

EXAMINING THE RELATIONSHIP BETWEEN CREDIT RATINGS AND COUNTRY RISKS IN GREECE: INSIGHTS FROM POLITICAL AND ECONOMIC FACTORS

YUNANİSTAN ÖRNEĞİNDE KREDİ NOTLARI İLE ÜLKE RİSKLERİ ARASINDAKİ İLİŞKİNİN İNCELENMESİ: POLİTİK VE EKONOMİK FAKTÖRLERDEN ANALİZLER

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Abstract: *The role of credit rating agencies in evaluating the creditworthiness and assessing the level of vulnerabilities of nations is essential not only for domestic and foreign investors to calibrate their portfolios but also for economists and policymakers to find better ways to stabilize the nation's risks, such as political and economic vulnerabilities. Based on this explanation, this paper examines the causal relationship between credit rating announcements and economic- and political-based country risks for the case of Greece in the 20 years, covering monthly data from 1999 to 2018. As far as current research is concerned, this is the initial attempt to investigate this nexus from a risk perspective, as the paper considers risk-based data for the empirical analyses. The empirical results demonstrate a unidirectional causal influence of political risk on sovereign credit risk in Greece, but a two-way causal link between sovereign credit risk and economic risk. We end by providing specific suggestions and opinions to both economists and policymakers in Greece, as the empirical results are crucial for policymaking decisions to be implemented, if necessary, to be more effective and sustainable governmental and economic decisions.*

Keywords: *Economic risk; political risk; sovereign credit ratings; causality; Greece.*

Öz: *Kredi derecelendirme kuruluşlarının ulusların kredi değerliliğini ve kırılganlık düzeyini değerlendirmedeki rolü, yalnızca yerli ve yabancı yatırımcıların portföylerini ayarlamaları açısından değil, aynı zamanda ekonomistler ve politika yapıcılar için de siyasi ve ekonomik istikrarlılıklar gibi ülkenin risklerini istikrara kavuşturmanın daha iyi yollarını bulmaları açısından önemlidir. Bu açıklamadan yola çıkarak bu çalışma, kredi notu duyuruları ile ekonomik ve politik bazı ülke riskleri arasındaki nedensel ilişkiyi Yunanistan örneğinde 1999'dan 2018'e kadar olan aylık verileri kapsayan 20 yıllık dönemde incelemektedir. Bildiğim kadarıyla, bu ilişkiyi risk perspektifinden yürüten ilk çalışma girişimidir; zira makale ampirik analizler için riske dayalı verileri dikkate almaktadır. Ampirik bulgular, Yunanistan'da ülke kredi notları ile ekonomik risk arasında iki yönlü nedensellik ilişkisi olduğunu, siyasi riskin ise ülke kredi notlarında tek yönlü nedensellik etkisi olduğunu göstermektedir. Ampirik sonuçlar, gerekirse daha etkili ve sürdürülebilir hükümet ve ekonomik kararların uygulanmasına yönelik politika oluşturma kararları açısından hayati önem taşıdığından, Yunanistan'daki hem ekonomistlere hem de politika yapıcılara özel görüşler sunmakla bitiriyoruz.*

Anahtar Kelimeler: *Ekonomik risk; politik risk; ülke kredi dereceleri; nedensellik; Yunanistan.*

1. INTRODUCTION

Due to global integration, worldwide economies and financial markets have become more dependent on each other and have faced numerous opportunities and risk factors for over several decades. This is primarily because of the encouragement of cross-border general transactions and international trade between nations in many fields in the late 1980s and early 1990s. Along with this economic integration and global dependence, government officials and economic policymakers, especially in developing countries, are looking to find methods to enhance liberalization and global integration with international markets in order to establish an investable environment for foreign investors, to have a share in overall international activities, and thus to increase economic, financial, and even political stability.

