share price reactions around the firm's announcement are reported in Table 5. For the overall sample, the results show that particularly the time before the announcement is associated with negative abnormal returns. This could be driven by firms that announced their decision relatively early and may therefore overlap with the *run-up and war outbreak period*. Focusing on the shorter event window around the firm decision ([-1;+1] event window), we observe slightly positive abnormal returns of + 0.31 % on average (median + 0.04 %). The difference between average and median might indicate that some firms benefited from their decision, while for other firms the announcement is not associated with any considerable gains in their share price. We therefore split the firm decisions into leave, stay, and wait statements. We observe that firms that announced to leave the Russian market significantly benefited from the decision as not only the average abnormal returns are positive with + 0.67 % but also the median abnormal returns are with + 0.21 %.¹⁸ However, we again note that due to the difference between the average and the median abnormal returns, some firms may have benefited more than

¹⁷ The results also hold when using alternative measures for proximity to Ukraine. The results are available upon request.

¹⁸ In robustness tests, we calculated abnormal returns using different models: +0.73% (median +0.27%) with a GARCH market model that includes ARMA terms, +0.53% (median +0.09%) with a Fama-French three-factor model, and +0.95% (median +0.49%) with a market-adjusted model. Average abnormal returns are always statistically significant and confirm the robustness of our results, irrespective of the methodology we employ.

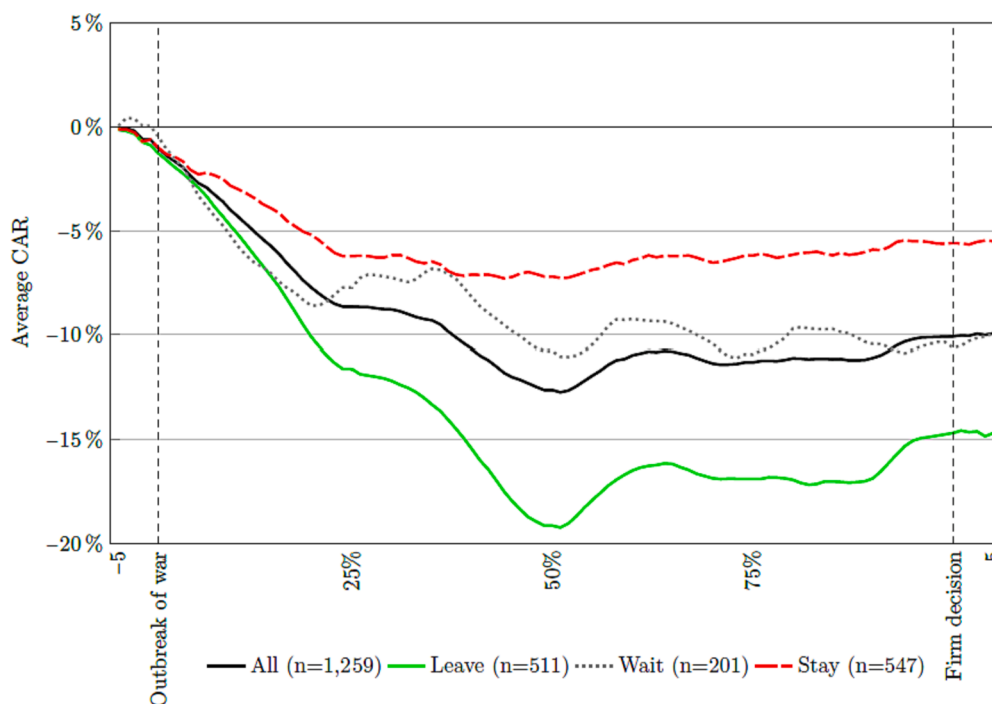


Fig. 4. Stock return development from the outbreak of the war to a firm's decision. This figure shows the average cumulative abnormal return (CAR) development of firms' stock returns during the $[Outbreak\ of\ war - 5; Firm\ decision + 5]$ event window, beginning five days prior to the outbreak of the Russia-Ukraine armed conflict on February 24, 2022, and ending five days after a firm's first decision on their Russian operations was announced. The sample consists of 1259 firms traded on an international stock exchange with available share price data until the firm's decision from the database of company announcements gathered by the KSE Institute (updated as of January 22, 2023). CARs are calculated using a market model event study with an estimation period from January 1, 2021, to December 31, 2021, and using the Datastream national stock index of the country of the firm's headquarter as the benchmark index. The CARs are standardized between the date of the outbreak of the Russia-Ukraine war (February 24, 2022; Outbreak of war) and the first announcement of a firm's decision on its Russian operations following the approach of [Malmendier et al. \(2016\)](#). The sample of all firms is further divided into companies that exited their Russian operations (Leave, 511 firms), continued their operations (Stay, 547 firms), and those that have not yet decided (Wait, 201 firms).

others from their decision to exit the Russian market. For firms that announced to stay or postpone their decision, we do not observe any significant market reaction around the firm's decision. The abnormal returns are close to zero for both samples (+0.13 % on average for firms that decided to stay and -0.09 % for firms that postponed their decision). The results support our *leave value creation hypothesis*.

