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Stock Market Response to the Russia-Ukraine War: Evidence from an Emerging Market

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ABSTRACT

This study examines the role of financial factors contributing to firms' resilience during the Russia-Ukraine war. Event study results show a significant adverse reaction, which started before the official war announcement and grew over time. Further, cross-sectional analyses uncover that the negative effect is mitigated for larger and more profitable firms but amplified for high market-cap firms with high cash and debt-holding; both effects are more pronounced for non-financial companies. This study contributes by exploring Turkey as a unique emerging market setting due to its significant geopolitical position, strategic trade, and business partnership with the European Union and Russia.

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Introduction

The Russia-Ukraine war started officially on 24th February 2022. This sad event destroyed towns and villages, leaving thousands of people dead, injured, and homeless. At the same time, the war increased the uncertainty in the global economy, inherited from the Covid-19 pandemic (Izzeldin et al. 2022).

According to Wall Street Journal's article on 26th September 2022, the recent Russia-Ukraine war cost $2.8 Trillion globally. In response to the war, sanctions imposed by Western countries led to increased oil and non-energy commodity prices such as wheat (OEC 2022). Due to these rising costs and sanctions, major stock markets have suffered and continue to suffer. Initial research documents the negative financial impacts of the war at the macro level (e.g., Ferrara, Mogliani, and Sahuc 2022; Sokhanvar and Bouri 2023) or index level (e.g., Huang and Lu 2022). Recent studies provide valuable insights, yet they present findings related to the United States (US) and Europe markets or examine reactions at the global level (e.g.,

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Ahmed, Hasan, and Kamal 2022; G.-D. Lo et al. 2022). However, research in this area, especially firm-level and emerging market context analysis, is still rare (Deng et al. 2022; Sun and Zhang 2022). This study extends this line of research by addressing the main research questions: (i) how did the Russia-Ukraine war impact the stocks traded in the Borsa Istanbul Stock Exchange (BIST), (ii) to what extent did firm-specific factors contribute to firm resilience, and provides firm-level evidence from Turkey. Specifically, it examines the association between crisis-period returns and firm-specific factors in the Turkish equity market. Turkey is an attractive setting to investigate, at least for three reasons. First, Turkey is one of the most important neighbors of Russia and the European Union (EU) (Fischer and Seufert 2018). Second, Turkey is a unique emerging market setting due to its significant geopolitical position. As the 8th largest European economy as of 2021, with €686 billion gross domestic product (Statista 2021), Turkey is a strategic trade and business partner of western countries and Russia. Focusing on Turkey might expand our limited knowledge regarding war-period returns in emerging markets.

The stock price, an unbiased estimator for firm fundamentals, reflects investor beliefs about a firm's future cash flows. According to the Efficient Market Hypothesis (EMH), stock prices immediately reflect new information about an unprecedented event. Extant literature examines investor reactions to crises such as war (Rigobon and Sack 2005; Schneider and Troeger 2006), terror attacks (Chesney, Reshetar, and Karaman 2011; Cutler, Poterba, and Summers 1989), and the Covid-19 pandemic (Kartal, Ertuğrul, and Ulussever 2022; Pagano, Zechner, and Wagner 2020; Ramelli and Wagner 2020). Indeed stock price reactions differ across firms and corporate characteristics.

Although wars are rare and sad events, they are unique settings to examine factors contributing to firm resilience during a crisis (Deng et al. 2022). This study examines the risk-mitigating role of financial factors to measure Turkish firms' resilience during the outbreak of the war. Therefore, the study proceeds in two steps. First, to document the direct effect of the war on the stock market, abnormal returns around the official start of the war were calculated by applying the event study methodology. Then, cross-sectional analyses are adopted to determine whether firm-specific characteristics might explain stock price variations (e.g., Capelle-Blancard and Petit 2019; Krüger 2015).

The research result highlights that the negative effect of the war began before the official war announcement and continued to grow at an increasing pace over time. The magnitude of the average cumulative response of *all BIST* stocks reached −6.47% at the [−14, +14] window while repeating the analysis for the *BIST 100*—top companies based on market capitalization

(market cap)—subsample reveals a slightly negative abnormal return (−0.05%) for the same period.

