ECHOES OF CATASTROPHIE: A COMPREHENSIVE STUDY OF MARKET REACTIONS IN AN INTERCONNECTED EUROPE

Presented by: Guru Ashish Singh
Institute of Economics and Finance
University of Szczecin

INTRODUCTION

- On the 24th of February, 2022 the world watched in horror as Russia launched the largest invasion on a European nation since World War II resulting in hundreds of people dead since the invasion started, and more than 500,000 fled their homes in search of safety abroad.

- The repercussion of such an event not only affected the lives of people, but also reflected on the financial markets.

- On the first day of the invasion, the Russian financial markets plunged 33% as assessed by the RTS Index (Thompson and Liakos, 2022).

- However, Wall Street did not share the initial investor despair for long but rather believed that NATO is stronger than ever as investors downplayed the invasion after first considering it to be a worldwide conflict.

INTRODUCTION

- Another example of a dramatic unexpected world event is the 2007/2008 sub-prime lending crises in the U.S, which became the most severe economic crises since the Great Depression of 1927.

- What began as a local crisis in the U.S eventually expanded and had an economic impact on the entire world.

- The two aforementioned events are instances of major unanticipated world events, also known as black swan events, which have potentially severe consequences to the economy, politics, and nature.

- Even if such an event may only physically exist in one nation, it may nonetheless have effects on several other countries due to spillover effects.

INTRODUCTION

- **The aim of this research is:**
  This research delves into the intricate interplay between catastrophic events, such as the Russia-Ukraine war, natural disasters, economic depressions, etc. illuminating the repercussions of these events on financial markets in Europe in an era characterized by unprecedented economic interconnectedness.

- **The research question is:**
  What is the impact of the 'Major Unanticipated World Events' on the European financial markets?

LITERATURE REVIEW

- Literature review indicates that the 'Major Unanticipated World Events' can be divided according to the following categories:

Political Events: events related to the political realm such as the state, government, public administration, etc. Eg. Political Coup, i.e., illegal seizure of power or removal of a government.

Financial and Economic Events: any event that impacts the financial institutions or the state of the economy. Eg., Economic Depression

Natural Events: any event related to naturally occurring physical occurrence. Eg., Earthquake or Volcano eruption

METHODOLOGY

- Employing an event study methodology, this study meticulously scrutinizes historical price fluctuations within financial market indices.

- An event study is an empirical analysis that examines the impact of a significant catalyst event on the value of a stock and can reveal important information about how the stock is likely to react to a given event.

- This approach plays a vital role in capturing any "abnormal" or "residuals" (a significant deviation from average) value changes in an index prices.

- For the purpose of the analysis, daily price index (PI) of the four stock markets in Sweden (OMX Stockholm 30), Finland (OMX Helsinki), Germany (DAX 30 Performance) and United Kingdom (FTSE 100) are used and the data extends from 2000 to 2023.

- The main reason for choosing these countries, is because they are developed economies with a high-degree of international integration

METHODOLOGY

Study Design

- The event window will take place at t = 0 = 24 hour event date. If the event day of interest take place at holiday or other reasons for the stock market to be closed, the next opened day is accounted as the event day, "0".

- The estimations window contains: 10 days (T0=−14, T1=−4) prior to the event, 5 days of the event window (T1=−3, T2=+1) and finally 10 days of post-event window (T2=+2, T3=+11).

- The primary idea is to capture abnormal returns of the overall return on the market.

METHODOLOGY

$$AR_{m,t} = R_{m,t} - \overline{R_m}$$

- Where, $AR_{m,t}$ is the excess return for stock market index m at time t

  $R_{m,t}$ is the actual observed market return for stock market index m at time t

  $\overline{R_m}$ is the average of stock market index m's daily returns in the estimations window and is calculated as:

$$\overline{R_m} = \frac{1}{10} \sum_{-13}^{-4} R_{m,t}$$

- The study also considers several financial markets in different countries, therefore it is vital to (cross-section) average these excess returns across indexes in common event time

$$\overline{AR_{m,t}} = \frac{1}{N} \sum_{m=t_1}^{N} AR_{m,t}$$

METHODOLOGY

- In order to draw relevant and overall inferences for the event of interest, the abnormal return observations must be aggregated. The aggregation (i.e. Cumulative Abnormal Return CAR) will take both time and across major world events in consideration.

$$CAR\ (t_1, t_2)_m = \sum_{m=t_1}^{t_2} \overline{AR_{m,t}}$$

- In order to test the hypothesis t-test is used.