Next, we study the abnormal returns during the time period between the outbreak of the Russia-Ukraine armed conflict on February 24, 2022, ($t_1 = 0$) and a firm's decision on its Russian operations ($t_2 = 0$). The average time to announce the firm's decision is 50 trading days (median 30 trading days), but, as [Fig. 2](#) shows, there is large variation within the sample (from several days to almost one year). To analyze the abnormal returns during the interim period we apply the methodology developed by [Malmendier, Opp, and Saidi \(2016\)](#). Their approach is similar to that of traditional event studies but analyzes the time between two dates when the duration is not consistent across the sample. As this is the case for our sample, we use this method to graphically illustrate the time between the commencement of the military operations and the firm's individual decision.¹⁹

[Fig. 4](#) displays the abnormal returns in the period until a firm made its decision. The graph also covers the five days prior to the outbreak of the war and the five days following a firm's decision. We generally find that share prices decline for the entire sample as well as for all subsamples at the beginning of the military conflict on February 24, 2022. Moreover, the figure confirms that there is no pronounced market reaction when a firm makes its decision. We only observe a small positive trend for leave decisions. This trend is, however, relatively small compared to the losses at the beginning of the conflict. We find that stock returns begin to stabilize for firms that announce to stay after approximately 25 % of the time, while firms that announced to leave show more volatility until

¹⁹ In line with [Malmendier et al. \(2016\)](#), we first standardize the time to announcement period to a relative time, i.e., between $t_R = 0\%$ and $t_R = 100\%$. We use linear interpolation for the abnormal returns between the event-specific event windows T_i , beginning on the day of the outbreak of the armed conflict (*outbreak of war*), and the firm's decision (*firm decision*). For example, if the firm management needs 50 trading days to announce its decision, i.e., $T_i = 50$, the standardized cumulative abnormal returns after $t_R = 10\%$ relative time, $\widehat{CAR}_i(10\%)$, are equal to the CAR after $50 \times 10\% = 5$ trading days, i.e., $CAR_i(t_R T_i)$. If the firm decision time is not an integer number, \widehat{CAR}_i is calculated via linear interpolation.

Table 6
Determinants of stock returns around firm decisions.

	All announcements			Early announcements	Late announcements
	(1)	(2)	(3)	(4)	(5)
<i>Firm decision and stock market variables</i>					
leave	0.560* (0.297)	0.549* (0.297)	0.528** (0.244)	0.370 (0.369)	0.842 (0.781)
stay	0.051 (0.257)	0.053 (0.253)		0.416 (0.427)	0.220 (0.880)
runupandwaroutbreak	0.367 (0.861)		0.370 (0.863)		-4.161** (1.658)
initial stock response		-0.060 (0.054)		-0.018 (0.040)	
turningthetide	1.556 (1.259)	1.843 (1.351)	1.559 (1.260)		-1.884 (2.030)
netdays	0.195 (0.127)	0.225* (0.133)	0.201 (0.129)		-0.298 (0.443)
<i>Firm-specific control variables</i>					
netsales	-0.048 (0.063)	-0.041 (0.063)	-0.048 (0.063)	-0.006 (0.064)	-0.061 (0.202)
ppe	-0.336 (0.632)	-0.418 (0.651)	-0.339 (0.637)	0.106 (0.855)	0.224 (1.127)
roa	0.020 (0.015)	0.023 (0.017)	0.020 (0.015)	0.053** (0.021)	-0.016 (0.019)
leverage	-0.665 (0.665)	-0.779 (0.625)	-0.669 (0.666)	-0.921 (0.666)	-0.247 (1.483)
beta	-0.226 (0.231)	-0.179 (0.209)	-0.225 (0.231)	-0.248 (0.356)	0.036 (0.509)
gscore	0.000 (0.003)	-0.000 (0.003)	0.000 (0.003)	-0.001 (0.004)	0.001 (0.007)
<i>Country-specific control variables</i>					
distance	0.078 (0.078)	0.096 (0.083)	0.079 (0.077)	0.118 (0.094)	-0.056 (0.158)
usa	0.067 (0.207)	0.059 (0.203)	0.064 (0.206)	0.119 (0.275)	-0.154 (0.237)
sanction	-0.545 (0.560)	-0.518 (0.569)	-0.554 (0.562)	-0.827 (0.700)	0.137 (0.692)
Industry FE	YES	YES	YES	YES	YES
Observations	1208	1208	1208	785	423
R ²	0.029	0.032	0.029	0.054	0.042

