Does the Quality of Governance Affect Crime Rates? Evidence from European Countries

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Abstract

The importance of governance quality in various spheres has been extensively documented in the relevant literature. Studies have shown that the levels of criminality are affected by the quality of government institutions and law enforcement agencies. Using the six governance indicators developed by the World Bank and unemployment rates this paper examines whether the quality of governance and unemployment affect criminal activity and crime rates. The issue at hand is examined for a panel of thirty-two European countries for which consistent data on crime rates are available. The empirical investigation spans the period 2008-2021. Findings reported herein, indicate that quality of governance does not affect crime rates in the case of Europe, with the exception of "political stability and no violence" index when it comes to the serious assaults recorded incidents.

1. Introduction

The importance of good governance for the smooth functioning of the economy and society and the quality of democracy cannot be overstated. Accumulated ample empirical evidence indicates that good quality governance exerts a positive impact on a country's economic and social life (*inter alia*: Gjaltema *et al*. 2020; Savoia and Sen, 2015; Dellepiane-Avellaneda, 2009). As stressed by Pérez-Moreno *et al*. (2020), the quality of institutions through which a state is governed, directly impacts economic performance, social cohesion, the protection of human rights, the effective administration of justice, bar undue influence on government decisions, augment the quality of public policies' formulation and their effective implementation.

Crime is an omnipresent challenge to societies. Ever since the seminal work of Becker (1968), a growing body of empirical literature has focused on how criminal activity is affected by the prevailing social and economic conditions as well as the policies that can affectively curtail it (*inter alia*: Engelen *et al*. 2016; Altindag, 2012; Buonanno and Leonida,

2009; Cebula, 2012; Kollias and Paleologou, 2012). In the latter strand of the literature, studies have examined how the performance of law enforcement agencies thwarts criminal activities and on a broader level how the quality of governance affects the levels of criminality within a society (*inter alia*: Gingerich and Oliveros, 2018; Kochel *et al*. 2013; Kollias *et al*. 2013; Soares, 2004).

Neumayer (2003) was the first to explicitly address the nexus between the quality of governance and criminality reporting findings that showed that good governance and economic policies that prop-up growth and lead to higher income can lower homicide rates. In Neumayer's steps (2003) Habibullah *et al*. (2016) and Asongu and Kodila-Tedika, (2016) have examined the association between governance and crime. The first reports findings indicating that good governance reduces crime rates in the case of Malaysia. In particular, property crime is reduced but no similar effect is detected on violent crime. The second paper, reports results showing that regulatory quality, government effectiveness, political stability, rule of law and corruption-control are important facets of governance when it comes to fighting crime and conflict in the sample of African countries used. The theme that refers to the possible nexus between governance quality and crime is taken up by the present study in an effort to offer further insights. Moreover, the nexus is examined through the use of disaggregated crime statistics that allow for a possible heterogeneous relationship between crime and governance quality that depends on the type of criminal activity. The governance – crime relationship is examined for a panel of thirty-two European countries for which consistent data on crime rates are available. The empirical estimations span the period 2008-2021. We add to the existing research by examining the relationship between good governance and crime rates in the case of Europe. To the best of our knowledge the nexus linking good governance and criminality has received little empirical scrutiny in the case of European countries. In addition to the main variables of interest, the unemployment rate is also included in the estimations given that as the findings reported in the extant literature indicate, economic conditions invariably emerge as an important explanatory factor of crime rates. To probe into the issue at hand the Generalized Method of Moments (GMM) estimators for panel Vector Autoregressive Regression (PVAR) models are used (Sigmund and Ferstl, 2001). The section that follows offers a brief descriptive presentation of the variables used to probe into the issue at hand. In section three the empirical methodology and findings are presented and discussed, while section four concludes the paper.

2. The Variables: A Descriptive Presentation

Governance is a multidimensional concept encompassing many institutional and political facets that lacks a universally accepted, standardized definition (*inter alia*: Gjaltema *et al*. 2020; Fukuyama, 2013; Treib *et al*. 2007). Indeed, as observed by Kaufmann and Kraay (2008), the many definitions of governance are also accompanied by intensely debated definitional disagreements. Nonetheless, a widely used definition in the relevant literature is the one provided by the World Bank: "*governance consists of the traditions and institutions by which authority in a country is exercised*". Moreover, in view of the multidimensionality of the concept, the World Bank includes "*…the process by which governments are selected, monitored and replaced; the capacity of the government to effectively formulate and implement sound policies; and the respect of citizens and the state for the institutions that govern economic and social interactions among them*"[1]. According to the World Bank, "*good governance entails sound public sector management (efficiency, effectiveness and economy)*

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[1] http://info.worldbank.org/governance/wgi/

and a legal framework for development (justice, respect for human rights and liberties)" (United Nations Economic and Social Council, 2006). The World Bank's six "Worldwide Governance Indicators" (henceforth WGI) that allow for the multidimensionality of governance - Voice and Accountability, Political Stability and Absence of Violence, Government Effectiveness, Regulatory Quality, Rule of Law, Control of Corruption – offer a useful framework that encompasses the multidimensionality of governance and, for our purposes here, allows the empirical investigation of the nexus between the quality of governance and levels of criminality (Habibullah *et al.* 2016; Asongu and Kodila-Tedika, 2016). The six composite governance indicators are indices of an annual frequency aimed to quantify governments' quality. They are constructed by the World Bank for 212 countries and territories and are available from 1996 onwards. Specifically, these governance indicators were developed by Kaufmann, Kraay and Zoido-Lobaton in 1999 (Williams and Siddique, 2008) and have subsequently been updated every second year, until 2002 and every year after 2002. The units in which governance is measured follow a normal distribution with a mean of zero and a standard deviation of one, in each period. They take values on a scale ranging from -2.5 to +2.5, with higher scores correspond to better outcomes, indicating higher levels of government quality (Kurtz and Schrank, 2007a, b; Williams and Siddique, 2008; Kaufmann et al., 2008). The Worldwide Governance Indicators (WGI) correspond to six basic governance concepts:

(a) Voice and accountability (VA): capturing perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media.

(b) Political stability and absence of violence (PV): measuring perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically motivated violence and terrorism.

(c) Government effectiveness (GE): capturing perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.

(d) Regulatory quality (RQ): measuring perceptions of the ability of the government to formulate and implement sound policies and regulation that permit and promote private sector development.

