Journal of
Risk and Financial Management

MDPI

Article

Granger Causal Nexus between Good Public Governance and Unemployment: Evidence from Cross-Country Panel Data Investigation

Cristina Boţa-Avram [1,*], Adrian Groşanu [1], Paula-Ramona Răchişan [2] and Sorin Romulus Berinde [2]

[1] Faculty of Economics and Business Administration, Babeş-Bolyai University, 400591 Cluj-Napoca, Romania; adrian.grosanu@gmail.com
[2] Faculty of Business, Babeş-Bolyai University, 400174 Cluj-Napoca, Romania; rachisan_ramona@yahoo.com (P.-R.R.); soberinde@yahoo.com (S.R.B.)
* Correspondence: botaavram@gmail.com; Tel.: +40-740-048-084

Abstract: The purpose of this paper is to investigate the causality between good public governance captured through six World Bank governance indicators and unemployment rate (unemployment as % of the total labour force) as a clear indicator of labour market performance. Although some previous papers have empirically demonstrated the casual nexus between country-level governance and economic development, this study investigates the relation of causality between public governance and the labour market. By employing Granger non-causality tests, we tested two hypotheses with regard to this nexus. We argue that bidirectional Granger causality is predominant for the relation of country-level governance and unemployment. Finally, our paper offers a complex quantitative analysis of the causal nexus between public governance quality and one of the most known labour market activity indicators for an extended panel dataset of countries worldwide for 10 years.

Keywords: country-level governance; unemployment as % of the total labour force; Granger non-causality test; vector error correction model; sustainable economic development

Citation: Boţa-Avram, Cristina, Adrian Groşanu, Paula-Ramona Răchişan, and Sorin Romulus Berinde. 2021. Granger Causal Nexus between Good Public Governance and Unemployment: Evidence from Cross-Country Panel Data Investigation. *Journal of Risk and Financial Management* 14: 63. https://doi.org/10.3390/jrfm14020063

Received: 28 December 2020
Accepted: 29 January 2021
Published: 3 February 2021

1. Introduction

There is a wide range of previous studies in the academic literature concerning the linkage between country-level governance and various outcomes of economic development (Brinkerhoff and Goldsmith 2005; Kaufmann et al. 2005; Demirguc-Kunt et al. 2006; Jalilian et al. 2006; Cule and Fulton 2013; Avram et al. 2015; Boţa-Avram et al. 2018), but too fewer studies about the nexus between country-level governance and unemployment rate as an indicator of a good labour market. For instance, Cule and Fulton (2013) argued that the significance of good governance for proper economic and business development is supported by the argument that one expects an economy with a minimum level of bureaucracy, with significant concern for the quality of the regulatory framework and implementing useful tools to manage the level of corruption adequately, will be able to ensure a proper business environment encouraging to sustainable economic development. Jalilian et al. (2006) demonstrated the relevant impact of the quality of the regulatory framework for economic development at micro- and macro-levels, while Kaufmann et al. (2005) noticed the broad consensus among academics and policymakers all over the world that good public governance matters for economic development for the effectiveness of development assistance. Moreover, in one of our previous papers, as a result of testing four hypotheses on the causalities between governance, economic growth and sustainable development, we argue that there is a Granger causality from public governance to economic growth, but the vice-versa causality was not confirmed (Boţa-Avram et al. 2018).

However, the relationship between good public governance and labour market performance was less investigated in the previous empirical studies. Khraief et al. (2020) argued

that the labour market is heavily regulated, while the state intervention policies strongly influence job market training and employment program development. Even more, they noticed while taking in consideration the influence of some factors (such as mobility of capital, capital–labour substitution, and technology's influence on the relocation of production), "it is not possible to think of a situation where the state is not actively intervening in the labour market" (Khraief et al. 2020, p. 13).

One indicator considered a crucial measure in measuring labour market performance is unemployment, which refers to the percent of the labour force for which there is no workplace available and seeking employment. Considering the core elements of sustainable development such as economic growth, social conditions, and environmental changes, providing more decent jobs for people, particularly for younger ones, is meant to improve life quality. At the same time, higher unemployment levels are seen as premises for bad influences on people's welfare (Auty and Brown 1997). The standard definition given by the World Bank for the unemployment rate (as percent of the total labour force) is represented by those individuals without work, seeking work in a recent past period, and currently available for work, including people who have lost their jobs or who have voluntarily left work. The significance of the unemployment rate for proper economic development is undoubtedly a great one. The unemployment rate is widely accepted as a critical indicator of labour market development, while during recessions and difficult economic periods, the unemployment rate is one closely watched economic indicator.

Thus, given the lack of attention paid to good country-level governance–unemployment nexus in the previous literature, the goal of this research paper is to investigate the causal linkage between public governance estimated through six World Bank governance indicators and the unemployment rate as one of a critical indicators of labour market performance by using a Granger non-causality test. This study is looking for answers for the next research questions:

RQ1: Does public governance cause unemployment?

RQ2: Or a high level of unemployment causes the level of good public governance?