This table reports the regression results using the firms' cumulative abnormal return (CAR) around a firm's decision. The dependent variable is the $[-1; +1]$ event window CAR around a firm's initial decision on its Russian operations. Columns (1) through (3) show the results for the entire sample, while column (4) reports the results for early announcements, (i.e., firm decision made before April 19, 2022) and column (5) reports the results for late announcements (i.e., firm decision made since April 19, 2022). All variables are defined as in Panel A of Table A3. Standard errors are clustered by country and shown in parentheses. *, **, and *** indicate statistical significance at the 10 %, 5 %, and 1 % levels, respectively.

approximately 50 % of the time until the firm has reached a decision.

The results so far indicate that investors appreciate a decision to leave the Russian market, providing some support for our *leave value creation hypothesis*, but the results are mixed as not all firms tend to benefit in a similar manner. We study the cross-section of abnormal stock returns around a firm decision and examine which factors are associated with positive abnormal returns. For this, we use the abnormal returns during the $[-1; +1]$ event window around a firm's initial decision on its Russian operations, as this window provides the largest variation in returns and is not biased by overlapping announcements.²⁰ Table 6 reports the results for the determinants of abnormal returns around the firm's decision. In line with the univariate results, we find that leave decisions are appreciated more by investors than stay or wait decisions, supporting the *leave value creation hypothesis*. Moreover, we find that the initial stock market reaction has an impact on the abnormal returns around the firm's decision for firms that announced their decision after the *turning the tide period*. This result indicates that firms who suffered higher share price losses during the *run-up and war outbreak period* gained value by announcing their decision. As we excluded all events in which firms announced their decision before the *turning the tide period*, this result only applies for firms that announced their decision after this period.²¹

In summary, we find no support for the *market feedback hypothesis* as abnormal returns do not have an impact on a firm's decision.

²⁰ In a robustness test, we also examined the $[-2; +2]$ event window and the results remain similar.

²¹ We also tested several other event windows to examine the relationship between the returns prior to the firm's decision and the share price reaction to a firm's decision. We used the abnormal returns using the *pre-war period* but also the standardized abnormal returns using the approach of Malmendier et al. (2016). The results are not significant, indicating that the stock returns during these periods do not influence the abnormal returns around a firm's decision.

Table 7
Determinants of firm decision revisions.

	All events				Change to leave (without initial leave)	Change to stay (without initial stay)
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Firm decision and stock market variables</i>						
wait	-0.504** (0.201)	-0.492** (0.194)	-2.812*** (0.694)			
wait × fdeventwindow11		0.049 (0.042)				
wait × initial stock response		0.005 (0.031)				
wait × netdays			0.721*** (0.179)			
fdeventwindow11	-0.009 (0.015)	-0.016 (0.017)	-0.012 (0.014)	-0.008 (0.015)	0.023 (0.015)	-0.040 (0.053)
initial stock response	-0.005 (0.015)	-0.006 (0.016)	-0.004 (0.015)	-0.006 (0.015)	-0.017 (0.021)	-0.059** (0.027)
netdays	0.136*** (0.052)	0.131** (0.052)	0.044 (0.059)	0.160*** (0.049)	-0.837*** (0.091)	-0.154 (0.129)
<i>Firm-specific control variables</i>						
netsales	0.004 (0.065)	0.001 (0.067)	0.004 (0.064)	-0.005 (0.063)	0.064 (0.079)	0.434*** (0.089)
ppe	0.248 (0.354)	0.221 (0.357)	0.286 (0.367)	0.186 (0.347)	-0.299 (0.479)	0.399 (1.223)
roa	0.018*** (0.005)	0.018*** (0.005)	0.018*** (0.005)	0.019*** (0.005)	-0.013* (0.007)	0.020*** (0.007)
leverage	0.805** (0.355)	0.802** (0.341)	0.856** (0.363)	0.793** (0.315)	-0.351 (0.340)	1.219*** (0.271)
beta	0.152 (0.146)	0.153 (0.147)	0.104 (0.146)	0.173 (0.148)	0.416** (0.203)	0.638* (0.367)
gscore	-0.003 (0.003)	-0.003 (0.002)	-0.003 (0.002)	-0.003 (0.003)	0.004 (0.003)	0.007 (0.005)
<i>Country-specific control variables</i>						
distance	0.030 (0.064)	0.033 (0.064)	0.051 (0.067)	0.040 (0.063)	-0.121 (0.084)	-0.135 (0.187)
usa	0.104 (0.159)	0.102 (0.158)	0.063 (0.157)	0.093 (0.159)	0.211 (0.162)	0.041 (0.362)
sanction	-0.197 (0.207)	-0.202 (0.208)	-0.186 (0.212)	-0.241 (0.212)	1.398** (0.414)	13.521*** (0.684)
Observations	1208	1208	1208	1208	724	675
Pseudo R ²	0.024	0.025	0.029	0.020	0.124	0.121

