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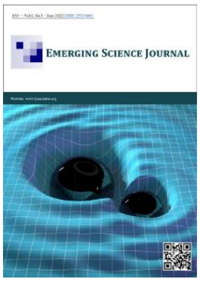

The Role of Economic Policy Uncertainty in Predicting Stock Return Volatility in the Banking Industry: A Big Data Analysis

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Abstract

The research aims to study the effects of economic policy uncertainty on the return volatility of stocks with data from the largest banking institutions in Greece. Volatility is constructed using intraday data, whereas the research period extends over a period of about thirteen years, more specifically from January 5, 2001, to June 30, 2014. This period includes various phases of the market, such as stock market crashes along with stock market booms (e.g. the financial crisis of 2007 and 2008 in the United States and the European sovereign debt crisis). The estimated regressions were used to indicate the direct effects of economic policy uncertainty on the return volatility of the stocks of the four large Greek banks. The volatility index is constructed based on intraday data, whereas four different estimators of volatility were used. There is a statistically significant "direct" effect of economic policy uncertainty on the volatility of stock returns of the largest Greek banks, which are (a) Alpha Bank, (b) Eurobank, (c) National Bank of Greece, and (d) Piraeus Bank. Such findings are highly important for specific groups of people, such as investors, policymakers, and regulators. This study is the first research that seeks to identify the effect of economic policy uncertainty on the stock return volatility of the Greek banking system, constructed from intraday data.

Keywords:

Volatility;

Economic Policy Uncertainty;

Intraday Data;

Banks;

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1- Introduction

In recent decades, citizens around the world have experienced world-historic changes, most notably the financial crisis of 2007 and 2008 in the US, which later spread to Europe. According to Al-Thaqeb and Algharabali (2009), these changes have caused instability at the economic and political levels, leading to uncertainty worldwide [1]. The term "uncertainty" in financial terms is difficult to understand, but Abel (1983) defined it as "*economic uncertainty,*" the changes that occur without being foreseen and contribute to the shaping of the economic environment. In addition, the specific changes have a decisive effect on the companies, which in this paper are the Greek banking institutions, through various policies pursued by the government such as monetary and fiscal policy. Therefore, the Economic Policy Uncertainty (EPU) is defined by the economic risk associated with the unpredictable policies of each government and regulatory framework [2], and has been the subject of numerous studies since Baker et al. (2016) [3] constructed the EPU index to measure economic policy uncertainty [4]. Several researchers, after the introduction of the index EPU, sought to measure or estimate the economic policy uncertainty in financial markets [5-10].

The Greek banking system has changed due to globalization and the general instability observed worldwide [11]. These changes in the Greek banking system are related to the mergers that took place in the banking sector, the evolution of technology, and the abolition of regulations and restrictions. From 1997 onwards, the Greek banking system began

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to undergo drastic changes in its operation because, until that time, the activities of the banking system were controlled by state bodies and relied on bureaucracy and several laws [12]. Today, according to Tsagkanos et al. (2021), the financial system of Greece is defined as an oligopolistic structure within the financial system of the country, and its operation is based on an emerging market that is relatively small [11]. Also, the Greek financial system has a human resources department with properly trained staff. Lastly, the Athens Stock Exchange (ASE) is a small stock exchange that is considered inferior to other stock exchanges in Europe [13]. Nowadays, it should be noted that there are four large Greek banks Alpha Bank, Eurobank, National Bank of Greece, and Piraeus Bank.

Moreover, volatility is an integral part of the research conducted because the purpose of this paper is to understand the link between economic policy uncertainty and the Greek banking system. Firstly, the concept of volatility must be defined. Volatility is defined as a unit of measurement of market risk and has the potential to cause great concern to all individuals who have some form of market participation or not [14]. However, according to Floros et al. (2020), volatility is a variable that is difficult to observe, making it almost impossible to predict its impact on financial markets [15]. Also, volatility plays a key role in the financial sector, and everyone's interest is focused on the level and nature of volatility [16]. Finally, over the years, volatility may change, leading to modeling with stochastic models [11, 17].

