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Corporate decisions in times of war: Evidence from the Russia-Ukraine conflict☆

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ABSTRACT

Despite sanctions and public demand for companies to exit the Russian market due to its 2022 invasion of Ukraine, several firms chose to keep their businesses operating in Russia. We investigate the financial market reaction to announcements of companies remaining in Russia during the eventful two weeks following the invasion. Our findings show that a portfolio of remainers underperforms the leavers and the market benchmark. Investors impose a significant market penalty on the remainers. There is evidence of higher trading volume and selling pressure on remainers, suggesting equity markets are acutely sensitive to corporate decisions in times of political conflict.

1. Introduction

At the time of writing this paper, the full-scale Russian invasion of Ukraine since 24 February 2022 is a still unfolding international conflict with wide-ranging implications across geopolitical, military, and economic spheres. Unprecedented economic sanctions have already been imposed on the Russian Federation in terms of, inter alia, imports and exports of goods and services including banking and payment processing services. In addition, several hundred highly affluent individuals (commonly known as 'oligarchs') with alleged ties to the Russian regime have been placed under sanctions with their assets seized or frozen, among other punitive measures.[1]

Against this backdrop, many international businesses operating in the Russian market chose to cut their ties and close up shop, or curtail investments in Russia for the foreseeable future (Sonnenfeld, 2022). This trend was observable even in the days before the invasion but took real momentum following the full-scale invasion. Several of the firms that announced the suspension of their business operations in Russia did so following social media campaigns and threats of consumer boycotts (e.g., Coca Cola). However, a small sample of firms have chosen to remain operating in the country despite sanctions, difficulty of banking transactions and souring public sentiment. In this paper, we focus on the economic aspects of the crisis by investigating the decisions made by such companies. Specifically, we focus on firms that stayed open in Russia during the turbulent two weeks following the invasion and investigate the reaction of financial markets to associated corporate announcements.

Finance literature shows that the aggregate impact of international conflicts on financial markets is typically negative in the short-term. This strand of literature goes back to studies on the destructive impact of World War 2 on equity and particularly debt markets

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[1] Retrieved on 14 March 2022 from https://edition.cnn.com/2018/01/30/politics/full-us-list-of-russian-oligarchs-with-putin-ties-intl/index.html.

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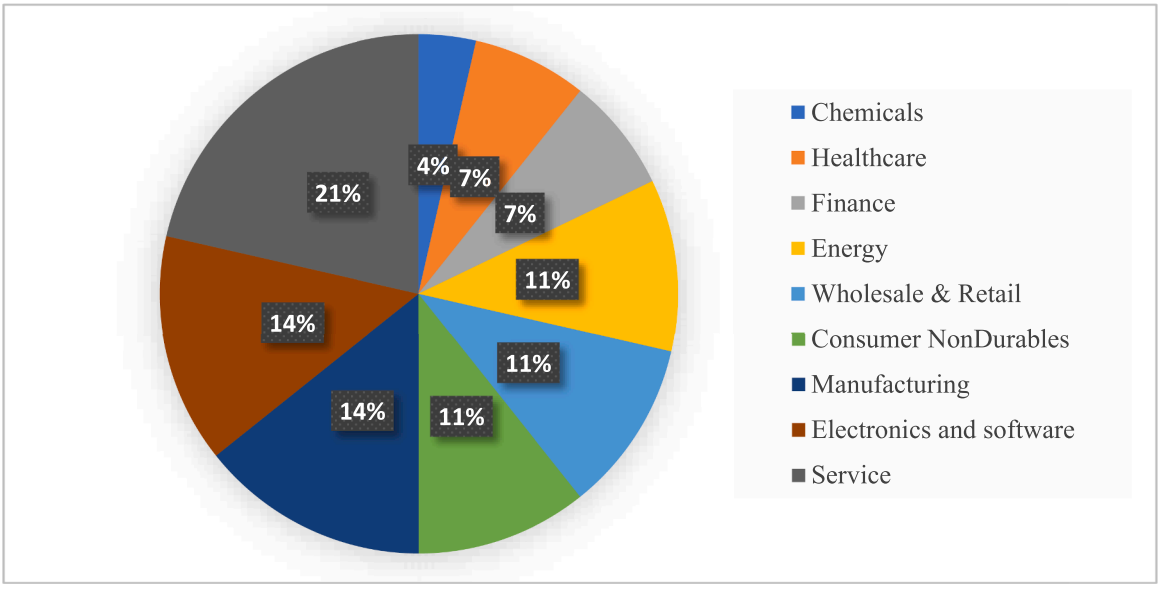

Fig. 1. Industry distribution.
This figure represents the distribution of Remainer firms across industry sectors based on the 12 Fama-French industry classification.

