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ORIGINAL PAPER

The impact of COVID-19 pandemic on stock markets from CEE countries

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Abstract:
This paper explores the impact of the COVID-19 pandemic on the stock markets of Central and Eastern European countries, including Romania, Hungary, the Czech Republic, and Poland. Adopting a longitudinal approach, we analyze data spanning from 2019 to 2022, covering the pre-pandemic, pandemic, and post-pandemic periods. The study focuses on assessing changes in market capitalization, trading behaviors, and exchange-specific responses within these markets. The analysis utilizes various financial indicators that reflect the level of development of a stock market (size, liquidity and profitability ratios) to understand the pandemic's influence. This research aims to provide insights into the complexities of market dynamics under the stress of a global health crisis and subsequent geopolitical events. It also seeks to contribute to the broader understanding of how such unprecedented events shape financial markets, offering implications for investors, policymakers, and academics in the field of financial studies.

Keywords*:* *COVID-19 Pandemic, Central and Eastern European Stock Markets, Market Dynamics, Investment Behavior, Geopolitical Tensions.*

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Introduction

The onset of the COVID-19 pandemic has undeniably ushered in a period of unprecedented economic upheaval, with profound effects on global stock markets. Central and Eastern European (CEE) countries have not been immune to these impacts. This article aims to synthesize various scholarly perspectives on the subject, focusing particularly on the stock markets of Romania, Hungary, the Czech Republic, and Poland, to provide a comprehensive understanding of the pandemic's multifaceted impact on these economies.

Hatmanu & Cautisanu (2021) provide a foundational analysis by examining the Romanian stock market, particularly the Bucharest Exchange Trading (BET) index. Their research indicates a significant long-term negative impact of the pandemic, marked by volatility and reduced abnormal returns, despite some positive influences from the broader European economic climate. This study underscores the complexity of regional and global economic interplays during such crises.

Fang et al. (2021) extend this analysis by exploring the phenomenon of herding behavior in Eastern European stock markets, including Hungary. Their study, covering a decade-long period, reveals a substantial increase in herding behavior post-pandemic onset, influenced by global market returns and regional return dispersion. This finding highlights the importance of monitoring behavioral shifts in stock markets during global crises.

Turning to the Czech market, Altouma (2022) employs the Autoregressive-Distributed Lag (ARDL) Bounds Test to dissect the pandemic's impact on stock prices. Their granular analysis of daily closing prices offers insights into the immediate and lasting effects of the pandemic on country-specific financial systems.

In Poland, Buszko et al. (2021) adopt a sectoral approach to assess market stability during the pandemic. Their advanced clustering methods reveal distinct sectoral responses, highlighting the varied resilience and vulnerabilities across industries. This sector-specific perspective is further elaborated by Oleksiuk & Łochowski (2022), who identify differential impacts across various sectors of the Polish enterprise sector, using the Warsaw Stock Exchange WIG 20 Index.

On a broader scale, Zaremba et al. (2021) and Jabeen et al. (2022) examine the global implications of the pandemic. Zaremba et al. focus on the effects of government policy responses on stock market liquidity, noting significant variability among different economies. Jabeen et al. discuss the extensive global financial disruptions, emphasizing both the challenges and the potential for recovery in global stock markets, including those in CEE countries.

Latif et al. (2021) delve into the relationship between the pandemic and market volatility, finding a significant correlation between COVID-19 case increases and declines in stock returns and GDP growth. This research underscores the pandemic's role in amplifying market volatility and shifting investor behavior towards safer investments.

Finally, Bieszk-Stolorz & Markowicz (2022) provide a sector-specific analysis of the Warsaw Stock Exchange, using advanced survival analysis methods. They uncover disparities in how different sectors reacted to the crisis, particularly highlighting the distinct responses of the Finance sector compared to Industry and Services sectors.

Our research, which uses data spanning from 2019 to 2022, covering the pre-pandemic, pandemic, and post-pandemic periods, aims to provide insights into the complexities of market dynamics under the stress of a global health crisis and subsequent geopolitical events. The analysis utilizes various financial indicators that reflect the level of development of a stock market (size, liquidity and profitability ratios) to understand the pandemic's influence.

The remainder of this paper is organized as follows. Section 2 explains the methodological approach and the data used, and Section 3 discusses the results. Finally, Section 4 concludes the paper.

