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Socioeconomic Development Aspects of Democratic Governance across Selected Countries

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ABSTRACT

There is a need to question the main socioeconomic, political, and cultural aspects of crime rates in a cross-country context. In this context, Dumitrescu and Hurlin's (2012) Granger causality method, which is not common in the criminological literature, is used – which does not ignore cross-sectional dependence. Moreover, we generate an indicator of "democratic governance" using principal component analysis (PCA) from "government effectiveness" and "voice and accountability." The key advantage of using PCA is to avoid multicollinearity and make better inferences with dimensionality reduction. The democratic governance contains 93.5% common variance and is equally affected by both governance indicators. The key findings of our study underscore that crime rates are significantly Granger caused by economic growth, democratic governance, unemployment, and urbanization. The intuition drawn from the findings of this paper and the previous researchers' contribution is that crime can be reduced as a product of good governance. Moreover, the findings revealed that urbanization and democratic governance Granger causes each other. Therefore, urbanization can make countries converge to democratic governance. What the study is unable to say is the dynamic relationship between variables; however, the current evidence offers relevant policy guidelines.

Introduction

Crime can be defined as follows in the field of law: the misuse of free will and intentional selection of unlawful conduct following the behavioral pattern described as a crime in the legislation. Based on this definition, crime can be seen as a narrow concept of obligation and punishment. On the contrary, the notion of crime is of interest to a wide range of disciplines – and has direct and indirect social and economic effects [1]. The principal factor that causes crime take the attention of economists is the exacerbating effect on markets by negative

externalities. The territories facing high crime rates experience deterioration in the tourism market, labor force participation, and the residential sector [2–8]. Therefore, researchers have started to pay attention to the drivers of crime and probable precautionary measures to mitigate crimes in society. Provided that the triggers for crime rates are multifaceted, economists have mainly focused on three areas: (i) economic determinants that are based on income-related topics, (ii) demographic determinants that focus on the migration of population, and (iii) governance factors that try to infer the impact of organizations.

One of the early studies in this context demonstrates the significant linkage between crime and income that emerged in the late 1960s [9]. The author carefully opined that conducting a crime is a matter of cost and utility. A later study reports that economic growth contributes to a decline in crime rates [10]. Additionally, the study conducted for the case of India identified a reciprocal relationship between economic growth and crime[11]. Country-based papers examining crime and growth nexus for emerging economies are mainly split into two conclusions. Some researchers found evidence that growth has a lowering effect on crime rates in developing economies [12–15]. The probable reason for this is that households have the opportunity to earn legitimate income from the additional employment created by growth. Interestingly, some studies are investigating the nexus between growth and criminal activity in developing economies have unexpected results. There is a significant positive relationship between growth and crime in nations suffering from high crime [16,17]. As a possible explanation, they defend the view that growth does not bring development but increased inequality. Although it is an exception, some recent studies do not find a statistically significant relationship connecting the subjected variables [18,19].

Another income-related perspective on the major causes of crime concentrates on labor market conditions. Narayan and Smyth[20] investigate the long-run linkage between male unemployment and property crimes. They conclusively show that there is cointegration between three types of property crime and unemployment. Altindag [21] notes a significant association between property crime and unemployment in Europe, as well as in similar investigations [22–26]. The justification of these results is that households' failure to earn income through legal means potentially incites them to commit a crime. In contrast, with the presented studies investigating nexus unemployment-crime, some investigations cannot find a significant relationship between crime and unemployment [27,28]. We believe that increased support through transfer payments to the unemployed may reduce the connection between unemployment and crime – or provide puzzling results [29].

Concerning empirical investigations on the impact of demographic determinants in crime, there is attention on urbanization. The change in production relations, after the Washington Consensus, the increasing uncontrolled urbanization process brought the crime phenomenon with it. The increase in

the number of cities with the migration of labor from rural areas with industrialization created a population distribution process that led to a change in the social structure. The problems caused by the rapid change in the city brought many types of crime to the agenda of the city dwellers. As a result of this, related studies began to emerge linking urbanization with crime [30,31]. Entorf and Spengler [32] ascertain that demographic variable is statistically significant on crime by applying panel data techniques on German provincial data. In studies conducted for China and India, the most rapidly urbanizing countries, in recent years, a consensus has been formed that urbanization increases various criminal activities [33–36]. The probable reason for this may be the insufficient infrastructure due to the rapid growth and migration. While mentioned papers identify urbanization as the principal determinant causing crime, some studies do not yield results in the same direction [37,38]. Their work underlines that crime is incited as a result of governance mechanisms rather than urbanization.