(Frey and Kucher, 2000; Frey and Waldenstorm, 2004; Schneider and Troeger, 2006; Choudhry, 2010; Hudson and Urquhart, 2015). For example, Choudhry (2010) found that the majority of WW2 events deemed as historically significant could be picked up in the structural breaks observed in the Dow Jones Index. Related to this, Frey and Kucher (2000) show, through examining government bond prices of five European nations, that the loss and gain of national sovereignty during WW2 influenced the bond prices of the countries involved. One observes qualitatively similar results when more recent conflicts are examined such as the conflict between Israel and Palestine, the Gulf War, and the conflicts in former Yugoslavia (Schneider and Troeger, 2006), or terrorist events such as 9/11 (Tosun et al., 2021). Overall, geopolitical risk is detrimental not only for equity markets (Kannadhasan and Das, 2020) but also for the energy sector (Antonakakis et al., 2017), commodities and the stability of the financial system in aggregate (Phan et al., 2021).

Another body of work relevant to our study examines consumer boycotts and their financial impact. Heilmann (2016) finds that boycotts have an overall significant and negative effect on exports from the boycotted country to the boycotter, but there is strong heterogeneity in the response to boycott calls. Interestingly, the effects of actual boycotts and threats of boycotts are similar (see, e.g., Koku et al., 1997). Innes (2006) shows, through theoretical modeling, that small persistent boycotts tend to target small firms, and large transitory boycotts tend to target large firms in the industry, resulting in target firms in the latter group acceding to boycott demands more quickly, a pattern also observable in our data.

2. Data and variables

We study corporate decisions and market behavior during the period from 3 February to 8 March 2022. This interval includes the start of the Russian invasion of Ukraine on 24 February and two major news announcements across international media channels regarding Remainer firms (those who stayed in Russia) and Leaver firms (those who left) around 28 February and 3 March.[2] To identify Remainers we rely on the daily updated list of firms by Sonnenfeld (2022) and cross-check that with other media sources such as CNN and Business Insider. As of 10 March, we observe 22 stocks trading in NYSE and 6 stocks in NASDAQ, a total of 28 Remainers, who kept their business operations in Russia for more than two weeks following the invasion. Fig. 1 shows the industry distribution of Remainers in our sample based on the 12 Fama-French industry classification. Services (21%), electronics and software (14%), and manufacturing (14%) firms make up about half of the sample, although we observe no considerable clustering across industries.

We collect daily data on publicly traded US firms from CRSP. *Excess Return* is the daily stock return in excess of the risk-free rate proxied by the one-month T-Bill rate. Market activity is measured through three different variables. Ln*(TradedVolume)* is the natural logarithm of the number of shares traded daily by a firm. Ln*(DollarVolume)* is the natural logarithm of the number of shares traded multiplied by the daily closing price of the shares. *Signed Volume* is the daily stock return multiplied by the natural logarithm of the number of daily traded shares. While the former two variables denote a proxy for the aggregate fund flows that come into the marketplace, the latter gives a sense of the direction of trading activity. *Signed Volume* takes a positive (negative) value if there is buy (sell) pressure in the market (Llorente et al., 2002; Tosun, 2021).

We incorporate a number of control variables in our model. Dahlquist and Robertsson (2001) suggest that investors have a bias

[2] These media channels include CBS News, Bloomberg, Forbes, ITV News, Metro, The Wall Street Journal, Reuters, and BBC News, among others.

Table 1
Descriptive statistics.

