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Résumé de l'article

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Does Political Risk Matter for Economic Growth in Cyprus?

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This study aims to capture the co-movement between political risk and economic growth in Cyprus employing quarterly data over the time period between 1995Q1 and 2018Q4, adopting a wavelet coherence technique allowing to investigate both the short and long run causal link between economic growth and political risk in Cyprus. The outcomes obtained expose that (i) economic growth and political risk were significantly vulnerable in 2000 and 2004 at varying frequencies; (ii) political risk was an important factor for predicting economic growth in Cyprus between 2006 and 2018; (iii) economic growth causes political risk in Cyprus in the short term between 2006 and 2009. In addition, it is noteworthy that causality tests of gradual–shift and Toda-Yamamoto are utilized to verify the significance of political risk for predicting economic growth in Cyprus.

Keywords: Economic growth, political risk, Cyprus, wavelet coherence

JEL Classifications: C60, P16, E5, R11, G0

I Introduction

There are numerous empirical and theoretical research in current literature which focuses on the nexus between political instability and economic growth. There is consensus on the negative impact of rising political tension over macro-economic dynamics in both developed and developing countries (Olson, 1963; Barro, 1991; Alesina and Perotti, 1996; Darby et al., 2004; Uddin et al., 2017). It is broadly acknowledged that rising political tension is associated with shortening governors' horizons leading to sub-optimal macro-economic policies. Moreover, this situation is likely to trigger governors to change policies more frequently and raise the possible volatility in the market. Consequently, the macro-economic performance of

a country is adversely affected by the rising political tension. In the literature; a wide-ranging variety of macro-economic indicators, such as economic growth, public expenditures and investment, taxation, private investment, debt, and inflation, are negatively affected. Most empirical studies taking into account the impact that political instability has on economic growth are panel data analysis concentrating on several countries (Alesina et al. 1996; Kirikkaleli, 2016; Uddin, Ali and Masih 2017; Okafor 2017). In contrast, this study investigates the effect of political risk on economic growth for a single country, Cyprus.

Cyprus is characterized as a small island economy with a population of 1,189,265 located in the Mediterranean Sea. Accounting for a per capita GDP of USD 28,159 and a GDP of USD 24,962 billion, Cyprus is a developed country achieving independence in 1960 (World Bank, 2020). The Cyprus conflict has been an ongoing problem ever since which generates both political and economic instability in the country. The Cyprus conflict has not only been having an impact on Cypriots and neighboring Mediterranean countries -especially Turkey and Greece- but also on the United Nations and the international community. Such a small island is divided into two since 1974, still negotiating to fix the internal political problems on a global stage.

Besides the unresolved political conflict, there have been several economic alterations and fluctuations. After gaining her independence, in Cyprus, a gradual shift has taken place from an agriculture-based economy to a service oriented one, accompanied -in recent years- with a diminished manufacturing sector. From the start of the 1980s, the services sector, especially tourism, finance and business services, turned out to be the main factors that boosts the economic growth (Athanassiou 2006). Notably, the banking sector of the finance sector gained further importance with the development of private banks which led the island to become an international business center (Stephanou 2011). Developments in the banking sector based on the main objective of providing international financial services to foreign countries significantly improved the economic growth of Cyprus. Cyprus joined the European Union as a new member in 2004 and a member of the European Monetary Union. Thus, the euro is adopted as the official local currency in 2008 in Cyprus. The economic growth of Cyprus slowed down in the same year partly due to the global financial crises. Besides the political instabilities existing ever since, Cyprus faced a severe economic crisis in mid-2012, which is known as the 2012-2013 financial crisis. After the crises, Cyprus turned out to be the fourth European Union country, following Greece, Ireland and Portugal which had to adopt an official borrowing arrangement with the other European Union members.

The special case of Cyprus deserves more detailed attention since the interrelation between political instability and economic growth still remains unexplained in the literature.