On the other hand, such global integration of nations can also bring risk factors, as stated above. Due to the complex nature of the global finance and economic environment, investors need to consider several domestic and international factors to construct their global investment strategies, which demand greater attention and examination process. Not only local and foreign investors would be experiencing this sophisticated environment, but also economic policymakers and officials should take into account worldwide financial and economic conditions and improvements, and their possible deterministic consequences to avoid any risk transmissions and, thus, execute more suitable and solid financial and macroeconomic strategies to maintain global policy coordination.

For instance, the subprime mortgage crisis that emerged in the US in 2007 affected the functions of the credit market and financial stability; risk premiums increased, and asset values were significantly lost within the country. The underlying factors of mortgage-based credit risks were the failure of loans distributed to high-risk segments to return to the financial system and the increasing losses in the banking sector due to the falling housing prices. After that, the growth and prosperity period of the US that had been observed in the country since the early 2000s stopped; the systemic risk and financial risk led to the economic slowdown and lower employment rates, and thus, the US faced the vital consequences of economic instability (Reinhart and Rogoff, 2008). Due to international finance and economic activities, the credit crisis in the US transmitted to cross-border nations and ignited the 2007 – 2008 global financial crisis. It has caused severe problems in the world economy (especially in developing countries), such as economic slowdown and contraction, rise in the rates of job loss, adverse impacts on the balance of payments, decrease in foreign direct investment, instabilities in exchange rates, decrease in financial aid to developing economies, the collapse of financial markets, and even political based instabilities (Te Velde, 2008).

Specifically, Greece, a developing country in the Eurozone, faced the harmful effects of such financial volatility spillover during and after the global financial crisis. Greece faced a sovereign debt crisis stemming from the impacts of the worldwide-felt financial crisis of 2007-2008 and the fallout from the US mortgage catastrophe in 2007. At the time, it has been investigated that the crisis in Greek government debt was instigated by inherent weaknesses in economic and financial systems, as well as

unsustainable monetary and fiscal policies (Featherstone, 2011). This highlights not just the financial and economic fragilities but also the political vulnerabilities that occurred in Greece.

Due to these facts, the complex nature of global integration in worldwide economies has encouraged investors and policymakers to be more cautious. It highlights the importance of risk assessments and sustainable policy coordination. Moreover, these factors highlight the crucial role of credit score organizations, such as Standard & Poor's (S&P), Moody's, and Fitch Ratings, have in the global economies and in determining nations' credit risk levels.

Credit rating agencies provide independent and objective information on the nation's potential to cover its present and forthcoming obligations by considering mainly nations' economic, financial, and political behaviors (Bissoondoyal-Bheenick, 2005). On the one hand, investors can assess whether a country is suitable for investment and make efficient decisions on their investment portfolio by considering sovereign credit rating announcements while evaluating. On the other hand, policymakers and economists can use the sovereign credit rating of those credit scoring agencies and their impact on a nation's economy to make suitable and effective macroeconomic decisions, if needed, to make critical and sustainable policy choices. In this manner, credit rating agencies have created a global and standardized scale of credit risks for nations, enabling objective data of credit ratings and transparency worldwide. Since nations' financial and economic activities can be transformed into credit rating reports, the significant impacts of credit rating agencies have started to be seen in the behavior of economies.

The impacts of sovereign credit scorings of three key credit scoring organizations, S&P, Moody's, and Fitch Ratings, are more likely captured in developing economies throughout the literature. This is because they are less stable, vulnerable to exogenous factors, and have fluctuating financial and economic activities concerning developed economies. When we look at the previous studies in the literature, Chen et al. (2016) examined the effects of sovereign credit ratings on macroeconomic indicators, such as GDP growth and inflation for the case of selected 103 countries; Sensoy (2016) showed the determining factors of sovereign credit scorings and their determining impacts on countries' stock markets and exchange rates for the case of Latin American countries. It has been also shown that there is a two-way causal effect between political risk and sovereign credit risk in South American countries (Kirikkaleli and Ozun, 2019).

Thus, based on the above-mentioned history of Greece's country vulnerabilities, the present study finds Greece an interesting case to research and aims to elucidate the nexus among sovereign credit risk and political- and economic-based risks of Greece. Moreover, the linkage among sovereign credit ratings and economic- and political-based risks in Greece, one of the developing countries in a developing Balkan region, has yet to be specifically examined.