(e) Rule of law (RL): capturing perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular, the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.

(f) Control of corruption (CC): measuring perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption as well as "capture" of the state by elites and private interests.

A comprehensive presentation of the WGIs and the associated methodology can be found in Kauffman and Kraay (2023) as well as Kaufmann et al. (2011). Hence, for reasons of brevity we refrain from producing a similar presentation here. In addition to the WGIs, the unemployment rate is introduced in the estimations since, as has been shown in the relevant literature, it emerges as a key variable that encapsulates the prevailing socioeconomic conditions that affect crime (*inter alia*: Engelen *et al.* 2016; Altindag, 2012; Cebula, 2012; Kollias and Paleologou, 2012). The governance indicators and unemployment rate data are drawn from World Bank[2] and the disaggregated crime rates are drawn from Eurostat[3]. The

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[2] Data for governance indicators were drawn from: info.worldbank.org/governance/wgi [download 25/9/2023] and data for unemployment rates were drawn from:
https://data.worldbank.org/indicator/SL.VEM.TOTL.ZS?locations=OE [download 25/9/2023]

police-recorded offences provided by Eurostat include annual data for intentional homicides, burglaries, rapes, robberies, serious assaults, sexual assaults, sexual violence and thefts. As already noted, the period for which the models presented in the next section are estimated span the years 2008 to 2021. The choice of the time-period is solely dictated by the availability of consistent data on crime rates and evidently presents a significant limitation that needs to be allowed for when inferences are drawn from the findings yielded[4].

As can be seen from the data presented in Table 1, for the period under scrutiny, France, Spain and Cyprus are the countries with the higher average unemployment score, while, Czechia, Switzerland and Norway are the countries with the lowest average. In respect to the first government quality index "voice and accountability", Norway, Switzerland and Serbia are the countries with the higher average score, while, Cyprus, Sweden and Bulgaria are the countries with the lowest average one. When it comes to the second government quality index "political stability-no violence", higher scores are depicted for Poland, Switzerland and Norway, while lower scores are depicted for Sweden, France and Spain. With reference to the third government quality index "political stability-no violence", Switzerland, Denmark and Norway have the higher average value, while, Spain, Bulgaria and Sweden have the lower value. As for the fourth government quality index "regulatory quality", Serbia, Denmark and Poland are the countries with the higher average score, while, Sweden, Spain and Cyprus are the countries with the lowest average. In respect to fifth government quality index "rule of law", Serbia, Norway and Denmark have the higher average value, while, Sweden, Cyprus and Bulgaria have the lower one. Finally, when it comes to the sixth government quality index "control of corruption", higher scores are observed for Denmark, Serbia and Norway, while lower scores are observed for Spain, Sweden and Bulgaria.

Table 1:

Countries with the highest and lowest average score in unemployment and six governance indicators during 2008-2021

Countries with the highest unemployment average score		Countries with the lowest unemployment average score	
Country	**Score**	**Country**	**Score**
France	18.87	Czech Republic	4.75
Spain	18.85	Switzerland	4.59
Cyprus	11.72	Norway	3.70
Countries with the highest of "voice and accountability"		Countries with the lowest of "voice and accountability"	
Country	**Score**	**Country**	**Score**
Norway	1.67	Cyprus	0.51
Switzerland	1.56	Sweden	0.48
Serbia	1.55	Bulgaria	0.41
Countries with the highest of "political stability-no violence"		Countries with the lowest of "political stability-no violence"	
Country	**Score**	**Country**	**Score**
Poland	1.37	Sweden	0.25

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[3] Data for crime rates were drawn from: ec.europa.eu/Eurostat/web/crime/database [download 2/12/2023]

[4] Habibullah *et al.*, (2016) used 13 years' period in order to investigate the long-run relationship between good governance and crime rates in Malaysia.

Switzerland	1.30	France	0.12
Norway	1.23	Spain	-0.03
Countries with the highest of "government effectiveness"		**Countries with the lowest of "government effectiveness"**	
Country	**Score**	**Country**	**Score**
Switzerland	1.97	Spain	0.37
Denmark	1.96	Bulgaria	-0.01
Norway	1.87	Sweden	-0.11
Countries with the highest of "regulatory quality"		**Countries with the lowest of "regulatory quality"**	
Country	**Score**	**Country**	**Score**
Serbia	1.82	Sweden	0.54
Denmark	1.75	Spain	0.50
Poland	1.73	Cyprus	0.40
Countries with the highest of "rule of law"		**Countries with the lowest of "rule of law"**	
Country	**Score**	**Country**	**Score**
Serbia	2.01	Sweden	0.25
Norway	1.96	Cyprus	0.21
Denmark	1.92	Bulgaria	-0.10
Countries with the highest of "control of corruption"		**Countries with the lowest of "control of corruption"**	
Country	**Score**	**Country**	**Score**
Denmark	2.31	Spain	-0.03
Serbia	2.21	Sweden	-0.21
Norway	2.14	Bulgaria	-0.25

Source: World Bank

3. Data, methodology and findings

To examine the nexus between the indices presented above, unemployment and criminality we resort to the use of panel data that includes 32 countries[5] and spans the period 2008-2021. The period choice was dictated by data availability constraints. From a methodological point of view and in contrast to the aforementioned studies, this study applies Generalized Method of Moments (GMM) estimators for panel Vector Autoregressive Regression (PVAR) models (Sigmund and Ferstl, 2021). Utilizing this methodological approach, the dynamic causal linkages between governance quality, unemployment and criminality can be analyzed in a more comprehensive manner. The GMM - PVAR framework ensures the endogenous relationship among the covariates and therefore allows the elimination of potential bias generated from endogeneity. Also, another advantage of the GMM – PVAR pattern is the inclusion of lags among the dependent and independent variables. Moreover, such a modelling treatment allows for dynamic or static dependencies that may arise among the examined countries (Koop and Korobilis, 2016). In addition, it can deal with the existence of potential heterogeneity in the estimated coefficients on the variables examined (Sigmund and Ferstl, 2021).

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[5] These are: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Montenegro, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden and Switzerland.

To probe into the empirical association between the governance indices, unemployment and crime rates forty-eight different models are used to study the nexus between the covariates. Each model includes the variables: one of eight type of criminality, unemployment and one of six governance indicators. Specifically, the variables and countries included in each model are detailed in Table A1.