Research methodology and data collection

In order to comprehensively assess the impact of the COVID-19 pandemic on the stock markets of Central and Eastern European countries, including Romania, Hungary, the Czech Republic, and Poland, we adopted a longitudinal approach in our data collection strategy. Recognizing the necessity of capturing both the pre-pandemic economic conditions and the subsequent changes during the pandemic, we decided to gather annual data spanning from 2019 through the end of 2022.

This time frame was specifically chosen to provide a robust dataset that encompasses:

- The Pre-Pandemic Period (2019): This serves as a baseline, offering insights into the normal functioning of the stock markets before the onset of the pandemic. By comparing pre-pandemic data with subsequent years, we can isolate the effects attributable to the pandemic.
- The Pandemic Period (2020-2021): This period includes the initial outbreak of COVID-19 and its ongoing effects over the subsequent years. Analysing data from these years allows us to track the evolution of the pandemic's impact over time.
- The Post-Pandemic Period (2022): The year 2022 stands out in our analysis as a period marked by both the lingering effects of the COVID-19 pandemic and the onset of the Ukraine war. This dual impact is expected to have had a profound influence on the stock markets of Romania, Hungary, the Czech Republic, and Poland. While some of the initial shock of the pandemic might have subsided by 2022, its economic repercussions likely continued to influence market dynamics. This period may reflect a transitional phase in market recovery or further instability induced by pandemic-related factors. The start of the Ukraine war introduced a new set of challenges and uncertainties. As a significant geopolitical event in the region, it likely had direct and indirect effects on market sentiments, investor confidence, and economic stability in the CEE countries. The proximity of these countries to the conflict zone might have amplified these impacts.

Excepting GDP, exchange rate and stock market indices, we sourced our data from the World Federation of Exchanges, a comprehensive and reliable platform that provides standardized annual statistics for financial markets globally. This platform was instrumental in obtaining consistent and comparable data across the selected indicators for each of the four countries in our study.

GDP data for the countries in our study was sourced from Eurostat, the statistical office of the European Union, renowned for its comprehensive and up-to-date economic data. To convert financial values from USD to EUR, we used annual exchange rate data from the European Central Bank (ECB) Data Portal, known for its accuracy and reliability. For assessing the performance of Eastern European stock market indexes we collected data directly from the official websites of the selected stock exchanges.

In our analysis of the impact of the COVID-19 pandemic on Central and Eastern European (CEE) stock markets, we employed seven key financial indicators, categorized into indicators of size, liquidity, and profitability. This selection was carefully made to ensure a thorough understanding of the market dynamics and economic effects of the pandemic in these regions. These indicators were chosen for their effectiveness in offering a detailed perspective on the market conditions during this period.

Market capitalization, a key metric in our study, represents the total market value of a company's outstanding shares, computed by multiplying the number of all issued shares, including various classes, by their current market prices. It specifically accounts for the shares of domestic companies listed on the stock exchange, encompassing common, preferred, and non-voting shares, but excludes financial instruments like ETFs, rights, warrants, and shares of foreign or unlisted companies.

Alongside, we calculated the *Market Capitalization to GDP ratio*, for each country. This ratio, obtained by dividing the total stock market capitalization by the Gross Domestic Product (GDP), provides a measure of the stock market's size in relation to the national economy. It is especially useful in evaluating the impact of the COVID-19 pandemic on the stock markets of Central and Eastern European countries, revealing the interplay between market valuation and economic health during this challenging period.

Aggregated Value Traded encapsulates the total value of all shares traded over a given period, summing totals from Electronic Order Book (EOB), Reported Trades, and Negotiated Deals. This comprehensive metric is essential for gauging overall market activity and trends, with high aggregated values signaling an active market.

Aggregated Value Traded to GDP ratio is another crucial metric, linking the total value of shares traded in the stock market to a country's Gross Domestic Product (GDP). By dividing the Aggregated Value Traded by the GDP, this ratio offers a comparative scale to assess stock market activity against the economic output of a country.

Share Turnover Velocity, which measures trading activity relative to market size for domestic companies, is determined by comparing EOB trade values to total market capitalization. This ratio is annualized to provide a yearly perspective on how frequently stocks are traded, offering insights into market liquidity and investor behavior. These indicators collectively provide a nuanced view of market dynamics, particularly useful for understanding the impact of significant events such as the COVID-19 pandemic on trading activities and market trends.