Since the 1990s, the countries in the Balkan region have undergone significant changes by integrating their economies and financial systems with the global economies, enabling them to have a share in international financial transactions and to

improve their macroeconomic policies according to the global rules and regulations. With the help of global integration, this contributed to the nations in the Balkan region with financial, economic, and political stability. However, due to the absence of sufficient financial capital, access to capital and financial leverage, and general vulnerabilities concerning developed countries, the nations in the Balkan area, especially Greece, have found themselves in a difficult situation while coping with the 2008 worldwide financial catastrophe (United Nations, 2009B). Consequently, Greece became one of the most affected countries, with Ireland during and after the global financial disaster, turning into a massive sovereign debt crisis in particular (Basturk, 2015). Consecutively, credit scoring organizations have assessed and revised the credit scores of nations and lowered the credit rating of Greece. These significant issues and outcomes eventually affected the level of foreign direct investments, and hence, economic, financial, and political instabilities were triggered.

Therefore, the current examination aims to observe the causal nexus between sovereign credit ratings and economic- and political-based instabilities within the risk framework for Greece's case in 20 years covering from 1999 to 2018. The other contributing factor of this study is considering the economic and political risk indices extracted from the Political Risk Services (PRS Group) and the three major credit rating agencies' rating announcements. The present research proposes to shed light on existing literature by finding the nexus between (1) sovereign credit ratings and economic risk and (2) sovereign credit ratings and political risk in the case of Greece.

2. LITERATURE REVIEW

Numerous researches in the literature have inspected the decisive factors of sovereign credit scores and the impacts of credit scoring on a nation's monetary, financial, and political variables. For instance, it has been investigated that the macroeconomic factors such as default history, interest rate, consumer price index (CPI), and external debts can explain credit scoring declarations in Jüttner and McCarthy's (2000) study of examination of the determining aspects of credit scoring organizations' assessments in the case of the Asian crisis. Moreover, the impacts of sovereign credit risks on the macroeconomic variables have been examined by scholars (Reisen et al., 1998), especially in developing countries (Reisen & Von Maltzan, 1999). As per Amstad and Packer (2015), sovereign credit score updates by rating organizations have significant, versatile effects on both home-based and worldwide levels. Parallel to this, Canuto et al. (2012) examined 66 countries worldwide and found that economic—and political-based explanatory variables are the critical determinants for sovereign credit rating changes. Moreover, Chee et al. (2015) found that economic freedom is a key variable for sovereign credit rating agencies' decisions based on a broad data set from 53 countries.

Considering the linkage among sovereign credit scores and political-based indicators, Mellios and Paget-Blanc (2006) have concluded that the corruption index and government spending and income are key drivers for the sovereign credit risk in the case of 86 countries. More recently, Teixeira et al. (2018) showed that sovereign credit rating changes, especially for developing countries, are affected by default history, corruption, political constancy, public debt, liquidity risk, external debt, and unemployment. Moreover, Afonso et al. (2012) pointed out that the sovereign credit

rating announcements affect government stability and budget for the EU countries. Accordingly, Afonso et al. (2014) found the sovereign credit rating effects on financial markets and, thus, on the economic activities of the EU countries. Cai et al. (2018) examined the impacts of sovereign credit scores on the OECD and non-OECD nations. They found that sovereign credit risk levels affect foreign direct investment flows, creating financial, economic, and political instabilities for nations. Recently, Sonenshine and Kumari (2022) found that improving political instabilities can lower sovereign bond yields and improve credit rating outlooks by credit rating agencies. Moreover, as mentioned earlier, Kirikkaleli and Ozun (2019) studied the causal linkage among sovereign credit risk and political instability in Latin American countries. They found a two-way relationship effect between these variables for the nations.