Our findings resulting from Granger non-causality tests show that good public governance contributes to the improvement of unemployment as % of the total labour force, but vice versa is also available.

The rest of the paper is structured as follows: Section 2 presents a brief literature review, Section 3 describes the research methodology and data used for developing the empirical study, Section 4 discusses the empirical results and findings, and Section 5 concludes the paper and provides future perspectives for further research.

2. Literature Review

The concept of public governance became a topic of interest for scientists from all over the world in the early 1990s "when international aid agencies realised that poor governance across many developing countries was a major obstacle to their economic development" (Ngobo and Fouda 2012). A relevant definition of country-level governance is provided by the World Bank in its working paper "Governance and Economy: a review", citing from Random House College Dictionary (World Bank 1991) according to governance means "the political direction and control exercised over the actions of the members, citizens or inhabitants of communities, societies and states" (World Bank 1991, p. 3). Later, Kooiman (1999) defined country-level governance as "the totality of interactions, in which the public, as well as private actors, participate, aiming at solving societal problems or creating societal opportunities; attending to the institutions as a context for these governing interactions; and establishing a normative foundation for all these activities". Kadyrzhanova and Rhodes-Kropf (2011) defined governance as a situation of weak state intervention in a mixture with a set of self-organised social networks. In this regard, country-level governance expresses a substitute for the state's organisational role in exercising authority on behalf of the people.

Even if there are many conceptual approaches for country-level governance, most of them converge on the idea that governance means the efficiency of a capable state to

operate under the rule of law (Kaufmann and Kraay 2008). On the other hand, Kooiman (1999) emphasised the need to promote a proper approach of public governance so that to be able to encapsulate the main particularities of socio-political systems, considering their dynamics and complexity and having in mind the necessity to solve social problems and to create opportunities for further developing of the society in the context of a cooperative public–private partnership.

Even if several theoretical studies have explored the nexus between public governance and labour market performance, few studies have been provided empirical arguments to justify this linkage. As Lel and Miller (2019) note, a recent theory of Levit and Malenko (2016) argues that when country-level aggregate governance is weak, and boards of firms are kept captive by their managers who obtain substantial private benefits from control, the labour market will not be as effective as a governance mechanism in weak investor protection countries. Therefore, Lel and Miller (2019, p. 1) highlight the still open empirical issue "whether the directorial labour market functions as a mechanism for good governance in the countries where it is potentially needed the most" (p. 1). On the other hand, another branch of the academic literature supports the opposite view, while some empirical research papers argue that government policies are often complemented, emphasising a limited role of country-level governance for the labour market in countries with weak institutions (Doidge et al. 2007; Aggarwal et al. 2011).

Hibbs (1986) underlines that left-wing governments promote relatively low unemployment and tolerate high inflation rates, while right-wing governments sustain the idea of moderate low inflation to the detriment of high unemployment rates. Thus, the left-wing parties are more opposed to high unemployment and have less aversion to inflation than right-wing parties. Governments with right-wing ideologies encourage property rights and legal quality, while left-wing governments support government intervention in the economy (Bjørnskov 2005 cited by Fraj et al. 2018). Leal Leal Filho et al. (2016) argue that for economies characterised by a high level of good governance indicators, an increasing level of trust is more receptive to social needs. Those states have an adequate amount of financial resources to acquire an adequate level of sustainable economic development. The same authors also noticed some countries like Germany with a good quality of country-level governance, but a medium level of trust, while unemployment is still significant. Their findings also concluded that former socialist countries with a reduced quality of country-level governance record higher unemployment rates, negatively influencing social cohesion (Leal Filho et al. 2016; Tabellini 2010). Liew et al. (2012) emphasise that stabilisation of public and economic policies and the efficiency of labour market institutions have played their significant role in keeping unemployment rates at a sustainable level in Organization for Economic Cooperation and Development (OECD) countries. On the other hand, Khraief et al. (2020) demonstrate that labour and macroeconomic policies are likely to have no long permanent effect on OECD countries' unemployment rates through their empirical study. The same authors also argue that the labour market is heavily regulated, and job market training and employment programs are pillars of state intervention policies.

Summing up the conclusions of the previous studies, we can conclude that even if many research papers argued the relevance of state intervention and good public governance in increasing the efficiency of the labour market, still little empirical attention had been paid by previous scholars to explore the causal nexus between public governance and unemployment rate as a clear indicator of labour market performance. Thus, we have derived our next hypothesis:

Hypothesis 1. *Public governance (as an aggregated variable of the World Bank's six governance indicators) significantly contributes to the improvement of unemployment as % of the total labour force, as a selected proxy of labour market performance.*

Hypothesis 2. *Improvement in the value of unemployment as a % of the total labour force, as a selected proxy of labour market performance, causes a subsequent improvement in public governance quality (as an aggregated variable of the World Bank's six governance indicators).*

3. Methodology and Data

This empirical study[1] employs annual data from 2006 to 2015 on the quality of public governance and unemployment rate as a selected indicator of labour market performance to test by using the Granger non-causality procedure (a Toda–Yamamoto approach) in order to test both proposed directions: (1) from public governance to unemployment and (2) from unemployment to public governance. A Toda–Yamamoto non-causality test involves the estimation of a vector autoregressive model (V.A.R.) in levels. Using Toda–Yamamoto long-run methodology in testing causality demands the estimation of the order of variables integration and the maximum lag length of integration variables in the V.A.R., while the usual Granger causality test-statistics have the standard asymptotic distribution (Toda and Yamamoto 1995; Amiri and Ventelou 2012; Boţa-Avram et al. 2018).