- If the actual observed events' CAR deviates from zero with equal to or less than -2.5% and equal to or more than $+2.5\%$, it will be designed as a significant impact that has a potential for spillover in another financial markets.

- Thus, within the 5%-range the event will not be considered to promote any spillover effect.

RESULTS

| | Political | | | Economic | | | Natural Disasters | | |
| | n=130 | | | n=60 | | | n=45 | | |
Event Day	AR_m	t-statistic		AR_m	t-statistic		AR_m	t-statistic
-3	0.11	0.79		0.11	0.42		0.26**	2.1
-2	0.13	1.22		-0.17	0.74		0.34	1.24
-1	-0.07	0.42		-1.18***	3.84		-0.21	1.13
0	0.52***	3.14		1.62***	3.74		-0.12	1.16
1	0.01	0.18		0.4	1.22		-0.2	1.08
2	0	0.02		-0.97***	4.61		-0.07	0.47
3	0.14	1.39		-0.07	0.17		0.05	0.27
4	0.36***	2.87		-0.15	0.43		0.06	0.59
5	0.03	0.34		0.32*	1.7		-0.03	0.2
6	-0.48***	3.57		-0.4	1.62		0.14	1.21
7	-0.35**	2.52		-0.56**	2.42		-0.24	1.59
8	0.18	1.44		-0.45	1.5		0.11	0.93
9	0.45***	4.46		-0.01	0.02		-0.31	1.5
10	-0.08	0.63		-0.2	1.01		0.17	0.88
11	0.21**	2.06		-0.01	0.05		-0.14	0.89

Event Day	n	CAR	t-statistic	n	CAR	t-statistic	n	CAR	t-statistic
(-3,-1)	395	0.15	1.13	179	-1.24***	4.44	143	0.42**	2.05
(-3,+1)	658	0.70***	4.98	298	-2.45***	7.50	238	0.08	0.47
(0,+1)	263	0.54***	3.78	118	-1.20***	3.12	95	-0.32**	2.16
(+2,+11)	1319	0.50***	3.95	589	-2.54***	9.02	478	-0.25	1.56
(-3,+11)	1978	1.20***	9.18	897	-5.00***	16.77	718	-0.16	1.00

*, ** and *** indicate two-tailed significance levels of 10%, 5% and 1%, respectively.

RESULTS

Impact of Political Events

- The political group reported a significant positive CAR 1.20 % at level 0,001, for the entire event period of 15 days.

- This means that a political event on average generates positive AR, particularly on day "0", 0.52 %.

- The positive CARs occur on the observed event window, with CAR of 0.70 % and following 10 days of post-event, with CAR of 0.50 %.

- However, there were no significant abnormal returns three days prior to day "0".

RESULTS

Impact of Economic Events

- The economical events reported significantly more impact with a CAR of -5.00% at level 0.001, for the same period of 15 days.

- This means that the results indicate that economic events on average give rise to negative AR.

- The significant negative CAR occurs not only three days prior to day "0", -1.24%, but the event window reports -2,45%, followed by -2,54% 10 days of post event.

- In addition, the actual observed event day of interest, (0+1), show a significant CAR of -1.20 %.

RESULTS

Impact of Natural Events

- Even though the results did show a significant and positive CAR, 0.42 % at level 0.05, three days prior to day "0", followed by a significant CAR at -0.32 % on the actual event day, (0, +1).

- The overall results report no statistically significant CAR for natural disasters over the whole study period.

- This means that no market reactions were found in the observations when a natural disaster occurs.

DISCUSSION

- The underlying reasons for these results maybe because investors reacts differently to different news. It is possible that an investor might react positively to events that are considered as "bad news", and reacts negatively to "good news", which might cancel out the effect as observed with no significant effect for natural events.

- Efficient market hypothesis states that a market is efficient, leaving no room to make excess profits by investing since everything trade at their fair market value on exchanges, however, the findings of this study suggest that the hypothesis is indeed in need for complement of other academic subject areas, such as psychology to understand the decision making of investors.

CONCLUSION

- This study has several contributions. From an investor point of view, the awareness of tendencies of how the stock market reacts is helpful to carry out a more accurate risk management.

- Corporations that intend to invest internationally might perhaps consider primarily negative economical events, since these according to the result seem to generate the most spillover effects.

- Regarding the theoretical contribution, perhaps scholars can distinguish between the mechanisms that are driven by an under- or overreaction and for those that drives negative financial crisis.

References

- Thompson, M. and Liakos, C. (2022) Russian stocks crash 33% and ruble plunges to record low, CNN Business. https://edition.cnn.com/2022/02/24/investing/ruble-russian-stocks-crash/index.html