More recent studies, such as Türk and Erarslan (2016), studied the effects and costs of the Greek Debt crisis and found the increased vulnerability of the Greek economy to external shock and pointed out that the crisis happened in Greece was due to the high budget deficits, public sector debts, insufficient per capita savings, and low economic growth. Moreover, Tsarouhas (2018) argued that the economic and financial crises in Greece are triggered mainly by government-based instabilities, which are the key determinants of political risks. In addition to this, Athari et al. (2021) emphasized that Greece had the highest and lowest sovereign credit ratings after 2000 until 2019 in the Balkan countries, which shows the significance of instabilities that occurred in Greece's economy during the 2007-2008 international financial catastrophe and the 2009 Greek sovereign-debt crisis.

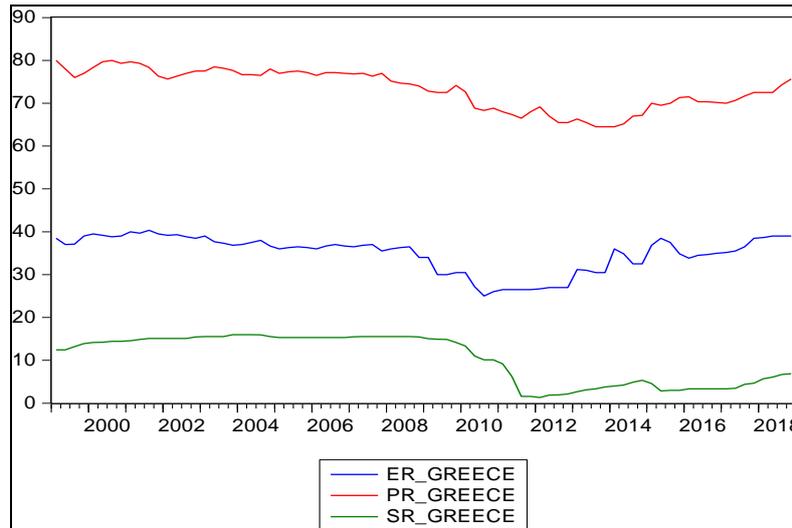
All in all, as seen in the literature, the outcome of sovereign credit assessments, especially downgrade revisions of the credit scores, can trigger economic, financial, and political conditions of both domestic and international economies. There are extensive studies on the decisive factors of sovereign credit risk and the impacts of sovereign credit scoring announcements. However, the study of the linkage among sovereign credit scores and economic- and political-based indicators from the risk perspective for the case of Greece has yet to be thoroughly examined, to the best of knowledge. According to the related existing literature and the above-mentioned reviews, this study finds the case of Greece interesting in conducting research and examining a causal nexus between sovereign credit risks and economic- and political-based risks. Therefore, this study aims to focus on this nexus in 20 years covering monthly data from 1999 to 2018 for the case of Greece within the risk framework and contribute to the present literature.

3. DATA AND METHODOLOGY

In this study, the economic risk and political risk indices datasets are considered from Political Risk Services (the PRS Group), and the sovereign credit rating data collected from 3 main credit scoring organizations, which are S&P, Moody's, and Fitch Ratings from official websites of these credit rating agencies. The data is collected monthly for each variable and covers 20 years time periods between 1999 and 2018. By employing the method of numerical transformation of Christopher et al. (2012), the sovereign credit announcements are transformed into a numerical scale and formed sovereign credit risks on a scale of 0 (equal to sovereign default) and 20 (equal to

sovereign solidity). **Figure 1** below shows the datasets collected in Greece, including the economic risk index, the political risk index, and sovereign credit risk.