This study seeks to identify the effect of economic policy uncertainty on the stock return volatility of the Greek banking system. The issue of economic uncertainty along with its potential impact on financial markets is of particular interest in the existing literature. Examples include Baker et al. (2016) [3], Karadag (2021) [18] among others. In general, one can argue that potential drivers of stock market return and volatility rank high in the research agenda [19-21]. Mahmood et al. (2019) examined the impact of bank-specific factors and macro-specific factors on bank liquidity [22]. Here, we contribute to this growing literature by conducting for a first time an empirical analysis over a specific period of time which includes the period of growth, the US crisis of 2007 and 2008, the European sovereign debt crisis, and the period of recession after the crisis in the Greek state. More specifically, the study refers to the period 5 January 2001 to 30 June 2014. The purpose of the research is to examine in detail the effects of economic policy uncertainty on the return volatility of the stock in the largest Greek banks. We focus on Greece as it can be viewed as a unique example running mostly significant current account imbalances. Specifically, as already emphasized by the existing literature [23-25], Greece remained at the center of the European sovereign debt crisis for a long period of time.

Our research was conducted to study the impact of economic policy uncertainty on stock return volatility. It should be noted that our study is among the first study aimed at investigating economic policy uncertainty on stock return volatility in the Greek banking industry, focusing on the four largest banking institutions in Greece. The contribution of the present study is related to the literature on the banking industry. This is among few studies conducted on the stocks of the Greek banking system using intraday data and several volatility estimators for all Greek systemic banking institutions.

The rest of this paper is planned along these lines: In the second section, data used for the empirical analysis and basic statistics are described. The methodology and the empirical results were discussed in the third and fourth sections, respectively. The fifth section concludes the paper. Additionally, the research methodology can be described as follows (Figure 1).