Cross-sectional regression results document that firm size and profitability mitigate the adverse effects of the war at the [−14, +14] window, confirming the event study findings. Further, the study exploits the asymmetric response of *all BIST* versus BIST 100 companies. While size and profitability are two significant determinants of crisis return for *all BIST* companies, leverage, and liquidity become the two significant indicators for *BIST 100* companies. *BIST 100* companies with high cash and debt had poorer performance in both windows.

Covid-19 research suggests high cash contributes to firm resilience (Fahlenbrach, Rageth, and Stulz 2021; Ramelli and Wagner 2020). Contradictory, the result of this study documents an interestingly negative liquidity effect for *BIST 100* companies, which dovetails with Deng et al. (2022). Unlike Deng et al. (2022), this effect is significant for the short instead of the long window. One possible explanation for this difference might be Turkey's political position in the Russia-Ukraine war which differs from its Western allies. Another possible explanation is Turkey's deteriorated inflationist expectations which became apparent long before the war; thus, the rising inflation concern escalated with the war is short-lived.

The study also analyzes whether the findings hold after excluding financial firms. The results reveal that the protective effect of firm size and profitability for *all BIST* companies is larger for non-financials. However, the effects of liquidity and leverage are more damaging for non-financial *BIST 100* companies.

The remaining sections are organized as follows. The methodology is presented in Section "Data and methodology." Section "Results" reveals and discusses the findings. Finally, Section "Conclusion" concludes.

Background and hypothesis development

Financial impacts of the Russia-Ukraine war

EU countries heavily depend on Russian fossil fuel, which accounts for 27% of crude oil and 41% of natural gas imports (Berner, Cecchetti, and Schoenholtz 2022). Recent research suggests that sanctions on Russia or sanctions Russia imposes are key factors shaping the expectations for future cash flows rather than the war's destruction itself (Huang and Lu 2022). Wide-variety of sanctions enforced by the US, EU, and some other countries include financial sanctions and import bans and embargoes on Russian exports, especially fossil fuel (Balyuk and Fedyk Forthcoming; Deng et al. 2022). Huang and Lu (2022) calculate the average cost of

sanctions as 0.1 Trillion USD for the stock markets of sanction-imposing countries and 2.4% decrease for each stock.

Disruption of the supply chain is another potential channel through which the war possibly impacts markets. Russia and Ukraine account for one-fourth (18.4% and 7%, respectively) of the world's total wheat production worth $44 billion (OEC 2022). In addition, Russia is the primary metal producer (Berner, Cecchetti, and Schoenholtz 2022). The disruptions in the supply chain during the Covid-19 pandemic brought an increase in costs which became more evident during the war (Izzeldin et al. 2022).

Further, stock market responses might also depend on geopolitical risk—geographic proximity and exposure to international trade. Research suggests that the adverse effect of the war is higher for stock indices of countries geographically close to the war region (Boungou and Yatié 2022; Federle et al. 2022; Sun and Zhang 2022). Federle et al. (2022) document that a stock market with an extra 1,000 km to the region experiences 1.1% lower returns.

Turkey is an interesting and unique emerging market setting in this context due to its significant geopolitical position and strategic trade and business partnership with EU countries and Russia. Further, Turkey is neither on the list of countries that enforce sanctions on Russia nor does Russia impose sanctions. Turkey's oil imports from Russia tripled in April (from 304 Thousand Tones in March to 1,008 in April), while total annual imports reached a 60 Billion USD level in 2022 (from nearly 30 Billion USD in 2021) (Trading Economics 2023). Thus, focusing on Turkey enables us to explore the war's disruption rather than the change in future cash flow expectations shaped by sanctions and provide firm-level and emerging market context analysis, which is still rare (Deng et al. 2022; Sun and Zhang 2022).

