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Article

The relationship between stock market and inflation in the period of COVID-19 and Ukrainian war: Evidence from Greece

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Abstract: This study explores the interactions between inflation and stock market. We carried out a bibliometric analysis with R package to highlight the worldwide research trends in the field, covering the period of three crises (financial, health crisis and war of Ukraine). Next, using monthly data for the period from 1 March 2020 to 31 August 2023 and based on a vector autoregressive model, impulse response and variance decomposition are performed to explore the dynamic relationships between inflation and Greek stock market. The results reveal the existence of high volatility in Athens' stock market during COVID-19 pandemic, owning to a shock of the inflation. Regarding the period of Ukrainian war, the study verified the Fama's hypothesis that there is a negative relationship between inflation and stock returns. The findings have significant implications for investors and policy makers.

Keywords: inflation; stock market; Greece; volatility; vector autoregressive; impulse response

1. Introduction

Interest rate is the main instrument of monetary policy in order to keep inflation at acceptable levels (around the 2% level). In period of crisis and deep recession, the Central Banks decided to continuously reduce interest rates, until they reached the zero threshold. At that point, conventional monetary policies were considered as inadequate (Adam and Billi, 2004), making it clear that there was need for non-conventional monetary policy measures, such as the Quantitative Easing. With this expansionary monetary policy, during the turbulent period of COVID-19 crisis, the inflation in the euro area surged, reaching 10.6% in October 2022 (European Central Bank). The reopening of the economy, after the lockdown, results in a significant increase of the demand side (Bouri et al., 2023). ECB decides to implement a restrictive policy by increasing interest rates in order to decrease the inflation rate. Despite the tightening policy, inflation remains in a very high level, revealing that the increase of inflation was not temporary (Selmi et al., 2022). The inflation got worse after the Russian invasion of Ukraine due to the global supply disruption (Selmi et al., 2023).

Economic policy uncertainty increases volatility of stock markets, so there is an increasing interest of researchers to explore the relationship between stock market and inflation and its impact on commerce, financial markets and investments. This paper aims to investigate the relationship between stock market returns and inflation. According to "The Theory", there are two hypotheses: Fama hypothesis and Fisher hypothesis (Barton, 2011; Hondroyiannis and Papapetrou, 2006). Fama hypothesis (Fama and French, 1988) reveals a negative relationship between stock market and inflation. As the stock price is equal to the current value of all future cash flows, an increase in interest rate lowers the net present value of stocks. Moreover, higher

interest rates lead to larger borrowing costs for firms, increase the attractiveness of competing assets such as bonds and deposits, dry up liquidity in the stock market and put downward pressures on stock returns (Zhang, 2021). Fama presents evidence of an existing positive relationship between stock returns and real activity, while inflation is negatively correlated with real activity. On the other hand, Fisher claims that a positive relationship between stock market and inflation exists. According to the Fisher's hypothesis, nominal assets should provide a natural hedge against inflation.

This study adds to the existing literature in two directions. Firstly, a bibliometric analysis is carried out, for the first time, in order to investigate the latest research trends in the field. The findings are visualized by using bibliometric R-tools such as R Studio, Biblioshiny, and VOSViewer. The results reveal that the investigation of stock market and inflation is of great value and depict the increasing interest of scholars in this topic. Furthermore, the study explores the linkages between Athens' stock market and inflation in the period of COVID-19 and war of Ukraine. According to the bibliometric analysis, most of the papers investigate the relationship between inflation and stock returns in US area. Motivated by this gap in the literature, our study focuses on Greek stock market, as Greece is a case study for several reasons. Although Greece became the epicenter of Europe's depth problems in 2009 and risked an exit from Eurozone in 2015, Greek economy managed to recover, and the Greek economic activity grew by 5.9% in 2022. In 2023, Greece is quickly reducing depth levels and has achieved to regain investment grade in its credit rating from Standard & Poor's Global Rating (S&P). The Economist ranked Greece the world's top economic performer for 2022 and 2023. A Vector Error Correction Model (VECM) was constructed to capture the relationship between the Greek stock returns and the Consumer Price Index of Greece (CPI). The time period has been divided into two sub-periods: sub-period 1 (COVID-19) and sub-period 2 (Ukrainian war). In the first sub-period, the results reveal a great volatility in Athens' stock prices, owning to the inflation, while regarding to the second sub-period, the results confirm the Fama's hypothesis, concluding that a negative relationship between stock returns and CPI is detected.

