Heterogeneous impacts of wars on global equity markets: Evidence from the invasion of Ukraine

Abstract

Using an event study methodology to examine the impact of the 2022 Russian invasion of Ukraine, we find that this invasion generated negative cumulative abnormal returns for global stock market indices, but with heterogeneous effects. Cross-sectional analysis reveals that economic globalization as measured by GDP-scaled trade is negatively associated with event-day and post-event returns. Consistent with the expected economic stimulus of military preparedness, markets of NATO countries exhibited higher returns. Results are consistent with markets of more globalized economies being more vulnerable to international conflicts, with, however, notable heterogeneities.

Keywords: Ukraine conflict; Conflicts and equity markets; Event study; Abnormal returns; Globalization

JEL codes: G12; G14; G15

The war in Ukraine is a catastrophe for the world, which will cut global economic growth.

David Malpass, President of the World Bank[1]

1. Introduction and motivation

The invasion of Ukraine on February 24, 2022, in addition to generating market and societal uncertainties through, for example, risks of escalating war and nuclear accidents, has tangentially generated outcomes that will arguably lead to both promoting and impeding globalization. For instance, some outcomes will arguably promote new global linkages. These include enormous cross-border flows of refugees that will certainly lead to some permanent resettlement; potential new or re-strengthened geopolitical and military alignments; and negative perceptual impacts of voters on domestic populist political parties that have been perceived as ideologically relatively more aligned with Russia, while concomitantly less supportive of European and western alliances.

Outcomes acting against globalization include new barriers to global transportation and trade, mainly to ostracize Russia. Other outcomes include strains on global energy supplies through sanctions on Russian gas[2]. This can incentivize greater development of local energy sources such as green energy and coal[3], as well as alternatively engender more global trade through the development of, for example, supply chains of liquefied natural gas. The Ukraine conflict is motivating changes in long-term energy and food supply policies.[4] Concomitantly, there are many reasons to expect global markets to be impacted by the war in Ukraine, with expanding and contracting shifts in economic globalization in differing national contexts having a primary conditioning role. Given the recent stock market turbulence (Batten et al., 2022; Kinateder et al., 2021), the Ukraine conflict will engender market effects that are likely to be large and distributed asymmetrically.

So far, literature has only lightly examined the impacts of wars, invasions, and border disputes on financial markets. Niederhoffer (1971) investigates the effect of world events (war, assassination, and political crises) on global equity. Others, such as Bradford & David-Robison (1997), Gu et al. (2021), Guidolin & La Ferrara (2010), and Hudson & Urquhart (2015) examine the impact of both violent and non-violent world events on stock markets. Few studies report the implications of war events. Leigh et al. (2003) evidence weaker equity markets and stronger gold and energy sectors during

[1] https://www.bbc.com/news/business-60610537

[2] Tom Fairless (2022), "Global Economy Braces for Impact of Russia's War on Ukraine", The Wall Street Journal, https://www.wsj.com/articles/global-economy-braces-for-impact-of-russias-war-on-ukraine-11646684060

[3] Roosevelt Room (2022), "Remarks by President Biden Announcing U.S. Ban on Imports of Russian Oil, Liquefied Natural Gas, and Coal", The White House; https://www.whitehouse.gov/briefing-room/speeches-remarks/2022/03/08/remarks-by-president-biden-announcing-u-s-ban-on-imports-of-russian-oil-liquefied-natural-gas-and-coal/

[4] Of course, such new doubts regarding reliance on global supply chains are occurring at a time when international trade is already undergoing stress as a result of COVID–19 social distancing (Ashraf & Goodell, 2021; Baker et al., 2020; Corbet et al., 2021; Goodell & Huynh, 2020; Pandey & Kumari, 2021).

the war in Iraq. Schneider & Troeger (2006) evidence a negative market impact of Iraq's invasion of Kuwait in 1990 and positive impacts of the US-led Operation Desert Storm.

Similar studies support the adverse effects of wars. For example, Fernandez (2007) examines the impacts of the Middle-East conflicts. Guyot (2011) examines the geopolitical implications on Islamic market indices. Zaremba et al. (2022) examine the impact of geopolitical risks on emerging market indices. Alshwawra & Almuhtady (2020) examine the impact of regional conflicts in Jordan. Ruiz Estrada et al. (2020) the effects of a hypothetical US-Iran conflict.

This study seeks an initial investigation of the impacts of the Russia-Ukraine war on stock markets. We contribute to the literature by adding to the few event studies that examine the impact of wars on the financial markets. Additionally, while some studies evidence negative impacts (Bradford & David-Robison, 1997; Hudson & Urquhart, 2015), others suggest that war events engender positive effects (Guidolin & La Ferrara, 2010). We seek to add to our knowledge regarding what contexts condition positive versus negative effects. We analyze cross-sectional variations to determine if some country-specific variables drive stock market post-event performance. We evidence that higher trade-to-GDP ratios negatively impact returns around war events. We also find that being a member of NATO positively conditioned abnormal returns during the post-event period.