Figure 1: Economic, Political, and Sovereign Risks of Greece



The present study first examines the presence of unit roots in time series by performing the Augmented Dickey-Fuller test (the ADF test) (Dickey and Fuller, 1981) before the study moves on employing econometric analysis in the selected data for Greece. The ADF test is explicitly designed to assess the time series under the null hypothesis of the existence of unit root against the alternative hypothesis of stationarity. The collected datasets are evaluated for unit root testing at their levels, and unit roots are found, which means they are non-stationary at levels. For this reason, the first differences in the collected data are taken on Eviews, and unit root testing is again applied. Thus, we found that the first difference in data on economic risk, political risk, and sovereign risk is stationary, and they do not have unit roots within 5% of critical values according to the ‘Schwarz information criterion.’ We also tested the presence of unit roots under other information criteria and found supportive results. Thus, we decided to consider the first differences between our datasets. Therefore, the unit root findings are obtained by employing the ADF test, and we have determined that the datasets of economic risk, political risk, and sovereign risk are stationary in their first differences. **Table 1** on the next page shows the unit root findings, and the first differences of datasets are shown as Economic Risk, Political Risk, and Sovereign Risk, respectively.

After finding the stationary patterns of economic risk, political risk, and sovereign risk datasets, we aim to do the selection of the lag orders of each dataset which is necessary for better empirical outcomes. Therefore, we constructed the Vector autoregressive (VAR) model to see the lag order selection criteria. For the VAR modeling of economic risk and sovereign risk variables in Greece, we find that the lag

length 6 is significant with major information criteria. In contrast, we find the most fitted lag length as 12 according to the major information criteria for the connection among political risk and sovereign risk variables in Greece. The tables in the next pages (**Table 2** and **Table 3**) show the lag orders selected by the multiple information criteria.

Table 1: Unit Root Test Results (ADF TEST)

Economic Risk			
Series at First Difference	T – Stat (ADF Test: -3.206)	Test Critical Values	Prob
	-2.901	5%	0.0235
Political Risk			
Series at First Difference	T – Stat (ADF Test: -7.093)	Test Critical Values	Prob
	-3.517	1%	0.0000
Sovereign Risk			
Series at First Difference	T – Stat (ADF Test: -4.924)	Test Critical Values	Prob
	-3.517	1%	0.0001

Table 2: VAR Lag Order Selection Criteria (Economic Risk and Sovereign Risk variables)

Endogenous variables: First differences of Economic Risk and Sovereign Risk variables						
Exogenous variables: C						
Sample: 1999Q1 2018Q4						
Included observations: 72						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	-213.4283	NA	1.361204	5.984120	6.047361	6.009297
1	-201.0324	23.75893	1.078145	5.750899	5.940621*	5.826428
2	-197.6249	6.341697	1.096422	5.767358	6.083562	5.893240
3	-194.4565	5.720774	1.122923	5.790457	6.233142	5.966691
4	-180.4032	24.59326	0.850504	5.511199	6.080366	5.737786*
5	-179.7832	1.050475	0.936278	5.605089	6.300737	5.882029
6	-168.8503	17.91788*	0.774730*	5.412508*	6.234637	5.739800
7	-168.6501	0.316904	0.864750	5.518059	6.466670	5.895704
* indicates lag order selected by the criterion						

Table 3: VAR Lag Order Selection Criteria (Political Risk and Sovereign Risk variables)

Endogenous variables: First differences of Political Risk and Sovereign Risk variables						
Exogenous variables: C						
Sample: 1999Q1 2018Q4						
Included observations: 64						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	-171.7613	NA	0.782150	5.430040	5.497505	5.456618
1	-161.3510	19.84452	0.640250	5.229720	5.432115*	5.309454*
2	-160.3022	1.933889	0.702455	5.321942	5.659268	5.454832
3	-157.9898	4.118815	0.741326	5.374682	5.846938	5.560728
4	-148.7866	15.81809	0.631334	5.212081	5.819267	5.451282
5	-146.4643	3.846267	0.667409	5.264510	6.006626	5.556867
6	-144.7122	2.792462	0.719255	5.334756	6.211802	5.680268
7	-142.1626	3.903987	0.757360	5.380082	6.392059	5.778751
8	-134.8973	10.67099	0.689622	5.278040	6.424947	5.729864
9	-133.0501	2.597635	0.745587	5.345315	6.627152	5.850295
10	-128.1449	6.591376	0.734677	5.317027	6.733794	5.875163
11	-124.2524	4.987156	0.749617	5.320389	6.872086	5.931681
12	-110.4109	16.86936*	0.562557*	5.012841*	6.699469	5.677289
13	-109.8601	0.636839	0.642273	5.120630	6.942187	5.838233
14	-104.6360	5.713947	0.636751	5.082374	7.038862	5.853133
15	-102.8311	1.861259	0.706421	5.150972	7.242390	5.974887