The main findings of the paper can be summarized as follows. According to the bibliometric analysis, there is an increasing interest of scientific committee in investigating the relationship between inflation and stock market. In the period of COVID-19, our results show that there is a great volatility in Athens' stock prices, owning to the inflation. Regarding to the period of Ukrainian war, we conclude that there is a negative impact of inflation on the stock prices. To the best of our knowledge, this is the first paper focuses on the Greek economy and investigates the relationship between Greek stock market and inflation in the period of COVID-19 and Ukrainian war. It is crucial to select Greece, as Greece hailed as global economic "country of the year". The Economist ranked Greece the world's top economic performer for 2022 and 2023, which is based on five economic and financial indicators (inflation, inflation range, GDP, jobs and stock market).

The rest of the paper is structured as follows: Chapter 2 covers the literature review; in Chapter 3, the methodology and variables are described; Chapter 4 presents the results of the study, while the last chapter presents the conclusion.

2. Literature review

2.1. "Black Swan" events and market uncertainty

"Black Swan" events, such as financial crisis, epidemic and war, cause financial uncertainty and increase the fear of investors leading them in an unexpected behavior (Chen et al., 2020). In these periods, there is an increasing volatility on stock prices (Bali et al., 2017; Kurov and Stan, 2018; Megaritis et al., 2021; Liu and Garrett, 2023). Many researchers investigate the effects of Economic Policy Uncertainty (EPU) on stock returns and conclude that EPU has a negative impact on stock prices (Li et al., 2020; Nusair and Al-Khasawneh, 2022; Wang and You, 2023). Hong et al. (2024) conclude that EPU affects the stock market in periods of a major international crisis or national event. They result that global EPU has a causal impact on equity markets in the short term, while domestic EPUs appears to be longer-term. In line with Benchimol et al. (2023b) and Hong et al. (2024) reveal that stock markets respond more aggressively to monetary policy surprise during periods of high uncertainty.

According to Shehzad et al. (2021), COVID-19 has caused significant loss of returns in all financial markets. Zaremba et al.(2020) examine stock prices from 67 countries during the COVID-19 period, investigating the role of government policy responses on stock market volatility and conclude that stringent policy responses lead to a significant increase in stock market volatility. Karamti and Jeribi (2023) investigate the severe effects of continued economic disruption caused by COVID-19 and the Ukrainian war on the stock markets of the G7 (the sanctioning nations during the conflict) and the three big BRIC members (the Russia-China-India). They find evidence that the G7 countries' stock marketsare revealed to be more sensitive to domestic macroeconomic factors during market stress than those of the BRIC triad. Long and Guo (2022) conclude that Russia's invasion of Ukraine exerts a significant impact on market uncertainty. According to Aliu et al. (2023), the results from impulse response function, variance decomposition, SVAR, and VECM indicate that the war in Ukraine is showing that the European financial system is still fragile to external shocks. In turbulent periods, such as financial crisis or war, high inflation rate is observed (Cavallo, 2020; Goodell and Huynh, 2020). An explanation of the high level of inflation after the COVID-19 crisis is the increasing savings of consumers during the lockdowns (Bouri et al., 2023; Jiang et al., 2022). The Russo-Ukrainian war resulted in a further increase of inflation due to the disruption of the supply chain.

2.2. Inflation and stock market

There is a large body of literature that focuses on the relationship between inflation and stock market verifying either "Fama hypothesis" or "Fisher hypothesis" (Apergis and Eleftheriou, 2002; Bouri et al., 2023; Cheema et al., 2022; Časta, 2023; Chiang, 2023; Chiang and Chen, 2023). According to Fama hypothesis, inflation has a negative relationship with stock returns. Similarly, Chiang and Chen (2023) examine the relationship between US inflation and ten sectorial stock indices (financials, health cares, industrials, real estates, consumption goods, retails, basic materials, energy, investment services and technology) and conclude that inflation is negatively correlated with stock returns, except for energy sector, which shows a positive

interaction with inflation. Supporting Fama's hypothesis, Raghutla et al. (2020) provide evidence that there is a positive relationship between stock returns and output and a negative one between inflation and output.

On the other hand, Fisher hypothesis supports the existence of a positive relationship between stock market and inflation. Similarly, Bouri et al. (2023) use daily data of the S&P500 Composite index and its 11 sector indices to detect the relationship between inflation and indices during COVID-19 crisis and Ukraine war. Their results reveal the existence of low positive correlation during COVID-19 and high positive correlation during the Ukraine war in the medium term (32 to 64 days beyond). Similarly, Citci and Kaya (2023) result that the uncertainty of exchange rate has a positive impact on inflation.