The remainder of the paper is organized as follows. Section 2 presents data and methodology. Section 3 portrays the results. Section 4 concludes.

2. Data and methodology

We include all countries in the Morgan Stanley Capital Investment (MSCI) market classification (23 developed and 24 emerging markets). The event windows end of March 07th, 2022[5].

The list of sample countries and their leading stock market indices are in Table 1.

"Please insert Table 1 about here"

Abnormal returns (AR) and cumulative abnormal returns (CAR) are calculated following Brown and Warner (1985).

$$AR_{it} = R_{it} - (\hat{\propto} + \hat{\beta}.R_{mt}) \quad (1)$$

where, AR_{it} is the abnormal return for index *i* on day *t*; R_{it} is the actual log-return for the index *i* on day *t*; $\hat{\propto}$ and $\hat{\beta}$ are intercept and slope coefficients of the OLS regression model, respectively; and R_{mt} is the rate of return on the benchmark index *m* on day *t*.

[5] Due to differences in trading days the event windows ends up after March 07th for some countries to be able to have 5 trading days following the event (e.g., Kuwait).

$$CAR_{i,p-q} = \sum_{t=p}^{q} AR_{it} \quad (2)$$

$CAR_{i,p-q}$ is the cumulative abnormal return for each index i for the event window (p–q). The event timeline is in Figure 1. We use cross-sectional regressions to examine whether some country-specific variables are associated with impacts. We include as independent variables Trade-to-GDP (*TGDP*) as in Sikarwar (2021), past returns (*PAST*) as in Chaturvedula et al. (2015), and the US dollar value of the currency, i.e., the exchange rate (*EXRATE*). We use *TGDP* because wars impact worldwide trade but, more pointedly, is immediately impacting investor expectations regarding the economic role of international trade. Economies with more dependence on trade and related activities are expected to be affected more.

In addition, investors in countries with weaker USD exchange currency values may experience institutional selling due to the invasion. As such, we include *EXRATE* as an independent variable. Moreover, the flow-oriented approach of Dornbusch & Fischer (1980) suggests that currency values impact stock prices. Chaturvedula et al. (2015) and Pandey & Kumar (2021) evidence that past returns predict event-induced abnormal returns. Hence, we also control for past returns (*PAST*). Further, we use dummy variables such as *NATO* and *DEV* to assess whether the impacts differ among the NATO members and developed nations. Our model is

$$CAR_{iw} = \alpha_{iw} + \beta_1 NATO_{iw} + \beta_2 DEV_{iw} + \beta_3 TGDP_{iw} + \beta_4 PAST_{iw} + \beta_5 EXRATE_{iw} + \varepsilon_{iw} \quad (3)$$

where, CAR_i is the cumulative abnormal return of the country i for the event window w. The definitions of the variables are in Table 2. The robust standard errors are used to deal with heteroskedasticity issues in Equation 3 (Shehadeh et al., 2021).

"Please insert Table 2 about here"

3. Empirical results

3.1. Event study analysis

As reported in Table 3, event day abnormal returns are generally significantly negative for all markets except the Asian and pan-American markets.[6] Figure 2 shows the AAR is negative on the event day for almost all markets. For the Americas, the magnitude is lower on the event day due to the far distance from the belligerent countries and loose economic relationship with them. The day after the event exhibits significantly positive abnormal returns in the markets that had negative abnormal returns the day before; those in the other markets have been insignificant.

[6] By 'pan-American' we mean countries from North, South, or Central America.

"Please insert Table 3 here"

The positive event day impacts might be attributable to a market sentiment that the Russia-Ukraine war would not lead to a global conflict. Perhaps quickly imposed economic and financial sanctions on Russia engendered an investor view in some markets that these sanctions would pressure a quick end to the war. However, as noted in the introduction, there are many possible serious long-term outcomes of the Ukraine conflict, and we expect results that are non-uniform across global markets as investors consider economic impacts in differing regions.

While developed markets experienced significant negative returns on days t+3 to t+5, emerging markets experienced significantly negative returns on day t+3. Literature suggests that developed markets are more efficient than emerging markets due to their long experiences and advanced technologies (Hull & McGroarty, 2014; Risso, 2009). However, market efficiency is affected by extreme events and crises (Lim et al., 2008; Wang & Wang, 2021). While European and Pacific markets experienced significant negative returns in the post-event period, the Middle Eastern and African (ME&A) markets experienced a significant positive return on t+1 and t+2. In contrast, the Asian markets did not experience any significant returns. From the event day onwards, the CAARs are significantly negative for all markets except for the ME&A (significant positive values from t+2 to t+5) and the Asian and pan-American markets (no significant values). The positive cumulative impacts in the ME&A are potentially attributable to the OPEC nations with positive CARs during the post-event windows.