Sigmund and Ferstl (2021) proposed a panel vector autoregressive model (PVAR) with fixed effects based on the classical PVAR model of Holtz-Eakin *et al*. (1988). This alternative approach includes several lags, endogenous and exogenous that are predetermined and strictly variables. The fixed effects equation is expressed as:

$$\xi_{i,t} = e_i + \sum_{k=1}^{\rho} M_k\, \xi_{i,t-k} + Us_{i,t} + Sc_{i,t} + b_{i,t} \qquad (1)$$

Where $\xi_{i,t-1}$ depicts the endogenous variables whilst $s_{i,t}$ shows the predetermined (weakly) and $c_{i,t}$ displays the strictly exogenous variables at time t. By applying GMM-PVAR, we can obtain a robust approach to explore the causal linkages among governance, unemployment and criminality. The GMM-PVAR pattern has several advantages: Firstly, it guarantees the endogenous linkage among the covariates, effectively mitigating any potential bias arising from endogeneity. Secondly, the incorporation of lags in equation 2 allows for capturing both short and long-term dynamics, accommodating the complex temporal dependencies that may exist among the examined countries. Thirdly, it accommodates the possibility of heterogeneity in the estimated coefficients, accounting for variations that may arise across different contexts or regions, as emphasized by Sigmund and Ferstl (2021). Moreover, incorporating the first difference or the forward orthogonal transformation model, fixed effects can be removed. Consequently, a Generalized Method of Moments (GMM) technique can be more powerful tool than fixed effects since we can employ the coefficients as instrumentals variables. Considering this, Sigmund and Ferstl (2021) modulated and improvement Binder *et al*. (2005) estimator's by adding more lags for the endogenous, predetermined and strictly exogenous variables. As a result, equation (1) can be modified by utilizing the first difference or the forward orthogonal transformation as:

$$\Delta\xi_{i,t} = e_i + \sum_{k=1}^{\rho} M_k\, \Delta\xi_{i,t-k} + U\Delta s_{i,t} + S\Delta c_{i,t} + \Delta b_{i,t} \qquad (2)$$

Where Δ is the first difference or the forward orthogonal transformation. Governance indicators, unemployment and criminality are denoted by $\Delta\xi_{i,t}$ (lagged endogenous variables), while there are not weakly exogenous ($\Delta s_{i,t}$) and strictly exogenous variables ($\Delta c_{i,t}$) in this study. Additionally, following Luetkepohl (2005), it is reckoned the orthogonal impulse response function (OIRF) so as to capture the response among the endogenous variables. The computation function can be expressed as:

$$OIRF(p, c) = \frac{\partial x_{i,t+p}}{\partial \left(u_{i,t}\right)_c} \qquad (3)$$

In expression (3) $x_{i,t}$ is the endogenous variable (governance indices, unemployment rates and crime rates), p is the shock number of each period to the $c - th$ component of $u_{i,t}$. Luetkepohl (2005) introduced the bootstrap framework for the OIRF by estimating confidence bands. The bootstrap pattern can be used to examine the distributions of functions for a VAR model. This methodological model not only uses a VAR model but also a GMM-

PVAR. Moreover, following Kapetanios (2008), a cross-sectional bootstrap for a panel dataset is applied.

Firstly, to verify the estimation of the GMM-PVAR model are applied some typical pretests. In particular, Tables 2-9 show two of the most popular tests for panel unit root tests (Im *et al.*, 2003; Pesaran, 2007). According to tables 2-9, it is evident that all variables are stationary at 1%, 5% and 10% significance level at first difference, rejecting the null hypothesis of a unit root.

Table 2: Tests for panel unit root and cointegration - model with homicides

Variables	Pesaran (2007)-(1st difference)	Im, Pesaran and Shin (2003)-(1st difference)
Homicides	-14.436 ***	-9.8433 ***
Unemployment	-3.3994 ***	-5.6259 ***
Voice and Accountability	-5.2922 ***	-4.7689 ***
Political stability and no violence	-2.7062 *	-6.0588 ***
Government effectiveness	-2.3341 *	0.10371
Regulatory quality	-3.9817 ***	-6.6121 ***
Rule of law	-11.455 ***	-5.0122 ***
Control of corruption	-9.7854 ***	-5.319 ***

Notes: *** and ** depict significance at 1% and 5% level, respectively. The variables are integrated in first differences.

Table 3: Tests for panel unit root and cointegration - model with burglaries

Variables	Pesaran (2007)-(1st difference)	Im, Pesaran and Shin (2003)-(1st difference)
Burglaries	-6.7062 ***	-4.2444 ***
Unemployment	-1.6675 *	-5.3585 ***
Voice and Accountability	-2.3196 *	-4.6033 ***
Political stability and no violence	-25.113 ***	-5.5036 ***
Government effectiveness	-2.4656 *	0.38471
Regulatory quality	-5.7453 ***	-5.6038 ***
Rule of law	-4.3996 ***	-5.3105 ***
Control of corruption	-10.572 ***	-4.0985 ***

Notes: *** and ** depict significance at 1% and 5% level, respectively. The variables are integrated in first differences.

Table 4: Tests for panel unit root and cointegration - model with rapes

Variables	Pesaran (2007)-(1st difference)	Im, Pesaran and Shin (2003)-(1st difference)
Rapes	-1.7447 *	-1.8316 **
Unemployment	-2.034 *	-7.2112 ***
Voice and Accountability	-2.0621 *	-5.2317 ***
Political stability and no violence	-13.26 ***	-6.5522 ***
Government effectiveness	-5.0067 ***	0.32536
Regulatory quality	-0.36884 *	-5.7733 ***
Rule of law	-4.0601 ***	-5.2693 ***
Control of corruption	-9.1724 ***	-5.2075 ***

Notes: *** and ** depict significance at 1% and 5% level, respectively. The variables are integrated in first differences.

Table 5: Tests for panel unit root and cointegration - model with robberies

Variables	Pesaran (2007)-(1st difference)	Im, Pesaran and Shin (2003)-(1st difference)
Robberies	-10.093 ***	-7.0567 ***
Unemployment	-2.8943 *	-6.9606 ***
Voice and Accountability	-1.7109 *	-5.667 ***
Political stability and no violence	-0.32963 *	-6.2159 ***
Government effectiveness	-5.3944 ***	0.72133
Regulatory quality	-2.778 *	-5.847 ***
Rule of law	-3.8347 ***	-5.4546 ***
Control of corruption	-3.5325 ***	-4.9275 ***

Notes: *** and ** depict significance at 1% and 5% level, respectively. The variables are integrated in first differences.