This table reports the regression results for companies that made changes to their first decision on their Russian operations. We define the firm's decision to leave as "1", wait as "2", and stay as "3". We subsequently subtract the initial decision recorded by the KSE Institute from the last recorded decision (updated as of January 22, 2023). The range therefore is between "-2" (from stay to leave) and "+2" (from leave to stay). This numerical value then serves as the dependent variable in an ordered logit model. All other variables are defined as in Panel A of Table A3. Standard errors are clustered by country and shown in parentheses. *, **, and *** indicate statistical significance at the 10 %, 5 %, and 1 % levels, respectively.

However, our results show that the timing of the firm's decision is impacted by the stock market reaction around the outbreak of the armed conflict, providing support for our *market timing hypothesis*. The *early leave decision hypothesis* is supported most strongly by our results, as we find positive abnormal returns for leave decisions, but abnormal returns close to zero for stay or wait decisions.²² Finally, we do not find that abnormal returns during the *run-up and war outbreak period* have a significant impact on the abnormal returns around the firm's decision announcement.

5.3. What drives changes in strategic decisions regarding a firm's Russian operations?

The KSE Institute continuously tracks firm decisions since the onset of the Russia-Ukraine military conflict. While firms usually do not explicitly announce changing their strategy, the detailed database of KSE provides weekly updates on all firm decisions and reclassifies a firm's decision if the firm is not acting in line with its initial firm decision or is providing statements that run counter to its initial decision. The data therefore allows us to test whether and when firms reconsidered their initial decision on their Russian operations. We code a firm's decision to leave as "1", wait as "2", and stay as "3". We subsequently subtract the first recorded decision from

²² To ensure that the results are not driven by our methodology, we also applied a multifactor model for estimating abnormal returns, following the approach of Granát et al. (2023), and a market-adjusted model as in Kau, Linck, and Rubin (2008) and Liu and Tian (2022). Finally, we estimated abnormal returns using a GARCH market model that includes ARMA terms to estimate abnormal returns. The results are similar to the ones reported and are available upon request.

Table A1
Country statistics.

Country	Min Distance to Ukraine	Sanctions against Russia	Leave	Stay	Wait	Total
Australia	10,735	Yes	9	1	4	14
Austria	391	Yes	5	12	2	19
Bangladesh	4931	No		1		1
Belgium	1173	Yes	3	4	1	8
Brazil	8171	No	2	1		3
Bulgaria	186	Yes		1		1
Canada	5161	Yes	11	3	2	16
China	3038	No	4	55	2	61
Croatia	410	Yes	1			1
Cyprus	1014	Yes	1	1	2	4
Czech Republic	278	Yes	1	1	1	3
Denmark	883	Yes	10	2	8	20
Estonia	670	Yes			1	1
Finland	911	Yes	25	7	7	39
France	1047	Yes	19	36	10	65
Georgia	446	Yes	1			1
Germany	590	Yes	28	41	22	91
Greece	467	Yes		6	2	8
Hungary	25	Yes	2	4	1	7
Iceland	2648	Yes		1	2	3
India	3237	No	1	34	8	43
Ireland	2035	Yes	7	6		13
Israel	1251	Yes		5	2	7
Italy	706	Yes	10	16	4	30
Japan	7094	Yes	36	77	19	132
Kazakhstan	528	No	1	1		2
Kenya	4574	No		1		1
Kuwait	2033	No		1		1
Latvia	462	Yes		1		1
Lithuania	267	Yes	1			1
Luxembourg	1156	Yes	2	1		3
Macedonia	616	No		1		1
Malaysia	7326	No		1		1
Mexico	9518	No	2	2		4
Netherlands	1152	Yes	8	11	6	25
New Zealand	15,978	Yes	1	1		2
Norway	1156	Yes	6	1	2	9
Poland	27	Yes	18	1	4	23
Portugal	2355	Yes	2		1	3
Saudi Arabia	1486	No		1		1
Serbia	304	No		2		2
Singapore	8021	Yes		3		3
Slovenia	475	Yes		3	1	4
South Africa	7444	No	1	3		4
South Korea	6759	Yes	6	17		23
Spain	1633	Yes	5	5	1	11
Sri Lanka	5699	No		1		1
Sweden	755	Yes	25	10	3	38
Switzerland	942	Yes	9	30	12	51
Taiwan	7170	Yes	3	7		10
Thailand	6094	No		1		1
Turkey	279	No		8	1	9
United Arab Emirates	2785	No		2		2
United Kingdom	1508	Yes	46	17	8	71
United States	6253	Yes	205	113	63	381
Vietnam	6251	No	1			1
Total			518	561	202	1281

This table shows the country of each firm's headquarter for our sample of 1281 firms that are traded on an international stock exchange with operations in Russia at the outbreak of the armed conflict between Russia and Ukraine. Our sample includes all stock-listed companies from the database of company announcements gathered by the KSE Institute (updated as of January 22, 2023). We obtain the sanction data from various sources (e.g., SanctionScanner, official government websites, etc.). The sample of all firms is further divided into companies that exited their Russian operations (*Leave*), continued their operations (*Stay*), and those that have not yet decided (*Wait*).