To investigate the nexus between political risk and economic growth is an essential objective for investors, governors and researchers. However, the co-movement of economic growth and political risk has not been utilized in Cyprus using the wavelet coherence method

combining the frequency and time dimensions based causality approaches, which provides the advantage to distinguish how economic growth and political risk are linked in short-run and long-run. In the case of nonlinear and chaotic time series variables, the wavelet technique allows to obtain more reliable outcomes compared to the traditional time domain causality tests. In addition, the traditional time domain causality is not quite efficient in dealing with the dominant properties of the fluctuations in time series. In the wavelet approach, it is possible to perform local analysis, allowing the capture of a localized sub-image area of a wider image. Thus, the outcome of the wavelet technique allows for capturing causality and correlation between two time series variables over the selected time period. This is the main difference between the wavelet approach and other previous causality tests. As a result, this study mainly contributes to the literature via filling this gap through the construction of time-frequency based models using wavelet techniques. Briefly, the question "is there any co-movement between economic growth and political risk in Cyprus?" is addressed to be answered by this study. A new debate is likely to be raised in the literature with the findings of this study, and in Cyprus, the outcomes obtained by this study will have highly valuable implications for the governors.

Scholars clearly stated that economic growth is negatively impacted by the deteriorating economic environment, but political uncertainty is also regarded as harmful to economic growth due to the deteriorating factor of political uncertainty over the economic environment (Kirikkaleli, 2016). Moreover, economic growth is likely to slow down whenever the country is faced with a political turmoil or an unexpected regime change. It is widely accepted that one of the main reasons behind the high economic prosperity, improved economic performance, attracting of foreign investment and the fostering entrepreneurs of a nation is to obtain a politically stable environment. Therefore, it is commonly accepted that long-term investment decisions directly depend on the political environment (Acemoglu, 2003; Telatar, 2003; Campos and Nugent, 2002; Görmü and Kabaskal, 2010).

Since the Great Depression in 1929, the nexus between political uncertainty and economic growth has received significant awareness and is well documented by scholars; but in the literature, using a wavelet coherence approach, the co-movement between economic growth and political risk has not been explored in Cyprus before. The wavelet coherence approach applied in this study provides the advantage to capture both the long-term and short term co-movement over the period of 1995Q1 to 2018Q4. Therefore, the gap in the literature will be filled by answering the question: Is there any co-movement between economic growth and political risk in Cyprus? In other words, the direction of movement, whether it is leading or lagging. The connectedness of political risk and economic growth has received considerable interest by the political economics field. The roots of this nexus go back to the study of Olson (1963) which argues that despite the fact that chronic political instability harms a country's economy, rapid growth can destabilize politics. The adverse connection between political uncertainty and economic growth is empirically supported and well documented in the related

literature (Benhabib and Rustichini, 1996; Alesina and Perotti, 1996; Barro, 1991; Ades and Chua, 1997). According to Darby et al. (2004) and Devereux and Wen (1998), political uncertainty negatively correlates with economic development. Julio and Yook (2012) explore investors' reactions for the political election periods and they conclude that during the non-election years, the firms increase investment spending by 4.8% on average relative to election years. Thus, they underline that economic development in a nation is hindered by political uncertainty.

To identify the impact of political unrest on the economy of Pakistan, Tabassam, Hashmi and Rehman (2016) use ARCH and GARCH models. Their findings reveal that economic growth in Pakistan is adversely impacted by political instability; thus they suggest that political stability can be obtained through the governors' corrective measures. Uddin, Ali and Masih (2017) aim to capture the possible impact of political uncertainty on economic growth in the 120 emerging markets through the application of dynamic two step system-GMM and quantile regression. Their findings confirm the limiting impact of political risk on economic grwoth, where it is verified that the OIC countries have higher political risk. Furthermore, a revolution, coup, or assassination may adversely affect economic growth, according to Barro (1991) and Knack and Keefer (1995). However, a nation's growth is not strongly influenced by the probability of a coup, according to London and Poole (1990). In addition, Acemoglu (2003) states that persistent macroeconomic stability can be achieved through improved institutional quality and efficient macro-economic.