As highlighted in Figure 2, AARs and CAARs differed across market groupings. In contrast to developed markets, emerging markets recovered after the event day. CAARs of the pan-American and ME&A groups moved upward post the event, while those in the Asian and Pacific markets were positive and negative on alternate days. However, the event day impact is visible in all markets except the pan American markets.

Country-wise CARs (Table 4) reveal that event day CARs are significantly negative (positive) for 17 (one) developed market indices and 16 (zero) emerging market indices. The US market exhibited a positive event day abnormal return, consistent with Schneider & Troeger (2006), who evidence a positive reaction of the US market during the US-led Operation Desert Storm.

Thirteen market indices did not react to the beginning of the war. Post-event [+1, +3] window CARs are significantly negative (positive) for six (six) developed markets and two (thirteen) emerging markets. The [+1, +3] window exhibits a positive market reaction on t+1, which may be attributable to lower risk perceptions owing to weaker initial sanctions against Russia and the NATO nations' intention not to indulge in armed conflict with Russia. The [+1, +5] post-event window CARs are significantly negative (positive) for ten (five) developed markets and two (thirteen) emerging markets. Country-wise analysis reveals that most emerging markets were positively impacted in the post-event period, except Greece and Hungary as emerging market countries geographically closer to the conflict region.

"Please insert Table 4 about here"

As most of the developed markets in our sample are from Europe, the proximity to the war zone might be a reason for comparatively greater reactions in these market indices. It is interesting to find that the impact on Finland is negative post-event, while the effects on Norway and Poland are positive. While all three nations share a border with Russia, the latter two are NATO members. Further, we evidence post-event significant positive CARs for Mexico, Norway, Qatar, Saudi Arabia, and the United Arab Emirates, which are all oil and gas major exporters and may benefit from the war due to the significant increase in natural resources prices.

3.2. Cross-sectional analysis

The results in the previous section indicated that the cross-sectional variations might be present. The country-specific data were available for 44 nations. The cross-sectional regression results in Table 5 reveal that the stock market indices of NATO member countries reacted positively in the post-event windows [+1, +3] and [+1, +5], while CARs in the developed markets were positively impacted during the windows [–5, –1], [–3, –1], and [0, 0].

"Please insert Table 5 about here"

We evidence a significant negative association between respective currency values and CARs on the event day [0, 0] and during the post-event windows [+1, +3] and [+1, +5], consistent with stronger currency values leading to lower abnormal returns given adverse impacts on international trade activities during uncertainties (Mishra & Mishra, 2020). In other words, an appreciation of a country's currency creates a negative impact on its stock market. According to the flow-oriented approach (Dornbusch & Fischer, 1980), causality runs from exchange rates to stock prices. Further, weaker exchange rates are a signal for cheaper exports, thus enhancing the competitiveness of the export-oriented firms (Bahmani-Oskooee & Saha, 2016). In this respect, Nusair & Olson (2022) support the flow-oriented approach in the short-run. Thus, the nations with weaker exchange rates experience higher abnormal returns. The trade-to-GDP ratio negatively impacts the CARs in all windows except [+1, +3] and [+1, +5], indicating that nations that are relatively trading more have been more impacted than others. Further, the past returns significantly impact the CARs in the pre-and post-event windows, supporting the views of Chaturvedula et al. (2015) that past returns can predict the event-induced returns.

3.3. Robustness testing

As a robustness check, we calculate the Corrado (1989) value (a non-parametric rank test) for the event-wise AARs, as modified by Ataullah et al. (2011):

$$C = \sqrt{\frac{3}{N(T^2-1)}} \sum_{i=1}^{n} [2\mathrm{K}(\mathrm{AR_{it}}) - (\mathrm{T}-1)] \quad (4)$$

where, C is the Corrado (1989) value, N is the sample size (i.e., the number of global stock market indices), T is the total number of days, including the estimation and event window (150 in our case), K ($\mathrm{AR_{it}}$) is the rank of the abnormal return of the index *i* in the 150 days. The Corrado values (Table 6) depict similar results as in Table 3.

"Please insert Table 6 about here"

4. Conclusions

Using an event study methodology, we examine the impact of the 2022 Russian invasion of Ukraine. We find that this invasion generated negative CARs for global stock market indices, but with heterogeneous effects. Cross-sectional analysis reveals that GDP-scaled trade is negatively associated with event-day and post-event returns, while markets of NATO countries exhibited higher returns. We also find that past returns significantly predict returns during this event period. Results are consistent with markets of more globalized economies being more vulnerable to international conflicts, with, however, notable heterogeneities.