Table 6: Tests for panel unit root and cointegration - model with serious assaults

Variables	Pesaran (2007)-(1st difference)	Im, Pesaran and Shin (2003)-(1st difference)
Serious assaults	4.1295 ***	-15.032 ***
Unemployment	-4.9775 ***	-7.0741 ***
Voice and Accountability	-2.8195 *	-5.5627 ***
Political stability and no violence	-3.2617 **	-5.5658 ***
Government effectiveness	-4.7548 ***	0.71492
Regulatory quality	-10.925 ***	-5.8773 ***
Rule of law	-5.2103 ***	-5.2141 ***
Control of corruption	-2.445 *	-5.0843 ***

Notes: *** and ** depict significance at 1% and 5% level, respectively. The variables are integrated in first differences.

Table 7: Tests for panel unit root and cointegration - model with sexual assaults

Variables	Pesaran (2007)-(1st difference)	Im, Pesaran and Shin (2003)-(1st difference)
Sexual assaults	-8.9977 ***	-4.7795***
Unemployment	-3.3175 **	-6.5153***
Voice and Accountability	-3.2318 **	-3.0633***
Political stability and no violence	-4.1722 ***	-5.9175***
Government effectiveness	-20.84 ***	-0.36627
Regulatory quality	-2 *	-4.8693***
Rule of law	-6.9291 ***	-4.2711***
Control of corruption	-2.6901 *	-5.7148***

Notes: *** and ** depict significance at 1% and 5% level, respectively. The variables are integrated in first differences.

Table 8: Tests for panel unit root and cointegration - model with sexual violence

Variables	Pesaran (2007)-(1st difference)	Im, Pesaran and Shin (2003)-(1st difference)
Sexual violence	-11.385 ***	-5.3575 ***
Unemployment	-2.2669 *	-6.4028 ***
Voice and Accountability	-1.0319 *	-3.5228 ***
Political stability and no violence	-5.8378 ***	-6.9339 ***
Government effectiveness	-4.3308 ***	-0.2183
Regulatory quality	-4.3111 ***	-5.1476 ***
Rule of law	-2.3143 *	-4.3673 ***
Control of corruption	-9.8555 ***	-6.4117 ***

Notes: *** and ** depict significance at 1% and 5% level, respectively. The variables are integrated in first differences.

Table 9: Tests for panel unit root and cointegration - model with thefts

Variables	Pesaran (2007)-(1st difference)	Im, Pesaran and Shin (2003)-(1st difference)
Thefts	-4.6972 ***	-5.4974 ***
Unemployment	-152.72 ***	-4.963 ***
Voice and Accountability	-3.3828 ***	-4.2695 ***
Political stability and no violence	-3.0205 **	-5.8925 ***
Government effectiveness	-1.88 *	-0.24828
Regulatory quality	-3.7113 ***	-6.4153 ***
Rule of law	-4.273 ***	-4.779 ***
Control of corruption	-11.387 ***	-5.1795 ***

Notes: *** and ** depict significance at 1% and 5% level, respectively. The variables are integrated in first differences.

Furthermore, we can test the stability of PVAR models using the modulus of each eigenvalue of the calculated model. The existence of stability is valid when all the eigenvalues are inside the unit circle (less than one). The decision of lag order is based on Andrews and Lu's (2001) model. There are three alternative criteria adapted from the moment selection criteria (MMSC): the MMSC-BIC (Bayesian information criterion), the MMSC-AIC (Akaike information criterion) and the MMSC-HQIC (Hannan-Quinn information criterion). In this study, it is employed the MMSC-BIC to select the lag length (Andrews and Lu, 2001; Sigmund and Ferstl, 2021; Kollias and Tzeremes, 2023). The findings disclose *p=1* for all models. Table 10 depicts Pesaran's (2004) test that estimates the cross-sectional dependence (CD). According to table 10, Pesaran's (2004) test reveals cross sectional dependence at 1% significance level.

Table 10: Tests for cross-sectional dependence

Model	Homicide	Burglary	Rape	Robbery	Serious assaults	Sexual assaults	Sexual violence	Thefts
1	42.905***	41.175***	49.976***	48.741***	46.54***	40.974***	43.331***	45.254***
2	41.627***	39.288***	47.556***	48.155***	46.92***	34.992***	39.973***	45.463***
3	42.904***	41.247***	50.149***	49.027***	47.021***	40.225***	43.177***	43.94***
4	42.800***	41.557***	49.879***	49.008***	46.96***	40.998***	43.415***	44.061***
5	42.828***	41.123***	50.134***	48.929***	47.137***	40.825***	43.338***	45.142***
6	42.943***	41.185***	50.525***	48.972***	46.837***	41.549***	43.746***	43.871***

Notes: *** and ** depict significance at 1% and 5% level, respectively. The variables are integrated in first differences.

The results yielded from the estimation of the GMM-PVAR estimation for all forty-eight models are reported in Tables 11-58 respectively. Worth noting is that all variables in all models are positively affected by their past values (-1).

Table 11: Findings for the GMM-PVAR Model 1

Variables	Homicides	Unemployment	Voice accountability
Homicides$_{(t-1)}$	0.7305 ** (0.2670)	1.3450 *** (0.2779)	-0.1050 (0.5359)
Unemployment$_{(t-1)}$	0.0200 (0.0223)	0.7415 *** (0.0638)	-0.0092 (0.0484)
Voice accountability$_{(t-1)}$	-0.5883 (1.2220)	4.8537 (2.8487)	2.3055 (4.7546)

Notes: *** and ** depict significance at 1% and 5% level, respectively.

Table 12: Findings for the GMM-PVAR Model 2

Variables	Homicides	Unemployment	Political stability-No violence
Homicides(t-1)	0.6816 ** (0.2618)	1.2570 *** (0.3196)	0.1426 (0.2636)
Unemployment(t-1)	0.0139 (0.0206)	0.7706 *** (0.0501)	-0.0062 (0.0175)
Political stability-No violence(t-1)	0.1620 (1.1080)	-0.3351 (1.5085)	0.8594 (0.7625)

Notes: *** and ** depict significance at 1% and 5% level, respectively.