In our study, we construct a Vector Error Correction Model (VECM) in order to capture the dynamic relationships between stock prices and inflation. Similarly, using a VECM technique Gopinathan and Durai (2019) find solely a long-run and varying association between the Indian stock market and macroeconomic variables (industrial output, inflation, and exchange rate). Hoynck and Rossi (2023) estimate a Bayesian Vector Autoregressive (BVAR) model using daily data in order to explore the drivers of market-based inflation expectation in the euro area and in the US. A Markov Switching vector autoregressive model is employed by Hondroyiannis and Papapetrou (2006) to explore the interaction between stock returns and inflation in Greece.

2.3. Bibliometric analysis with R package

A comprehensive bibliometric analysis, based on the R package, is carried out in order to point out the worldwide research trends in the field. To address the research question, 1.029 documents were regained from the Scopus database using the keyword search ("inflation" OR "CPI" OR "Consumer Price Index") AND ("stock market" OR "stock market index") and analyzed, using Bibliometrix R tool, Biblioshiny and VOSviewer for the period 2007–2023. The Scopus database is chosen as one of the world's largest "peer-reviewed" databases (Faruk et al., 2021). The period 2007–2023 includes three crises: financial crisis (2007–2018), health crisis (2020–2022), war of Ukraine (2023).

According to **Table 1**, the most cited country in papers related to inflation and stock market is United States of America (3.050 articles), followed by United Kingdom (920 articles) and China (370 articles). Although Greece is one of the most cited countries (6th position), none of these articles have been published recently. Filling this gap in the literature, this study aims to explore the relationship between inflation and Athens' stock market in the turbulent period of COVID-19 and Ukraine war.

Figure 1 depicts the cluster analysis of keywords using the VOSviewer software. Cluster analysis presents linkages among inflation, exchange rate and stock market. These results verify the researchers interest to investigate the impact of macroeconomic news on financial stock markets (Hussain et al. 2020; Queku et al., 2022; Wang et al., 2022). Guo et al. (2022) investigate the relationship between monetary policy surprises and investor sentiment and conclude that in periods of uncertainty stock market reacts strongly to monetary surprises. Similarly, Benchimol

et al. (2023) find evidence that the influence of monetary policy on the stock market depends on the degree of financial uncertainty.

Table 1. The 10 most cited countries.

Countries	Articles
USA	3.050
United Kingdom	920
China	370
India	194
Italy	9
Greece	8
Korea	7
Turkey	5
South Africa	4

Source: Scopus/Biblioshiny (Own elaboration).

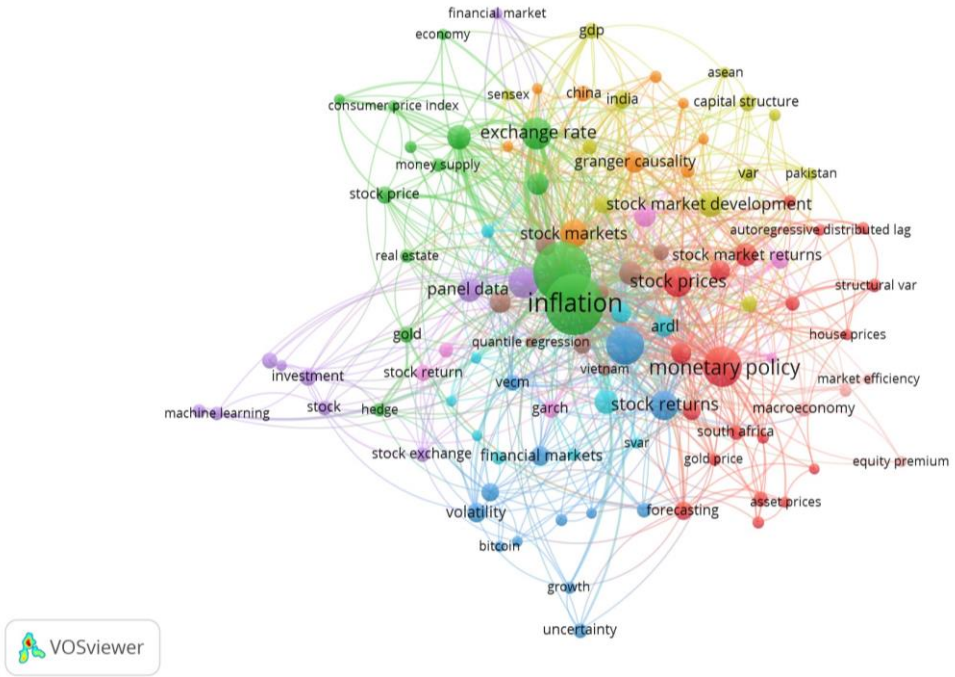

Figure 1. Cluster analysis.

Source: VOSviewer/Scopus.