The Granger causality test begins from the prerequisite that one supposes two stochastic processes Xt and Yt. According to this selected approach, we assume that the Xt variable has predictive power for the Yt variable if and only when the delayed value of both variables has better predictive power on Yt than just the lagged values of Yt on itself (Granger 1969). Thus, it is imperative to construct a model that should include past information as long as possible; that is why our empirical analysis has been considered a considerable period for our analysis, according to the cross-country data availability (Boţa-Avram et al. 2018).

To measure public governance quality, we employ the six indicators of country-level governance developed by the World Bank within the project "*The Worldwide Governance Indicators*"[2] (World Bank 2016b). Based on the methodology proposed by Kaufmann et al. (1999), which proposes using an unobserved component model and based on information from more than 40 data sources collected from over 30 different organisations worldwide, the World Bank developed a long-term research project on the quality of public governance that is measured through six governance aggregate indicators (Voice and Accountability; Political Stability and Absence of Violence; Government Effectiveness; Regulatory Quality; Rule of Law and Control of Corruption). This project, updated annually started measuring country-level governance indicators from 1996 for more than 200 economies worldwide. Because country-level governance indicators are highly correlated, they cannot be simultaneously included in a panel analysis because of their multicollinearity. Therefore, we used an unweighted average of the six country-level governance indicators proposed by the World Bank.

Next, we use the indicator of unemployment as % of the total labour force (UNEMP) extracted from the World Development Indicators database (World Bank 2016a). This database is a collection of development indicators, compiled from information provided by officially recognised international sources, looking to present the most current and accurate world development data available, including national, regional, and global estimates.

For the study, we have extracted data for the period 2006–2015. Our research's initial phase supposes a sample consisting of 190 countries, based on the data's availability, but afterwards, 54 countries were excluded because there were missing data for the unemployment rates. Table 1 discloses the variables selected and the databases used.

[1] This paper represents the second part of one of our previous papers (Boţa-Avram et al. 2018) which investigated the relationship between country level governance and economic growth, on one hand, and between country level governance and adjusted net savings, as a selected indicator of economic sustainable development. The current study examines the nexus between public governance and unemployment and it is built on the previous paper (Boţa-Avram et al. 2018).

[2] Undoubtedly, we can find both pros and cons for all these six indicators in the prior literature. Even the authors of these governance indicators (developed by the World Bank) admit the imprecision of these aggregate governance proxies and accept that some standards errors are associated with the estimates of various governance dimensions (Kaufmann et al. 1999). However, one significant advantage of using these indicators is their clarity that permits measuring progress on governance issues for large samples of countries for extended periods. Another advantage is their potential to support the developing of complex cross-country studies, where the broad groups of countries can be considered depending on their level of governance indicators, as a basis for studying the significant correlations that might exist between country-level governance and various economic development outcomes.

Table 1. Description of variables and data sources.

Variable Name	Symbol	Source	Description
Country-level governance	GOV_AVG	World Bank—Worldwide Governance Indicators	An aggregated measure of country-level governance quality, which consists of an average value of six governance indicators developed within the Worldwide Governance Indicators
Unemployment as % of the total labour force	UNEMP	World Bank—World Development Indicators	Employment is a standard indicator to measure the status of a country's economy. Moreover, for most people, employment is an essential condition for the possibilities of developing her- or himself.

The first step is to investigate each time series involved in the study (GOV_AVG and UNEMP) to analyse the stationarity characteristics and determine the order of variables integration (Toda and Yamamoto 1995). While it is not identified from the very beginning if the selected variables are stationary, integrated or cointegrated, there is a necessary pre-test for a unit-roots and cointegration in the economic time series before estimating the V.A.R. model (Toda and Yamamoto 1995). Thus, if there is a unit root, the null hypothesis is accepted, and the tested time series is not stationary. When the p-value is less than or equal to a specified significance level (0.01, 0.05, or even 0.1), the null hypothesis is rejected, this being a confirmation that this economic time series is stationary. As tests for panel data unit root and their differences, we employed Levin–Lin–Chu (Levin et al. 2002), Im–Pesaran–Shin (Im et al. 2003), augmented Dickey–Fuller (ADF–Fisher) (Dickey and Fuller 1979) and Phillips-Perron (PP) Fisher Chi-Square test of Maddala and Wu (1999). Table 2 presents the results of *t*-tests for GOV-AVG time series.

Table 2. Panel unit root test for GOV_AVG time series.