Aisen and Veiga (2013) confirm that a frequent switch in macroeconomic policies causes economic instability, which leads to negative macroeconomic performance. As they pointed out, political stability and conditions also affect economic growth. In addition, Barro (2013) argues that persistent and effective government policies lead to economic growth. As a result of implementing such government policies, the mass population can become more proficient and skilled, as well as attract new technologies. Government policies that promote economic growth and protect the environment are crucial to increasing domestic and foreign investment in a country. It has also been found that political volatility is negatively associated with economic performance and growth, according to Jong-a-pin (2009).

On the contrary, Miljkovic and Rimal (2008) argue that causality runs in the opposite direction. They come up with the view that the perception of a country's economic stability determines its political stability. This is of paramount importance to an incumbent government that tries to maximize its chances of remaining in power. Hence, changes in economic policies can, therefore, determine the political stability of a nation. Furthermore, Campos and Nugent (2002) also support this view by underlining the importance of economic stability over political uncertainty. Telatar (2003) claims that the possibility of a recount in a democratic state depends on the nation's economic performance. In contrast, a low rate of economic growth may cause political unrest in an autocratic (authoritarian) regime, which may lead to a coup or revolution.

Campos and Nugent (2002) and Görmü and Kabaskal (2010) verified that economic growth is significantly affected by regime changes and government crises. In addition, their results confirm the existence of an adverse link between political instability and economic growth.

Table 1. Summary of the Literature Review

Authors	Countries	Econometric Techniques	Time-Frame	Results
Barro (1991)	72 Countries	Panel Data Cross Country Regression Analyses and Correlation	1960-1985	Adverse link between political uncertainty and economic growth
Alesina and Perotti (1996)	Greece	71 countries	1960–85	Adverse link between political uncertainty and economic growth
Ades and Chua (1997)	118 Countries	Panel Data Cross Country Regression Analyses and Correlation	1960-1985	Adverse link between political instability and economic growth
Darby et al. (2004)	13 European OECD	Panel Data Cross Country Regression Analyses	1963-1996	Negative effect of political instability on economic growth
Julio and Yook (2012)	48 Countries	Panel Data Cross Country Regression Analyses	1980-2005	Negative effect of political instability on economic growth
Tabassam, Hashmi and Rehman (2016)	Pakistan	ARCH and GARCH models	1988-2010	Negative effect of political instability on economic growth
Uddin, Ali and Masih (2017)	120 Emerging Economies	Quantile regression and dynamic two step system-GMM	1996-2014	Negative effect of political instability on economic growth
Aisen and Veiga (2013)	169 Countries	Dynamic GMM estimator	1960-2004	Negative effect of political instability on economic growth
Jong-a-pin (2009)	90 Countries	Dynamic GMM estimator and Granger causality	1974-2003	For some countries uni-directional causality from political instability to economic growth, for some others bi-directional causality exists.
Miljkovic and Rimal (2008)	122 Countries	Panel Data Cross Country Regression Analyses	1960-1988	Negative effect of economic growth on political instability
Campos and Nugent (2002)	98 Develping Countries	Granger causality	1960-1995	No causal relationship in the long-run
Görmü and Kabaskal (2010)	51 Countries	Signal approach	1990-2007	Adverse link between economic growth and political instability
Sahinoz and Erdogan Cosar (2018)	Turkey	Impulse responses	2006-2016	Negative effect of policy uncertainty on economic growth
Murad and Alshyab (2019)	Jordan	FMOLS	1980 - 2015	Negative effect of policy instability on economic growth

The upcoming sections of this study are structured as follows: Section 2 provides information on the dataset and methods. Section 3 reports and explains the empirical findings of the present study, Section 4 concludes and provides policy implications.

II Data and Methodology

Despite there have been several studies in the related literature aiming to investigate the interrelation between political risk and economic growth; the presence and direction of the relationship still remain inconclusive, necessitating further research on the issue by utilizing newly developed econometric techniques. To do so, this study employs quarterly data over the time period between 1995Q1 and 2018Q4 for the Republic of Cyprus. The data for the political risk indicator is collected from the Political Risk Services (PRS) Group, which has rated, assessed, and forecasted geopolitical and country risks for over 40 years. while the data for the economic growth indicator is gathered from the World Bank database. The growth rates of both variables are taken for the empirical analysis. The political risk index is denoted by PR while the economic growth rate is represented by GDP. Table 2 below summarizes the statistical description of the variables under consideration.