We also find that the event of February 24, 2022, had a strong negative impact on the global indices on the event day, followed by a positive impact on the very next day. While the cumulative effect was generally negative on the global stock markets, the Asian, ME&A, and pan-American stock markets were an exception to this. We also evidence a positive impact on NATO member nations in the post-event period, consistent with expectations of economic stimulus from increased military preparedness.

Supporting the flow-oriented approach, the exchange rate strength negatively affects the event day and post-event period CARs. The negative relationship between the country trading and the CARs indicates that investors perceive that the war will impact the nations with higher TGDP. This impact may be attributed to the economic sanctions by the United Nations and a few European countries that will impact the Russian economy and the rest of the world. Findings are compared to other studies on the impact of wars on financial markets (Gu et al., 2021; Guidolin & La Ferrara, 2010; Hudson & Urquhart, 2015). The results are important for policymakers, investors, and researchers to understand the market effects of wars.

Our results explain the heterogeneous impacts of war on global stock markets. The negative association between economic globalization and event-induced returns has important implications for policymakers, investors, and researchers in making well-grounded decisions for their future course of action following war events. While developing insights into how exogenous shocks interact with stock markets, the results offer future research opportunities to better understand how different country

variables drive the returns during crises. Concomitantly, the findings also empower policymakers and investors in managing risks.

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Figure 1: Event timeline

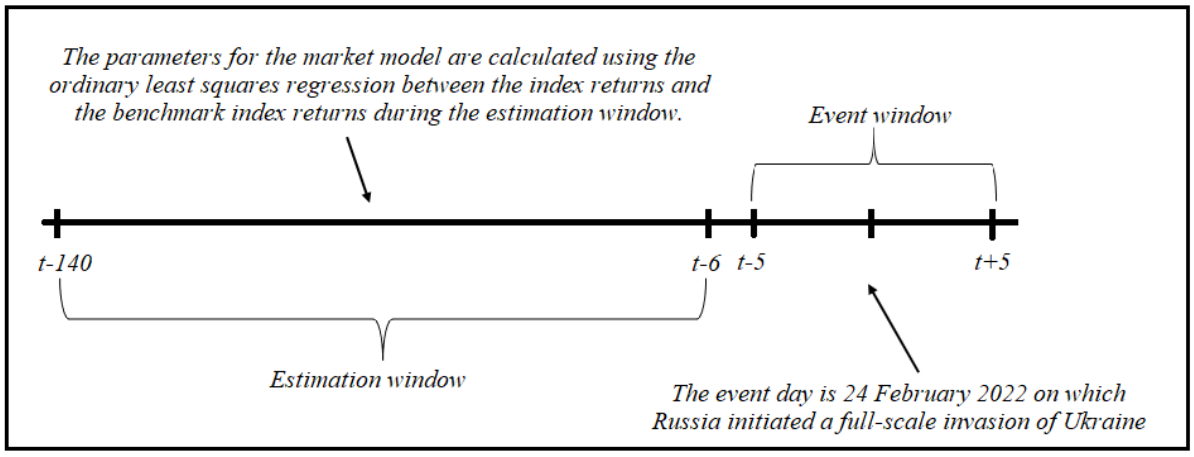
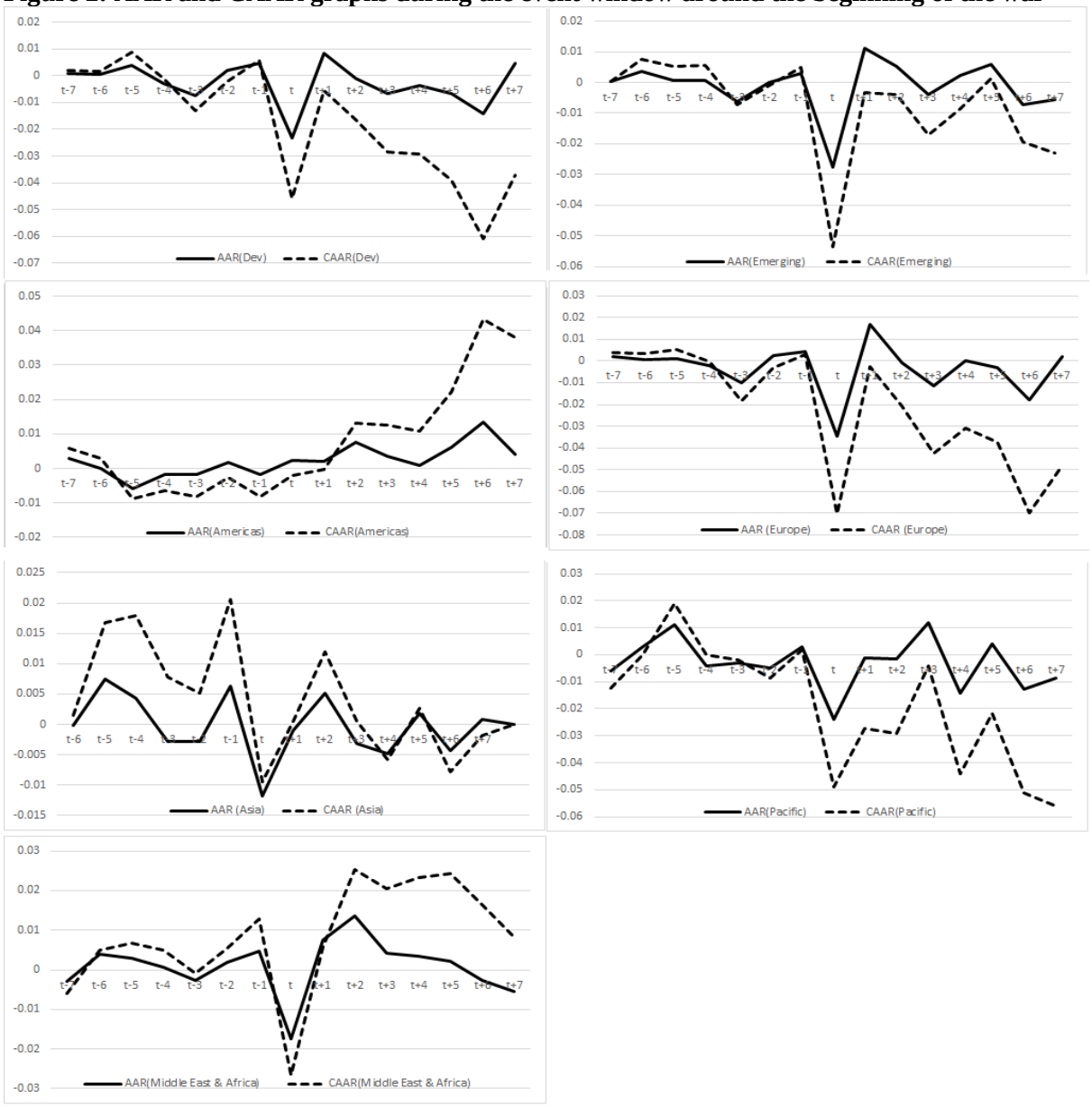