Method	Statistic	Prob. **	Cross-Sections	Obs
Levin, Lin and Chu t *	−14.7503	0.0000	138	1102
Breitung t-stat	5.63647	1.0000	138	964
Null: Unit Root (Assumes Individual Unit Root Process)				
Im, Pesaran and Shin W-stat	0.76483	0.7778	138	1102
ADF–Fisher Chi-square	279.720	0.4262	138	1102
PP–Fisher Chi-square	435.186	0.0000	138	1240

Note: Panel unit root test: Summary Series: GOV_AVG. Sample: 2006–2015. Exogenous variables: Individual effects, individual linear trends. User-specified lags: 1. Newey-West automatic bandwidth selection and Bartlett kernel. * Probabilities for Levin, Lin and Chu tests suppose asymptotic normality. ** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests suppose asymptotic normality.

Referring to the GOV_AVG time series, we reject the null hypothesis by employing the Levin–Lin–Chu t* statistics test for unit-root. Thus, there is no standard unit-root and this time series is stationary. On the other hand, by employing the Im–Pesaran–Shin and ADF-Fisher *t*-tests for individual unit root *p*-value > 0.05, we have to accept the null hypothesis, which means there is a standard unit-root and the governance time series is not a stationary one. In this situation, this type of time series is called a difference-stationary one. Thus, we have to employ the first-order difference (as a series of changes from one period to another) to establish GOV_AVG data stationary at d = 1. (Boţa-Avram et al. 2018). Next, the results of *t*-tests applied for UNEMP time series are illustrated in Table 3.

Table 3. Panel unit root test for UNEMP time series.

Method	Statistic	Prob. **	Cross-Sections	Obs
Levin, Lin and Chut *	−18.0284	0.0000	138	1102
Breitung t-stat	0.18262	0.5725	138	964
Null: Unit Root (Assumes Individual Unit Root Process)				
Im, Pesaran and Shin W-stat	−0.44599	0.3278	138	1102
ADF–Fisher Chi-square	342.180	0.0041	138	1102
PP–Fisher Chi-square	433.376	0.0000	138	1240

Note: Panel unit root test: Summary Series: UNEMP. Sample: 2006–2015. Exogenous variables: Individual effects, individual linear trends. User-specified lags: 1. Newey-West automatic bandwidth selection and Bartlett kernel. * Probabilities for Levin, Lin and Chu tests suppose asymptotic normality. ** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests suppose asymptotic normality.

Regarding the UNEMP time series, Levin-Lin-Chu t* statistics for standard unit root p-value < 0.05 we reject the null hypothesis, we will suppose that the process does not have a standard unit root and the UNEMP data are stationary. The Im–Pesaran–Shin test results for individual unit root p-value > 0.10 and ADF-Fisher t-test for individual unit-root p-value < 0.05, we will suppose that the process does not have an individual unit root and the UNEMP data is stationary.

4. Findings of Granger Non-Causality Tests for UNEMP–GOV_AVG

According to Hypothesis 1–2 proposed to be tested in our study, the bidirectional causal nexus refers from UNEMP to GOV_AGV and vice versa. We summarise the UNEMP–GOV_AVG model in the following V.A.R. system:

$$(\mathrm{DUNEMP})_t = \alpha_1 + \sum_{i=1}^{n} \beta_{1,i}(\mathrm{DUNEMP})_{t-i} + \sum_{i=1}^{n} \gamma_{1,i}(\mathrm{DGOV\_AVG})_{t-i} + \varepsilon_{1,t} \quad (1)$$

$$(\mathrm{DGOV\_AVG})_t = \alpha_2 + \sum_{i=1}^{n} \beta_{2,i}(\mathrm{DGOV\_AVG})_{t-i} + \sum_{i=1}^{n} \gamma_{2,i}(\mathrm{DUNEMP})_{t-i} + \varepsilon_{2,t} \quad (2)$$

where $\varepsilon_{1,t}$ are $\varepsilon_{2,t}$ are independently and normally distributed error terms, α_1, α_2, are constants and $\beta_{1,i}$, $\beta_{2,i}$, $\gamma_{1,i}$, $\gamma_{2,i}$ for i = 1, ..., N are coefficients. Next, in Table 4, the Pedroni residual cointegration test presents the results to test whether GOV_AVG and UNEMP time-series are cointegrated. One can note that most tests above have $p < 0.05$ to reject the null hypothesis and accept time-series' cointegration.

Table 4. Pedroni residual co-integration test.

Alternative Hypothesis: Standard A.R. Coefficients (Within-Dimension)				
	Statistic	Prob.	Weighted Statistic	Prob.
Panel v-Statistic	−0.451899	0.6743	−3.615194	0.9998
Panel rho-Statistic	−2.719696	0.0033	−3.537682	0.0002
Panel PP-Statistic	−12.51618	0.0000	−16.29717	0.0000
Panel ADF-Statistic	−11.15976	0.0000	−12.06253	0.0000
Alternative Hypothesis: Individual A.R. Coefficients (Between-Dimension)				
	Statistic	Prob.		
Group rho-Statistic	1.943186	0.9740		
Group PP-Statistic	−19.45591	0.0000		
Group ADF-Statistic	−11.64026	0.0000		

Note: Pedroni Residual Co-integration Test Series: DUNEMP; DGOV_AVG. Sample: 2006–2015. Included observations: 1360. Cross-sections included: 136. Null Hypothesis: No cointegration; Trend assumption: No deterministic trend. User-specified lag length: 1. Newey-West automatic bandwidth selection and Bartlett kernel.