According to **Figure 1**, GARCH, VECM, ARDL and SVAR are some of the models that are used in order to investigate the volatility of stock returns. Using an APGARCH model, Chiang (2023) conclude that real stock prices are negatively correlated with inflation in US.

Figure 2 shows the thematic map of the authors' keywords. There are two dimensions: the horizontal axis depicts the centrality, and the vertical axis depicts the density. Centrality reveals the importance of the theme in scientific committee, while density reveals the degree to which each theme has been developed. Thematic map is divided into four quadrants. In the first quadrant, there are themes most investigated for a long time. In the second quadrant, we find themes well-developed but not

important in the specific scientific area. The third one includes themes less developed by researchers, while the fourth quadrant reveals themes important to scholars but less developed. The appearance of stock market, inflation and macroeconomics in the fourth quadrant is of great value as it reveals the increasing interest in this scientific area.

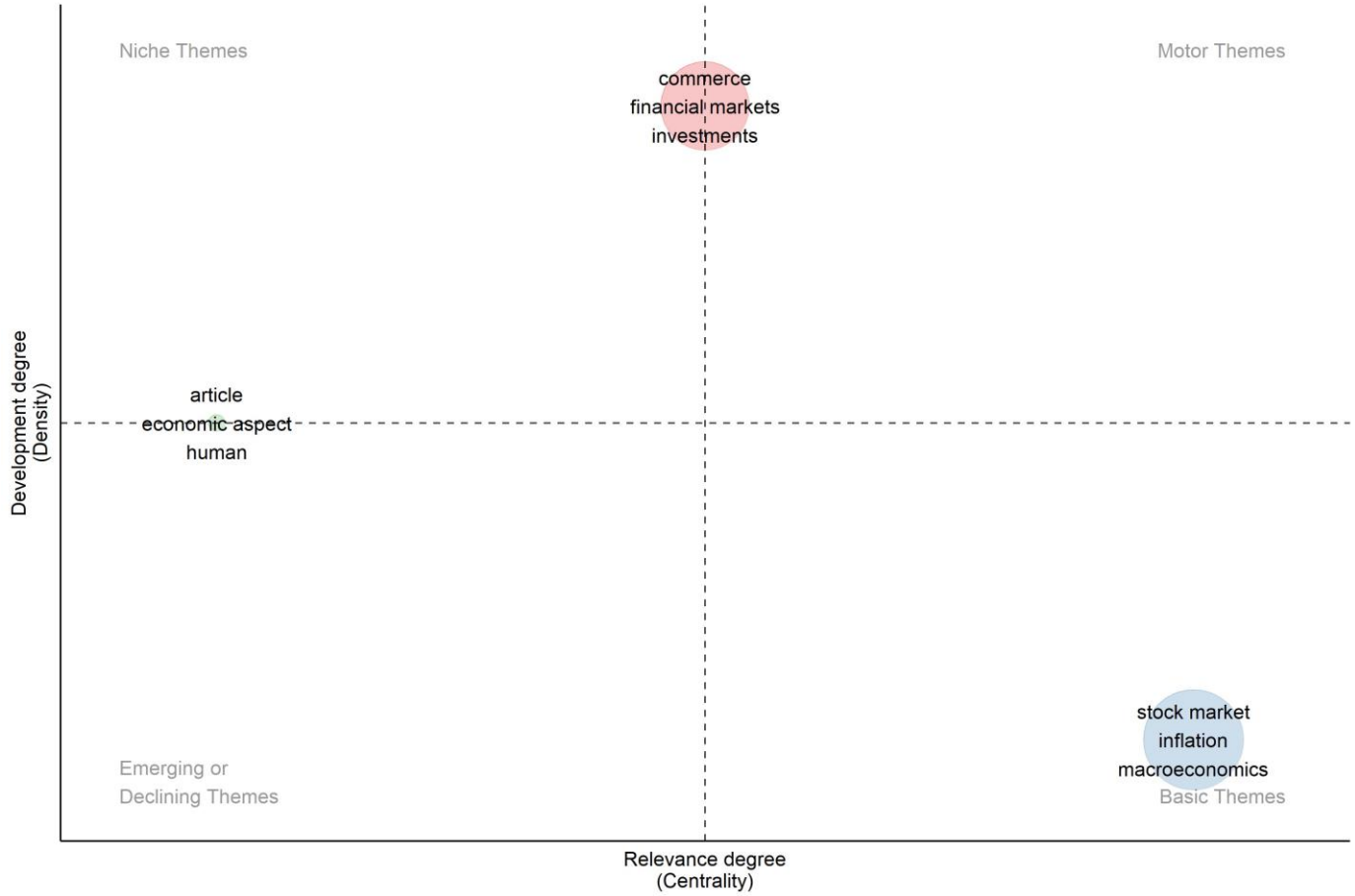

Figure 2. Thematic map.