Investor reactions allow an understanding of adverse events' impacts, such as war (Rigobon and Sack 2005; Schneider and Troeger 2006), terror attacks (Chesney, Reshetar, and Karaman 2011; Cutler, Poterba, and Summers 1989), and the Covid-19 pandemic (Kartal, Ertuğrul, and Ulussever 2022; Pagano, Zechner, and Wagner 2020; Ramelli and Wagner 2020). According to the EMH, stock prices immediately reflect new information about an unprecedented event. Stock prices are unbiased estimators for firm fundamentals and mirror investor beliefs about a firm's future cash flows (Fama 1970). Based on the Russia-Ukraine war background and the EMH, the first hypothesis of this study is proposed:

Hypothesis 1: The Russia-Ukraine impacted BIST stocks negatively.

Firm-specific factors and resilience

Wars are rare and sad events; thus, they are unique settings to examine factors contributing to firm resilience during a crisis (Deng et al. 2022). Also, based on the EMH, examining stock price responses by considering firm-level information may allow determining which characteristics contribute to which extent to the firm resilience (Lins, Servaes, and Tamayo 2017).

Extant research documents that traditional market-based measures of risk, such as the market capitalization of a firm, might be significantly correlated with crisis-period returns (Demers et al. 2021; Deng et al. 2022). Prior evidence shows that crises hit small and medium firms more than large firms (Ahmed, Hasan, and Kamal 2022; Fauzi and Wahyudi 2016), and that large firms might respond to or recover from crises faster than small firms (A. W. Lo and MacKinlay 1990; Wang et al. 2009). As expected, empirical results reveal that small market-cap firms could be more vulnerable to the war (Deng et al. 2022; Sun and Zhang 2022). Therefore, the following hypothesize is proposed:

Hypothesis 2a: Compared to *all BIST* stocks, the average war response of *BIST 100* stocks may be higher, thus more resilient.

Further, accounting-based factors, including liquidity, leverage, size, and profitability, could play an important role in explaining crisis response and resilience. Research on previous crises reveals that liquidity, size, and profitability could positively affect firm resilience, while leverage could have a negative effect on stock returns (Fahlenbrach, Rageth, and Stulz 2021; Glossner et al. 2020; Wang et al. 2009). High liquidity and low leverage could provide financial flexibility, which refers to strength in funding during a cash flow shortfall (Fahlenbrach, Rageth, and Stulz 2021), suggesting that financially flexible firms are likely to be those less influenced by a crisis. In addition, firm size and profitability are also expected to relate positively to crisis returns and tend to be more resilient (Au Yong and Laing 2021; Wang et al. 2009). The impact of these factors might diverge for high and low-market cap firms since market capitalization is among the critical cross-firm determinants of accounting-based factors (Kalemli-Ozcan, Sorensen, and Yesiltas 2012). Consequently, the following hypothesis is proposed:

Hypothesis 2b: Firms' accounting-based factors may influence the average war response. This influence may differ among *all BIST* stocks and *BIST 100* stocks.

Finally, the crisis response of non-financial firms might differ from financial firms, and research shows that leverage patterns diverge among financial and non-financial firms. Non-financial firms cannot adjust their

balance sheet as quickly as financials, thus might be affected more during turmoil (Adrian and Shin 2010; Fama and French 1992; Kalemli-Ozcan, Sorensen, and Yesiltas 2012). Accordingly, the following hypothesis is proposed:

Hypothesis 2c: Non-financial firms' average war response may be influenced more by accounting-based factors. This influence may differ among *all BIST* stocks and *BIST 100* stocks

Data and methodology

Data and sample

To examine the impact of the war on stock prices, daily stock return data for listed companies on Borsa Istanbul is obtained from the Wharton Research and Data Services (WRDS). Related observations are excluded if stock price data is unavailable for the investigation period from January 2021 to April 2022. Consequently, 438 firms are retained.

For the cross-sectional regressions, firm-specific data is collected from the Compustat-Capital IQ database for the last quarter of 2021. Following the related literature, *Size, Liquidity, Leverage,* and *Profitability* variables are used as firm-specific factors to predict the crisis-period returns (Albuquerque et al. 2020). All variables are used after a 1% winsorization in each tail. Table 1 summarizes all variables used in the paper. Firms with insufficient financial data are also excluded, which leaves a sample of 364 firms. 68 out of these 364 firms are listed in the *BIST 100* index, which is the primary index of the Turkish Stock Market.