Table 2. Statistical Description of the Variables

Variables	GDP	PR
Mean	0.6534	0.0196
Median	0.7957	0.0000
Maximum	3.4652	7.4324
Minimum	-2.3874	-5.2173
Std. Dev.	1.1265	1.7462
Skewness	-0.7164	0.9297
Kurtosis	3.5362	6.8921
Jarque-Bera	9.2653	73.6511
Probability	0.0097	0.0000

Granger and Newbold (1974) underlined the importance of testing for stationarity of series as the primary step of empirical analysis since non-stationary series might lead to superous regression problems. However, the unit root test is not crucial for the wavelet coherence analysis. Still, we start our empirical analysis with the testing for the stationarity of the variables098w 0 since finding the maximum order of the variables' integration is a prerequisite for the Toda-Yamamoto causality test, which is applied as a robustness check for the wavelet technique outcomes. The second-generation econometric procedures of quasi-generalized least squares (GLS) technique-based unit root test recently developed by Carrion-i-Silvestre et al. (2009) is employed which allows to detection of structural break points up to five in series which is the expanded version of the de-trending technique developed by Elliott et al. (1996). The null hypothesis states the presence of a unit root against the alternative of no unit root of the series. There are five statistics provided by the test as Gaussian point optimal statistic (PT), modified feasible point optimal statistic (MPT), and three optimal statistics of Mtype, MZα, MSB, and MZt which is adopted by the use of GAUSS codes.

After investigating the maximum order of integration of the series, the wavelet power spectrum and wavelet coherence developed by Goupillaud, Grossmann and Morlet (1984) are employed, respectively. Since the economic literature generally relies on either time series analysis or frequency domain analysis, wavelet analysis offers the advantage of capturing frequency and time dimensions simultaneously. Therefore, the wavelet approach is an advantageous technique in empirical analysis. In short, the wavelet analysis unifies the widely used two techniques under one time-frequency frame. In other words, the wavelet analysis provides the advantage for the researcher to examine the connectedness between economic indicators are at varying frequencies and allows to identify how the relationship changes over time. However, compared to other fields such as medicine, engineering, etc., the number of studies utilizing wavelet technique in the economic literature is considerably low (Rua, 2010). Yet, the number of studies in the literature of economics using the wavelet approach is increasing, because of the significantly valuable information that can be provided by the technique about the interrelation between the economic indicators that cannot be gathered through the application of the other techniques, as mentioned by Ramsey (2002).

As a robustness check of the wavelet test results, the two causality tests of the Toda-Yamamoto causality test (Toda and Yamamoto, 1995) and the more recent test of Fourier Toda-Yamamoto introduced by Nazlioglu, Gormus and Soytas (2016) are conducted respectively. Economic indicators are usually integrated at mixed orders. Toda-Yamamoto causality test provides the advantage of overcoming specification bias and spurious regression problems when series are integrated at mixed order of I(0), I(1) or I(2). Furthermore, Toda-Yamamoto causality test is applicable regardless of the existence of co-integration relationship between economic indicators. However, the Toda-Yamamoto causality test requires a unit root check to obtain the maximum level of integration of the economic indicators for the estimation which is conducted based on a vector autoregressive (VAR) model through a modified WALD test as described by Equations (1) and (2) below;

$$GDP_t = \delta_o + \sum_{i=1}^{m} \vartheta_i GDPG_{t-1} + \sum_{i=m+1}^{m+dmax} \vartheta_i GDP_{t-1} + \sum_{i=1}^{m} \beta_1 PR_{t-1} + \sum_{i=m+1}^{m+dmax} \beta_1 PR_{t-1} + \mu_t \quad (1)$$