* indicates lag order selected by the criterion

Before we elucidate the causal relationship between sovereign risk and political- and economic-based risk variables, we constructed the Engle-Granger residual-based cointegration test to detect the long-term relationship between sovereign credit ratings and economic risk, and sovereign credit ratings and political risk. Such a cointegration test enables us to see the long-term nexus among the variables by considering the stationarity of the variables and their residuals (Engle and Granger, 1987). By saying this, the residuals of each regression of data should be stationary without requiring any difference level. We employ a regression of sovereign credit ratings and economic risk (and sovereign credit ratings and political risk) and create their own residual series to test whether it is stationary or not. On the next page, you can see the regressions and the unit root test of the residual series (**Table 4** and **Table 5**). We find that the sovereign credit ratings and political- and economic-based risk variables in Greece are cointegrated, meaning that there is a long-term relationship among these variables.

Table 4: Engle-Granger Residual Based Cointegration Test (Economic Risk and Sovereign Risk)

Dependent Variable: Economic Risk in Greece				
Method: Least Squares				
Sample (adjusted): 1999Q2 2018Q4				
Included observations: 79 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
Sovereign Risk in Greece	0.168829	0.198327	0.851268	0.3973
Constant	0.018202	0.156359	0.116411	0.9076

Null Hypothesis: Economic risk & Sovereign Risk Residual has a unit root				
Exogenous: Constant				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-3.453154	0.0121
Test critical values:	1% level		-3.520307	
	5% level		-2.900670	
	10% level		-2.587691	

Table 5: Engle-Granger Residual Based Cointegration Test (Political Risk and Sovereign Risk)

Dependent Variable: Political Risk in Greece				
Method: Least Squares				
Sample (adjusted): 1999Q2 2018Q4				
Included observations: 79 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
Sovereign Risk in Greece	0.339691	0.150565	2.256119	0.0269
Constant	-0.030964	0.118703	-0.260852	0.7949

Null Hypothesis: Political risk & Sovereign Risk Residual has a unit root				
Exogenous: Constant				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-7.088735	0.0000
Test critical values:	1% level		-3.516676	
	5% level		-2.899115	
	10% level		-2.586866	

Considering the lag length, we found with the ‘VAR Lag Order Selection Criteria’ on Eviews, we performed the Granger causality test, which was first proposed by Granger (1969). It is one of the fundamental and popular causality methods used to examine the interactions between the selected datasets.

First, suppose we have two different variables, X_t and Y_t , and we aim to find the causal nexus between them. If X_t does granger-cause Y_t , this means that Y_t can be explained and triggered by considering not only the historical records of Y_t but also the past values of both X_t and Y_t . The same fact would be valid for the opposite direction, too.

Therefore, we aim to examine whether the past values of X_t can improve, cause, and trigger Y_t or not. The following steps show the mathematical definition of Granger causality by considering these variables.

$$X_t = \alpha_0 + \alpha_1 X_{t-1} + \dots + \alpha_z X_{t-z}$$

$Y_t = \beta_0 + \beta_1 Y_{t-1} + \dots + \beta_z Y_{t-z}$ where α 's β 's are the parameters, and both variables have a lag length of z (historical values back to time z). X_t Granger causes Y_t when;

- $E[Y_t | \beta_1 Y_{t-1} + \dots + \beta_z Y_{t-z}] \neq E[Y_t | \beta_1 Y_{t-1} + \dots + \beta_z Y_{t-z}, \alpha_1 X_{t-1} + \dots + \alpha_z X_{t-z}]$
- $\{\beta_1 Y_{t-1} + \dots + \beta_z Y_{t-z}, \dots, \alpha_1 X_{t-1} + \dots + \alpha_z X_{t-z}\}$, which shows the causation effect of X_t on Y_t and gives a better prediction for Y_t compared to its dataset $\{\beta_1 Y_{t-1} + \dots + \beta_z Y_{t-z}\}$.