The consequences of governance mechanisms on illegal activities are investigated using various variables. Recently, there has been a growing perception of the vital links between several illegal activities and lack of institutional quality in local government units [39–46]. Soares [47] argues that institutional stability is a prominent factor in dealing with crime. Adopting a similar position, Ajide [19] finds evidence on national-level data that the quality of institutions plays a significant role in the prevention of crime. Although rare, studies are attempting to measure governance factors at the macro-level using World Governance Indicators that have suffered from serious empirical flaws [48,49]. Apart from shortcomings in the methodological approaches of the aforementioned studies [48,49], they used government effectiveness, voice and accountability, and other strongly correlated governance indicators together which can cause multicollinearity problems.

Berg and Johansson [50] highlight the influence of building credence employing democratic institutions in reducing insecurity as a result of the micro-level analysis. As stated in Ott's study [51], concepts such as democracy, institutionalism, and supremacy of law can be a universal norm in the establishment of global welfare. For this reason, investigating the nexus of institutions and democracy might be interesting to make inferences on illegal and criminal activities [52]. There are countries in the world that show good economic performance regardless of democracy. Furthermore, there are anti-democratic structures in which people cannot feel part of these institutions even though they have strong institutions.

In light of the above motivation, the current study is aimed at examining the main determinants of crime rates comprehensively by taking into account the deficiencies and gaps in the literature. Thus, this study's contribution to the literature is in multiple ways. Primarily, the indicator of "democratic governance" is created in order to have a better inference of effective institutions that

do not disregard democracy. The indicator is formed by extracting the common factors of "government efficiency" and the "voice and accountability" by principal component analysis. We used a PCA vector that explains 93% of common fluctuations in the subjected variables. Thus, the created indicator has a place where government effectiveness and democracy are met on common ground. Second, this study tries to provide more captivating results by combining macro data sets including demographic, economic, and governance factors from 22 countries for years between 2003 and 2017. Moreover, since the types of crimes are diverse, we have designated the prisoner rate per 100,000 individuals as a proxy variable for crime rates to have a holistic view [53]. The final contribution is the causality approach of Dumitrescu and Hurlin[54], which is rare in the literature of criminology – and it provides efficient results in the case of heterogeneous and cross-sectional dependent panels.

Data and methodology

Data

This study uses R software packages for the preprocessing and standardization of variables in the range 1 and 0 [54–57]. The data set of this work collected based on data availability consists of yearly observations from the following 22 countries between 2003 and 2017: Brazil, Chile, Colombia, Czechia, Estonia, France, Finland, Greece, Hungary, Italy, Ireland, Latvia, Lithuania, the Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Sweden, Switzerland, and Turkey. As a proxy for crime statistics, the prisoner rate per 100,000 people gathered from the United Nations Office on Drugs and Crime. The annual growth rate of Gross Domestic Product with constant prices and the rate of unemployment was collected from the database of the Organization for Economic Co-operation and Development (OECD), while the statistics on urbanization rates of countries are taken from the United Nations Department of Economic and Social Affairs (UNDESA). "Voice and Accountability" is the first variable we used to generate the indicator for democratic governance that Kaufmann et al.[58] explain in detail – it represents democratic perceptions of residents who can take part in elections and their freedom of expression obtained from the World Bank. "Voice and Accountability" is the first variable we used to generate an indicator for democratic governance that Kaufmann et al.[58] explain in detail. It represents the democratic perceptions of residents who can take part in elections and their freedom of expression obtained from the World Bank. The second subjected variable used to generate an indicator of democratic governance is "Government Effectiveness" – which mirrors judgments of the state of public services, the credibility and autonomy of institutions from partisan pressures adapted from the World Bank [58]. Moreover, the indicator of "Democratic

Governance" generated by PCA is used to extract common factors of government effectiveness and voice and accountability.