In the following, starting from the premise that we are testing for Granger non-causality, and because of the cointegration of the series, we decided to employ the vector error correction model (VECM). Because the number of lags has a relevant influence on Granger non-causality tests, we have to identify the correct number of lags. Table 5 discloses the results of the chosen techniques used to identify the lag length for UNEMP—GOV_AVG causal relationship.

Table 5. Test for selection number of lags.

Lag	LogL	LR	FPE	AIC	SC	HQ
0	47.46384	NA	0.001430	−0.874305	−0.823451	−0.853702
1	59.25232	22.89685	0.001231	−1.024083	−0.871522 *	−0.962276
2	60.20153	1.807162	0.001306	−0.965414	−0.711146	−0.862403
3	65.46203	9.812851	0.001275	−0.989654	−0.633679	−0.845438
4	68.23614	5.068089	0.001306	−0.966080	−0.508397	−0.780659
5	83.26824	26.88433	0.001057	−1.178235	−0.618845	−0.951610
6	97.48321	24.87619 *	0.000869 *	−1.374677 *	−0.713579	−1.106847 *
7	98.55289	1.830805	0.000921	−1.318325	−0.555520	−1.009290
8	99.31467	1.274512	0.000982	−1.256051	−0.391539	−0.905812

Note: V.A.R. Lag Order Selection Criteria. Endogenous variables: DUNEMP; DGOV_AVG. Exogenous variables: C. Sample: 2006–2015. * indicates the lag order selected by the criterion. LR: sequential modified LR: test statistic (each test at 5% level); FPE: Final prediction error; AIC: Akaike information criterion; SC: Schwarz information criterion; HQ: Hannan–Quinn information criterion.

Considering the different information criteria disclosed by Table 5, one can note that it should have a maximum lag length of 6 for each variable. Because of the series' cointegration, Table 6 presents the findings of using the VECM for six lags.

Table 6. Vector error correction model (VECM) for 6 lags-short run effect.

R-Squared	0.368416	0.068980
Adj. R-squared	0.319329	−0.003379
Sum sq. Resids	68.91806	1.030451
S.E. equation	0.597569	0.073069
F-statistic	7.505390	0.953299
Log-likelihood	−180.6242	258.5812
Akaike AIC	1.881571	−2.321351
Schwarz SC	2.137444	−2.065479
Mean dependent	−0.168134	0.009078
S.D. dependent	0.724301	0.072946
Determinant residual covariance (of adj.)		0.001893
Determinant residual covariance		0.001614
Log-likelihood		78.69717
Akaike information criterion		−0.427724
Schwarz criterion		0.116005

Note: Sample (adjusted): 2006–2015. Included observations: 648 after adjustment. Standard errors in ( ) and t-statistics in [ ].

According to Table 6, R-square (0.368) from column 1 explains the variance—36.8% of model 1, when unemployment on its lag and the lags of governance while R-square (0.068) from column 2 explains the variance, 7% when governance on its lags and the lags of unemployment. To identify the model coefficients' statistical significance, we employed OLS (ordinary least square) in Table 7, to estimate these coefficients. According to Table 7, there is a confirmed long-run causality running from independent to dependent. There would be a speed of adjustment to long-run equilibrium. In the case of model 1, C (1) = −0.018, p-value < 0.10, there is a indication of a long-run causality running from GOV_AVG to UNEMP, while for model 2, C (17) = −0.0023, p-value < 0.10 a long-run causality running from UNEMP to GOV_AVG is confirmed. Still, the small R-square

indicates that this model does not sufficiently confirm the long-run causality between unemployment and public governance.

Table 7. Ordinary least square (OLS) regression.