Table 13: Findings for the GMM-PVAR Model 3

Variables	Homicides	Unemployment	Government Effectiveness
Homicides(t-1)	0.7510 ** (0.2560)	1.2232 *** (0.3180)	-0.0561 (0.1635)
Unemployment(t-1)	0.0122 (0.0192)	0.8010 *** (0.0540)	0.0022 (0.0086)
Government Effectiveness(t-1)	0.0629 (0.7181)	-1.6917 (2.1444)	1.0229 (0.7385)

Notes: *** and ** depict significance at 1% and 5% level, respectively.

Table 14: Findings for the GMM-PVAR Model 4

Variables	Homicides	Unemployment	Regulatory Quality
Homicides(t-1)	0.6170 * (0.3018)	1.3335 *** (0.3242)	-0.0118 (0.2852)
Unemployment(t-1)	0.0148 (0.0177)	0.7785 *** (0.0534)	-0.0025 (0.0160)
Regulatory Quality(t-1)	-0.2676 (0.6675)	1.4625 (2.1473)	0.0387 (0.9899)

Notes: *** and ** depict significance at 1% and 5% level, respectively.

Table 15: Findings for the GMM-PVAR Model 5

Variables	Homicides	Unemployment	Rule of Law
Homicides(t-1)	0.6933 * (0.3088)	1.2957 *** (0.3448)	-0.0416 (0.2462)
Unemployment(t-1)	0.0126 (0.0191)	0.7698 *** (0.0493)	0.0006 (0.0156)
Rule of Law(t-1)	0.0870 (1.0705)	2.9973 (2.2575)	0.8748 (1.5187)

Notes: *** and ** depict significance at 1% and 5% level, respectively.

Table 16: Findings for the GMM-PVAR Model 6

Variables	Homicides	Unemployment	Control of Corruption
Homicides(t-1)	0.4918 * (0.2225)	1.2229 ** (0.3981)	0.0833 (0.2579)
Unemployment(t-1)	0.0242 (0.0195)	0.7926 *** (0.0498)	-0.0063 (0.0152)
Control of Corruption(t-1)	-1.4528 (1.6264)	2.4398 (2.0036)	0.7411 (1.0477)

Notes: *** and ** depict significance at 1% and 5% level, respectively.

Table 17: Findings for the GMM-PVAR Model 7

Variables	Burglaries	Unemployment	Voice accountability
Burglaries(t-1)	0.9374 *** (0.0736)	0.0064 (0.0034)	0.0040 (0.0684)
Unemployment(t-1)	-1.5465 (2.1289)	0.6193 ** (0.2385)	-0.6542 (6.9335)
Voice accountability(t-1)	-0.0278 (0.1853)	-0.1289 (1.2099)	-0.0057 (0.0663)

Notes: *** and ** depict significance at 1% and 5% level, respectively.

Table 18: Findings for the GMM-PVAR Model 8

Variables	Burglaries	Unemployment	Political stability-No violence
Burglaries$_{(t-1)}$	0.9478 *** (0.0640)	0.0084 * (0.0037)	0.0478 (0.0415)
Unemployment$_{(t-1)}$	-0.8962 (1.8092)	0.5200 ** (0.1868)	-1.8583 (2.3001)
Political stability-No violence$_{(t-1)}$	0.0539 (0.0629)	0.1543 (0.1771)	-0.0075 (0.0076)

Notes: *** and ** depict significance at 1% and 5% level, respectively.

Table 19: Findings for the GMM-PVAR Model 9

Variables	Burglaries	Unemployment	Government Effectiveness
Burglaries$_{(t-1)}$	0.8930 *** (0.0863)	0.0043 (0.0046)	0.0303 (0.1477)
Unemployment$_{(t-1)}$	-0.2060 (1.9257)	0.7375 (0.4009)	-1.0378 (9.7479)
Government Effectiveness$_{(t-1)}$	-0.0078 (0.0618)	-0.1779 (1.8899)	-0.0255 (0.2407)

Notes: *** and ** depict significance at 1% and 5% level, respectively.

Table 20: Findings for the GMM-PVAR Model 10

Variables	Burglaries	Unemployment	Regulatory Quality
Burglaries$_{(t-1)}$	0.9381 *** (0.0750)	0.0039 (0.0073)	0.0074 (0.1027)
Unemployment$_{(t-1)}$	-1.2555 (2.1269)	0.8931 (0.5957)	1.1294 (7.7145)
Regulatory Quality$_{(t-1)}$	0.0312 (0.1075)	0.5717 (3.7388)	0.0072 (0.0284)

Notes: *** and ** depict significance at 1% and 5% level, respectively.

Table 21: Findings for the GMM-PVAR Model 11

Variables	Burglaries	Unemployment	Rule of Law
Burglaries$_{(t-1)}$	0.9258 *** (0.0825)	0.0064 * (0.0027)	0.0132 (0.0299)
Unemployment$_{(t-1)}$	-1.5880 (1.7390)	0.6539 *** (0.1437)	-0.0846 (0.1124)
Rule of Law$_{(t-1)}$	-0.0117 (0.0126)	0.0581 (0.0569)	-0.0009 (0.0011)

Notes: *** and ** depict significance at 1% and 5% level, respectively.

Table 22: Findings for the GMM-PVAR Model 12

Variables	Burglaries	Unemployment	Control of Corruption
Burglaries$_{(t-1)}$	0.9304 *** (0.0789)	0.0082 * (0.0041)	-0.0186 (0.0487)
Unemployment$_{(t-1)}$	-1.4026 (1.8854)	0.5267 * (0.2368)	3.0057 (4.4736)
Control of Corruption$_{(t-1)}$	0.1580 (0.2354)	0.9131 (1.3709)	0.1345 (0.1986)

Notes: *** and ** depict significance at 1% and 5% level, respectively.

Table 23: Findings for the GMM-PVAR Model 13

Variables	Rapes	Unemployment	Voice accountability
Rapes$_{(t-1)}$	0.8334 *** (0.1552)	-0.0956 * (0.0471)	0.0037 (0.4560)
Unemployment$_{(t-1)}$	-0.0964 (0.0738)	0.7327 *** (0.0822)	0.0777 (0.4339)
Voice accountability$_{(t-1)}$	1.2899 (4.6258)	7.3771 (4.8495)	-0.1653 (29.8567)

Notes: *** and ** depict significance at 1% and 5% level, respectively.