Methodology

Principal component analysis

This section attempts to give a conceptual brief of PCA and avoids mathematical specifications. This paper will highlight enough studies with a fuller discussion of those who want more information on the topic. PCA is a tool to design the variance formation of variables, by utilizing linearly integrating principal components (PCs) linking them, which can efficiently be applied in the analysis. PCA is able to present general information about the common influential characteristics of variables that hold similarities [59]. Traditionally, PCA is calculated by utilizing the eigenvectors of covariance to assess commonalities. PCA seeks to distinguish inclinations on which variance of variables greatest – chooses among the vectors that give the highest eigenvalue. It permits researchers to compile the knowledge in data by unique variables denominated as principal components [59,60]. Besides, this study utilizes stats, FactoMineR, factoextra, and ade4 packages to generate the indicator of democratic governance [61–63].

Cross-sectional dependency test

It is widely presumed that errors in cross-sectional investigations are not correlated among large-scaled panels. Nonetheless, neglecting interdependence in the estimations of panel models may lead to significant critical outcomes. There is performance loss in estimator and fallacious statistics in the analysis in case of disregarding error dependence. Therefore, cross-sectional correlations should be tested before an investigation. In this respect, to observe the inter-dependence we use Pesaran's cross-sectional dependence (CD) and scaled LaGrange Multiplier (LM) tests [64]. Pesaran scaled LM test proposes a standardized bias-corrected form of the statistics which is superior to previously proposed LM tests as follows:

$$LM_s = \sqrt{\frac{1}{N(N-1)}} k \sum_{i=1}^{N-1} \sum_{j}^{N} (T_{ij}\hat{p}_{ij}^2 - 1) - \frac{N}{2(T-1)} \rightarrow N(°0, 1) \quad (1)$$

where i = 1, 2, 3, . . . ,N represents cross sections; $\hat{p}_{ij}$ correlation parameter; and t = 1,2,3, . . .T time dimensions; T_{ij} observations common to i and j.

To cope with misleading inference due to dimension distortions, Pesaran [64]proposed an alternative way:

$$CD_P = \sqrt{\frac{2}{N(N-1)}} k \sum_{i=1}^{N-1} \sum_{j}^{N} (T_{ij}\hat{p}_{ij}) \rightarrow N(^\circ 0, 1) \qquad (2)$$

mainly based on $\hat{p}_{ij}$, represent the average correlations.

Unit root tests

The conduction of unit root tests to examine the integration level of variables is a principal tool of empirical analysis. Traditionally, the unit root test is based on the Augmented Dickey–Fuller (ADF) process, which assumes the null hypothesis suggesting the presence of non-stationarity in the data. However, with the development of panel data econometrics, researchers should select unit root tests based on cross-sectional independence. After testing for the presence of cross-sectional dependence, the stationarity of the series should be tested according to panel specifications. Since there is a cross-sectional dependence in the series, we chose four methods to generate efficient results. The Fisher–ADF test is based on the independence of identities and the averaging process of the calculated t-bar statistics while deciding on the stationarity of variables, which is very popular in the literature [65,66]. Second, Levin et al. [67] show proof of asymptotic outcomes gives a good approximation which obtains calculations standardized and independent of autocorrelations in cross-sections of medium extent. However, we are going to use these first-generation panel unit root tests with the demeaning procedure. A couple of points is worth mentioning here: firstly, by demeaning local power influencing the test statistics based on mitigating the influence of cross-sectional inter-dependence [68–70]. Second, It provides efficiency in the testing process in case of involving an intercept that creates a bias in the calculation of the AR coefficient – which can be adjusted if the resulting analysis faces weakness in power and inaccuracy[69]. Besides, the fact that the second-generation unit root tests contain still unanswered queries at the current age caused us to include tests from two generations. Additionally, the second-generation unit root tests, which are relatively new and still subject to discussion in several aspects, lead us to include tests from both generations [69–71].

In contrast to first-generation tests, there is a cross-sectional augmented Dickey–Fuller (CADF) testing for the presence of unit roots under the assumption of cross-sectional dependence – available in Stata with pescadf module [64,72]. It is an expansion of the ADF procedure, including the panel averages of lags and differences in the specific period. In addition, this study investigates the presence of unit roots in the framework of IPS[73]. That is introduced in the literature in a short form as CIPS in a module called xtcips, plainly average form of CADF statistics [72,74].

$$CIPS(N, T) = N^{-1} \sum_{i}^{N} t_i (\Delta Y_{it} = \theta_i + \beta_i y_{i,t-1} + Y_i \bar{y}_{i,t-1} + \delta_i \Delta \bar{y}_{i,t} + e_t) \quad (2)$$

where t_i is the panel test statistic for the ith individual entity provided by the t-ratio of βi, which is extensively explained in the relevant literature [64–72,75,76].