	Coefficient	Std. Error	t-Statistic	Prob.
C (1)	−0.018825	0.009994	−1.883535	0.0604
C (2)	0.189865	0.061230	3.100840	0.0021
C (3)	−0.963264	0.655935	−1.468535	0.1428
C (4)	−0.024389	0.054761	−0.445362	0.6563
C (5)	−0.319382	0.908730	−0.351459	0.7254
C (6)	−0.167908	0.050044	−3.355205	0.0009
C (7)	−1.925014	0.827752	−2.325593	0.0206
C (8)	−0.079585	0.045120	−1.763837	0.0785
C (9)	0.590860	0.824402	0.716713	0.4740
C (10)	−0.143699	0.032407	−4.434137	0.0000
C (11)	−0.190928	0.722401	−0.264296	0.7917
C (12)	−0.070773	0.031072	−2.277728	0.0233
C (13)	0.621524	0.767105	0.810221	0.4183
C (14)	0.046908	0.038590	1.215564	0.2249
C (15)	0.673583	0.764710	0.880835	0.3790
C (16)	−0.041699	0.049805	−0.837238	0.4030
C (17)	−0.002374	0.001221	−1.943961	0.0526
C (18)	0.001821	0.007489	0.243208	0.8080
C (19)	0.129729	0.079183	1.638333	0.1022
C (20)	−0.003186	0.006699	−0.475535	0.6347
C (21)	0.062485	0.110783	0.564033	0.5731
C (22)	0.005595	0.006123	0.913788	0.3614
C (23)	0.071038	0.101132	0.702431	0.4828
C (24)	0.002699	0.005497	0.491045	0.6237
C (25)	0.138396	0.099499	1.390930	0.1650
C (26)	0.002734	0.003951	0.691992	0.4894
C (27)	−0.139912	0.088356	−1.583492	0.1141
C (28)	0.001227	0.003780	0.324619	0.7456
C (29)	0.031643	0.092273	0.342926	0.7318
C (30)	0.000372	0.004713	0.079013	0.9371
C (31)	0.042362	0.093201	0.454529	0.6497
C (32)	0.003288	0.006081	0.540742	0.5890
Determinant residual covariance 0.001617				
Model 1				
Equation: D(UNEMP) = C(1)*(UNEMP(−1) + 3.38841878612*GOV_AVG(−1) − 7.50265468868 + C(2)*D(UNEMP(−1)) + C(3)* D(GOV_AVG(−1)) + C(4)*D(UNEMP (−2)) + C(5)*D(GOV_AVG(−2)) + C(6)*D(UNEMP(−3)) + C(7)*D(GOV_AVG(−3)) + C(8)*D(UNEMP(−4)) + C(9)*D(GOV_AVG(−4)) + C(10)*D(UNEMP(−5)) + C(11)*D(GOV_AVG(−5)) + C(12)*D(UNEMP(−6)) + C(13)*D(GOV_AVG(−6)) + C(14)*D(UNEMP(−7)) + C(15)*D(GOV_AVG(−7)) + C(16)				
Observations: 209				
R-squared	0.368416	Mean dependent var.	−0.168134	
Adjusted R-squared	0.319329	S.D. dependent var.	0.724301	
SE of regression	0.597569	Sum squared residuals	68.91806	
Durbin–Watson stat	2.164758			
Model 2				
Equation: D(GOV_AVG) = C(17)*(UNEMP(-1) + 3.38841878612*GOV_AVG(-1) − 7.50265468868 + C(18)*D(UNEMP(-1)) + C(19)*D(GOV_AVG(-1)) + C(20)*D(UNEMP(-2)) + C(21)*D(GOV_AVG(-2)) + C(22)*D(UNEMP(-3)) + C(23)*D(GOV_AVG(-3)) + C(24)*D(UNEMP(-4)) + C(25)*D(GOV_AVG(-4)) + C(26)*D(UNEMP(-5)) + C(27)*D(GOV_AVG(-5)) + C(28)*D(UNEMP(-6)) + C(29)*D(GOV_AVG(-6)) + C(30)*D(UNEMP(-7)) + C(31)*D(GOV_AVG(-7)) + C(32)				
Observations: 210				
R-squared	0.075447	Mean dependent var.	0.008496	
Adjusted R-squared	0.003961	S.D. dependent var.	0.073258	
SE of regression	0.073112	Sum squared resid.	1.037013	
Durbin–Watson stat	2.201654			

Note: Estimation Method: Ordinary Least Squares. Sample: 2006–2015. Included observations: 210. Total system (unbalanced) observations 419.

Analysing the significance of the p-values acquired as a result of testing for Granger causality by using VECM/block exogeneity Wald tests as presented in Table 8, we obtain reasonable evidence of Granger causality from GOV_AVG to UNEMP for p-value > 0.05,

and from UNEMP to GOV_AVG for p-value > 0.05. In other words, our findings confirm the bidirectional causality between public governance and unemployment rate, as a selected indicator for labour market performance.

Table 8. Granger causality test GOV_AVG—UNEMP.

Dependent Variable: D(UNEMP)			
Excluded	**Chi-sq**	**df**	**Prob.**
D(GOV_AVG)	10.87594	7	0.1441
All	10.87594	7	0.1441
Dependent Variable: D(GOV_AVG)			
Excluded	**Chi-sq**	**df**	**Prob.**
D(UNEMP)	1.549935	7	0.9805
All	1.549935	7	0.9805

Note: V.E.C. Granger Causality/Block Exogeneity Wald Tests. Sample: 2006–2015. Included observations: 209.