Figure 2: AAR and CAAR graphs during the event window around the beginning of the war



Source: Drawn by the authors based on the event study analysis.

Table 1: Sample distribution

Developed markets (23)		Emerging markets (24*)	
Country	**Index**	**Country**	**Leading Index**
US	Dow Jones Industrial Average	China	SHANGHAI SE
Spain	IBEX 35	Turkey	BIST 100
Italy	FTSE Italia All Share	Brazil	BOVESPA
Germany	DAX Index	South Korea	KOSPI
France	CAC 40	India	SENSEX–30
UK	FTSE 100	Chile	CLX IPSA
Belgium	BEL 20	Poland	WIG
Switzerland	Swiss Market Index	Czech Republic	SE PX
Netherlands	AEX	Peru	S&P/LIMA GENERAL
Canada	TSX Composite	Malaysia	KLCI
Portugal	PSI 20	Philippines	PSEI COMPOSITE
Austria	ATX	Mexico	S&P BMV IPC
Israel	TA–35	Indonesia	IDX COMPOSITE
Sweden	OMXS–30	Saudi Arabia	TASI
Ireland	ISEQ	UAE	ADX GENERAL
Norway	Oslo All Share Index	Thailand	SET
Australia	S&P/ASX–200	Qatar	QE GENERAL
Denmark	OMXC20	Colombia	COL CAP COLOMBIA
Japan	NIKKIE 225	Greece	ATHENS GEN COMPOSITE
Finland	OMX HELSINKI	South Africa	SA TOP 40(JTOPI)
Singapore	STI	Kuwait	KUWAIT MAIN MARKET 50
Hong Kong	HANG SENG	Egypt	EGX–30
New Zealand	NZX–50	Hungary	BUDAPEST SE
		Taiwan	TPEX–50

Benchmark Index: MSCI All Country World Index

* Russia's MOEX is not included in our sample as it was closed on February 24th, 2022, for a month, and only a few stocks (33 out of several hundred) were allowed to trade.