Table 24: Findings for the GMM-PVAR Model 14

Variables	Rapes	Unemployment	Political stability-No violence
Rapes$_{(t-1)}$	0.8379 *** (0.1495)	-0.0890 * (0.0354)	-0.0185 (0.0620)
Unemployment$_{(t-1)}$	-0.0891 (0.0712)	0.7518 *** (0.0709)	-0.0107 (0.0795)
Political stability-No violence$_{(t-1)}$	-0.1548 (2.2811)	-0.2691 (1.9614)	1.2394 (2.2860)

Notes: *** and ** depict significance at 1% and 5% level, respectively.

Table 25: Findings for the GMM-PVAR Model 15

Variables	Rapes	Unemployment	Government Effectiveness
Rapes$_{(t-1)}$	0.8478 *** (0.1528)	-0.0812 * (0.0371)	0.0272 (0.0643)
Unemployment$_{(t-1)}$	-0.0843 (0.0777)	0.7633 *** (0.0680)	0.0491 (0.1228)
Government Effectiveness$_{(t-1)}$	-1.5235 (2.0067)	-1.2320 (1.5239)	0.8628 (3.5874)

Notes: *** and ** depict significance at 1% and 5% level, respectively.

Table 26: Findings for the GMM-PVAR Model 16

Variables	Rapes	Unemployment	Regulatory Quality
Rapes$_{(t-1)}$	0.8388 *** (0.1509)	-0.0795 (0.0480)	-0.0184 (0.1442)
Unemployment$_{(t-1)}$	-0.1081 (0.0939)	0.7800 *** (0.0732)	-0.0257 (0.2175)
Regulatory Quality$_{(t-1)}$	-3.7563 (3.9576)	3.9754 (2.4984)	-0.8234 (4.2929)

Notes: *** and ** depict significance at 1% and 5% level, respectively.

Table 27: Findings for the GMM-PVAR Model 17

Variables	Rapes	Unemployment	Rule of Law
Rapes$_{(t-1)}$	0.8505 *** (0.1537)	-0.1008 ** (0.0375)	0.0030 (0.1523)
Unemployment$_{(t-1)}$	-0.0750 (0.0806)	0.7616 *** (0.0672)	0.0189 (0.2257)
Rule of Law$_{(t-1)}$	-1.0392 (4.2868)	4.2398 (2.3554)	1.2091 (8.7507)

Notes: *** and ** depict significance at 1% and 5% level, respectively.

Table 28: Findings for the GMM-PVAR Model 18

Variables	Rapes	Unemployment	Control of Corruption
Rapes$_{(t-1)}$	0.8437 *** (0.1511)	-0.0779 * (0.0361)	0.0059 (0.1191)
Unemployment$_{(t-1)}$	-0.0714 (0.0752)	0.7766 *** (0.0777)	-0.0011 (0.1993)
Control of Corruption$_{(t-1)}$	-4.6731 (3.6806)	0.8645 (1.7043)	-0.0944 (1.8239)

Notes: *** and ** depict significance at 1% and 5% level, respectively.

Table 29: Findings for the GMM-PVAR Model 19

Variables	Robberies	Unemployment	Voice accountability
Robberies$_{(t-1)}$	1.0197 *** (0.0414)	0.0418 ** (0.0128)	0.0131 (0.0365)
Unemployment$_{(t-1)}$	-0.4981 * (0.2471)	0.6673 *** (0.0682)	-0.0470 (0.3383)
Voice accountability$_{(t-1)}$	20.0410 (16.4413)	3.7025 (4.1364)	-1.6699 (1.3205)

Notes: *** and ** depict significance at 1% and 5% level, respectively.

Table 30: Findings for the GMM-PVAR Model 20

Variables	Robberies	Unemployment	Political stability-No violence
Robberies(t-1)	1.0399 *** (0.0353)	0.0474 *** (0.0112)	0.0059 (0.0147)
Unemployment(t-1)	-0.5226 * (0.2594)	0.6389 *** (0.0738)	-0.0700 (0.2107)
Political stability-No violence(t-1)	-6.0580 (9.4859)	-1.0705 (1.5750)	1.0555 (4.9916)

Notes: *** and ** depict significance at 1% and 5% level, respectively.

Table 31: Findings for the GMM-PVAR Model 21

Variables	Robberies	Unemployment	Government Effectiveness
Robberies(t-1)	1.0314 *** (0.0356)	0.0447 *** (0.0105)	-0.0059 (0.0119)
Unemployment(t-1)	-0.3646 * (0.2602)	0.7215 *** (0.0816)	-0.0805 (0.1476)
Government Effectiveness(t-1)	-2.1540 (8.7209)	-4.4567 (2.9157)	-0.9049 (3.4452)

Notes: *** and ** depict significance at 1% and 5% level, respectively.

Table 32: Findings for the GMM-PVAR Model 22

Variables	Robberies	Unemployment	Regulatory Quality
Robberies(t-1)	1.0342 *** (0.0535)	0.0438 *** (0.0132)	0.0080 (0.0217)
Unemployment(t-1)	-0.4878 (0.4043)	0.6791 *** (0.0814)	-0.0508 (0.1821)
Regulatory Quality(t-1)	4.0868 (12.2954)	1.3793 (2.7333)	-3.1172 (8.0572)

Notes: *** and ** depict significance at 1% and 5% level, respectively.

Table 33: Findings for the GMM-PVAR Model 23

Variables	Robberies	Unemployment	Rule of Law
Robberies$_{(t-1)}$	1.0270 *** (00434)	0.0442 *** (0.0127)	0.0079 (0.0254)
Unemployment$_{(t-1)}$	-0.4139 (0.2264)	0.6784 *** (0.0696)	-0.0088 (0.3348)
Rule of Law$_{(t-1)}$	7.4195 (9.0875)	2.0093 (2.7696)	-3.0636 (7.8387)

Notes: *** and ** depict significance at 1% and 5% level, respectively.