	Mean	St Dev.	25th	Median	75th
Return	−0.001	0.036	−0.018	−0.002	0.016
MarketValue ($bn)	46.315	63.518	7.658	17.651	55.871
Ln(MarketValue)	2.914	1.583	2.036	2.871	4.023
Ln(TradedVolume)	7.547	1.716	6.757	7.657	8.767
Ln(DollarVolume)	11.735	1.778	10.797	11.993	13.014
Signed Volume	−0.005	0.301	−0.131	−0.011	0.113
Mktrf	−0.002	0.013	−0.011	−0.006	0.008
Unemployment	0.038	0.000	0.037	0.038	0.038

This table reports descriptive statistics for the main variables. The mean, standard deviation, and quartiles are reported for the period between 3 February and 08 March 2022. *Return* is the daily stock return for Remainer firms. Ln*(MarketValue)* is the natural logarithm of daily closing price multiplied by common shares outstanding for that firm. Ln*(TradedVolume)* is the natural logarithm of the number of shares traded daily for that firm. Ln*(DollarVolume)* is the natural logarithm of the number of shares traded multiplied by the daily closing price for that firm's shares. *Signed Volume* is the daily stock return multiplied by the natural logarithm of the number of that firm's daily traded shares. *Mktrf* is the daily NYSE return in excess of the risk-free rate proxied by the one-month T-Bill rate. *Unemployment* is the seasonally adjusted national unemployment rate in the US, measured monthly in percentages.

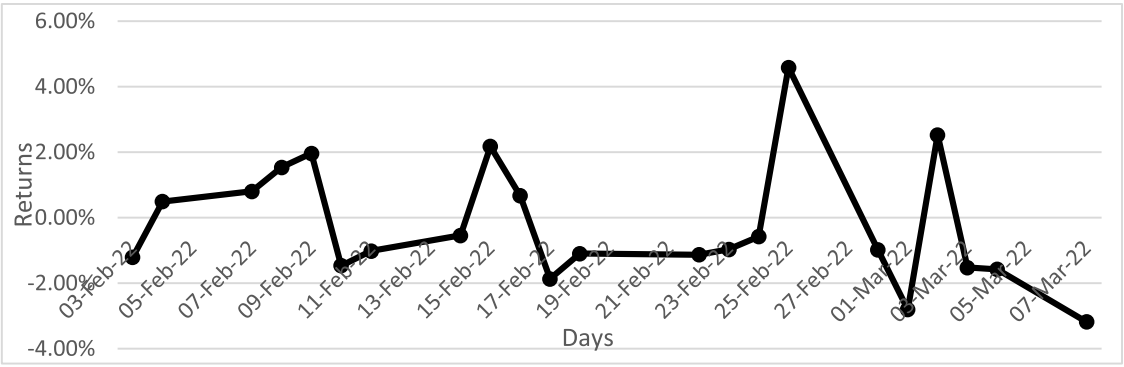

Fig. 2. Remainer firm portfolio returns.
This figure displays daily returns of an equally weighted portfolio of Remainer firms from 3 February to 8 March 2022. The period includes the start of Russian invasion of Ukraine on 24 February 2022 as well as two major news announcements regarding Remainer and Leaver firms around 28 February and 3 March 2022.

towards larger firms. Sharpe (1964) argues that systematic risk is embedded in stock prices. Further, Devos and Rahman (2018) discuss the necessity of controlling for macro-economic factors in panel regressions because different firms may have varying exposures to such variables. Therefore, we control for the potential effect of firm size, market risk and macro-economic factors on investor reaction. Ln*(MarketValue)* is the natural logarithm of daily closing price multiplied by common shares outstanding for the firm. *Mktrf* is the daily NYSE return in excess of the risk-free rate. *Unemployment* is the seasonally adjusted national unemployment rate in the US, measured monthly in percentages. All variables are winsorized at the 1st and 99th percentiles. Table A.1 in Appendix describes the variables in greater detail.

Table 1 gives descriptive statistics for Remainer firms. The average daily *Return* for Remainers is −0.1%. The highly right-skewed distribution of Remainers' market value suggests the sample includes few very large firms. *Signed Volume* with an average of −0.5% indicates there is a slight sell-pressure in the markets during this period.