The present study aims to provide significant insights by considering the causal nexus among sovereign credit scores and political- and economic-based variables within the risk framework. In summary, sovereign credit ratings are transformed into risk scores after the numerical transformation, and two country risk variables are collected from the PRS group, as mentioned in previous pages in detail. Later, unit roots in time series are tested, and the stationary data are obtained for an econometric analysis. Moreover, we find the most fitted lag lengths for the selected times series with the VAR Lag Order Selection specification in Eviews. This will enable us to choose not the higher order lag length but the proper lag length for the selected time series to minimize errors that can occur while doing the econometric analysis (Lutkepohl, 1993). In the next chapter, we provide the causal analysis test results to observe the causal association among sovereign risk and economic risk, as well as between sovereign risk and political risk, in the case of Greece.

4. EMPIRICAL FINDINGS

To be able to find the causal dependencies between sovereign credit ratings and economic- and political-risk variables for the situation of Greece, we conducted the preliminary data analysis; first, we found the ideal forms of the datasets by unit root testing and then found the suitable lag lengths for each dataset. Then, we conducted the Granger causality test for the causal linkage among sovereign risk and economic risk, as well as sovereign risk and political risk.

For the case of Greece, we obtained that sovereign credit scores have a causal effect on and trigger economic risk at the 5% significance level. Moreover, we also detected the inverse causal impact of economic risk on the sovereign credit scoring assessments at the 5% significance level. Therefore, we conclude that there is a feedback causality effect among sovereign credit scorings and economic risk in Greece for 20 years, covering the 1999 and 2018 time periods. On the other hand, we found that political risk in Greece significantly led to changes in sovereign credit grades at the 1% significance level throughout the years. Moreover, we detected a slight causal effect (compared to the impact of political risk) running from sovereign credit ratings to political risk at the 5% significance level. Therefore, we conclude that there is a strong causal effect from political risk to the sovereign credit ratings in Greece. The empirical findings of the causal dependencies between sovereign risk and economic risk, and sovereign risk and political risk are presented in **Table 6** and **Table 7** below.

Table 6: Causal Effect Analysis Results: Economic Risk – Sovereign Risk in Greece

Null Hypothesis:	Lag (6)	Obs (73)	F-Statistic	Prob.
Sovereign Risk does not Granger Cause Economic Risk			2.35074	0.0418
Economic Risk does not Granger Cause Sovereign Risk			2.34409	0.0423

Table 7: Causal Effect Analysis Results: Political Risk – Sovereign Risk in Greece

Null Hypothesis:	Lag (12)	Obs (67)	F-Statistic	Prob.
Sovereign Risk does not Granger Cause Political Risk			2.02392	0.0461
Political Risk does not Granger Cause Sovereign Risk			2.76282	0.0074

5. CONCLUSION

The determination of this study was to analyze the causal nexus between sovereign credit scorings and economic- and political-based risk variables for the case of Greece, covering the period between 1999 and 2018. The contributing and motivational factors

of this study were to look at these relationships within the framework of risk, which are directly related to the instabilities and vulnerabilities of Greece throughout the selected period. Moreover, unlike some of the previously conducted studies where they considered only one credit rating agency, this study took into account credit rating announcements of 3 main credit rating organizations, which are the leading indicators of whole credit ratings in the world, namely, Standard & Poor's (S&P), Moody's, and Fitch Ratings. Then, the numerical transformation of Christopher et al. (2012) was used to extract a single credit risk dataset from these three agencies. On the other hand, in order to conduct the causal nexus between sovereign credit risks and economic- and political-based variables from the risk perspective, the economic risk and political risk variables of Greece were collected from the PRS group. After econometric preliminary analyses and the causality effect analyses; first, we conclude that there is a feedback causality effect between sovereign credit ratings and economic risk in Greece. This means that there is a two-way causal relationship between credit rating announcements and the economic risk level; which can result, in a downgraded credit rating scenario, in a weakened ability of Greece to repay its foreign debt, an increase in costs for borrowing, a decrease foreign investment, and a decrease in access to international capital markets. Eventually, this could not only negatively affect the economic risk level of Greece, but also the political risk level and financial risk level in the country. Second, we conclude that there is a significant causal effect of political risk on sovereign credit ratings in Greece in the chosen period. This means that political vulnerabilities in Greece, such as in the level of government stability, bureaucratic quality, fiscal, monetary, and trade policy, internal and external conflicts, and democratic accountability, play an important role as a decisive factor for credit rating leading agencies.