Dumitrescu-Hurlin non-causality test

Regressions can have several distinct forms, depending on assumptions given concerning the formation of the cross-sections. Considering Granger Causality is calculated by operating bivariate regressions, researchers employ various strategies for testing causality links in a panel setting. Overall, the bivariate causality calculation in a cross-sectional setting holds for the pattern:

$$Y_{i,t} = \alpha_i + \sum_{k=1}^{K} \Phi_i^{(k)} Y_{i,t-k} + \sum_{k=1}^{K} \beta_i^{(k)} X_{i,t-k} + \mu_{i,t} \tag{3}$$

where t expresses the period dimension of the panel, and i expresses the identity. Also, α_i expresses individual-fixed effects; both $\beta_i^{(k)} = \beta_i^{(1)}, \beta_i^{(2)}, \ldots, \beta_i^{(k)}$ and $\Phi_i^{(k)}$ are slope differences across groups k showing the lags. Conventional Granger Causality tests operate with the cross-sections as a giant set. Subsequently, it employs the causality technique that considers that all coefficients are identical across all panels. In contrast to previously published studies, Dumitrescu-Hurlin[54] offers a contrary assumption, enabling all coefficients to vary across all panels. The test is estimated by just operating conventional Granger Causality separately for each identity in the panel. Afterward, it extracts the average statistics of each cross-section, namely Wbar and Zbar statistics with a standard normal distribution.

Empirical results

Generation of democratic governance and descriptive statistics

This subsection aims to provide information on the generation process of the indicator of democratic governance and descriptive statistics of the dataset. The lead and lag correlations were investigated between (voa) voice and accountability and (govf) government effectiveness before PCA. The top of Figure 1 provides a simple plot showing correlations of subjected variables in different dimensions. As shown in Figure 1, there is a strong correlation between them. Because of the high correlation between different lags and leads of the variables, the authors performed PCA to capture common characteristics. There is another plot in the middle of Figure 1, which provides the dimensions of variables – and the explanation power of each vector on subjected variables. Among the created vectors, PCA1, which is demonstrated as Dim-1 in Figure 1, explains 93.6% of the variance. However, PCA 2 represents only 6.30% of the variance. The contribution of each variable to PCA1 is illustrated at the bottom of Figure 1. It is clear from this figure that
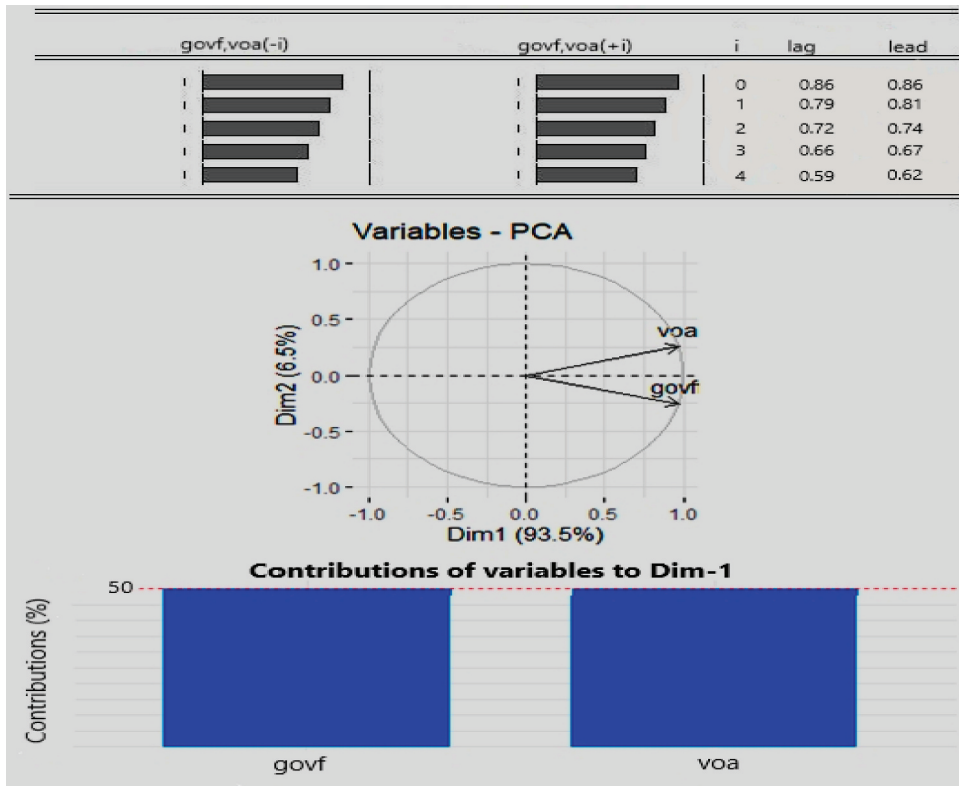
Figure 1. Correlation and PCA plot of government effectiveness with voice and accountability.

both variables contribute to PCA1 equally. As a result of the analysis, the PCA1 vector was extracted to proxy the (demgo) democratic governance.