3. Data and methodology

3.1. Data

The aim of this investigation is to explore the linkages between inflation of Greece and Athens' stock market using monthly data for the period from 1 March 2020 to 31 August 2023. The original data was sourced by Thomson Reuters Database. We calculate the returns of the variables, while stock returns are transformed into logarithmic form. Using EVIEWS 12 software and based on a Vector Error Correction Model, Athens' stock returns (ASE) are defined as dependent variable (target group in VECM model), while inflation (Consumer Price Index-CPI) is defined as independent variable.

3.2. Methodology

The flexibility and simplicity of Vector Autoregressive model (VAR) makes this model to be considered as one of the most popular models in econometrics for

multivariate time series data. A Vector Autoregressive model was employed by Lee (2010) to explore the relationship among economic variables, such as stock returns, inflation, real activity and money supply.

We present the methodology we follow, in order to construct the VECM model. In the first step, we carried out the test of stationary in order to detect unit roots in time series. The Augmented Dickey-Fuller (ADF) test is used, as one of the most commonly used unit root test (Bouri et al., 2017; Huang et al., 2017).

In the next step, based on the Unrestricted VAR, we select the lag-length criteria through the Akaike Information Criteria (AIC), Schwartz Information Criteria (SIC) and Hannan-Quinn Criteria (HQ). If we detect the existence of stationary in our variables in the first step, then we use the Bayesian Vector Error Model. If one, at least, of the variables are not stationary, then we carry out the Johansen Cointegration Test in order to investigate whether our variables are cointegrated. In the fourth step, we construct the VECM model. The validation of the VECM model depends on the coefficients of the Error Correction Term (ECT). The Error Correction Term reflects the strength of the self-correction mechanism and must be negative.

According to Liu and Garret (2023) high stock market volatility appears in periods of high macroeconomic uncertainty. In the 5th step, this study tends to explore the volatility of stock returns owning to a shock of inflation, using impulse response and variance decomposition. Impulse response reveals the dynamic relationships among variables (Danish et al., 2018; Etokakpan et al., 2020; Koch and Dimpfl, 2023), while variance decomposition shows the percentage of volatility of the independent variable that is due to its own shocks, versus shocks to other variables.

4. Results

The scope of this study is to investigate the linkages between the inflation and the stock returns for the period from 1 March 2020 to 1 August 2023. This period can be divided into two sub-periods: sub-period 1 includes the period of COVID-19 (1 March 2020 to 23 February 2022) and sub-period 2 includes the period after the Russian invasion of Ukraine (24 February 2022 to 31 August 2023).

4.1. Descriptive statistics

The descriptive statistics are summarized in **Table 2**. Stock returns have the highest standard deviation (0.076 in the first sub-period and 0.063 in the second sub-period). All the variables in both sub-periods have positive asymmetry, except for Athens stock market in the sub-period 2 (−0.317). Regarding Kurtosis, all the variables are leptokurtic. According to Jarque-Bera test, the null hypothesis of residuals normality is not rejected for all the variables apart from stock returns of Athens in the first sub-period.

Table 2. Descriptive statistics.

Variables	CPI		ASE	
	Sub-period 1	**Sub-period 2**	**Sub-period 1**	**Sub-period 2**
Mean	1.002	1.004	0.020	0.021
Median	1.0026	1.004	0.026	0.036
Maximum	1.024	1.029	0.258	0.116
Minimum	0.983	0.982	−0.093	−0.094
Std. Dev	0.011	0.013	0.076	0.063
Skewness	0.017	0.353	1.217	−0.317
Kurtosis	2.364	2.454	5.358	2.165
Jarque-Bera	0.498	0.597	11.007	0.826
Probability	0.780	0.742	0.004	0.662

4.2. Stationary test

Table 3 depicts the results of the Augmented Dickey-Fuller (ADF) unit root test. The results reveal that stock returns remain stable in all levels in both sub-periods at 1% significance level, while Consumer Price Index is not stable at levels and became stable at the first differences in both sub-periods at 1% significance level. Employing the variables in levels, in order to estimate the long-run relationship, would result in non-robust estimators, unless the series were cointegrated.

Table 3. ADF stationary test.

Variables	Level values		First differences	
	***t*-statistic**		***t*-statistic**	
	Sub-period 1	**Sub-period 2**	**Sub-period 1**	**Sub-period 2**
CPI	0.306	−0.693	−7.625***	−5.276***
ASE	−5.020***	−4.055***	−7.139***	−7.341***

Notes: *** are the significance level of 1%. For sub-period 1 and for the level, critical *t*-value was taken as −2.69 (−2.728 for sub-period 2) for the significance level of 1%. For the first differences, critical *t*-value was taken as −2.575 for the significance levels of 1%.