Table A2
Selected major events during the Russia-Ukraine armed conflict.

Headline	Date	Description	References (selected examples)
False pretenses	February 8, 2022	Emmanuel Macron says Vladimir Putin promises not to 'escalate' Ukraine crisis.	https://www.ft.com/content/16cd11e8-b800-4846-b977-c1349da38759
First signs of confrontation	February 10, 2022	Russia holds military exercises with Belarus in Belarus. Generally (now) seen as a pre-cursor to the military action.	https://www.ft.com/content/bd3588ac-75a5-42ad-a9fd-c51860299944
Markets start pricing risk	February 18, 2022	US stocks fall as market participants start to price an increased probability of war.	https://www.ft.com/content/50ce3f10-d911-461d-9dac-12ffb94f203e
Outbreak of war	February 24, 2022	Russia is launching military actions / official start of the armed conflict.	https://www.theguardian.com/world/2022/feb/24/russia-has-invaded-ukraine-what-we-know-so-far
Turning the tide	March 23, 2022	Ukrainian armed forces start to regain ground around Kyiv and are able to push Russian forces back significantly.	https://www.cnbc.com/2022/03/23/live-updates-latest-news-on-russia-and-the-war-in-ukraine.html
Stale mate	July 2022	Fighting continues, but there are no meaningful advances from either side. No specific date.	https://www.nytimes.com/article/ukraine-russia-war-timeline.html
Counter-offensive	August 19, 2022	Ukraine formally launches its counteroffensive.	https://www.reuters.com/world/ukraine-says-long-anticipated-southern-offensive-has-begun-2022-08-29/
Some success for Ukraine	November 11, 2022	Russia confirms complete withdrawal of its forces from Kherson.	https://www.reuters.com/world/europe/russia-says-it-has-completed-kherson-withdrawal-tass-2022-11-11/
The calm before the (next) storm?	December 2022	Stale mate situation. While fighting continues, no meaningful advances of either side. Ukraine warning of a Russian spring offensive.	https://www.ft.com/content/4351d5b0-0888-4b47-9368-6bc4dfbcbf5
The start of the 2023 counter-offensive	June 2023	Ukraine appears to begin its summer 2023 counter-offensive during June 2023, with the offensive developing more momentum during July 2023.	https://www.economist.com/europe/2023/06/05/ukraines-counter-offensive-appears-to-have-begun

This table provides the most important dates prior to and since the outbreak of the Russia-Ukraine armed conflict on February 24, 2022.

the last recorded decision (as of January 22, 2023). The range is therefore between "-2" (from stay to leave) and "+2" (from leave to stay).²³ We then run an ordered logit model to determine when firms diverge from their original decision. We postulate that firms that have announced their decision shortly after the outbreak of the Russia-Ukraine armed conflict are more likely to change their decision (*decision reconsideration hypothesis*).

The results are reported in Table 7. Perhaps not surprising, we observe that firms that initially announced to wait eventually changed their decision over time. Interestingly, we find that firms opt to leave the Russian market rather than continuing with their Russian operations.²⁴ However, we do not observe that firms changed their strategy due to the stock returns around the firm's initial decision on how to deal with its Russian operations. Neither the stock market reaction around the beginning of the armed conflict nor around the firm's decision has an impact on the subsequent changes in a firm's decision. However, we find that firms that announced their decision earlier are more likely to revise it. As the coefficient is positive, firms changed from stay/wait to leave if they announced their first decision relatively quickly after the start of the military operations. This is also supported in models (5) and (6) which are probit regressions and the binary outcome variables are defined as "1" if the firm changed to leave (model 5) and stay (model 6), and "0" otherwise. These two samples exclude all firms that directly announced to leave (stay). As the coefficient of net days is negative and significant in model (5), announcements soon after the start of the armed conflict are associated with a higher probability of the firm changing its initial decision from stay or wait to leave. For the firm-specific control variables, we observe that ROA and leverage also explain a firm's decision to a certain extent, indicating that poor performing firms or firms with larger financial constraints are more likely to change their decision and to continue with their Russian operations rather than to exit the Russian market.