Table 2. Variable definitions

Variable	Abbreviation	Description	Data Sources
Cumulative abnormal return	*CAR*	The cumulative abnormal return over the event window. The abnormal return is computed as the difference between the actual raw returns and the predicted returns based on the market model in equation (1).	Calculated using Equation (2)
NATO members	*NATO*	A dummy variable that takes one for NATO member countries, and 0 otherwise.	https://www.nato.int/cps/en/natohq/nato_countries.htm
Developed market	*DEV*	A dummy variable that takes one for developed market countries, and 0 otherwise.	https://www.msci.com/our-solutions/indexes/market-classification
Trade-to-GDP ratio	*TGDP*	The level of trade to the country's GDP as of 2020 (Source: World Bank website).	https://data.worldbank.org/indicator/NE.TRD.GNFS.ZS
Past Returns	*PAST*	Average returns of the last 20 days before the war event.	Calculated based on Equation (1)
Exchange rate	*EXRATE*	The ten-day average of the country's exchange rate in terms of US dollar before the war event day (Source: International Monetary Fund website)	https://www.imf.org/external/np/fin/data/param_rms_mth.aspx

This table defines all variables used in the study.

Table 3: Average and cumulative average abnormal returns for different sets of markets during the event window

Days	Developed		Emerging		Americas		Europe		Middle East & Africa		Asia		Pacific	
	AAR	**CAAR**	**AAR**	**CAAR**	**AAR**	**CAAR**	**AAR**	**CAAR**	**AAR**	**CAAR**	**AAR**	**CAAR**	**AAR**	**CAAR**
t–5	0.004**	0.005	0.001	0.005	–0.006	–0.003	0.001	0.004	0.003	0.004	0.008	0.009	0.011**	0.008
	(2.24)	(1.19)	(0.31)	(0.92)	(–1.45)	(–0.30)	(0.34)	(0.74)	(0.95)	(0.52)	(0.72)	(0.36)	(2.79)	(0.82)
t–4	–0.003*	0.002	0.001	0.005	–0.002	–0.005	-0.003	0.001	0.001	0.004	0.004	0.014	–0.004	0.004
	(–1.77)	-0.51	-0.29	-1.14	(–0.46)	(–0.53)	-1.41	0.18	0.20	0.66	-0.42	-0.59	(–1.01)	-0.45
t–3	–0.008***	–0.006	–0.006***	–0.001	–0.002	–0.006	-0.013***	-0.012***	-0.003	0.002	–0.003	0.011	–0.003	0.001
	(–4.43)	(–1.64)	(–3.11)	(–0.28)	(–0.43)	(–0.81)	(-6.14)	(-2.86)	(-0.88)	(0.29)	(–0.28)	(0.52)	(–0.72)	(0.14)
t–2	0.002	–0.004	0.000	–0.001	0.002	–0.005	0.003	-0.009**	0.002	0.004	–0.003	0.008	–0.005	–0.004
	(1.04)	(–1.29)	(0.07)	(–0.29)	(0.48)	(–0.66)	(1.40)	(-2.50)	(0.61)	(0.69)	(–0.27)	(0.44)	(–1.25)	(–0.56)
t–1	0.005***	0.001	0.003	0.002	–0.002	–0.006	0.004**	-0.005	0.005	0.008*	0.006	0.014	0.003	–0.001
	(2.78)	(0.38)	(1.47)	(0.69)	(–0.45)	(–1.13)	(2.08)	(-1.59)	(1.56)	(1.94)	(0.61)	(0.97)	(0.72)	(–0.17)
t	–0.023***	–0.022***	–0.028***	–0.026***	0.002	–0.004	-0.041***	-0.045***	-0.017***	-0.009**	–0.012	0.002	–0.024***	–0.025***
	(–13.6)	(–13.07)	(–13.82)	(–12.85)	(0.56)	(–1.04)	(-19.47)	(-21.72)	(-5.81)	(-3.06)	(–1.14)	(0.23)	(–6.09)	(–6.34)
t+1	0.008***	–0.014***	0.011***	–0.015***	0.002	–0.002	0.020***	-0.025***	0.007**	-0.002	–0.001	0.002	–0.001	–0.026***
	(4.88)	(–5.79)	(5.59)	(–5.13)	(0.50)	(–0.38)	(9.51)	(-8.63)	(2.50)	(-0.40)	(–0.09)	(0.10)	(–0.29)	(–4.69)
t+2	–0.001	–0.015***	0.005***	–0.009***	0.008*	0.006	-0.006***	-0.031***	0.014***	0.012*	0.005	0.007	–0.001	–0.028***
	(–0.66)	(–5.11)	(2.67)	(–2.65)	(1.93)	(0.80)	(-2.75)	(-8.63)	(4.53)	(2.29)	(0.50)	(0.37)	(–0.37)	(–4.04)
t+3	–0.007***	–0.022***	–0.004*	–0.013***	0.004	0.009	-0.017***	-0.048***	0.004	0.016**	–0.003	0.004	0.012**	–0.016
	(–3.89)	(–6.37)	(–1.93)	(–3.26)	(0.89)	(1.14)	(-8.03)	(-11.49)	(1.44)	(2.70)	(–0.30)	(0.17)	(3.00)	(–2.00)
t+4	–0.004**	–0.026***	0.002	–0.011	0.001	0.01	-0.001	-0.049***	0.004	0.020**	–0.005	–0.001	–0.014**	–0.03**
	(–2.13)	(–6.66)	(1.16)	(–2.40**)	(0.23)	(1.12)	(-0.55)	(-10.53)	(1.19)	(2.95)	(–0.46)	(–0.05)	(–3.58)	(–3.39)
t+5	–0.007***	–0.032***	0.006***	–0.005	0.006	0.016	-0.005**	-0.054***	0.002	0.022**	0.002	0.001	0.004	–0.026
	(–3.96)	(–7.69)	(2.99)	(–0.97)	(1.55)	(1.66)	(-2.37)	(-10.58)	(0.75)	(3.00)	(0.18)	(0.03)	(1.05)	(–2.67)