Table 34: Findings for the GMM-PVAR Model 24

Variables	Robberies	Unemployment	Control of Corruption
Robberies$_{(t-1)}$	1.0438 *** (0.0311)	0.0491 *** (0.0136)	-0.0067 (0.0167)
Unemployment$_{(t-1)}$	-0.4536 (0.2127)	0.6564 *** (0.0762)	0.1089 (0.1743)
Control of Corruption$_{(t-1)}$	2.2920 (8.8148)	1.1991 (2.0063)	-0.4402 (5.8714)

Notes: *** and ** depict significance at 1% and 5% level, respectively.

Table 35: Findings for the GMM-PVAR Model 25

Variables	Serious assaults	Unemployment	Voice accountability
Serious assaults$_{(t-1)}$	0.5216 ** (0.1658)	0.0088 (0.0045)	-0.0024 (0.0105)
Unemployment$_{(t-1)}$	-0.9845 (0.6990)	0.8090 *** (0.0532)	0.0176 (0.1561)
Voice accountability$_{(t-1)}$	-0.8840 (0.8776)	5.4256 (5.4170)	0.2334 (0.2325)

Notes: *** and ** depict significance at 1% and 5% level, respectively.

Table 36: Findings for the GMM-PVAR Model 26

Variables	Serious assaults	Unemployment	Political stability-No violence
Serious assaults(t-1)	0.5292 *** (0.1545)	0.0089 * (0.0035)	-0.0001 (0.0090)
Unemployment(t-1)	-0.5949 (0.6825)	0.7704 *** (0.0623)	-0.0991 (0.2073)
Political stability-No violence(t-1)	23.8574 * (11.9362)	-0.2455 (1.7807)	1.5123 (0.7228)

Notes: *** and ** depict significance at 1% and 5% level, respectively.

Table 37: Findings for the GMM-PVAR Model 27

Variables	Serious assaults	Unemployment	Government Effectiveness
Serious assaults(t-1)	0.5273 *** (0.1569)	0.0096 * (0.0047)	-0.0001 (0.0033)
Unemployment(t-1)	-1.0251 (0.6947)	0.7874 *** (0.0717)	0.0237 (0.2396)
Government Effectiveness(t-1)	0.6738 (18.0177)	-0.9799 (1.4832)	-0.4369 (8.1720)

Notes: *** and ** depict significance at 1% and 5% level, respectively.

Table 38: Findings for the GMM-PVAR Model 28

Variables	Serious assaults	Unemployment	Regulatory Quality
Serious assaults(t-1)	0.5264 *** (0.1562)	0.0091 * (0.0045)	-0.0021 (0.0115)
Unemployment(t-1)	-0.9059 (0.7562)	0.8480 *** (0.0618)	0.0340 (0.1204)
Regulatory Quality(t-1)	2.2695 (18.1151)	3.7906 * (1.8378)	-0.0807 (5.5165)

Notes: *** and ** depict significance at 1% and 5% level, respectively.

Table 39: Findings for the GMM-PVAR Model 29

Variables	Serious assaults	Unemployment	Rule of Law
Serious assaults(t-1)	0.5265 *** (0.1544)	0.0095 * (0.0048)	0.0012 (0.0156)
Unemployment(t-1)	-1.0445 (0.8389)	0.8065 *** (0.0469)	-0.0243 (0.3208)
Rule of Law(t-1)	-0.2009 (0.1373)	3.8336 (2.6325)	-0.0459 (0.0305)

Notes: *** and ** depict significance at 1% and 5% level, respectively.

Table 40: Findings for the GMM-PVAR Model 30

Variables	Serious assaults	Unemployment	Control of Corruption
Serious assaults(t-1)	0.5262 *** (0.1529)	0.0106 * (0.0048)	0.0018 (0.0094)
Unemployment(t-1)	-1.0219 (0.6873)	0.8129 *** (0.0388)	-0.0182 (0.0811)
Control of Corruption(t-1)	-2.6863 (13.2810)	1.5479 (1.6892)	-0.1714 (0.9312)

Notes: *** and ** depict significance at 1% and 5% level, respectively.

Table 41: Findings for the GMM-PVAR Model 31

Variables	Sexual assaults	Unemployment	Voice accountability
Sexual assaults(t-1)	0.6395 *** (0.1107)	0.0493 (0.0711)	0.2609 (0.3802)
Unemployment(t-1)	-0.2829 (0.1223)	0.8148 *** (0.1125)	-0.0075 (0.4182)
Voice accountability(t-1)	14.0097 (16.3949)	2.9509 (5.3745)	-0.2286 (0.4624)

Notes: *** and ** depict significance at 1% and 5% level, respectively.

Table 42: Findings for the GMM-PVAR Model 32

Variables	Sexual assaults	Unemployment	Political stability-No violence
Sexual assaults(t-1)	0.6164 *** (0.1123)	0.0593 (0.0518)	0.1104 (0.1862)
Unemployment(t-1)	-0.2451 (0.1488)	0.8758 *** (0.1603)	0.1231 (0.3985)
Political stability-No violence(t-1)	2.2164 (5.4425)	-2.2267 (3.1421)	9.4701 (20.9146)

Notes: *** and ** depict significance at 1% and 5% level, respectively.

Table 43: Findings for the GMM-PVAR Model 33

Variables	Sexual assaults	Unemployment	Government Effectiveness
Sexual assaults(t-1)	0.5863 ** (0.2236)	0.0609 (0.1057)	-0.1999 (0.9392)
Unemployment(t-1)	-0.3006 * (0.1352)	0.8075 *** (0.1014)	0.0299 (0.4629)
Government Effectiveness(t-1)	-7.4112 (14.6373)	1.1446 (7.0346)	-15.3582 (55.2766)

Notes: *** and ** depict significance at 1% and 5% level, respectively.

Table 44: Findings for the GMM-PVAR Model 34

Variables	Sexual assaults	Unemployment	Regulatory Quality
Sexual assaults(t-1)	0.6720 *** (0.1285)	0.0317 (0.0519)	0.2835 (0.3953)
Unemployment(t-1)	-0.3339 ** (0.1295)	0.8145 *** (0.0973)	0.5039 (1.1143)
Regulatory Quality(t-1)	-0.9206 (8.9498)	7.7218 (8.2361)	-20.8671 (47.1349)

Notes: *** and ** depict significance at 1% and 5% level, respectively.