6. Conclusion

We investigate several factors that potentially influence when and how firms with Russian operations responded to the escalation of the Russia-Ukraine conflict on February 24, 2022, and how investors reacted to these firm decisions. We first confirm results from prior studies that firms experienced significant negative returns around the outbreak of the armed conflict, potentially putting the management under pressure to decide on the future of their Russian operations. For our overall sample of 1281 firms traded on an international stock exchange, the average CAR is -2.87 % during the *run-up and war outbreak period* (from February 21, 2022, to March 18, 2022). However, we find no evidence that the stock returns at the beginning of the war have impacted a firm's decision on its

²³ We double checked our results by setting only three outcome variables ("0" for no change, "1" for changes towards "stay", and "-1" for changes towards "leave"). The results are qualitatively very similar to the ones reported here.

²⁴ Table A.5 provides the distribution of firm decision changes across our sample. We observe a total 272 changes (out of 1,281 possible changes). We also observe in the univariate analysis that more firms opt to leave rather than stay (29.2% vs 4.5%; while 66.3% so far adhere to their initial decision).

Table A3

Variable definitions and descriptive statistics.

Panel A: Variable descriptions						
Variable	Definition					
<i>Firm decision and stock market variables</i>						
firm decision	Categorical variable with three possible outcomes (-1,0,+1): leave decisions are defined as "+1", stay decisions as "-1" and the base case is zero in case a firm postponed a final decision (i.e., wait).					
firm decision change	Change in the firm decision as recorded by the KSE Institute (updated as of January 22, 2023). We define the firm's decision to leave as "1", wait as "2", and stay as "3". We then subtract the first decision from the last decision (as of January 22, 2023). The range therefore is between "-2" (from stay to leave) and "+2" (from leave to stay).					
leave	Binary variable defined as one, in case the firm decided to leave Russia in the wake of the Russia-Ukraine armed conflict on February 24, 2022, zero otherwise. Data on individual firm's decision on their Russian operations is obtained from the KSE Institute database.					
stay	Binary variable defined as one, in case the firm decided to remain in Russia after the begin of the armed conflict on February 24, 2022, zero otherwise. Data on individual firm's decision on their Russian operations is obtained from the KSE Institute database.					
netdays	Number of trading days between the escalation of the Russia-Ukraine conflict on February 24, 2022, and the firm's decision on its Russian operations as recorded by the KSE Institute database.					
pre-war stock return	Cumulative abnormal returns in the [-38; -4] event window (<i>pre-war period</i>) prior to the outbreak of the Russia-Ukraine armed conflict on February 24, 2022 ($t = 0$), estimated using a market model event study with an estimation period from January 1, 2021, to December 31, 2021, and using the Datastream national stock index of the country of the firm's headquarter as the benchmark index.					
runupandwaroutbreak	Cumulative abnormal returns in the [-3;+16] event window (<i>run-up and war outbreak period</i>) surrounding the outbreak of the Russia-Ukraine armed conflict on February 24, 2022 ($t = 0$), estimated using a market model event study with an estimation period from January 1, 2021, to December 31, 2021, and using the Datastream national stock index of the country of the firm's headquarter as the benchmark index.					
initial stock response	Cumulative abnormal returns in the [-1;+1] event window surrounding the outbreak of the Russia-Ukraine armed conflict on February 24, 2022 ($t = 0$), estimated using a market model event study with an estimation period from January 1, 2021, to December 31, 2021, and using the Datastream national stock index of the country of the firm's headquarter as the benchmark index.					
turningthetide	Cumulative abnormal returns in the [+17;+38] event window (<i>turning the tide period</i>) after the outbreak of the Russia-Ukraine armed conflict on February 24, 2022 ($t = 0$), estimated using a market model event study with an estimation period from January 1, 2021, to December 31, 2021, and using the Datastream national stock index of the country of the firm's headquarter as the benchmark index.					
fdeventwindow11	Cumulative abnormal returns in the [-1;+1] event window surrounding the firm's first announced decision ($t = 0$), estimated using a market model event study with an estimation period from January 1, 2021, to December 31, 2021, and using the Datastream national stock index of the country of the firm's headquarter as the benchmark index.					
<i>Firm-specific control variables</i>						
netsales	Firm's net sales in million US Dollar in the year prior to the begin of the armed conflict (i.e., as of December 31, 2021). The data is obtained from Refinitiv using the Worldscope identifier WC01001.					
ppe	Firm's property, plant, and equipment (net) in the year prior to the begin of the armed conflict (i.e., as of December 31, 2021). The data is obtained from Refinitiv using the Worldscope identifier WC02501.					
roa	Firm's return on assets in the year prior to the begin of the armed conflict (i.e., as of December 31, 2021). The data is obtained from Refinitiv using the Worldscope identifier WC08326.					
leverage	Firm's leverage in the year prior to the begin of the armed conflict (i.e., as of December 31, 2021). The data is obtained from Refinitiv and leverage is defined as Total Debt (Worldscope identifier WC03255) divided by Total Assets (Worldscope identifier WC02999).					
beta	Firm's beta, estimated using a market model event study starting from January 1, 2021, to December 31, 2022. The Datastream national stock index of the country of the firm's headquarter is used as the benchmark.					
gscore	Firm's governance score in the year prior to the begin of the armed conflict (i.e., as of December 31, 2021). The data is obtained from Refinitiv using the identifier CGSCORE.					
<i>Country-specific control variables</i>						
distance	Distance from the Ukraine in thousand kilometers based on the city database of Simplemaps (https://simplemaps.com/data/world-cities), which contains more than 40,000 cities and their geographical coordinates. The distance between the Ukraine and the country of the firm's headquarter is calculated as the shortest distance between any possible pair of cities across the Ukraine and the respective country in which the firm's headquarter is located.					
usa	Binary variable defined as one, if the firm is headquartered in the United States, zero otherwise.					
sanction	Binary variable defined as one, if the country in which the firm's headquarter is located imposed sanctions on Russia, zero otherwise. Data on sanctions is predominantly obtained from SanctionsScanner (https://sanctionsscanner.com/blog/sanctions-on-russia-following-the-russo-ukrainian-war-605) and supplemented by official government press releases if necessary.					
Panel B: Descriptive statistics						
	Observations	Mean	Median	Standard deviation	25 % quantile	75 % quantile
<i>Firm decision variables</i>						
leave	1281	0.404	0.000	0.491	0.000	1.000
stay	1281	0.438	0.000	0.496	0.000	1.000
netdays	1281	50.311	30.000	48.280	15.000	70.000
<i>Firm-specific control variables</i>						
netsales	1255	16.146	16.106	2.025	14.890	17.374
ppe	1255	0.223	0.182	0.184	0.081	0.322
roa	1281	5.485	5.460	11.994	1.700	9.270
leverage	1255	0.274	0.251	0.201	0.146	0.369
beta	1273	0.985	0.976	0.462	0.701	1.258
gscore	1281	52.552	60.980	31.622	30.830	78.390
<i>Country-specific control variables</i>						