Significance level is shown as *** p<0.01, ** p<0.05, *p<0.1. The sample size for developed, emerging, pan-American, European, MEA, Asian and Pacific markets is 23, 24, 7, 20, 7, 8, and 5, respectively.

Table 4: Cumulative abnormal returns for the event day and post-event windows

Country	Developed markets			Country	Emerging markets		
	Event	Post-event			Event	Post-event	
	[0,0]	[+1,+3]	[+1,+5]		[0,0]	[+1,+3]	[+1,+5]
United States	0.85**	–0.71*	0.47	China	–1.47*	1.44*	1.15
	(2.02)	(–1.69)	(1.12)		(–1.79)	(1.75)	(1.40)
Spain	–2.48***	–0.75	–3.13***	Turkey	–8.57***	5.12***	7.18***
	(–2.62)	(–0.79)	(–3.30)		(–4.54)	(2.71)	(3.81)
Italy	–3.47***	0.96	–0.66	Brazil	0.02	2.54**	2.00
	(–5.28)	(1.47)	(–1.00)		(0.02)	(2.03)	(1.59)
Germany	–3.52***	–1.81**	–3.54***	South Korea	–2.06**	1.01	3.28***
	(–4.32)	(–2.22)	(–4.34)		(–2.41)	(1.19)	(3.84)
France	–3.38***	–2.86***	–3.47***	India	–4.48***	0.24	–0.41
	(–4.08)	(–3.46)	(–4.20)		(–5.71)	(0.31)	(–0.53)
UK	–3.70***	1.05	–0.47	Chile	0.69	0.24	3.36**
	(–5.40)	(1.53)	(–0.68)		(0.45)	(0.15)	(2.19)
Belgium	–1.49**	0.57	–1.15	Poland	–11.00***	6.30***	7.77***
	(–2.13)	(0.81)	(–1.64)		(–11.36)	(6.51)	(8.02)
Switzerland	–2.22***	1.33**	–0.45	Czech Republic	–4.80***	0.14	0.82
	(–3.30)	(1.98)	(–0.67)		(–7.52)	(0.22)	(1.28)
Netherlands	–2.12***	–0.19	–1.61**	Peru	–0.97	2.93**	3.46***
	(–2.88)	(–0.26)	(–2.19)		(–0.78)	(2.35)	(2.77)
Canada	0.52	0.23	1.04***	Malaysia	–0.73	1.19*	2.45***
	(1.43)	(0.64)	(2.84)		(–1.08)	(1.76)	(3.63)
Portugal	–1.24	2.03***	1.18	Philippines	–2.02*	0.47	1.39
	(–1.58)	(2.58)	(1.50)		(–1.75)	(0.41)	(1.21)
Austria	–7.07***	–7.84***	–8.07***	Mexico	0.49	2.69***	3.14***
	(–7.17)	(–7.95)	(–8.18)		(0.68)	(3.71)	(4.35)
Israel	–2.62***	–0.09	0.15	Indonesia	–1.40*	0.00	0.46
	(–3.18)	(–0.11)	(0.19)		(–1.94)	(0.00)	(0.63)
Sweden	–2.42***	–0.49	–2.49***	Saudi Arabia	–1.74**	2.01**	3.73***
	(–2.97)	(–0.60)	(–3.05)		(–2.08)	(2.40)	(4.46)
Ireland	–4.14***	–2.15**	–5.54***	UAE	–0.44	3.96***	5.76***
	(–4.49)	(–2.33)	(–6.00)		(–0.52)	(4.70)	(6.84)
Norway	–0.08	3.24***	2.35***	Thailand	–1.84***	1.30**	1.14**
	(–0.09)	(3.71)	(2.69)		(–3.26)	(2.30)	(2.02)
Australia	–2.71***	1.06	1.70**	Qatar	–0.97*	5.59***	6.63***
	(–3.72)	(1.45)	(2.33)		(–1.79)	(10.32)	(12.24)
Denmark	0.81	5.74***	4.28***	Colombia	–0.05	1.32	0.72
	(0.67)	(4.74)	(3.53)		(–0.04)	(1.10)	(0.60)
Japan	–0.45	2.60***	1.37	Greece	–6.28***	–3.31***	–5.01***
	(–0.43)	(2.46)	(1.30)		(–7.58)	(–3.99)	(–6.05)
Finland	–3.24***	–2.85***	–4.57***	South Africa	–1.31	3.91***	3.93***
	(–3.90)	(–3.43)	(–5.49)		(–1.41)	(4.21)	(4.24)
Singapore	–3.41***	–0.37	–1.35**	Kuwait	–1.50**	0.60	0.04
	(–5.09)	(–0.56)	(–2.02)		(–2.53)	(1.01)	(0.07)
Hong Kong	–2.81**	–1.23	–2.72**	Egypt	–3.57***	1.74**	1.52*
	(–2.48)	(–1.09)	(–2.40)		(–4.03)	(1.97)	(1.71)
New Zealand	–3.21***	3.80***	3.92***	Hungary	–10.04***	–10.75***	–4.16***
	(–4.58)	(5.43)	(5.60)		(–9.72)	(–10.40)	(–4.02)
				Taiwan	–2.48***	–0.25	0.05
					(–2.96)	(–0.30)	(0.06)