4.3. Cointegration analysis

After the stationary test, the second step is the selection of the appropriate lag selection criteria (Matar and Bekhet, 2015). Based on the Unrestricted VAR and according to the prices of AIC, SC and HQ criteria, two lags are chosen. As it was mentioned above, we have to examine whether the variables are cointegrated. The most appropriate cointegration test for multi-period cointegration time-series analysis is the Johansen cointegration test (Zhang et al., 2017). Employing the Johansen test, we investigate the existence of cointegration between stock prices and CPI. **Table 4** presents the results of the Johansen test. The prices of Trace and Max-Eigenvalue tests are higher than the critical bounds at the 1% significance level, revealing the existence of one cointegration equation at the 1% level for both sub-periods. Confirming the long-term cointegration relationship, we can construct the VECM model for every sub-period separately.

Table 4. Johansen cointegration results for ASE with CPI.

Hypothesized No CE(s)	Trace test					Maximum Eigenvalue test		
	Trace statistic		0.05 Critical value	Prob**		Max-Eigen statistic		0.05 Critical value
	Sub-period 1	Sub-period 2		Sub-period 1	Sub-period 2	Sub-period 1	Sub-period 2	
None*	31.953	26.014	15.495	0.0001	0.0009	19.419	14.247	14.265
At most 1*	12.53	11.767	3.841	0.0004	0.0006	12.534	11.767	3.841

*Denotes rejection of the hypothesis at the 0.05 level.
**MacKinnon-Haug-Michelis (1999) *p* values.

For the first sub-period, the results of VECM model are not statistically significant at any level, so we cannot explore the kind of relationship between the inflation and the stock returns during the period of COVID-19 (Appendix **Tables A1** and **A2**). Regarding the second sub-period, the cointegration equation of VECM model is presented in **Table 5**.

Table 5. Cointegration equation of VECM.

Cointegrating Eq.	ASE(−1)	CPI(−1)	*C*
CointEq1	1.000	6.122	−6.168
		(1.413)	
		[4.331]	

Standard errors in ( ) & *t*-statistics in [ ].

According to **Table 6**, the equation is the following:

$$\mathrm{ECM}_{t-1} = 1.000\mathrm{ASE}_{-1} + 6.122\mathrm{CPI}_{-1} - 6.168 \quad (1)$$

According to **Table 5**, the coefficients of the Error Correction Model (ECM) are statistically significant, showing the long-run relationship between the inflation and the stock return in the period of Ukraine war. As shown in Equation (1), there is a negative relationship between Consumer Price Index and Athens' stock prices. Specifically, a 1% increase in CPI, will decrease stock returns by 6.12%. Our results are in line with other researchers (Chiang and Chen, 2023; Raghutla et al., 2020) verifying the Fama's hypothesis and the negative relationship between stock market and inflation.

Table 6. Error correction term of VECM (sub-period 2).

Error correction	D(ASE)	D(CPI)
CointEq1	−0.498	−0.105
	(0.438)	(0.082)
	[−1.138]	[−1.281]

The validity of the VECM model is verified by the coefficients of the Error Correction Term shown in **Table 6**. The variables were unstable at levels and became stable at first differences. According to Johansen test, CPI and ASE were cointegrated I(1). The Error Correction Term (ECT) reflects the strength of the self-correction mechanism to reestablish the balance of the system. Confirming that the coefficients

of ECT are negative, the validity of the model has been verified (−0.498 and −0.105 of ASE and CPI respectively).

4.4. Impulse response and variance decomposition

The volatility of the stock returns has been examined, by utilizing the impulse response analysis. The following graph depicts the response of the ASE to one-standard-deviation shock in the CPI for the next 5 periods. According to Li and Su (2017) and Zhang et al. (2017), there is a sensitivity in ordering the variables in the impulse response, so we put the dependent variable ASE in the first place. **Figure 3** presents the impulse response of the ASE to a shock in the CPI in the period of COVID-19. The graph reveals that high volatility exists in the stock returns, owning to a change in the inflation rate. In the second period, the response is negative reaching at −0.015, while in the third period, the response changes to positive reaching at 0.022. These results may explain why we could not conclude about the relationship between ASE and CPI in the first sub-period (the coefficients of the VECM model were not statistically significant).