Average Daily Turnover emerged as a pivotal metric in our comprehensive analysis of stock market activity. This indicator is derived by dividing the Aggregated Value Traded by the number of active trading days. This measure is particularly valuable in understanding the typical level of trading activity on an average day, providing insights into the market's liquidity and investor behavior.

Stock Index Return is an essential financial indicator for evaluating the yearly performance of various stock market indices, such as PX (Prague Stock Exchange), BUX (Budapest Stock Exchange), WIG (Warsaw Stock Exchange), and BET (Bucharest Stock Exchange). Calculated as a percentage, it measures the annual rate of return for these indices over the specified period, focusing on the fluctuations in their index prices. This metric is instrumental in shedding light on the state and trends within the Prague, Budapest, Warsaw, and Bucharest stock markets, providing a reflection of the wider economic and financial landscape in these areas.

Results and discussions

In this section, we present the findings of our analysis, exploring the intricate dynamics of stock market performance in Central and Eastern Europe during a period marked by significant global and regional upheavals. Our results stem from a detailed examination of market capitalization, stock index returns, and other key financial indicators. These findings not only reflect the impact of events such as the COVID-19 pandemic and geopolitical tensions but also delve into the nuanced interplay of economic policies, sectoral shifts, and investor behavior. The data, carefully analyzed, offers valuable insights into the resilience and adaptability of these markets in the face of unprecedented challenges. This section aims to provide a comprehensive overview of these complex market trends and their implications for the regional economic landscape.

Table 1. Market Capitalization

Market Capitalisation (bln. Eur.)	2019	2020	2021	2022
Bucharest Stock Exchange	29.23	29.14	38.19	30.52
Budapest Stock Exchange	36.82	31.95	37.34	25.13
Prague Stock Exchange	29.46	30.40	44.31	30.34
Warsaw Stock Exchange	169.74	202.75	233.45	155.48

Source: Authors' own calculations.

The table shows market capitalization in billions of Euros for four major Central and Eastern European stock exchanges from 2019 to 2022, covering the pre-pandemic period, the COVID-19 pandemic, and the aftermath, including the onset of the Ukraine war.

Our analysis is presented bellow:

- Bucharest Stock Exchange: Stable market capitalization from 2019 to 2020, showing resilience during the pandemic onset, followed by a significant increase in 2021 (suggesting recovery and increased investor confidence or market expansion) and a dip in 2022 due to post-pandemic correction or effects of the Ukraine war.
- Budapest Stock Exchange: Decreased market capitalization from 2019 to 2020, indicating the pandemic's impact, with a recovery in 2021 and a notable decrease in 2022, suggesting market contraction possibly aggravated by pandemic aftershocks and geopolitical risks.
- Prague Stock Exchange: Upward market capitalization trend through 2021, possibly reflecting delayed but strong response to pandemic stimuli, with a significant reduction in 2022, returning near pre-pandemic levels, due to pandemic persistence and geopolitical instability.
- Warsaw Stock Exchange: Substantial growth during 2020 and 2021, showing resilience and opportunity capitalization during the pandemic, but a sharp decline in 2022, the most significant among the exchanges, likely due to market correction or impacts of the geopolitical conflict.

Market capitalization fluctuations reveal diverse aspects such as shifts in risk perception, institutional actions, global capital movements, sectoral effects, and the balance between domestic and international economic elements. These variations underscore the unique response of each market to universal shocks, reflecting their individual roles in the regional economy. Beyond 2021, divergent trends necessitate a focus on country-specific factors impacting market capitalization, like fiscal strategies, health outcomes, industry trends, and external influences, including the Ukraine conflict. Analyzing 2022 data requires a comprehensive understanding of potential economic slowdowns and a reevaluation of growth, taking into account the persistent effects of the pandemic and new challenges emerging from regional disputes.

Table 2. Market Capitalisation / GDP Ratio

Market Capitalisation/GDP	2019	2020	2021	2022
Bucharest Stock Exchange	13.04%	13.22%	15.81%	10.68%
Budapest Stock Exchange	25.12%	23.17%	24.25%	14.88%
Prague Stock Exchange	13.06%	14.09%	18.60%	10.98%
Warsaw Stock Exchange	31.88%	38.53%	40.50%	23.75%

Source: Authors' own calculations.