3. Methodology and findings

Remainer firms may inherently differ from Leaver firms (those that have announced to take considerable action, e.g., suspending certain operations, divesting from or completely exiting the Russia market) unobservable ways. Such unobserved differences can explain the market reaction upon publication of firms as Leavers vs Remainers. To address this issue and provide a benchmark comparison in the analysis, we match our list of 28 Remainer firms individually to respective Leaver firms. Particularly, we focus on two major disclosure dates, i.e., 28 February and 03 March, where certain firms are listed for taking actions against Russia while other companies are criticized in numerous media channels for remaining silent. On each of these dates, we identified the Leavers and match them to our list of Remainers by requiring that each pair operates in the same four-digit SIC industry code. In case of multiple Leavers

Table 2
T-test analysis of portfolio performance for remainer firms.

	Before News Announcement	After News Announcement	*Difference*	p-value
Remainer Portfolio Return	0.114%	−0.822%	*−0.936%**	0.084
Remainer Portfolio Return (benchmarked to NYSE)	0.062%	−0.217%	*−0.279%**	0.073

This table presents the T-test analyses comparing daily equally weighted portfolio returns of Remainer firms before and after major news announcements where the list of Remainer and Leaver firms were made public. The test is repeated by deducting the daily NYSE returns from the Remainer portfolio returns to measure over(under)performance of the portfolio. The difference in portfolio returns and p-values from the T-tests are provided. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

that can be matched to one Remainer, we pick the one with the closest size to the Remainer.[3]

To examine the causal impact of being announced as a Remainer on daily excess returns and market activity, we conduct the following Difference-in-differences (DID) analysis:

$$\left(Investor\ Reaction_{i,t} = \alpha + \beta' \mathbf{N}_{i,t} + \delta' \mathbf{z}_{i,t} + \theta_t + \mu_i + \varepsilon_{i,t} \quad t = \tau - 16, \cdots, \tau + 8\right) \tag{1}$$

where τ identifies the major news announcement dates of 28 February and 3 March. $Investor\ Reaction_{i,t}$ represents *Excess Return*, Ln *(TradedVolume)*, Ln*(DollarVolume)*, and *Signed Volume* for firm i at time t; $\mathbf{N}_{i,\tau}$ is a $(k+1)$-dimensional vector of interaction variables between the dummy variable of Remainer firms and dummies that take a value of one for each of the $[-3, +3]$ days around the news announcement, where k is from -3 to $+3$; $\mathbf{z}_{i,t}$ is a set of control variables, i.e., Ln*(MarketValue), Mktrf*, and *Unemployment ;*[4] $\boldsymbol{\theta}_t$ is a (t)-dimensional vector of daily dummy variables; and μ_i is the firm fixed effect. Standard errors are clustered at the firm level. The model does not include a separate indicator for Remainer firms as it is subsumed by the firm-fixed effects. The null hypothesis that announcement of a Remainer firm impacts the investor reaction is tested based on the regression coefficients $\beta' = (\beta_{\tau-k}, \ldots, \beta_{\tau}, \ldots, \beta_{\tau+k})$, which represent the reaction of investors to a Remainer versus a Leaver over the event window.

Fig. 2 displays daily returns of an equally weighted portfolio of Remainer firms from 3 February to 8 March 2022. The period includes the start of Russian invasion of Ukraine on 24 February as well as two major news announcements regarding Remainer and Leaver firms around 28 February and 3 March. The figure provides an overall picture of Remainers and their stock performance in days leading up to and following the invasion. One can observe remarkable falls in portfolio returns on 28 February and 3 March, which happen to coincide with substantial news announcements in media regarding the firms that have left Russia or stayed there. Altogether, this graph provides suggestive evidence of market reacting to the decisions made by Remainers around these critical times. Similar patterns exist when the Remainer portfolio is value-weighted.

Table 2 presents the T-test analysis comparing daily equally weighted portfolio returns of Remainer firms before and after news announcements regarding Remainers and Leavers. The test is repeated by deducting the daily NYSE returns from the Remainer portfolio returns to measure outperformance (underperformance) of the portfolio. We can see that Remainer firms perform worse in the wake of being listed as such. This decline in performance is both in absolute terms and relative to the NYSE benchmark. It is also notable that Remainers were actually outperforming the market before the announcements but turned into underperformers after their 'public outing' by the media. Taken together, these results further show the impact media and market sentiment has on corporate returns, particularly in times of conflict.