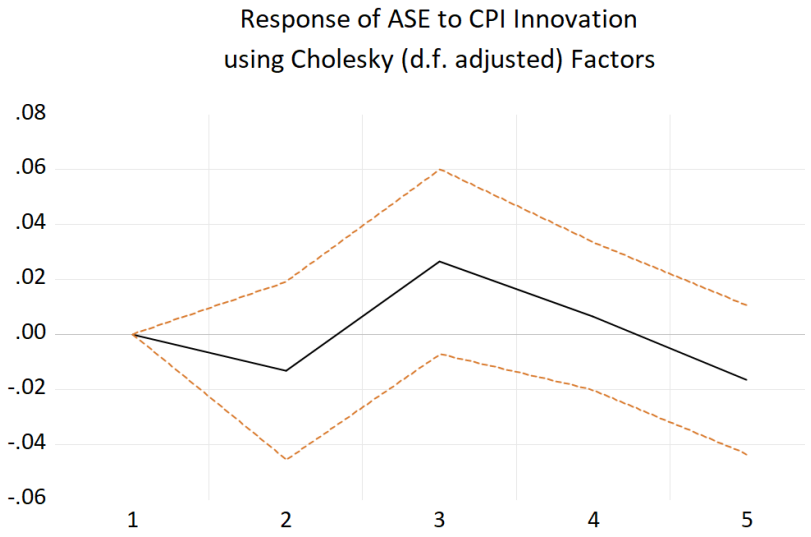

Figure 3. Impulse response of ASE in the period of COVID-19.

Figure 4 depicts the response of the ASE to one-standard-deviation shock in the CPI in the period of Ukraine war. According to the graph, there is an intensive negative response of the ASE to one shock in the inflation rate reaching its minimum rate in the third period (−0.030). ASE seems not to have the ability to recover quickly from the shock owning to inflation. In the fifth period, ASE remains to be affected by the shock. The negative response of ASE is in line with the results of VECM model, which reveal a negative long-run relationship between the inflation and the stock prices.

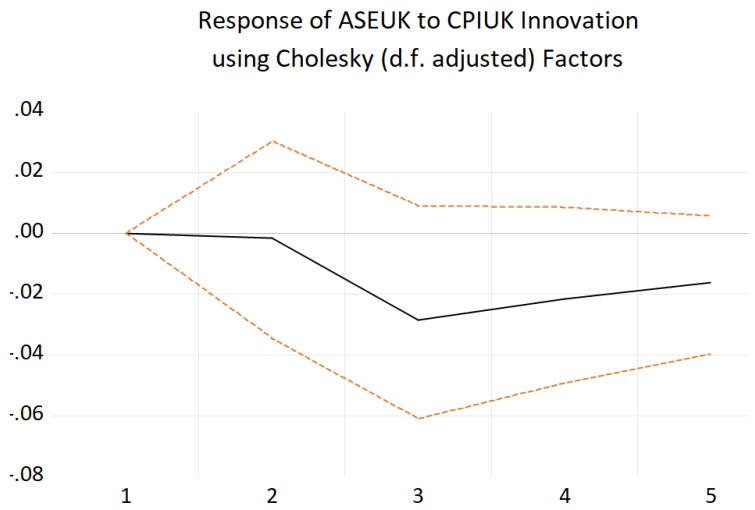

Figure 4. Impulse response of ASE in the period of Ukraine war.

Exploring the volatility of the ASE, variance decomposition analysis is also employed. At a forecasting horizon of 5 periods, variance decomposition gives the percentage of the ASE's variance that is due to its "own" shock, versus shock owning to the CPI. The results are presented in **Table 7**. Regarding the sub-period 1 (COVID-19), 83.19% of the ASE's variance is explained by its own innovations, while CPI explained 16.81%. On the other hand, in the sub-period 2 (Ukraine's war) 93.52% of the ASE's variance is explained by its own innovations, while CPI explained only 6.48%. Comparing the period of COVID-19 (sub-period 1) to the period of Ukraine war, we can conclude that in the period of COVID-19 the volatility of ASE is higher and most affected by the inflation.

Table 7. Variance decomposition of ASE.

	Sub-period 1		**Sub-period 2**	
Period	**ASE**	**CPI**	**ASE**	**CPI**
1	100.000	0.000	100.000	0.000
2	96.615	3.385	99.972	0.028
3	86.828	13.172	94.985	5.015
4	86.538	13.462	93.540	6.460
5	83.194	16.806	93.530	6.470

5. Conclusion

In turbulent periods, such as financial crises, health crises and wars, it is crucial for the investors to know about the volatility of financial markets and the impact of the high levels of inflation on them. This study adds to the literature by answering the following research questions: (i) What are the worldwide research trends in the field relative to the inflation and stock market? (ii) What is the relationship between stock market and inflation?