The descriptive statistics of the dataset are shown in Table 1. After z-score normalization, all variables are scaled from 0 to 1 by min–max normalization. What stands out from Table 1 is that the crime rate has a mean of 0.0349 with 0.1623 standard deviations. The standard deviation of democratic governance is 0.2330 with a mean value of 0.3971. The rest of the statistics on unemployment, growth, and urbanization rate provided in columns 4, 5, and 6, respectively.

Table 1. Descriptive statistics.

	crime	demgo	unemp	growth	urban
Minimum	0	0	0	0	0
1st Qu	0.0002	0.2139	0.1554	0.4454	0.3914
Mean	0.0349	0.3971	0.2340	0.6089	0.5272
Median	0.0006	0.4000	0.2582	0.6058	0.5548
3rd Qu.	0.0014	0.5065	0.3258	0.8676	0.7245
Maximum	1	1	1	1	1
Std. Dev.	0.1623	0.2330	0.1589	0.2494	0.2518
Sum Sq. Dev.	8.6695	17.866	8.3100	20.473	20.870
Observations	330	330	330	330	330

Cross-sectional dependence and unit root tests

Before performing any panel data analysis, it should be checked whether there is any dependency on cross-sections. It is a central criterion in the selection of probable methods to have better inferences. In this respect, the applied Pesaran [64] CD tests, the null hypothesis is that there is no dependence between the cross-sections. According to the results in Table 2, all series have cross-sectional dependencies at a 1% significance level.

Unit root tests are applied to examine the integration level of variables, in other words, their stability. Table 3 displays the output of unit root tests. Unemployment and economic growth are stationary, according to 7–8 different tests. Moreover, democratic governance is concluded to have stationarity from all the tests applied. The urbanization rate and crime rates were determined as the I(0) process in a consensus of applied tests but not CIPS. In summary, the variables have been calculated to be stationary. As a result, there is no need for an extra procedure to stabilize the variables.

Panel causality test

In this section, the causality relationship between crime rates and socioeconomic factors is presented in Table 4. If the relationship between democratic governance and crime rates is evaluated, it is determined that there is causality from democratic governance to crime rates. However, no causality relationship has been found between crime rates and democratic governance. A two-way relationship has been found between unemployment and crime rates which is consistent with the existing literature. It is attributed to employment opportunities decrease in territories with high crime and the territories with low employment opportunities upsurges in criminal activity [77,78]. The relationship between economic growth and crime rates is bidirectional because these

Table 2. Test for cross-sectional dependence.

Test/Variable	crime	demgo	unem	growth	urban
Peseran LM	37.99*	21.32*	27.58*	33.46*	111.6*
Peseran CD	3.59*	2.11**	10.95*	4.13*	25.52*

Note: *, symbolizes significance at 1%,

Table 3. Unit root test results.

Test	FISHER ADF					CIPS				
Variable	crime	demgo	unem	growth	urban	crime	demgo	unem	growth	urban
Trend&Cons	-2.84*	-1.30***	-5.25*	0.43	-6.16*	-2.31	-2.67***	-1.72	-2.62***	-0.59
Cons	-3.63*	-7.02*	8.86*	-5.52*	-6.48*	-1.66	-2.28**	-2.54*	-1.92	-0.57
Test			CADF					LLC		
Variable	crime	demgo	unem	growth	urban	crime	demgo	unem	growth	urban
Trend&Cons	-3.60*	-3.24*	-3.12**	-2.86**	-2.99**	-5.96*	-2.12**	-6.70*	-3.86*	-4.87*
Constant	-5.71*	-3.08*	-2.47**	-8.72*	-2.32*	-2.5*	-2.07**	-6.05*	-1.63***	-3.64*

Note: *, **, and *** symbolizes significance levels at 1%, 5%, and 10%, respectively.