Note – Returns are in percentage. ***, ** and * denote significance at the 1%, 5% and 10% statistical levels, respectively.

Table 5: Cross-sectional regression analysis of cumulative abnormal returns

Variables	Cumulative abnormal returns				
	[–5, –1]	**[–3,–1]**	**[0, 0]**	**[+1, +3]**	**[+1, +5]**
NATO	–0.00132	0.00064	–0.000154	0.02882***	0.03133***
	(0.0041)	(0.00311)	(0.00956)	(0.01004)	(0.00995)
DEV	0.01143**	0.00821*	0.02460**	0.00259	–0.01237
	(0.00485)	(0.00449)	(0.00925)	(0.1075)	(0.01145)
TGDP	–0.010118***	–0.0069***	–0.01202**	-0.00711	–0.00749
	(0.00311)	(0.00219)	(0.00470)	(0.00590)	(0.00494)
PAST	9.32548***	6.03707***	8.62377***	9.27146**	6.75116**
	(1.5890)	(1.10554)	(2.69319)	(4.44085)	(2.88977)
EXRATE	-0.00660	-0.00385	-0.02016***	-0.03296***	-0.041468***
	(0.0050)	(0.00446)	(0.00706)	(0.00823)	(0.00969)
Adjusted R^2	0.596	0.582	0.408	0.425	0.554
F–statistic	11.18***	13.65***	4.51***	5.56***	11.30***
Observations	44	44	44	44	44

Note – Robust standard errors are reported in parenthesis below the coefficients. ***, ** and * denote significance at the 1%, 5% and 10% statistical levels, respectively. All variables are defined in Table 2.

Table 6: Results of the parametric (t–value) and non–parametric tests (Corrado value)

Days	Global		Developed		Emerging	
	t-value	Corrado value	t-value	Corrado value	t-value	Corrado value
t–5	1.65*	2.13**	2.24**	2.09**	0.31	0.94
t–4	–0.90	–0.99	–1.77*	–1.98**	0.29	0.55
t–3	–5.22***	–4.15***	–4.43***	–3.41***	–3.11***	–2.47**
t–2	0.71	1.06	1.04	1.84*	0.07	–0.32
t–1	2.90***	4.33***	2.78***	3.58***	1.47	2.56**
t	–19.31***	–8.15***	–13.60***	–5.54***	–13.82***	–5.99***
t+1	7.42***	5.25***	4.88***	3.98***	5.59***	3.45***
t+2	1.64	2.43**	–0.66	–0.47	2.67***	3.87***
t+3	–3.96***	–1.33	–3.89***	–1.68*	–1.93*	–0.22
t+4	–0.45	0.21	–2.13**	–0.91	1.16	1.18
t+5	–0.20	0.51	–3.96***	–1.74*	2.99***	2.41**

Note – ***, ** and * denote significance at the 1%, 5% and 10% statistical levels, respectively.