The Greek economy experienced a dramatic national debt crisis in 2009, following the 2007-2008 financial crisis. The consequences could be seen until recent years. Several unforeseen economic and governmental reforms have been made to overcome the budget deficit condition, such as tax increases, spending cuts, or both. This eventually led the Greek economy to shrink. Featherstone (2011) argued that the sovereign debt crisis and the governmental vulnerabilities are generated by structural instabilities in economic actions and poor monetary and fiscal policies. In addition to this, Kotios et al. (2011) argued that Greece's participation in the Economic and Monetary Union (EMU) in 2001 is mainly agreed by several researchers as an enormous economic disappointment since the Greek economy was not completely equipped and coordinated with the EMU's monetary and fiscal policies. Based on the low competitiveness with other developed European nations and a lack of strong coordination with other EMU members, such uncoordinated and insufficient policy changes resulted in trade and investment imbalances and domestic financial and economic vulnerabilities (Featherstone, 2011). These statements are, in fact, in line with our findings; instabilities in economic conditions led to changes in sovereign credit scorings as a downgrade. Additionally, following the international financial crisis, the dramatic national debt crisis due to governmental instabilities and poor policies (political risk) affected the creditworthiness of Greece, which the credit rating agencies recorded as a downgrade. In summary, political and economic stability could be achieved by implementing sensible structural changes and economic policy arrangements before Greece's entrance into the EMU. Thus, there would be dangers for the political risk-based government issues and economic vulnerabilitie

According to Kirikkaleli (2019), the foreign debt, liquidity, and current account deficit condition in Greece are the primary elements that determine the political and economic instabilities, which would then affect sovereign credit rating announcements, suggesting to maintain economic stability with solid governmental policies in Greece. Recently, Athari et al. (2021) showed the bi-directional effect of economic risk and sovereign credit scorings and pointed out the importance of governmental economic decisions to sustain governmental-related stability.

Therefore, the empirical conclusions of this research are reliable with the previously conducted studies and the history of Greece. This study suggests economists and policymakers stabilize economic risk factors, such as GDP growth, GDP per capita, inflation, the current account, and especially the budget balances to achieve the improvement of sovereign credit ratings. Moreover, substantial monetary and fiscal policies could do this, as well as solid policy coordination with Eurozone countries to maintain budget surplus conditions and a sufficient current balance. This can be achieved by governmental actions in the financial system and economic policies, which then can increase the creditworthiness of Greece domestically and internationally. The empirical outcomes are crucial and can be considered by economics officials to create more effective and sustainable governmental and economic decisions. As a recommendation for further studies on the case of Greece, it can be suggested to do further econometric analysis by focussing not only on time-based causal analysis but also frequency-based causal analysis, such as Breitung and Candelon's frequency domain causal analysis (Breitung and Candelon, 2006), to see the spectral densities and dependencies among the variables. Moreover, the sup-variables of the political risk index can be individually considered, such as the level of government stability, bureaucratic quality, fiscal, monetary, and trade policies, and democratic accountability, to analyze the causal nexus with sovereign credit ratings. As a final recommendation, further studies can also consider the regional analysis in Eastern Europe, including Greece, to see geopolitical dynamics and observe the causal nexus between sovereign credit rating announcements and economic- and political-based variables within the region.

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