Table 4. Causality test results.

Null Hypothesis:	W-Stat.	Prob.
Demgo does not cause Crime	2.09	0.04
Crime does not cause Demgo	1.93	0.11
Unem does not cause Crime	2.86	0.00
Crime does not cause Unem	2.53	0.00
Growth does not cause Crime	2.74	0.00
Crime does not cause Growth	2.24	0.03
Urban does not cause Crime	4.42	0.00
Crime does not cause Urban	6.30	0.00
Unem does not cause Demgo	1.24	0.95
Demgo does not cause Unem	1.53	0.48
Growth does not cause Demgo	2.00	0.07
Demgo does not cause Growth	4.37	0.60
Urban does not cause Demgo	2.36	0.00
Demgo does not cause Urban	3.95	0.00
Unemp does not cause Growth	1.35	0.75
Growth does not cause Unemp	1.34	0.77
Urban does not cause Unemp	1.92	0.10
Unemp does not cause Urban	2.05	0.05
Urban does not cause Growth	2.45	0.00
Growth does not cause Urban	9.20	0.00

two factors are mutually exclusive. Interestingly, unemployment and democratic governance have no significant predictive impact on each other. Moreover, economic growth causes democratic governance at a 10% significance level, but there is no causality relationship from democratic governance to economic growth. A reciprocal causality relationship has been found between urbanization and democratic governance. The probable reason for this is the convergence of the wish of people to democratic development by means of globalization with urbanization[51]. The second surprising result of the study is that there is no causal relationship between unemployment and growth. The shreds of evidence presented thus far support the idea that economic growth might not create enough vacancy and unfair distribution of income[17]. There is a statistically weak relationship between urbanization and unemployment, but a significant relationship was found between growth and urbanization. The probable explanation for this is that as a result of urbanization with the globalizing world, all societies will demand and converge to democratic governance that leads to sustainable urbanization with low rates of crime [79].

Conclusion

The principal objective of this work was to investigate the socioeconomic factors affecting crime in a cross-sectional dimension. To understand the role of socioeconomic factors, Dumitrescu and Hurlin's (2012) causality analysis was performed, and stronger predictions were aimed in several ways. The data set is transnational rather than regional. This is a plus to the criminology literature by providing inclusive results containing more data than single-country investigations. Second, most of the panel studies applied

the traditional Granger causality analysis. Therefore, they neglected cross-sectional correlations. The technique of Dumitrescu and Hurlin[54] takes into account the heterogeneity across cross-sections and interdependency. Additionally, democratic governance variable introduced to the literature from common factors in government effectiveness and voice and account-ability. There are several points worth reiterating: urbanization and economic growth lead to democratic governance, but crime rates and unemployment rates do not. Even though economic growth is generally seen as a factor strongly related to unemployment, the findings of this study show that these ties disappeared. Moreover, urbanization and unemployment contribute to each other.

Policy recommendation

According to the results of our study, we can recommend the following policies. First and foremost, the way to save democracy and law from being controlled by the tyranny that ignores the minimization of social cost is only possible by building pluralist democratic institutions. With the construction of these institutions and the establishment of social justice and equality, the loss of social welfare probably will be minimized. As a consequence of these, crime rates will decrease. Second, society should have a belief that administrative actions and operations of policymakers are aimed at increasing the level of welfare by allocating credibility to institutions. Also, public participation should be ensured at the local and national levels, and the allocation of public voting power through online systems to make critical decisions for the community will have low-cost and democratic results.

The fact that a crime has been committed by other individuals does not make the society, opinion leaders, and policymakers independent of the crime committed. Instead of incarceration of criminals, building bigger prisons, hiring more policemen, policymakers should get to the root of the problem to eradicate crime. Criminal elements can be prevented before they occur. Instead of repressive and uncivilized solutions, importance should be given to crime prevention activities, and necessary post-crime rehabilitation and employment services should be provided to reintegrate criminals into society. To prevent crimes due to unemployment and economic growth, it should be considered that practices such as universal basic income and unemployment welfare support scheme could play a significant role. Will have positive effects on social welfare – provided that they do not cause a free-riders problem [29].

We should stress that these results show only causal relationships which is a limitation. Therefore, subsequent studies could apply panel vector autoregressions to see the impact of democratic governance shocks on the variables. Importantly, by using a similar study framework, the case of other countries could be considered.

Disclosure statement

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