(continued on next page)

Table A3 (continued)

Panel B: Descriptive statistics						
	Observations	Mean	Median	Standard deviation	25 % quantile	75 % quantile
distance	1281	3.764	3.236	2.839	0.942	6.252
usa	1281	0.297	0.000	0.457	0.000	1.000
sanction	1281	0.889	1.000	0.314	1.000	1.000

This table shows the variable definitions (Panel A) and descriptive statistics (Panel B) for the variables used throughout the subsequent empirical analyses. The descriptive statistics in Panel B report the mean, median, as well as the standard deviation and the 25 % and 75 % quantiles.

Table A4

Determinants of stock returns around the outbreak of the Russia-Ukraine armed conflict.

	Pre-War	Run-Up / War Outbreak	[-1;+1]	Turning the Tide	
	(1)	(2)	(3)	(4)	(5)
<i>Firm decision variables</i>					
stay	-0.007 (0.011)	0.009 (0.010)	0.280 (0.292)	-0.002 (0.009)	0.004 (0.017)
leave	-0.018** (0.008)	-0.003 (0.007)	-0.243 (0.374)	-0.004 (0.008)	-0.003 (0.013)
<i>Firm-specific control variables</i>					
netsales	0.017*** (0.002)	0.005** (0.002)	0.071 (0.098)	0.009*** (0.003)	0.007 (0.005)
ppe	0.109*** (0.035)	-0.007 (0.015)	-0.725 (0.934)	0.113*** (0.022)	0.134*** (0.037)
roa	-0.002*** (0.000)	0.001** (0.000)	0.055** (0.021)	0.000 (0.001)	0.001 (0.001)
leverage	0.020 (0.015)	-0.061** (0.024)	-1.463 (0.939)	0.006 (0.013)	0.024 (0.032)
beta	0.021** (0.009)	0.011 (0.007)	0.582 (0.373)	-0.026*** (0.004)	-0.028* (0.014)
gscore	0.000 (0.000)	-0.000 (0.000)	-0.004 (0.005)	-0.000 (0.000)	-0.000 (0.000)
<i>Country-specific control variables</i>					
distance	0.003 (0.003)	0.001 (0.005)	0.297*** (0.095)	-0.003 (0.003)	-0.002 (0.006)
usa	0.018*** (0.005)	0.005 (0.010)	-0.237 (0.297)	0.002 (0.007)	-0.004 (0.008)
sanction	0.020 (0.017)	0.023 (0.014)	0.486 (0.512)	0.009 (0.012)	0.008 (0.021)
Intercept	-0.299*** (0.082)	-0.119** (0.047)	-6.272*** (2.247)	-0.149*** (0.049)	-0.177 (0.113)
Industry FE	YES	YES	YES	YES	YES
Observations	1249	1249	1213	1249	440
R ²	0.123	0.053	0.061	0.092	0.115