Event study methodology

Event study methodology enables testing the effect of new information. To document the average impact of war information on stock returns, this study focuses on cumulative abnormal returns (CARs) and buy-and-hold-abnormal returns (BHARs) (Lins et al., 2017). Abnormal returns are

Table 1. Variable list.

Variable	Definition	Source
BHAR [−5, +5]	Buy-and-hold abnormal returns between 17th February and 3rd March 2022	WRDS
BHAR [−15, 15]	Buy-and-hold abnormal returns between 3rd February and 17th March 2022	WRDS
CAR [−5, +5]	Cumulative abnormal returns between 17th February and 3rd March 2022	WRDS
CAR [−15, 15]	Cumulative abnormal returns between 3rd February and 17th March 2022	WRDS
Size	Natural log of firms' book assets (ATQ) plus one (2021)	Compustat Global IQ
Liquidity	Cash holdings (CHEQ) over book assets (ATQ) (2021)	Compustat Global IQ
Leverage	Book value of debt (DLTTQ + DLCQ) over book assets, (ATQ) (2021)	Compustat Global IQ
Profitability	Net operating income (OIBDPQ) over book assets (ATQ) (2021)	Compustat Global IQ

calculated using the market model (MacKinlay 1997).

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \tag{1}$$

R_{it} and R_{mt} denote the returns of firm i and the value-weighted market index on day t, respectively. To estimate the market model parameters for each firm, an estimation period of 100 trading days ending 51 days before the event day ([−150, −51]) is used. Since the increased tension and deployment of troops started at the beginning of the year, this estimation window enables to control information leakage before the announcement day. Expected returns are calculated using the estimates $\hat{\alpha}_i$ and $\hat{\beta}_i$,. Abnormal returns are the difference between realized and expected returns over the event window.

$$AR_{it} = R_{it} - \left(\hat{\alpha}_i + \hat{\beta}_i R_{mt}\right) \tag{2}$$

Abnormal returns are aggregated over an event window $[t_1\ , t_2\ ]$ to obtain the CARs:

$$CAR_{i[t1,\,t2]} = \sum_{t=t1}^{t2} AR_{it} \tag{3}$$

where t_1 and t_2 represent the start and end of the event window.

To minimize the contaminating effects of out-of-war events and capture the pre- and post-announcement period effects (McWilliams and Siegel 1997), CARs for two event windows are computed: (1) 11-day event window starting five days before the war announcement and ending five days after (i.e., [−5, +5]), (2) 29-day event window starting fourteen days before the war announcement and ending fourteen days after (i.e., [−14, +14]). Considering the nature of this event—the tension between the two countries signaled the war—and possible confounding effects, this study focuses on short and relatively long two event windows following prior extant literature (Ahmed, Hasan, and Kamal 2022; Balyuk and Fedyk Forthcoming; Nerlinger and Utz 2022).

Additionally, BHARs, similar to CARs but involving compounding returns instead of summing, are calculated as below:

$$BHAR_{i,\,T} = \prod_{n=1}^{T}(1 + r_{it}) - \prod_{n=1}^{T}(1 + E[r_{it}|\Omega_t]), \tag{4}$$

where $E[r_{it}|\Omega_t]$ is the expected return on firm i in the event period.

Cross-sectional regressions

In addition to examining the direct effect of the war on Turkish stocks, it is aimed to determine whether certain firm-specific factors affect abnormal

returns. To this end, a regression-based approach is adopted. Precisely, the following model is estimated:

$$Abnormal\ Return_{it} = \alpha + \beta_1 \mathbf{X}_{i,t} + \beta_5 u_i + \varepsilon_{i,t} \quad (5)$$

where $Abnormal\ Return_{it}$ denotes CAR or BHAR for the firm i over the event window. $\boldsymbol{X}_{i,\ t}$ is the vector of firm-specific factors, and u_i shows two-digit gsector fixed effects. β_1 is the main coefficient of interest showing the magnitude of the firm-specific factors' impacts on abnormal returns. Standard errors are corrected for heteroscedasticity.