Our findings are discussed bellow:

- Bucharest Stock Exchange: The ratio rose from 13.04% in 2019 to 15.81% in 2021, showing market expansion relative to GDP, then fell to 10.68% in 2022, indicating a significant contraction.
- Budapest Stock Exchange: Starting at 25.12% in 2019, the ratio declined in 2020, rebounded slightly in 2021, and fell sharply to 14.88% in 2022, suggesting market capitalization growth lagged behind GDP growth, especially in the latter year.
- Prague Stock Exchange: The ratio increased steadily from 13.06% in 2019 to 18.60% in 2021, then dropped to 10.98% in 2022, indicating initial market growth surpassing economic growth, followed by a sharp reversal, possibly due to external shocks or downturns.
- Warsaw Stock Exchange: The ratio showed significant growth from 31.88% in 2019 to 40.50% in 2021, then dropped to 23.75% in 2022, indicating a realignment of market capitalization with the national economy.

These patterns reveal varying market elasticity, investor sentiment, and national economic agility in response to global challenges. The 2021 peak across exchanges may indicate transient overvaluation or rapid pandemic-era response, while the 2022 downturn could reflect a market recalibration amid geopolitical tensions and economic challenges. The ratios show stock market scaling relative to economic size, highlighting economic resilience or fragility, investor behavior, and policy intervention efficacy during turbulent periods.

Table 3. Aggregated Value Traded

Aggregated Value traded (bln. Eur.)	2019	2020	2021	2022
Bucharest Stock Exchange	3.39	4.23	3.32	3.51
Budapest Stock Exchange	11.54	15.15	14.60	10.82
Prague Stock Exchange	5.37	6.67	7.57	7.76
Warsaw Stock Exchange	58.98	104.76	99.41	71.19

Source: Authors' own calculations.

Our results are commented bellow:

- Bucharest Stock Exchange: Saw peak trading in 2020, likely due to COVID-19 volatility, followed by a decrease in aggregated value traded, indicating normalization or potential stagnation in market activity.

- Budapest Stock Exchange: Experienced a significant rise in trading in 2020, peaking at 15.15 billion Euros, likely a reaction to pandemic uncertainties. The decline in 2022 may reflect reduced liquidity or investor caution amid economic challenges.
- Prague Stock Exchange: Showed a steady increase in trading from 2019 to 2021, suggesting growing market participation during the pandemic, with a slight rise in 2022 indicating resilience or sustained investor interest.
- Warsaw Stock Exchange: Had the highest initial value in 2019 and saw a dramatic increase in 2020, likely due to its larger market and reactive investors to pandemic shocks. The decrease through 2022 suggests cooling off from high trading levels or broader market corrections.

The data demonstrates varied pandemic responses across markets. The 2020 increases in all exchanges likely result from pandemic-related volatility boosting trading volumes. Variances in subsequent years may be due to factors like policy effectiveness, economic recovery pace, Ukraine conflict impact, and investor sentiment. The 2022 figures show a decline from pandemic peaks but not a uniform return to pre-pandemic levels, suggesting lasting pandemic impacts on trading behaviors and market structures.

Table 4. Aggregated Value Traded/GPD Ratio

Aggregated Value traded/GDP	**2019**	**2020**	**2021**	**2022**
Bucharest Stock Exchange	1.51%	1.92%	1.37%	1.23%
Budapest Stock Exchange	7.87%	10.99%	9.48%	6.41%
Prague Stock Exchange	2.38%	3.09%	3.18%	2.81%
Warsaw Stock Exchange	11.08%	19.91%	17.25%	10.88%

Source: Authors' own calculations.

Our analysis is discussed bellow:

- Bucharest Stock Exchange: The ratio increased from 2019 to 2020, indicating growth in trading relative to GDP, likely a response to the pandemic. It declined in 2021 and further in 2022, suggesting reduced trading volumes relative to economic output, possibly due to market stabilization or post-pandemic investment shifts.
- Budapest Stock Exchange: Peaked in 2020, reflecting increased trading during early pandemic volatility. The subsequent decline through 2022 may indicate normalized trading volumes or a relative decrease in market activity against the overall economy, influenced by economic policies or investor sentiment.
- Prague Stock Exchange: Demonstrated steady ratio growth until 2021, suggesting resilient trading activity growth. A slight decrease in 2022 could reflect market corrections or economic factors reducing trading relative to GDP.
- Warsaw Stock Exchange: Showed a significant spike in 2020, likely due to a strong market response to the pandemic. While elevated in 2021, the ratio dropped in 2022 but remained above 2019 levels, indicating a reduction in trading activity relative to GDP, yet more active than pre-pandemic.