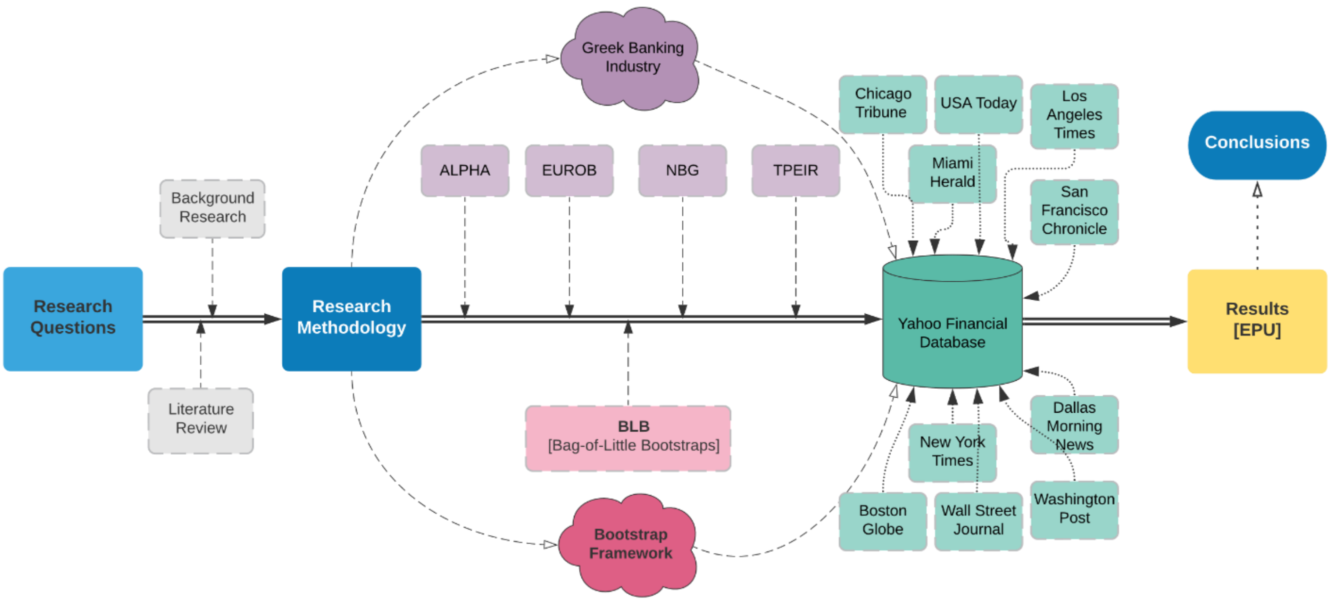

Figure 1. Flowchart of Research Methodology

2- Data and Basic Statistics

In this section we describe the data that we use to conduct the research. Due to the diversity of the dataset, we used the BLB bootstrap framework for big data sampling to make the sample efficient for data analysis, while not losing precision [26]. We have worked with the bank stock prices at the opening and closing calculating the volume of the four largest banks in Greece which are (a) Alpha Bank (ALPHA hereafter), (b) Eurobank (EUROB hereafter), (c) National Bank of Greece (NBG hereafter), and finally (d) Piraeus Bank (TPEIR hereafter). The four banks mentioned are the largest Greek banks and also, they are members of the Economic and Monetary Union, i.e., they belong to the 24 large European banks [27]. The period of the analysis extends from January 5, 2001, to June 30, 2014. The data retrieval was performed through the Yahoo Financial Database. The period of the analysis contains some periods that marked the economy, such as the periods of deep recession (e.g., the crisis of 2007 and 2008 in the United States, the sovereign debt crisis in Europe and Greece, and the period of recession after the Greek crisis).

We are interested in measuring financial uncertainty concerning politics by constructing a three-item index. One of the three elements is related to the quantification of newspaper coverage, which refers to the economic uncertainty associated with politics. The second element refers to the number of legislative provisions that expire shortly. Finally, the third element treats differences in economic forecasts to replace the economic uncertainty. The first item is a list of searches for the 10 large newspapers. The index is based on a list of newspapers which are as follows: the Boston Globe, the Chicago Tribune, the Dallas Morning News, the Los Angeles Times, the Miami Herald, the New York Times, the San Francisco Chronicle, USA Today, the Wall Street Journal and the Washington Post. Based on these ten newspapers, we create a normalization index that links economic policy uncertainty to the news articles that refer to it and more specifically to the volume of articles. The second element of the index is based on reports from the Congressional Budget Office (CBO) entered in lists indicating the temporary legislative provisions. We generate weighted numbers for the tax code on an annual basis which expire within 10 years, thus measuring the level of uncertainty concerning the evolution of the tax code in the coming years. The third element of the indicator that refers to the link between uncertainty and politics is based on the Federal Reserve Bank of Philadelphia's Survey of Professional Forecasters. In the third element, we use as a means of estimating the dispersion between the predictions of the separate forecasts related to the level of the Consumer Price Index, Federal Expenditures, and State and Local Expenditures in the future to establish several indicators for the uncertainty associated with variables related to macroeconomic policy [3].

2-1- Basic Statistics

The basic statistics of the closing stock prices of the largest banks in Greece are reported in Table 1. These Greek banks are the following: ALPHA, EUROB, NBG and TPEIR for each banking institution, respectively. We have the following basic statistics: (i) Mean (average), (ii) Median, (iii) Maximum, (iv) Minimum, (v) Standard Deviation (denoted by Std. Dev.), (vi) Skewness, (vii) Kurtosis, (viii) Jarque- Bera test and (ix) Probability of Jarque- Bera test. In Table 1, we can see the mean for Alpha Bank equals to 244.558, while the standard deviation is 261.333, a minimum of 0.416, and a maximum of 921.812. The skewness is equal to 0.594 and the kurtosis is equal to 1.799. For the closing prices of the National Bank of Greece, the mean is equal to 14462.05, the standard deviation equals 17126.830, a minimum of 0.8500, and a maximum of 62776.8. The skewness is equal to 1.074 and the kurtosis equals 3.025. Moreover, the mean of Eurobank equals 8498.103, with a standard deviation equal to 9726.92, a minimum of 0.283, and a maximum of 33829.6. The skewness and kurtosis are equal to 0.7765 and 2.230, respectively. In addition, for Piraeus Bank, the mean is equal to 3363.702, the standard deviation equals 4061.842, a minimum of 0.081, and a maximum of 14773.9. The skewness and kurtosis are equal to 1.106899 and 3.1090, respectively. We observe that for the four Greek banks, the spaces are positive, and this shows us that the tail of the distribution is greater than the left. Also, for banking institutions Alpha Bank and Eurobank, the kurtosis receives prices less than 3, while for banking institutions National Bank of Greece and Piraeus Bank, the kurtosis values are close to 3 showing that closing values are almost normally distributed. Finally, we use the Jarque- Bera test to check the normality of all series. At a 1% significance level, we reject the null hypothesis of normality for all test cases.