5. Conclusions

The empirical analysis reported above contributes to the literature by examining the causality of the public governance and unemployment rate nexus, using macroeconomic data for a large sample of 136 worldwide economies covering 10 years. An advantage of the methodology used in our paper is the analysis of both directions of causality between public governance and unemployment. Our results suggest that bidirectional Granger causality is predominant for public governance and unemployment nexus. Our findings are mostly in line with some of the previous findings in the literature. For instance, the relevancy of government efforts to cope with the harmful effects of unemployment and implement various policies to support reinsertion in the labour market was highlighted by Bauer (2018), while fighting against unemployment's adverse effects is one of the governments' most important objectives. Based on the investigation of 27 European Union countries and using Eurobarometer data, Roth et al. (2011) argued that an increase in unemployment is linked to declining trust in governmental institutions. Roth et al. (2011) found that, especially in the European Union 15 (EU-15) countries, declining trust in government effectiveness is related to an increase in unemployment for all periods, not only in crisis times. Battaglini and Coate (2016) emphasised that the inefficiency of governmental policies can be one of the causes for the increasing unemployment rate because even if unemployment arises, it still "can be mitigated by tax cuts and increases public production". The same authors also argued that adopting the right and effective policies make it possible for the government to mitigate unemployment in the long run completely.

This paper intends to fill the gap in knowledge concerning the relationship between country-level governance and unemployment as a proxy of labour market performance. Thus, the main contribution of our study to the literature in this field is to bring in the spotlight of scholars the necessity to examine in depth the potential factors that could determine this causal nexus, while trying to identify more well-argued answers to the question of causality between good public governance and labour market efficiency, maybe with the selection of other significant factors for measuring labour market performance.

Undoubtedly, our empirical results' important policy implication is that state intervention and government efficiency in applying macroeconomic policies are likely to have long-term effects on labour market performance. Thus, good country-level governance's role in retaining unemployment at a sustainable level is prominent and should be tackled with policymakers' utmost responsibility.

Author Contributions: The author's contributions are the following ones: C.B.-A. and P.-R.R. conceived and designed the statistical database; A.G. and S.R.B. performed the database; P.-R.R. and C.B.-A. analysed the data; A.G. and S.R.B. contributed with analysis tools; C.B.-A. and P.-R.R. wrote the paper, A.G. and S.R.B. review the final version of the paper. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: Publicly available datasets were analyzed in this study. This data can be found here: http://info.worldbank.org/governance/wgi/Home/Reports; https://databank.worldbank.org/source/world-development-indicators.

Conflicts of Interest: The authors declare no conflict of interest. The founding sponsors had no role in the study's design; in the collection, analyses, or interpretation of the data; in the writing of the manuscript, and in the decision to publish the results.

References

Aggarwal, Reena, Isil Erel, Miguel Ferreira, and Pedro Matos. 2011. Does governance travel worldwide? Evidence from institutional investors. *Journal of Financial Economics* 100: 154–81. [CrossRef]

Amiri, Arshia, and Bruno Ventelou. 2012. Granger causality between total expenditure on health and GDP in OECD: Evidence from the Toda-Yamomoto approach. *Economics Letters* 116: 541–44. [CrossRef]

Auty, Richard M., and Katrina Brown. 1997. *Approaches to Sustainable Development. Series: Global Development and the Environment*. New York: Routledge.

Avram, Cristina Bota, Adrian Grosanu, and Paula Ramona Rachisan. 2015. Does country-level governance influence auditing and financial reporting standards? Evidence from a cross-country analysis. *Current Science* 108: 1222–27.

Battaglini, Marco, and Stephen Coate. 2016. A political economy theory of fiscal policy and unemployment. *Journal of the European Economic Association* 14: 303–37. [CrossRef]

Bauer, Paul C. 2018. Unemployment, trust in government, and satisfaction with democracy: An empirical investigation. *Socius: Sociological Research for a Dynamic World* 4: 1–14. [CrossRef]

Bjørnskov, Christian. 2005. Does political ideology affect economic growth? *Public Choice* 123: 133–46. [CrossRef]

Boţa-Avram, Cristina, Adrian Groşanu, Paula-Ramona Răchişan, and Marius Dan Gavriletea. 2018. The Bidirectional causality between country-level governance, economic growth, and sustainable development: A cross-country data analysis. *Sustainability* 10: 502. [CrossRef]

Brinkerhoff, Derick W., and Arthur A. Goldsmith. 2005. Institutional Dualism and International Development: A Revisionist Interpretation of Good Governance. *Administration & Society* 372: 199–224.

Cule, Monika, and Murray Fulton. 2013. Corporate governance and subjective well-being. *Applied Economics Letters* 20: 364–67. [CrossRef]

Demirguc-Kunt, Asli, Inessa Love, and Vojislav Maksimovic. 2006. Business Environment and the incorporation decision. *Journal of Banking and Finance* 30: 2967–93. [CrossRef]

Dickey, David A., and Wayne A. Fuller. 1979. Distribution of the estimators for autoregressive time series with a unit root. *Journal of the American Statistical Association* 74: 427–31.

Doidge, Craig, G. Andrew Karolyi, and René M. Stulz. 2007. Why do countries matter so much for corporate governance? *Journal of Financial Economics* 86: 1–39. [CrossRef]

Fraj, Salma Hadj, Mekki Hamdaoui, and Samir Maktouf. 2018. Governance and economic growth: The role of the exchange rate regime. *International Economics* 156: 326–64. [CrossRef]

Granger, Clive W. J. 1969. Investigating causal relations by econometric models and cross-spectral methods. *Econometrica: Journal of the Econometric Society* 37: 424–38. [CrossRef]

Hibbs, Douglas A. 1986. Political parties and macroeconomic policies and outcomes in the United States. *American Economic Review* 76: 66–70.