$$PR_t = \omega_o + \sum_{i=1}^{m} \alpha_i PR_{t-1} + \sum_{i=m+1}^{m+dmax} \alpha_i PR_{t-1} + \sum_{i=1}^{m} \pi_1 GDP_{t-1} + \sum_{i=m+1}^{m+dmax} \pi_1 GDP_{t-1} + \mu_t \quad (2)$$

where *GDPG* stands for economic growth indicator while *PR* denotes the political risk indicator in Cyprus. ω, θ's, δ's, ϑ, ϑ's and β's determines the regression model parameters and *dmax* stands for the maximum level of integration of the series, while μ_t and ε_t determine the residuals of the models.

Fourier Toda-Yamamoto (gradual shift) causality test, on the other hand, provides the advantage of considering both gradual and smooth structural shifts simultaneously. Moreover, the causality test of Fourier Toda-Yamamoto provides the advantage of generating reliable results without requiring the exact date, form or number of the structural breaks in the series (Nazlioglu et. al, 2016). Nazlioglu et. al. (2016) developed the model by modifying the VAR model by relaxing the assumption of constant intercept over time. The model of the Fourier Toda-Yamamoto (gradual shift) causality test is represented by Equation (3) below:

$$y_t = \alpha_0 + \gamma_1 \sin(\frac{2\pi kt}{T}) + \gamma_2 \cos(\frac{2\pi kt}{T}) + \beta_1 y_{t-1} + ... + \beta_{p+d} y_{t-(p+q)} + \varepsilon_t \quad (3)$$

The null hypothesis of Granger non-causality is tested by using the bootstrap distribution of F-statistic as suggested by recent literature to improve the test statistics' power for the case of the empirical analysis of small samples (Gokmenoglu et al., 2019).

Results and Discussion

As the initial test for the study, the quasi-GLS-based unit root test is employed which captures structural breaks for five years of the series where the test results are summarized in Table 3 below.

Table 3. The Quasi-GLS Based Unit Root Tests Under Multiple Structural Breaks

	Levels					Break Years
	P_T	MP_T	MZ_α	MSB	MZ_t	
GDP	10.32 [9.14]	9.74 [9.14]	-44.35 [-46.51]	0.11 [0.10]	-4.71 [-4.81]	2000Q4; 2004Q1; 2008Q4; 2011Q4; 2014Q4
PR	9.84 [9.22]	9.13 [9.22]	-46.86 [-45.85]	0.10* [0.11]	-4.84* [-4.76]	2000Q4; 2003Q2; 2005Q4; 2008Q3; 2015Q2
	First differences					
ΔGDP	2.34* [5.54]	2.35* [5.54]	-39.32* [-17.32]	0.11* [0.17]	-4.43* [-2.89]	-
ΔPR	2.53* [5.54]	2.54* [5.54]	-37.07* [-17.32]	0.12* [0.17]	-4.29* [-2.89]	-

Notes: [i] The quasi-GLS-based unit root test developed by Carrion-i-Silvestre et al. (2009) is employed to obtain the break years. [ii] * indicates that the null hypothesis of a unit root is rejected at 0.05 significance level. [iii] Critical values from the bootstrap approach proposed by Carrion-i-Silvestre et al. (2009) are given in brackets.

The test results confirm that both the economic growth and the political risk series are not stationary at their levels. However, the test results verifies the stationarity of the series at their first difference. Thus, we can conclude that both series are I(1), so the maximum integration order of the series which will be used for the estimation of the Toda-Yamamoto test is taken as 1.

Before utilizing wavelet coherence, the wavelet power spectrum was utilized to reflect the vulnerability of each variable over the time period from 1995Q2 to 2018Q4 as represented by Figure 1 and Figure 2 below.