While *all BIST* sample covers all publicly traded companies in Borsa İstanbul, *BIST 100* comprises the highest 100 market-cap companies. Since high-market cap firms could be less vulnerable to war and recover faster (Wang et al. 2009), we examine the impact of firm-specific financial factors on abnormal returns during the war for *all BIST* and *BIST 100* companies. Additionally, non-financial firms have different leverage patterns and limited ability to adjust balance sheets quickly (Adrian and Shin 2010; Fama and French 1992; Kalemli-Ozcan, Sorensen, and Yesiltas 2012), while they do not have a spillover effect on global financial and commodity markets as financial ones such as banks (Batten et al. 2022; Boubaker et al. 2023). Thus, to isolate the ability of financials to confront the effects of unfavorable events during uncertain times and determine the sole impact of firm-specific factors (e.g., debt (Ramelli and Wagner 2020), we investigate whether the effects of these factors hold after excluding financial firms.

Table 2 displays the descriptive statistics. The average abnormal returns of Turkish stocks for the shorter and longer event periods are $CAR_{[-5,\ +5]} = -3.24\%$ and $CAR_{[-14,\ \ +14]} = -6.47\%$ respectively. At the shorter event window, the average abnormal return $CAR_{[-5,\ +5]}$ ranges from −22% to 27%, while it ranges from −45% to 31% for $CAR_{[-14,\ \ +14]}$. These statistics show the average reaction of firms and imply the increased volatility during these periods.

Results

Event study and abnormal return

The stock market reaction to the war announcement is depicted in Figures 1 and 2. Figure 1 portrays the average response of 438 *all BIST* stocks to the war. The negative CARs suggest that the Turkish stock market reacts negatively to the war announcement. This finding is consistent with Hypothesis 1 and the emerging literature on the impact of the current war (Ahmed, Hasan, and Kamal 2022; Deng et al. 2022; Izzeldin et al. 2022; G.-D. Lo et al. 2022). A downward trend in CARs starting earlier than 24th February implies that investors have anticipated the event before the

Table 2. Descriptive statistics.

Statistics	Observation	Mean	Std. Dev.	Min	Max
Panel A: *All BIST* companies					
CAR [−5, +5]	364	−0.033	0.09	−0.224	0.266
CAR [−15, +15]	364	−0.064	0.138	−0.453	0.31
BHAR [−5, +5]	364	−0.031	0.087	−0.2	0.291
BHAR [−15, +15]	364	−0.065	0.135	−0.387	0.322
Size	364	4.230	0.921	2.436	6.944
Liquidity	364	0.128	0.136	0.0004	0.739
Leverage	364	0.245	0.229	0.0003	1.021
Profitability	364	0.118	0.108	−0.14	0.487
Panel B: *BIST 100* companies					
CAR [−5, +5]	68	−0.017	0.094	−0.23	0.25
CAR [−15, +15]	68	−0.015	0.117	−0.262	0.217
BHAR [−5, +5]	68	−0.015	0.092	−0.201	0.27
BHAR [−15, +15]	68	−0.015	0.117	−0.245	0.237
Size	68	5.442	0.767	4.164	7.025
Liquidity	68	0.160	0.136	0.012	0.738
Leverage	68	0.284	0.175	0.004	0.757
Profitability	68	0.12	0.074	−0.034	0.285

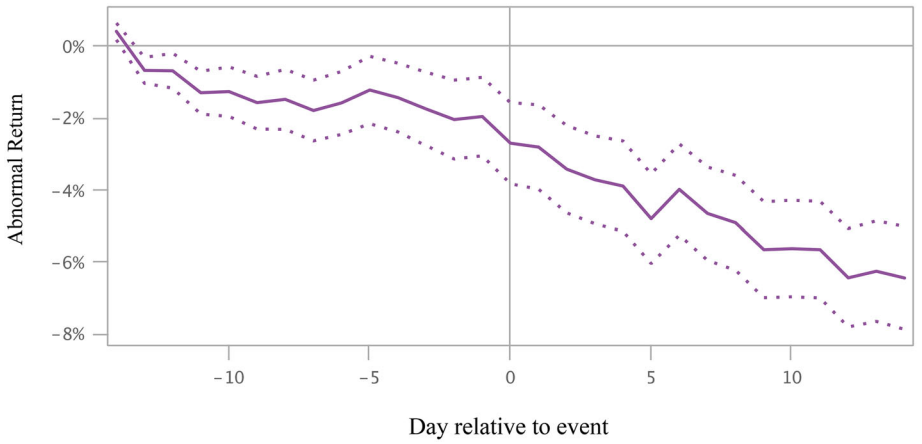

Figure 1. Cumulative abnormal returns of *all BIST* companies. *Note*: The figure shows the mean and 95% confidence limits.

announcement day. This trend became more apparent after the war announcement.