The Aggregated Value Traded to GDP ratios illustrate stock market activity relative to each country's economic size. Variations may result from factors like market liquidity, investor behavior, economic growth, and impacts of global events like the pandemic and geopolitical tensions. The 2022 decline across exchanges suggests a stabilization phase or recalibration of market activities as pandemic effects wane and new economic realities emerge.

Table 5. Share turnover velocity

Share turnover velocity	2019	2020	2021	2022
Bucharest Stock Exchange	7.83%	11.50%	6.72%	8.40%
Budapest Stock Exchange	26.36%	40.41%	27.40%	39.43%
Prague Stock Exchange	14.56%	15.89%	13.38%	19.63%
Warsaw Stock Exchange	33.24%	47.01%	39.76%	44.44%

Source: Authors' own calculations.

Our findings are commented bellow:

- Bucharest Stock Exchange: Increased share turnover velocity in 2020 indicates heightened trading activity due to the initial COVID-19 impact, followed by a drop in 2021, suggesting reduced trading or increased market capitalization. A slight uptick in 2022 may signify a moderate resurgence in market activity.
- Budapest Stock Exchange: A significant jump in 2020 could reflect increased liquidity or trading volumes during the pandemic. Despite a retraction in 2021, turnover velocity remained higher than in 2019, with a rise in 2022 suggesting a return to the higher trading levels of 2020, indicating continued market dynamism or volatility.
- Prague Stock Exchange: Showed a moderate increase in turnover velocity in 2020, a slight decrease in 2021, potentially indicating trading stabilization, and an increase in 2022, suggesting renewed acceleration in trading due to market growth or investor engagement.
- Warsaw Stock Exchange: Experienced a pronounced increase in turnover velocity in 2020, indicative of a substantial rise in trading volumes during the pandemic. Despite a decrease in 2021, turnover velocity was still significantly higher than in 2019, with 2022 figures suggesting ongoing market reactivity and investor interest.

These trends indicate that 2020 saw increased trading activity across all exchanges, likely driven by pandemic-related volatility and uncertainty. The years 2021 and 2022 displayed varying levels of continued high turnover velocity or retraction, reflecting each market's unique response to evolving economic conditions, investor sentiment, and regional factors like the ongoing pandemic and geopolitical tensions in Europe.

Table 6. Average daily turnover

Average daily turnover (mln. Eur.)	2019	2020	2021	2022
Bucharest Stock Exchange	13.47	16.72	13.16	13.94
Budapest Stock Exchange	45.79	59.87	57.95	42.94
Prague Stock Exchange	21.32	26.35	30.02	30.79
Warsaw Stock Exchange	234.06	414.07	394.49	282.51

Source: Authors' own calculations.

Our results are presented bellow:

- Bucharest Stock Exchange: Saw a surge in average daily turnover in 2020 to €16.72 million from €13.47 million in 2019, likely due to COVID-19 volatility. It dropped to €13.16 million in 2021, suggesting normalization, and slightly increased to €13.94 million in 2022, indicating possible recovery or stabilization.

- Budapest Stock Exchange: Exhibited a significant turnover increase from €45.79 million in 2019 to €59.87 million in 2020, likely due to pandemic-related trading. The turnover stayed high in 2021 before declining to €42.94 million in 2022, possibly reflecting a cooldown in market activity post-pandemic or broader economic challenges.
- Prague Stock Exchange: Showed consistent growth, peaking at €30.79 million in 2022 from €21.32 million in 2019, potentially due to a growing market or increased investor participation.
- Warsaw Stock Exchange: Had a substantial increase in turnover from €234.06 million in 2019 to €414.07 million in 2020, likely reflecting its large market size and response to the pandemic. Despite a decrease to €282.51 million in 2022, turnover remained above pre-pandemic levels.

The data indicates varied market reactions to the pandemic and macroeconomic factors, with an initial increase in trading activity during the pandemic's peak, likely driven by volatility and opportunistic trading. Subsequent years show a rebalancing, with some markets nearing pre-pandemic activity levels and others maintaining higher turnover, possibly due to structural changes or continued investor engagement.