Table 1. Basic statistics of closing prices

	ALPHA	EUROB	NBG	TPEIR
Mean	244.5589	8498.103	14462.05	3363.702
Median	124.4860	4200.00	8476.54	1769.41
Maximum	921.8120	33829.6	62776.8	14773.9
Minimum	0.4160	0.2830	0.8500	0.0810
Std. Dev.	261.3332	9726.920	17126.830	4061.842
Skewness	0.5943	0.776571	1.074902	1.106899
Kurtosis	1.7999	2.2307	3.0252	3.1090
Jarque-Bera	586.8475^{***}	617.9354^{***}	950.2674^{***}	1010.399^{***}
Jarque-Bera prob.	[0.0000]	[0.0000]	[0.0000]	[0.0000]

3- Methodology

In this section, we describe the methodology used in research. First of all, we mention some important assumptions. The value P follows a simple continuous stochastic process called Brownian motion as a result the log-price $p = \ln(P)$ follows a similar process Brownian motion with zero drift and diffusion σ.

$$dp_t = \sigma dB_t \tag{1}$$

The next assumption refers to the non-volatility of the diffusion parameter σ during the day, but σ changes from day to day. We define it as a unit of time one day. Through the observation, we find that, in Equation 1, the diffusion parameter is similar to the standard deviation of returns which shows normalization, resulting in unnecessary to distinguish the quantities of us. The basic variables defined in the equations below, are as follows $Open$ denotes the daily opening price, $Close$ denotes the daily closing price, $High$ denotes the highest daily price and Low denotes the lowest daily price. These variables are important for our returns that are Open-to-Close, Open-to-High, and Open-to-Low.

$$p_{close} = \ln(Close) - \ln(Open) \tag{2}$$

$$p_{max} = \ln(High) - \ln(Open) \tag{3}$$

$$p_{min} = \ln(Low) - \ln(Open) \tag{4}$$

where, p_{close} is defined as the return which is a random variable that is normally distributed with mean 0 and variance (volatility) σ^2

$$c \sim N(0, \sigma^2) \tag{5}$$

Our goal is to assess the volatility σ^2 that is not observable by three observable variables p_{close}, p_{max}, and p_{min}. It should be noted that p_{close}^2 is an impartial valuer of σ^2,

$$E(p_{close}^2) = \sigma^2 \tag{6}$$

In Equation 7, the first volatility estimator which symbolizes with the s due to the word "simple", is indicated below:

$$\widehat{\sigma_s^2} = p_{close}^2 \tag{7}$$

Because of the noisy simple estimator, a better estimator would be preferable to us. Plenty of information is presented by the changes between the upper and lower price points mentioned in the volatility from the closing price. From high and low prices, other information can be obtained. Widely known is the range distribution $d \equiv p_{max} - p_{min}$ of Brownian motion which determines the difference between higher and lower prices [28]. During the day, we define as $P(y)$ the probability that the treaty $d \leq y$ is practicable,

$$(y) = \sum_{n=1}^{\infty} (-1)^{n+1}\, n \left\{ Erfp_{close}\left(\frac{(n+1)y}{\sqrt{2\sigma}}\right) - 2Erfp_{close}\left(\frac{ny}{\sqrt{2\sigma}}\right) + Erfp_{close}\left(\frac{(n-1)y}{\sqrt{2\sigma}}\right) \right\} \tag{8}$$

where;

$$Erfp_{close} = 1 - Erf(y) \tag{9}$$

where the error function is denoted with $Erf(y)$. For the calculation (for $p \geq 1$), the distribution of Parkinson (1980) [29] will be used:

$$E(d^P) = \frac{4}{\sqrt{\pi}} \Gamma\left(\frac{p+1}{2}\right)\left(1 - \frac{4}{2^p}\right) \zeta(p-1)(2\sigma^2) \tag{10}$$

where the gamma function and the Riemann zeta function are denoted with $\Gamma(y)$ and $\zeta(y)$, respectively.