However, Figure 2 shows that the average CAR for only *BIST 100* index constituents follows a stable path and becomes nearly zero (−0.05%), showing that *BIST 100* companies differ from the whole sample. Event study findings dovetail with prior research suggesting that crises hit small market-cap firms and reveal that *BIST 100* companies were more resilient at the onset of the war, which supports Hypothesis 2a.

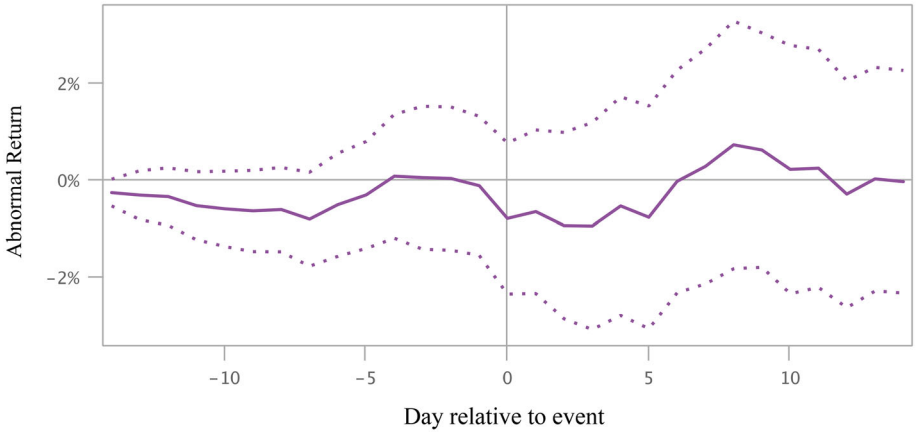

Figure 2. Cumulative abnormal returns of *BIST 100* companies. *Note*: The figure shows the mean and 95% confidence limits.

Table 3. Cross-sectional regressions of abnormal returns for *all BIST* companies.

	Dependent variable			
	(1) CAR [−5, 5]	(2) BHAR [−5, 5]	(3) CAR [−15, 15]	(4) BHAR [−15, 15]
Size	0.009	0.010*	0.024***	0.025***
	(0.006)	(0.006)	(0.008)	(0.008)
Liquidity	−0.009	−0.012	0.061	0.058
	(0.033)	(0.031)	(0.058)	(0.057)
Leverage	−0.029	−0.026	−0.010	−0.010
	(0.025)	(0.025)	(0.034)	(0.034)
Profitability	0.083	0.084	0.184**	0.184**
	(0.057)	(0.056)	(0.085)	(0.082)
Constant	−0.063*	−0.069**	−0.120	−0.122
	(0.035)	(0.032)	(0.080)	(0.081)
Industry dummies	Yes	Yes	Yes	Yes
Observations	357	357	357	357
Adjusted R^2	0.006	0.006	0.061	0.062

This table presents the results of regressing CARs and BHARs on firm-specific factors. Standard errors are adjusted for heteroskedasticity and reported in parentheses. Statistical significance at the 1%, 5%, and 10% levels is indicated by ***, **, and *, respectively.

Cross-sectional analysis of abnormal returns

Table 3 shows the results of regressing CARs and BHARs on firm-specific factors. The dependent variables in Columns 1 and 3 are CARs, while in Columns 2 and 4 are BHARs. Standard errors are robust to heteroscedasticity. The models are estimated by adding two-digit gsector dummies to control for industry-specific factors (repeating the analyses with two-digit SIC codes yields similar results). The effects of firm size and profitability for $CAR_{[-14,\ \ +14]}$ are significantly positive at the 1% and 5% levels, respectively. That shows the contributions of these two factors to the firm's resilience during the crisis. Both effects are larger for the longer [−14, +14] event window than the shorter [−5, +5] window. The impacts of liquidity and leverage are insignificant.