This table reports the regression results using firms' cumulative abnormal returns during the *pre-war period* from January 1, 2022, to February 18, 2022 (column 1), *run-up and war outbreak period* from February 21, 2022, to March 18, 2022 (column 2), the period immediately surrounding the outbreak of the Russia-Ukraine armed conflict (column 3), and the *turning the tide period* from March 21, 2022, to April 19, 2022 (column 4 and 5) as the dependent variable. All variables are defined in Panel A of Table A3. Standard errors are clustered by country and shown in parentheses. *, **, and *** indicate statistical significance at the 10 %, 5 %, and 1 % levels, respectively.

Russian operations. Therefore, we have to reject our *market feedback hypothesis*. The results indicate that sanctions and the associated potential reputational concerns are likely drivers for firms to exit the Russian market. Yet, we also find evidence that firms reacted faster if the abnormal stock returns at the outbreak of the war were more pronounced, suggesting that the stock return has an impact, but the impact is on the timing of the decision rather than on the decision itself. This supports our *market timing hypothesis*.

Regarding the announcement of a firm's decision, we do not observe an overall strong market response. The CARs are on average + 0.31 % during the [-1;+1] event window and driven by leave decisions with a statistical significant average CAR of + 0.67 %, while stay and wait decisions are close to zero, supporting our *leave value creation hypothesis*. The results are robust using alternative calculations of abnormal returns and the cross-sectional regressions confirms the statistical difference between leave and stay decisions, supporting our *early leave decision hypothesis*. The results from the regression analysis also show that firms with the largest losses at the beginning of the war are able to gain the most. However, this only applies for firms that announced their decisions after the *turning the tide period* (from March 21, 2022, to April 19, 2022). Finally, we examine which firms reconsidered their decision on their Russian operations. Our results show that firms announcing their decision relatively early are more likely to change their strategy. We also observe that they are more likely to change their decision to exiting the Russian market rather than changing it to continue their operations, supporting our *decision reconsideration hypothesis*.

Our research contributes and augments the existing research on armed conflicts (e.g., Choudhry 2010; Hudson and Urquhart, 2015;

Table A5
Descriptive statistics on firm decision reversals.

<i>Panel A: Absolute numbers of announcements</i>				
First decision (rows) / Last decision (columns)	Leave	Stay	Wait	Total
Leave	469	6	43	518
Stay	83	406	72	561
Wait	59	9	134	202
Total	611	421	249	1281
<i>Panel B: Relative percentages of initial and final decisions</i>				
First decision (rows) / Last decision (columns)	Leave	Stay	Wait	Total
Leave	90.54 %	1.16 %	8.30 %	518
Stay	14.80 %	72.37 %	12.83 %	561
Wait	29.21 %	4.46 %	66.34 %	202
Total	611	421	249	1281

This table shows the changes in firm decisions as recorded by the KSE Institute (updated as of January 22, 2023). The rows present the first decision, while the columns present the last recorded decision by the KSE Institute (updated as of January 22, 2023). The main diagonal indicates no changes in the firm decision (1009 firms), while 142 firms opted to leave after they initially announced to wait (59) or stay (83), and 15 firms decided to stay in Russia after initially announcing to wait (9) or to leave (6).

Rigobon and Sack, 2005) and on the Russia-Ukraine conflict in particular (e.g., Cumming, 2022; Korosteleva, 2022; Girardone, 2022). This paper also complements the studies examining the general stock market reactions surrounding the outbreak of the Russia-Ukraine armed conflict (e.g., Federle et al., 2022; Boungou and Yatié, 2022; Yousaf et al., 2022) as well as studies examining the share price reactions around the first responses of firms to the escalation of the Russia-Ukraine armed conflict (Glambosky and Peterburgsky, 2022; Tosun and Eshraghi, 2022; Sonnenfeld et al., 2022). We extend these studies not only by analyzing a larger and more comprehensive sample and a longer time horizon, but also by determining the drivers of when and why firms announce their decision and potential motives that let them to change their initial decision.

CRediT authorship contribution statement

Florian Kiesel: Conceptualization, Formal analysis, Investigation, Methodology, Project administration, Visualization, Writing – original draft, Writing – review & editing. **Sascha Kolaric:** Conceptualization, Data curation, Methodology, Writing – original draft, Writing – review & editing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

The authors do not have permission to share data.

Appendix A

See Tables A1-A5.

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