For $p = 1$

$$E(d) = \sqrt{8\pi}\sigma \tag{11}$$

and for $p = 2$

$$E(d^2) = 4\ln(2)\,\sigma^2 \tag{12}$$

Based on Equation 12, German and Klass (1980) [30] proposed a new volatility estimator

$$\widehat{\sigma_p^2} = \frac{(p_{max} - p_{min})^2}{4ln2} \tag{13}$$

The base estimator is detected only in quantity $p_{max} - p_{min}$ and thus an estimator could be appreciated more accurately by using all available information [30]. As on p_{close}, p_{max}, and p_{min}, the persistent attempt to find the minimum variance estimator appears as an infinite dimension problem, this problem has restrictions from estimators describing the function of p_{close}, p_{max}, and p_{min} and are called analytical estimators. The following equation states the minimum analytical variance estimator which is

$$\widehat{\sigma^2_{GKprecise}} = 0.511(p_{max} - p_{min})^2 - 0.019(p_{close}(p_{max} + p_{min}) - 2p_{max}p_{min}) - 0.383p_{close}^2 \tag{14}$$

We observe that the right term (cross-products) is considered insignificant and in the next equation we propose a further appropriate estimator:

$$\widehat{\sigma_{GK}^2} = 0{,}5(p_{max} - p_{min})^2 - (2ln2 - 1)p_{close}^2 \tag{15}$$

The Equation 15 describes the volatility estimator called Garman-Klass and symbolized GK according [30]. The GK estimator has a significant benefit over the estimator and is described by equation (14), which is detailed as the best possible (lowest variance) combinations of 2 basic estimators, a simple estimator, and the Parkinson volatility estimator [31].

Meilijson (2009) describes a new estimator who has the smallest variance [32]. Equation 16 reports this estimator

$$\widehat{\sigma_M^2} = 0.274\sigma_1^2 + 0{,}16\sigma_s^2 + 0.365\sigma_3^2 + 0.2\sigma_4^2 \tag{16}$$

where

$$\sigma_1^2 = 2[(p'_{max} - p'_{close})^2 + p'_{low}] \tag{17}$$

$$\sigma_3^2 = 2(p'_{max} - p'_{close} - p'_{min})p'_{close} \tag{18}$$

$$\sigma_4^2 = -\frac{(p'_{max} - p'_{close})p'_{min}}{2ln2 - 5/4} \tag{19}$$

where $p'_{close} = p_{close}, p'_{max} = p_{max}, p'_{min} = p_{min}\ if\ p_{close} > 0\ and\ p'_{close} = -p_{close}, p'_{max} = -p_{min}, p'_{min} = -p_{max}\ if\ p_{clos`e} < 0$.

The RS estimator is given to Equation 20 and with this estimator is allowed arbitrary drift

$$\widehat{\sigma_{RS}^2} = p_{max}(p_{max} - p_{close}) + p_{min}(p_{min} - p_{close}) \tag{20}$$

3-1- Impact of Economic Policy Uncertainty

Our research is carried out to look in detail and carefully the results of economic policy uncertainty in the volatility of the largest banks (i.e., ALPHA, EUROB, NBG and TPEIR). The nonparametric linear regression is used in research. Our estimation includes the volatility estimators' regression. Specifically, the vector coefficient γ is estimated as a direct effect of the EPU in all Greek banking institutions on volatility. In the next equation, the regression is defined:

$$\sigma_{t,j}^i = a + \gamma_j^i EPU_{t-1,j} + u_{t,j}^i \tag{21}$$

where $\sigma_{t,j}^i$ symbolizes the volatility of the volatility i estimator for $i = 1, \ldots, 4$ for some of the retainer volatility estimator: $\widehat{\sigma_p^2}$, $\widehat{\sigma_{GK}^2}$, $\widehat{\sigma_M^2}$ and $\widehat{\sigma_{RS}^2}$ of j banks at time t, with $j = 1, \ldots, 4$ for the four Greek banks ALPHA, EUROB, NBG and TPEIR. Moreover, the explanatory variable of volatility $\sigma_{t,j}^i$ at time t symbolizes with $EPU_{t,j}$.