Figure 1. Wavelet Power Spectrum for Economic Growth

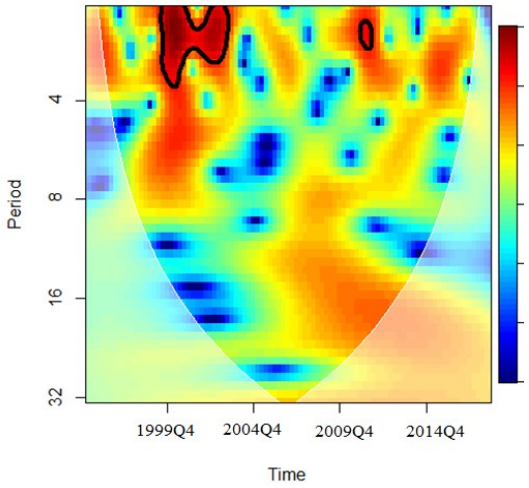
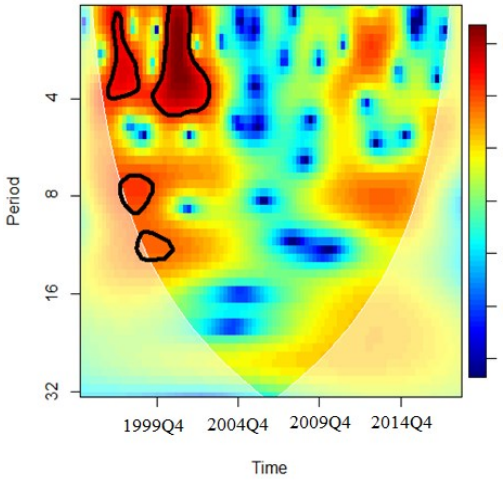


Figure 2. Wavelet Power Spectrum for Political Risk

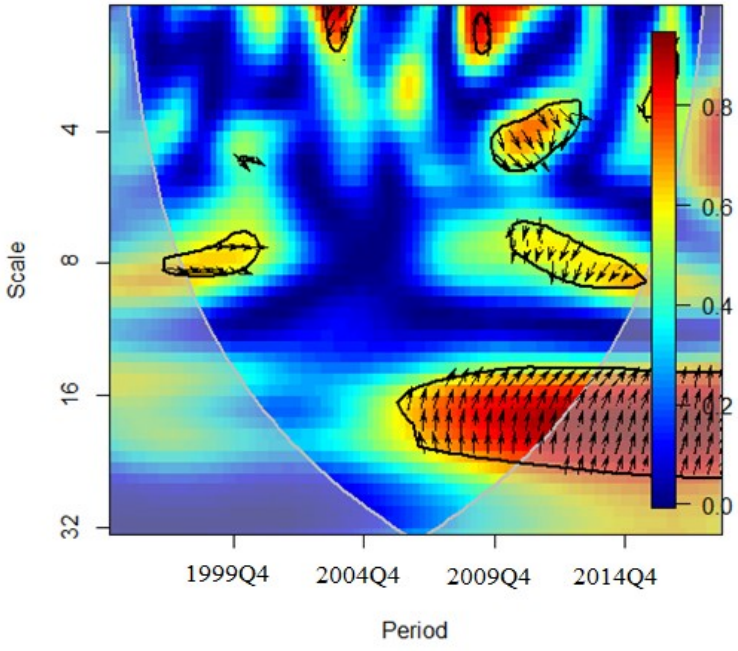


The wavelet power spectrums of the variables are estimated over a scale of 32 periods as the dataset contains 95 observations. The white cone-shaped line of Figure 1 and Figure 2 represents the cone of influence, while the thick black shape confirms the presence of vulnerability of the series at the significance level of 5% obtained by Monte Carlo simulations. As can be seen in Figure 1, economic growth is significantly vulnerable in Cyprus between the years 1999 and 2004 on a scale of 4. Moreover, the significant vulnerability of economic growth was detected in 2009 as an effect of the global crises of 2008 within a few quarters, falling to a scale 2 to 3. The wavelet power spectrum of the political risk growth represented by Figure 2 confirms that the political risk in Cyprus is considerably more volatile than economic growth over the years 1999 and 2004 since it covers a larger scale as observed at wider scales over 4, and 8 to 16.