Table 4. Cross-sectional regressions of abnormal returns for *BIST 100* companies.

	Dependent variable			
	(1) CAR [−5, 5]	(2) BHAR [−5, 5]	(3) CAR [−15, 15]	(4) BHAR [−15, 15]
Size	0.022	0.025	0.017	0.021
	(0.017)	(0.017)	(0.022)	(0.021)
Liquidity	−0.152**	−0.150**	−0.016	−0.014
	(0.072)	(0.071)	(0.075)	(0.077)
Leverage	−0.154***	−0.153***	−0.112*	−0.116*
	(0.058)	(0.056)	(0.059)	(0.059)
Profitability	0.226	0.226	0.291	0.306
	(0.183)	(0.174)	(0.229)	(0.228)
Constant	−0.039	−0.064	0.003	−0.020
	(0.118)	(0.114)	(0.145)	(0.142)
Industry dummies	Yes	Yes	Yes	Yes
Observations	68	68	68	68
Adjusted R^2	0.272	0.288	0.301	0.305

This table shows the regression results for *BIST 100* companies. Standard errors are adjusted for heteroskedasticity and reported in parentheses. Statistical significance at the 1%, 5%, and 10% levels is indicated by ***, **, and *, respectively.

As documented before, the average response to the war diverges among *all BIST* and *BIST 100* companies. Cross-sectional regressions are repeated for *BIST 100* companies to examine the drivers of this asymmetric response. Table 4 shows that firm size is positive albeit insignificant in predicting abnormal returns for *BIST 100* companies, while it is the main significant predictor for *all BIST* companies. That indicates that size matters for an average firm in the whole sample but not for big companies. This finding might explain the asymmetric reaction. Another result shows that high-cash companies yield lower returns than low-cash companies contrary to Covid-19 periods, in which cash holdings have contributed to firms' resiliency (Fahlenbrach, Rageth, and Stulz 2021; Ramelli and Wagner 2020). This effect is insignificant in the longer event window. However, inflationist pressures and expectations related to rising prices during the war might explain the less attractiveness of liquidity, which is in line with related papers (Deng et al. 2022). Leverage also has a significant negative impact on returns, implying that the stock market might be reluctant to hold high-debt stocks during this difficult time. These findings suggest that low cash and more indebted *BIST 100* firms were more resilient in the outbreak of the war. Although the coefficient of profitability is higher for the *BIST 100* than the whole sample, it is insignificant. Overall, this evidence provides support to Hypothesis 2b.

Further, the study analyzes whether the findings hold after excluding financial firms. As displayed in Table 5, the size effect is stronger for *all BIST* non-financial companies, meaning that high-asset firms performed better during the war. The impact of profitability is also higher for non-financials. In addition, leverage impacts abnormal returns negatively in the short window, showing that non-financials suffered from high debt.

Table 5. Cross-sectional regressions of abnormal returns for *all BIST* non-financial companies.

	Dependent variable			
	(1) CAR [−5, 5]	(2) BHAR [−5, 5]	(3) CAR [−15, 15]	(4) BHAR [−15, 15]
Size	0.016*	0.017**	0.034***	0.035***
	(0.008)	(0.008)	(0.010)	(0.010)
Liquidity	−0.035	−0.040	0.048	0.042
	(0.038)	(0.036)	(0.069)	(0.069)
Leverage	−0.053**	−0.052**	−0.047	−0.046
	(0.026)	(0.024)	(0.035)	(0.034)
Profitability	0.123*	0.131*	0.196*	0.206*
	(0.074)	(0.071)	(0.106)	(0.106)
Constant	−0.089*	−0.094**	−0.143	−0.146
	(0.049)	(0.047)	(0.106)	(0.107)
Industry dummies	Yes	Yes	Yes	Yes
Observations	272	272	272	272
Adjusted R^2	0.010	0.019	0.088	0.091

This table presents the regression results for all BIST non-financial companies. Standard errors are adjusted for heteroskedasticity and reported in parentheses. Statistical significance at the 1%, 5%, and 10% levels is indicated by ***, **, and *, respectively.