4- Empirical Results

Tables 2 to 5 mention the impact of EPU on the volatility series of stock returns considering four estimators of volatility as (i) σ_p^2, (ii) σ_{GK}^2, (iii) σ_M^2 and (iv) σ_{RS}^2, for ALPHA (Table 2), EUROB (Table 3) NBG (Table 4), and TPREIR (Table 5).

Table 2. EPU impact on ALPHA stock return volatility

Variables	γ_{ALPHA}
σ_p^2	4.24E-05* (0.0692)
σ_{GK}^2	3.53E-05** (0.0432)
σ_M^2	1.07E-04* (0.0755)
σ_{RS}^2	3.05E-05* (0.0845)

Table 3. EPU impact on EUROB stock return volatility

Variables	γ_{EUROB}
σ_p^2	-3.87E-05* (0.0933)
σ_{GK}^2	-2.14E-05 (0.1562)
σ_M^2	1.48E-04** (0.0109)
σ_{RS}^2	-2.64E-05* (0.0608)

Table 4. EPU impact on NBG stock return volatility

Variables	γ_{NBG}
σ_p^2	2.88E-05* (0.0731)
σ_{GK}^2	2.39E-05* (0.0798)
σ_M^2e	1.36E-04** (0.0181)
σ_{RS}^2e	2.12E-05* (0.0954)

Table 5. EPU impact on TPEIR stock return volatility

Variables	γ_{TPEIR}
σ_p^2	4.12E-05* (0.0576)
σ_{GK}^2	-2.58E-05* (0.0772)
σ_M^2	1.72E-04*** (0.0095)
σ_{RS}^2	4.46E-05*** (0.0032)

Table 2 mentions the direct effect of EPU of Alpha Bank (γ_{ALPHA}) on the return volatility of the stock. We observe that the impact (γ_{ALPHA}) of economic policy uncertainty on the estimator of volatility σ_p^2 is considered statistically significant at 10% and is equal to 4.24e-05. Also, the volatility estimator σ_{GK}^2 is statistically significant at 5% and is equal to 3.53e-05. Finally, there are two other estimators of volatility, σ_M^2, and σ_{RS}^2, which are statistically significant at 10% and equal to 1.07e-04 and 3.05e-05, respectively.

Table 3 mentions the effect of EPU of Eurobank (γ_{EUROB}) on stock return volatility. We observe that the impact (γ_{EUROB}) of economic policy uncertainty on the estimator of volatility σ_p^2 is considered statistically significant at 10% and is equal to -3.87e-05. The volatility estimator σ_{GK}^2 is not statistically significant and is equal -2.14e-05. Also, there is one estimator of volatility σ_M^2, which is statistically significant different from zero at 5% and is equal to 1.48e-04. Finally, the volatility estimator σ_{RS}^2 is statistically significant at 10% and is equal to -2.64e-05.

Table 4 mentions the effect of EPU of the National Bank of Greece (γ_{ETE}) on the return volatility of the stock. We observe that the volatility estimators σ_p^2 and σ_{GK}^2 are statistically significant at 10% and equal to 2.88e-05 and 2.39e-05, respectively. Moreover, the volatility estimator σ_M^2 is statistically significant at 5% and is equal to 1.36e-04, and the volatility estimator σ_{RS}^2 is statistically significant at 10% and equals 2.12e-05. Table 5 mentions the effect of EPU of Piraeus Bank (δ_{TPEIR}) on stock return volatility. We observe that the volatility estimators σ_p^2 and σ_{GK}^2 are statistically significant at 10% and equal 4.12e-05 and -2.58e-05, respectively. Moreover, there are two other estimators of volatility, σ_M^2, and σ_{RS}^2, which are statistically significant at 1% and are equal to 1.72e-04 and 4.46e-05, respectively.