Since this study mainly aims to explore the causal link or correlation between political risk and economic growth in Cyprus, wavelet coherence is utilized as represented in Figure 3. As it can be clearly seen from Figure 3, there is bi-directional causality between economic growth

and political risk in Cyprus; confirmed by the straight-up, right-down, and straight-right arrows within the thick black shapes at different frequencies over the years between 1995 and 2018. This result shows that there is an interconnection between economic growth and political risk in Cyprus. Estimation results confirm the existence of a positive correlation between economic growth and political risk over the years from 1997 to 2001 at a scale of 8. Furthermore, it is found that economic growth leads to political risk over the years from 2005 to 2018 at scales of 16; while political risk growth leads to economic growth over the period of 2009 to 2015 at scales of 4 and 8. Therefore, policymakers in Cyprus must hope to control economic growth volatility in the long run; thus more importance should be given to achieving political stability. In short, wavelet coherence estimation of the frequency-time dimension of the causal link between economic growth and political risk confirms the existence of bi-directional causality in the case of Cyprus.

Figure 3. Wavelet Coherence Between Economic Growth and Political Risk



To check for the robustness of the results obtained from the wavelet coherence estimations of the link for economic growth and political risk in Cyprus, the Toda-Yamamoto causality test assuming the intercept parameters are constant over time, and the Fourier Toda-Yamamoto causality test taking structural breaks into account are applied. The results of the tests are represented in Table 4 below. Toda-Yamamoto causality and Fourier Toda-Yamamoto causality tests not only applied as a robustness causality check but also provide information about the time domain causal relationship between economic growth and political risk in Cyprus over the years from 1995 to 2018. According to the test results represented in Table 4, there is a bi-directional causal link between economic growth and political risk in Cyprus, which is in line with the findings of Jong-a-pin (2009), Barro (1991), Ades and Chua (1997).

Table 4 Robustness Test Results: Toda-Yamamoto Causality Test

Direction of Causality	Lag	MWALD	Prob.
GDP→PR	6	13.713**	0.033
PR→ GDP	6	16.353**	0.012
Fourier Toda-Yamamoto (Gradual Shift) Causality Test			
Direction of Causality	Lag	F-Stat	Prob.
GDP→PR	6	13.672**	0.033
PR→ GDP	6	19.646***	0.003

Note: → stands for the direction of the causality. ** and *** denotes the statistical significance at the 5% and 1% levels respectively.

Furthermore, the outcomes of both the Toda-Yamamoto causality and Fourier Toda-Yamamoto causality tests verify the robustness of the outcomes of the wavelet coherence.

Conclusion

Although many empirical and theoretical studies have focused on the nexus between political instability and economic growth, no previous studies have explicitly examined the co-movement of economic growth and political risk in Cyprus over the period of 1995Q1-2018Q4, using the wavelet coherence technique, allowing the present study to explore both the long-run and short-run causal relationship between political risk and economic growth at the same time. In other words, the present study allows us to capture when there is significant co-movement between economic growth and political risk in Cyprus and how long it remains significant. The present study also uses the Toda-Yamamoto causality and the Fourier Toda-Yamamoto causality test as the robustness of the outcomes of the wavelet coherence. The empirical results clearly reveal that (i) there is a significant vulnerability in economic growth and political risk index in 2000 and 2004 in the short-run; (ii) political risk in Cyprus holds an important power for explaining economic growth between 2006 and 2018 in the long-run; (iii) economic growth causes political risk index in Cyprus in the short term between 2006 and 2009. Consequently, the policymakers` attention should be focused on achieving political stability in Cyprus in order to control economic growth volatility in the long run. Moreover, in the short-run, policymakers should aim to control political dynamics in Cyprus to achieve sustainable economic growth. The outcome of this study also highlights that the global crisis in 2007-08 and the domestic economic crisis in 2012 directly empowered the interaction between political instability and economic growth in Cyprus. It is worth mentioning that the present study also employs Toda-Yamamoto and gradual–shift causality approaches. Although this study makes it possible to identify strong empirical findings, further research is suggested to be conducted for the case of other countries.

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