A more detailed analysis appears in Table 3. This table, based on Eq. (1) described above, presents difference-in-differences estimates for a series of interaction between the dummy variable of Remainer firms and dummy variables that take a value of one for each of the $[-3, +3]$ days around the major news announcement. The table features four dependent variables: *Excess Return*, Ln *(TradedVolume)*, Ln*(DollarVolume)*, and *Signed Volume*.

The results indicate that Remainers experience an average decline in market returns of 1.3% on the day following major news announcements about the list of Remainers versus Leavers. This market reaction is concentrated on the day following the news announcement and does not persist over subsequent days; nor is there a meaningful market reaction prior to these announcements. *Traded Volume* and *Dollar Volume* react to the news announcements on the same day indicating an increase in trading of Remainers. This increased trading persists over the next two days at a comparable level.

The impact of the increased trading of Remainers is better understood when we observe *Signed Volume*. The day following the news announcements, Remainers experience a negative, statistically and economically significant signed volume which indicates the formation of selling pressure and can explain the decline in corporate returns. The results are robust to incorporating day and firm fixed effects as well as macroeconomic control variables.

4. Conclusions

We provide evidence of a collective market reaction to news of firms continuing to operate in a controversial market, namely, that of Russia during its war on Ukraine. We find that a portfolio of Remainers underperforms the Leavers and the market benchmark. This

[3] See the full list of Remainers and Leavers in Table A.2 of Appendix.

[4] In untabulated analysis, we see that the replacement of unemployment rate with other macro-economic factors such as GDP or inflation does not change the interpretation of our findings.

Table 3
Market reaction to remainers vs leavers.

	Excess Return	Ln(TradedVol)	Ln(DollarVol)	Signed Volume
	I	II	III	IV
N+3	−0.003	0.104	0.106	−0.017
	(0.006)	(0.086)	(0.087)	(0.045)
N+2	−0.001	0.185**	0.187**	0.001
	(0.006)	(0.080)	(0.081)	(0.053)
N+1	−0.013***	0.193**	0.194**	−0.099***
	(0.005)	(0.085)	(0.085)	(0.038)
N	−0.008	0.186**	0.188**	−0.076
	(0.006)	(0.086)	(0.087)	(0.052)
N-1	0.009	0.114	0.116	0.068
	(0.014)	(0.099)	(0.100)	(0.131)
N-2	−0.006	0.171**	0.172**	−0.044
	(0.007)	(0.070)	(0.070)	(0.048)
N-3	0.001	0.013	0.015	0.032
	(0.003)	(0.065)	(0.065)	(0.027)
Mktrf	1.138***	−2.237***	−2.211***	9.063***
	(0.109)	(0.672)	(0.673)	(0.991)
Ln(MarketValue)	0.107***	−0.192	0.783	0.874***
	(0.016)	(0.591)	(0.591)	(0.170)
Unemployment	−0.033*	−1.585***	−1.577***	−0.330**
	(0.019)	(0.475)	(0.473)	(0.160)
Constant	−0.254**	14.660***	15.540***	−1.837*
	(0.100)	(2.149)	(2.153)	(0.919)
Day and Firm FE	YES	YES	YES	YES
Adj. R^2	0.291	0.087	0.075	0.241
Observations	1266	1266	1266	1266

This table presents estimates from four regressions (Columns I – IV) with four different dependent variables, i.e. *Excess Return*, Ln*(TradedVolume)*, Ln *(DollarVolume)*, and *Signed Volume*, respectively. *Excess Return* is the daily stock return in excess of the risk-free rate proxied by the one-month T-Bill rate. Ln*(TradedVolume)* is the natural logarithm of the number of shares traded daily. Ln*(DollarVolume)* is the natural logarithm of the number of shares traded multiplied by the daily closing price. *Signed Volume* is the daily stock return multiplied by the natural logarithm of the number of that firm's daily traded shares. Across Columns I to IV, $N + k$ is a series of interactions between Remainer firms dummy variables and dummies taking a value of one for each of the [−3, +3] days around the news announcement, where k is from −3 to +3. *Mktrf*, Ln*(MarketValue)*, and *Unemployment* are the control variables in each regression model. Variable definitions are given in Table A.1. Day dummies and firm fixed effects are included. Standard errors are clustered at the firm level and given in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