We observe that the economic policy uncertainty has the highest impact in absolute value on the volatility estimator σ_M^2 in all cases (see Tables 2 to 5). The volatility estimator σ_M^2 mentioned with the highest impact due to EPU maybe is explained as the σ_M^2 volatility estimator has the smallest variation [32]. However, as the lowest impact of EPU on Greek banks' return volatility mentioned on σ_{GK}^2 and σ_{RS}^2 volatility estimators. More specifically as for EUROB and TPEIR banking institutions, EPU has the lowest impact on σ_{GK}^2 volatility estimator, while for ALPHA and NBG banking institutions, EPU has the lowest impact on σ_{RS}^2 volatility estimator.

In conducting this study, the direct effect of economic policy uncertainty on the volatility of stock returns is identified. Similar studies have been conducted by several researchers who have studied the effects of economic policy uncertainty on financial markets. Among others, Arouri et al. (2016) examined the impact of economic policy uncertainty on stock markets in the United States over a period of about 100 years, concluding that economic policy uncertainty is generally inversely proportional to stock returns [33]. More specifically, a negative relationship between stock market returns and economic policy uncertainty has been mentioned. Similar results to Arouri et al. (2016) [33] can be found in the study of Chiang (2019), who investigated the behavior of G7 stock market returns concerning the economic policy uncertainty index [6]. To be more precise, the decline in stock market returns seems to have its roots in a relevant increase in EPU. To further corroborate this, the research findings by Arouri et al. (2016) [33] and Chiang (2019) [6] are in line with the ones earlier provided by Antonakakis et al. (2013) [34]. Their findings revealed a negative relationship between stock returns and economic policy uncertainty. Therefore, our contribution is that it is revealed that the economic policy uncertainty affects, among others, the stock market return volatility by focusing on Greek systemic banking institutions.

5- Conclusion

Banks and financial markets were severely damaged by the financial crisis of 2008 in the United States, which quickly spread to Europe and turned into the European sovereign debt crisis [35]. Due to the rapid fall in prices, market participants, investors, policymakers, and regulators have started to feel uncertainty about the future of the stock markets. During and after the financial crisis, there have been several daily fluctuations and discrepancies in the return on stocks in the global banking sector. In this research, we focus on the Greek banking system and, more specifically, the aspects dealing with the volatility in stock market returns.

In this study, the research is carried out to investigate the effects of economic policy uncertainty on stock return volatility of the largest Greek banking institutions namely, (a) Alpha Bank (i.e., ALPHA), (b) Eurobank (i.e., EUROB), (c) National Bank of Greece (i.e., NBG), and finally (d) Piraeus Bank (i.e., TPEIR). Using intraday data for the calculation, we collect volatility measurements to explain volatility changes over the period from 5 January 2001 to 30 June 2014. The research is conducted during a period that includes various phases of the market. The conclusion is reached that reveals a direct effect of economic policy uncertainty on the volatility of stock market return. The findings of this study are highly important for policymakers and regulators in Greece in order to identify the drivers of large price volatility and thus propose the means to control it. Although this work uses a plethora of volatility estimators to study the effects of economic policy uncertainty on Greek systemic banks, future research may evaluate the role of economic policy uncertainty using high-frequency intraday data (e.g., 1 minute) and constructing more efficient volatility estimators. Such data allows higher statistical precision. Another limitation of this study is the end of sample size in 2014, resulting in the fact that no conclusions could be drawn after the end of the crisis.

6- Declarations

6-1- Author Contributions

Conceptualization, H.A., V.M. and L.T.; methodology, H.A., V.M. and L.T.; software, L.T.; validation, H.A., V.M. and L.T.; formal analysis, H.A. and L.T.; investigation, V.M.; resources, V.M.; data curation, V.M. and L.T.; writing—original draft preparation, H.A., V.M. and L.T.; writing—review and editing, H.A., V.M. and L.T.; visualization, L.T.; supervision, H.A. and L.T.; project administration, H.A.; funding acquisition, H.A. and V.M. All authors have read and agreed to the published version of the manuscript.

6-2- Data Availability Statement

The data presented in this study are available on request from the corresponding author.

6-3- Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

6-4- Informed Consent

Participants gave their written consent to use their anonymous data for statistical purposes. All of them were over 18 years old and voluntarily collaborated without receiving any financial compensation.

6-5- Conflicts of Interest

The authors declare that there is no conflict of interests regarding the publication of this manuscript. In addition, the ethical issues, including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, and redundancies have been completely observed by the authors.

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