Table 6. Cross-sectional regressions of abnormal returns for *BIST 100* non-financial companies.

	Dependent variable			
	(1) CAR [−5, 5]	(2) BHAR [−5, 5]	(3) CAR [−15, 15]	(4) BHAR [−15, 15]
Size	0.026	0.031	0.004	0.009
	(0.026)	(0.025)	(0.029)	(0.030)
Liquidity	−0.157**	−0.158**	−0.005	−0.005
	(0.076)	(0.075)	(0.078)	(0.080)
Leverage	−0.191***	−0.191***	−0.142*	−0.148**
	(0.073)	(0.070)	(0.073)	(0.073)
Profitability	0.252	0.254	0.275	0.295
	(0.185)	(0.177)	(0.230)	(0.230)
Constant	−0.054	−0.091	0.091	0.058
	(0.163)	(0.159)	(0.185)	(0.186)
Industry dummies	Yes	Yes	Yes	Yes
Observations	53	53	53	53
Adjusted R^2	0.262	0.277	0.241	0.243

This table presents the regression results for *BIST 100* non-financial companies. Standard errors are adjusted for heteroskedasticity and reported in parentheses. Statistical significance at the 1%, 5%, and 10% levels is indicated by ***, **, and *, respectively.

Table 6 shows the market reactions of *BIST 100* non-financial companies to the war-induced crisis. The effect of firm size is relatively low compared to the whole sample and statistically insignificant. Similar to prior findings for *BIST 100* stocks, the effects of liquidity (in the short window) and leverage (in the short and long window) are negative and significant for non-financial companies. However, the damaging effects of high cash and debt are more pronounced for non-financial *BIST 100* companies. Although the magnitude of profitability is higher than the whole sample, it is insignificant. This result reveals no evidence that profitable *BIST 100* non-financial firms outperformed at the beginning of the war.

Overall, the results lend support to Hypothesis 2c, showing a return differential between *all BIST* and *BIST 100* companies and revealing that the

protective effects of firm size and profitability for *all BIST* companies are larger for non-financial firms. In comparison, excluding non-financials breaks no squares for *BIST 100* companies. However, the adverse effects of liquidity and leverage are stronger for non-financial *BIST 100* companies.

Conclusion

This study examines the Russian-Ukrainian war's impact on the stock market of Turkey, one of the most critical neighbors of Europe and Russia. Results show that the adverse effects of the war began before the official initiation period, increased over time, and accelerated, especially after the official war announcement. The response to the crisis is asymmetric between all companies traded in the Turkish stock market and *BIST 100* companies. The study results reveal that firm profitability might be protective for *all BIST* companies against the adverse effects of the war. At the same time, high liquidity and leverage might deepen the negative effects for *BIST 100* companies. Both effects are observed more strongly for non-financial companies.

Considering that crises and geopolitical risk could affect stock markets (G.-D. Lo et al. 2022; Sun and Zhang 2022), this study offers theoretical implications by analyzing a geopolitical emerging market setting at the firm level and expands our knowledge by documenting interesting findings in this under-researched area. The study also offers important implications for investors and managers regarding understanding the influence of corporate characteristics before and during hard times (i.e., the Russian-Ukrainian war). For practitioners, our results show that low leverage could serve as a risk management tool. However, this is not valid for high liquidity, and it would not be wrong to conclude that the cost of holding cash could be higher than its possible benefit. Although high cash and low leverage offered high financial flexibility in the previous crises, results show that might depend on conditions, and such flexibility might come with its costs and damage firm value (Jensen 1986). Of course, this study is not without limitations. This study examines short-term stock market reactions. Investigating the extended period would be valuable to this line of research to understand the direction and spread of the war's financial impacts. The study considers firm-specific financial factors contributing to resilience. The role of other firm-specific factors, such as corporate social responsibility or corporate governance, in contribution to firm resilience, is open for investigation. As the paper is confined to a single emerging market, the Turkish equity market, comparative studies including other emerging and developed countries could further contribute to this field.

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