is consistent with prior literature on the negative impact of military conflicts, sanctions and boycotts on target firms involved in such episodes (e.g., Schneider and Troeger 2006; Choudhry 2010; Heilmann 2016). We document a statistically and economically significant market penalty imposed by investors on the Remainers, which may be attributed to the negative sentiment related to firms that have kept their business ties with Russia following the invasion of February 2022. Additionally, the findings provide evidence of higher trading volume due to selling pressure on Remainers.

Overall, firms that remained operating in Russia despite the invasion, sanctions and souring public sentiment, are doing so to the detriment of their market performance. Future research can examine the subtleties of making such corporate decisions in times of political and military conflict. It is also worth studying if the negative market sentiments persist in the longer term - weeks and months following the invasion - thereby providing a test for the memory of investors in relation to undesirable corporate behavior. The extent of market reactions in relation to Leavers can be equally examined in future research.

CRediT authorship contribution statement

Onur Kemal Tosun: Conceptualization, Methodology, Formal analysis, Investigation, Writing – original draft. **Arman Eshraghi:** Conceptualization, Methodology, Writing – original draft, Writing – review & editing.

Appendices

See Tables A.1 and A.2.

Table A.1
Definition of variables.

Variables	Description
N+k	The interaction between the binary indicator of Remainer firms and daily binary variables that take a value of one for each of the [−3, +3] days around the news announcement, where *k* is from −3 to +3.
Excess Return	The daily stock return in excess of the risk-free rate that is proxied by the one-month T-Bill rate.
Ln(TradedVolume)	Natural logarithm of the number of shares traded daily.
Ln(DollarVolume)	Natural logarithm of the amount of shares traded multiplied by the daily closing price of that share.
Signed Volume	The daily stock return multiplied by natural logarithm of the number of shares traded daily.
Ln(MarketValue)	Natural logarithm of daily closing price multiplied by common shares outstanding.
Mktrf	The daily NYSE return in excess of the risk-free rate that is proxied by the one-month T-Bill rate.
Unemployment	The seasonally adjusted national unemployment rate in the US, measured monthly in percentages.

Table A.2
List of remainer and leaver firms.

Remainers		Leavers	
Ticker	Name	Ticker	Name
ABT	Abbot Labs	UAA	Adidas
ABBV	Abbvie	AA	Alcoa
AC	Accor	ALNY	Alnylam
ABC	Amerisource Bergen	GOOGL	Alphabet
ARNC	Arconic	AAPL	Apple
BKR	Baker Hughes	T	AT&T
BG	Bunge	BCSF	Bain
QSR	Burger King	BLK	Blackrock
CARG	Cargill	BP	BP
C	Citi	GOOS	Canada Goose
CTXS	Citrix	DE	Deere
NET	Cloudflare	DIS	Disney
COTY	Coty	EQNR	Equinor
CNI	Cummins	XOM	Exxon
GEF	Greif	FDX	Fedex
HAL	Halliburton	GM	General Motors
HLF	Herbalife	HMC	Honda
IHG	Intercontinental Hotels	LEVI	Levis
IPG	Interpublic	LYB	Lyondell Basell
IPGP	IPG Photonics	FB	Meta
MAR	Marriott	NFLX	Netflix
MHK	Mohawk	NKE	Nike
MDLZ	Mondelez	SGEN	Seagen
WPP	Ogilvy & Mather	TJX	TJX
OMC	Omnicom	UBER	Uber
OTIS	Otis	UPS	Ups
SLB	Schlumberger	WMT	Walmart
TKR	Timken	WMG	Warner Bros

This table lists the Remainer firms in our sample as of 10 March 2022, and the closest matched Leaver firm. Of the Remainers, 22 are listed on the NYSE and 6 are listed on NASDAQ. The match is done by requiring that each pair operates in the same four-digit SIC industry code. In case of multiple Leavers that can be matched to one Remainer, we pick the one with the closest firm size to the Remainer firm. Both Remainer and Leaver columns below are alphabetically sorted.

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