Table 7. Exchange Indexes Return

Index return	**2019**	**2020**	**2021**	**2022**
BET	29.32%	5.38%	20.73%	-15.79%
BUX	17.74%	-8.76%	20.63%	-13.66%
PX	13.08%	-7.93%	38.84%	-15.73%
WIG	0.25%	-1.40%	21.52%	-17.08%

Source: Authors' own calculations.

Our analysis is commented bellow:
- BET: Started strong with a 29.32% return in 2019, but faced a significant decline in 2020 due to the initial COVID-19 shock. It rebounded to 20.73% in 2021, showing Romanian market resilience or recovery, but dropped to -15.79% in 2022, likely affected by pandemic aftershocks, rising inflation, or geopolitical tensions.
- BUX: Mirrored BET's pattern with a strong 2019, downturn in 2020, and a notable recovery in 2021, indicating market bounce-back or effective economic measures. However, it experienced a negative return in 2022, possibly due to market corrections or the Ukraine conflict's impact.
- PX: Increased in 2019, dropped in 2020, and surged to the highest 2021 return among these indices at 38.84%, suggesting strong Czech market fundamentals or sector growth. The 2022 decline aligns with regional trends, likely reflecting normalization or broader challenges.
- WIG: Showed a stable return in 2019, a slight decline in 2020, and a robust positive return in 2021. However, it fell significantly in 2022, potentially due to the Ukraine war's impact on Poland.

The trends indicate that 2020 and 2022 were challenging for these markets, affected by the pandemic's onset and geopolitical tensions, respectively. 2021 was a strong recovery year, possibly driven by stimulus measures and market adaptations. The 2022 declines across indices suggest a recalibration of market expectations amid ongoing challenges like supply chain disruptions, inflation, and geopolitical instability.

Conclusions

Our comprehensive examination of the impact of the COVID-19 pandemic on the stock markets of Central and Eastern European countries, including Romania, Hungary, the Czech Republic, and Poland, has revealed several critical insights. The study found that market capitalizations across these countries experienced varied fluctuations. Initially, there was a trend of stability or growth, which was then followed by a decline in 2022. This pattern likely reflects the dual impact of the pandemic and the geopolitical tensions brought about by the Ukraine war.

In terms of the Market Capitalization/GDP Ratio, a peak was observed in 2021 across multiple exchanges. This suggests a transient overvaluation or a rapid response to the stimuli introduced during the pandemic. However, the downturn in 2022 signals a recalibration of market expectations amidst the ongoing geopolitical tensions and economic challenges. This shift underscores the complex relationship between stock market valuations and the broader economic environment during such tumultuous periods.

The study also noted significant changes in trading behaviors. The initial increase in trading volumes across all exchanges in 2020 was likely due to the market volatility induced by the pandemic. However, a general decline in 2022 suggests a possible stabilization phase or a recalibration of market activities as the immediate impacts of the pandemic diminish. This trend was further reflected in the Share Turnover Velocity and Average Daily Turnover, where increased trading activity was observed in 2020, indicative of heightened market volatility and uncertainty. The subsequent years showed varying degrees of retraction or continuation of this high turnover velocity, reflecting each market's unique response to evolving economic conditions.

The analysis of exchange indices illustrated that the years 2020 and 2022 were particularly challenging for these markets, likely due to the initial shock of the pandemic and subsequent geopolitical tensions. Conversely, the year 2021 emerged as a period of strong recovery, possibly buoyed by effective stimulus measures and adaptive market strategies.

From a policy perspective, our study underscores the importance for financial authorities to closely monitor these markets for ongoing changes, especially in response to global crises and geopolitical events. Understanding the behavioral and structural shifts in these markets is crucial for formulating effective fiscal and monetary policies. For investors, the heightened volatility and sector-specific risks highlighted by our findings suggest the need for careful diversification and a keen eye on geopolitical developments.

In conclusion, the COVID-19 pandemic has profoundly impacted the stock markets of Central and Eastern European countries, revealing both their resilience and vulnerabilities. The interplay of regional and global economic dynamics during this period has been complex and instructive. As the world continues to navigate the post-pandemic landscape, the insights gleaned from this tumultuous period will be invaluable for future economic strategies and market analyses. Further research is necessary to explore the long-term impacts of the pandemic and geopolitical tensions on these markets, especially as the global economic landscape continues to evolve.

Authors' Contributions:

The authors contributed equally to this work.

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