Im, Kyung So, M. Hashem Pesaran, and Yongcheol Shin. 2003. Testing for unit roots in heterogeneous panels. *Journal of Econometrics* 115: 53–74. [CrossRef]

Jalilian, Hossein, Colin Kirkpatrick, and David Parker. 2006. The Impact of regulation on economic growth in developing countries: A cross-country analysis. *World Development* 35: 87–103. [CrossRef]

Kadyrzhanova, Dalida, and Matthew Rhodes-Kropf. 2011. Concentrating on governance. *Journal of Finance* 66: 1649–85. [CrossRef]

Kaufmann, Daniel, and Aart Kraay. 2008. Governance Indicators: Where Are We, Where Should We Be Going? *The World Bank Research Observer* 23: 1. Available online: http://web.worldbank.org/WBSITE/EXTERNAL/WBI/EXTWBIGOVANTCOR/0,,contentMDK:21499997~{}pagePK:64168445~{}piPK:64168309~{}theSitePK:1740530,00.html (accessed on 15 June 2019). [CrossRef]

Kaufmann, Daniel, Aart Kraay, and Pablo Zoido-Lobaton. 1999. Governance Matters. World Bank Policy. Research Working Paper No. 2196. Available online: http://info.worldbank.org/governance/wgi/pdf/govmatters1.pdf (accessed on 15 June 2019).

Kaufmann, Daniel, Aart Kraay, and Massimo Mastruzzi. 2005. *Governance Matters IV: Governance Indicators for 1996–2004*. Washington: World Bank.

Khraief, Naceur, Muhammad Shahbaz, Almas Heshmati, and Muhammad Azam. 2020. Are unemployment rates in OECD countries stationary? Evidence from univariate and panel unit root tests. *The North American Journal of Economics and Finance* 51: 100838. [CrossRef]

Kooiman, Jan. 1999. Social-Political Governance. *Public Management: An International Journal of Research and Theory* 1: 67–92. [CrossRef]

Leal Filho, Walter, Joost Platje, Wolfgang Gerstlberger, Remigijus Ciegis, Juha Kääriä, Maris Klavins, and Linas Kliucininkas. 2016. The role of governance in realising the transition towards sustainable societies. *Journal of Cleaner Production* 113: 755–66. [CrossRef]

Lel, Ugur, and Darius Miller. 2019. The labour market for directors and externalities in corporate governance: Evidence from the international labour market. *Journal of Accounting and Economics* 68: 101222. [CrossRef]

Levin, Andrew, Chien-Fu Lin, and Chia-Shang James Chu. 2002. Unit root tests in panel data: Asymptotic and finite-sample properties. *Journal of Econometrics* 108: 1–24. [CrossRef]

Levit, Doron, and Nadya Malenko. 2016. The labour market for directors and externalities in corporate governance. *The Journal of Finance* 71: 775–808. [CrossRef]

Liew, Venus Khim-Sen, Ricky Chee-Jiun Chia, and Chin-Hong Puah. 2012. Does hysteresis unemployment occur in OECD countries? Evidence from parametric and nonparametric panel unit root tests. *International Journal of Economics and Management* 6: 446–58.

Maddala, G.S., and S. Wu. 1999. A comparative study of unit root tests with panel data and a new simple test. *Oxford Bulletin of Economics and Statistics* 61: 631–52. [CrossRef]

Ngobo, Paul Valentin, and Maurice Fouda. 2012. Is good governance good for business? A cross-national analysis of firms in African countries. *Journal of World Business* 47: 435–49. [CrossRef]

Roth, Felix, Felicitas Nowak-Lehmann D, and Thomas Otter. 2011. *Has the Financial Crisis Shattered Citizens' Trust in National and European Governmental Institutions? Evidence from the E.U. Member States, 1999–2010*. Centre for European Policy Studies Papers, No. 343. Brussels: Centre for European Policy Studies.

Tabellini, Guido. 2010. Culture and Institutions: Economic development in the regions of Europe. *Journal of the European Economic Association* 8: 677–716. [CrossRef]

Toda, Hiro Y., and Taku Yamamoto. 1995. Statistical inference in vector autoregressions with possibly integrated processes. *Journal of Econometrics* 66: 225–50. [CrossRef]

World Bank. 1991. Governance and Economy: A Review. Available online: http://wwwwds.worldbank.org/external/default/WDSContentServer/WDSP/IB/1991/12/01/000009265_3961002050636/Rendered/PDF/multi0page.pdf (accessed on 10 December 2017).

World Bank. 2016a. *World Development Indicators*. Washington: World Bank.

World Bank. 2016b. Worldwide Governance Indicators (W.G.I.) Project 1996–2016. Available online: http://info.worldbank.org/governance/wgi/index.asp (accessed on 10 December 2017).