In order to highlight the worldwide trends in the field, a bibliometric analysis is employed, using R-package. According to the Cluster Analysis, stock market, inflation and macroeconomics are themes very important to the scientific committee and less

developed. US is the most cited country, while Greece is in the 6th position. Although the position of Greece reveals the interest of the scholars, none of these papers are recently published. This study fills this gap by exploring the linkages between Athens' stock returns and inflation in the period of COVID-19 and Ukrainian war.

Employing a Vector Error Correction model, the study results that there is a negative relationship between Athens' stock prices and inflation in the period of Ukrainian war. The findings verify the Fama's hypothesis, being in line with other researchers (Chiang and Chen, 2023; Raghutla et al., 2020). Regarding the period of COVID-19, the results of VECM model are not statistically significant at any level, so we cannot explore the kind of the relationship between the inflation and the stock returns in this period. In order to explore the volatility of stock prices, owning to the inflation rate, we utilize impulse response and variance decomposition. In the period of COVID-19, the results of impulse response reveal that the high levels of inflation cause very high volatility on stock prices. This could be the reason why we could not find the direction of the relationship between the stock returns and inflation. The impact of inflation rate on the volatility of stock market is the main topic of many researchers (Baker et al., 2020; Białkowski et al., 2022; Dridi and Boughrara, 2023). In the period of Ukrainian war, the results of impulse response reveal an intensive negative response of the ASE to one shock, in the inflation rate reaching its minimum rate in the third period (−0.030). According to the variance decomposition, a great percentage of ASE's variance (16.8%) is due to the change of the inflation rate in the period of COVID-19.

The results of the study are crucial for academics, policymakers and investors. For the first time, a bibliometric analysis with R-package is utilized, revealing that the relationship between inflation and stock market is an important theme in the research area and further investigation is suggested. It is worthwhile to investigate the case of Greece for several reasons. Although Greece became the epicenter of Europe's depth problems in 2009 and risked an exit from Eurozone in 2015, Greek economy manage to recover, and the Greek economic activity grew by 5.9% in 2022. The Economist ranked Greece the world's top economic performer for 2022 and 2023, followed by Spain, Japan, France, Italy, Britain, US and Germany. Policymakers should make their decisions, taking into consideration the profound impact of the high inflation level on financial markets. Regarding the investors, it is essential for them to understand the reactions of the financial markets due to the inflation, otherwise the investors' anxiety makes them behave in an unexpected way, increasing the possibility of a market crash (Chen et al., 2020). Besides the important contribution to the literature, our study have some limitations. The major limitation of this study is the narrow research sample. Future developments, as well as bigger and reacher datasets, will allow us to re-evaluate and verify our findings. The linear restrictions of this study could be overcome by using non-linear models such as SVAR. Moreover, the comparative study of European countries and their level of inflation could be a subject for future research.

Author contributions: Conceptualization, SK; methodology, SK and NS; software, SK; validation, NS; formal analysis, SK; investigation, SK and NS; resources, SK; data curation, SK and NS; writing—original draft preparation, SK and NS; supervision,

NS; project administration, SK and NS. All authors have read and agreed to the published version of the manuscript.

Conflict of interest: The authors declare no conflict of interest.

Abbreviations

ECB	European Central Bank
VAR	Vector Autoregressive model
BVAR	Bayesian Vector Autoregressive model
VECM	Vector Error Correction Model
GARCH	Generalized Autoregressive Conditional Heteroskedasticity
ARDL	Autoregressive Distributed Lag
AIC	Akaike Information Criterion
SIC	Schwartz Information Criterion
HQ	Hannan-Quinn Criterion
ADF	Augmented Dickey Fuller
ECT	Error Correction Term
ECM	Error Correction Model
CPI	Consumer Price Index
ASE	Athens Stock Exchange

Description of all variables

Variable	**Definition**	**Source**
CPI	Consumer Price Index of Greece	World Bank
ASE	Athens Stock Exchange	Thomson Reuters
1.029 documents	1.029 documents for bibliometric analysis	Scopus

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Appendix

Table A1. Cointegration equation of VECM in the period of COVID-19.

Cointegrating Eq.	**ASE(−1)**	**CPI(−1)**	***C***
CointEq1	1.000	0.082	−0.101
		(1.208)	
		[0.068]	

Standard errors in ( ) & *t*-statistics in [ ].

Table A2. Error Correction Term of VECM in the period of COVID-19.

Error correction	**D(ASE)**	**D(CPI)**
CointEq1	−1.524	−0.004
	(0.308)	(0.066)
	[−4.942]	[−0.062]

Standard errors in ( ) & *t*-statistics in [ ].