Table 45: Findings for the GMM-PVAR Model 35

Variables	Sexual assaults	Unemployment	Rule of Law
Sexual assaults(t-1)	0.6148 *** (0.1433)	0.0830 (0.0603)	-0.0034 (0.5247)
Unemployment(t-1)	-0.2858 (0.1621)	0.8270 *** (0.0946)	0.0526 (0.3200)
Rule of Law(t-1)	-0.8187 (7.9588)	4.5923 (4.8823)	0.0533 (0.1372)

Notes: *** and ** depict significance at 1% and 5% level, respectively.

Table 46: Findings for the GMM-PVAR Model 36

Variables	Sexual assaults	Unemployment	Control of Corruption
Sexual assaults(t-1)	0.6239 *** (0.1358)	0.0834 (0.0743)	-0.1747 (0.5679)
Unemployment(t-1)	-0.2424 (0.1340)	0.8506 *** (0.1267)	0.0658 (0.3322)
Control of Corruption(t-1)	0.7176 (9.5274)	5.2711 (6.9843)	-6.8971 (32.9616)

Notes: *** and ** depict significance at 1% and 5% level, respectively.

Table 47: Findings for the GMM-PVAR Model 37

Variables	Sexual violence	Unemployment	Voice accountability
Sexual violence(t-1)	0.7366 *** (0.1467)	-0.0109 (0.0306)	-0.0472 (0.5500)
Unemployment(t-1)	-0.3737 * (0.1556)	0.7963 *** (0.1051)	0.2543 (1.6031)
Voice accountability(t-1)	8.3592 (13.1658)	6.4890 (5.1415)	-0.0084 (0.4160)

Notes: *** and ** depict significance at 1% and 5% level, respectively.

Table 48: Findings for the GMM-PVAR Model 38

Variables	Sexual violence	Unemployment	Political stability-No violence
Sexual violence(t-1)	0.7304 *** (0.1886)	-0.0155 (0.0622)	0.4745 (0.5144)
Unemployment(t-1)	-0.3424 * (0.1633)	0.7562 *** (0.2257)	1.6246 (1.7060)
Political stability-No violence(t-1)	0.2970 (6.0528)	-1.5138 (2.5865)	-14.8084 (22.1236)

Notes: *** and ** depict significance at 1% and 5% level, respectively.

Table 49. Findings for the GMM-PVAR Model 39

Variables	Sexual violence	Unemployment	Government Effectiveness
Sexual violence(t-1)	0.8169 *** (0.1607)	0.0249 (0.1201)	-0.1570 (0.2332)
Unemployment(t-1)	-0.2735 (0.2669)	0.8818 ** (0.2974)	-0.1493 (0.6096)
Government Effectiveness(t-1)	-4.3185 (6.1848)	1.1561 (9.1528)	-17.9648 (45.6178)

Notes: *** and ** depict significance at 1% and 5% level, respectively.

Table 50: Findings for the GMM-PVAR Model 40

Variables	Sexual violence	Unemployment	Regulatory Quality
Sexual violence(t-1)	0.7384 *** (0.1681)	0.0032 (0.0925)	-0.0588 (0.5807)
Unemployment(t-1)	-0.4081 (0.2543)	0.8178 *** (0.1761)	-0.4062 (2.8551)
Regulatory Quality(t-1)	-4.5691 (19.1644)	3.5319 (9.1038)	3.7473 (39.6801)

Notes: *** and ** depict significance at 1% and 5% level, respectively.

Table 51: Findings for the GMM-PVAR Model 41

Variables	Sexual violence	Unemployment	Rule of Law
Sexual violence(t-1)	0.7286 *** (0.1871)	0.0240 (0.0400)	-0.0975 (0.1860)
Unemployment(t-1)	-0.3893 * (0.1828)	0.8605 *** (0.1202)	-0.0863 (0.6287)
Rule of Law(t-1)	0.1805 (6.6621)	3.7829 (2.7223)	-0.0865 (0.1675)

Notes: *** and ** depict significance at 1% and 5% level, respectively.

Table 52: Findings for the GMM-PVAR Model 42

Variables	Sexual violence	Unemployment	Control of Corruption
Sexual violence(t-1)	0.7599 *** (0.1589)	0.0111 (0.0371)	-0.2159 (0.5577)
Unemployment(t-1)	-0.2942 (0.1943)	0.8469 *** (0.1010)	-0.5468 (1.4620)
Control of Corruption(t-1)	-4.6893 (16.7689)	3.0105 (3.0520)	-6.7760 (32.3789)

Notes: *** and ** depict significance at 1% and 5% level, respectively.

Table 53: Findings for the GMM-PVAR Model 43

Variables	Thefts	Unemployment	Voice accountability
Thefts(t-1)	1.0283 *** (0.0274)	0.0031 (0.0042)	0.0231 (0.0307)
Unemployment(t-1)	-0.0432 (0.1306)	0.3638 (1.0295)	0.0183 (0.0522)
Voice accountability(t-1)	0.0004 (0.0009)	0.0008 (0.0019)	0.0000 (0.0000)

Notes: *** and ** depict significance at 1% and 5% level, respectively.

Table 54: Findings for the GMM-PVAR Model 44

Variables	Thefts	Unemployment	Political stability-No violence
Thefts(t-1)	1.0328 *** (0.0353)	0.0064 (0.0051)	0.0157 (0.0423)
Unemployment(t-1)	0.7801 (6.6459)	-0.2605 (1.0518)	-0.0559 (0.4452)
Political stability-No violence(t-1)	-0.0214 (0.1907)	-0.0946 (0.8151)	-0.0038 (0.0291)

Notes: *** and ** depict significance at 1% and 5% level, respectively.

Table 55: Findings for the GMM-PVAR Model 45

Variables	Thefts	Unemployment	Government Effectiveness
Thefts(t-1)	1.0193 *** (0.0297)	0.0011 (0.0044)	0.0135 (0.0206)
Unemployment(t-1)	4.3956 (5.2046)	0.8700 (0.9857)	-0.6454 (0.7429)
Government Effectiveness(t-1)	0.0649 (0.0701)	0.2271 (0.2502)	-0.0354 (0.0408)

Notes: *** and ** depict significance at 1% and 5% level, respectively.

Table 56: Findings for the GMM-PVAR Model 46

Variables	Thefts	Unemployment	Regulatory Quality
Thefts(t-1)	1.0335 *** (0.0346)	0.0058 (0.0044)	0.0229 (0.0202)
Unemployment(t-1)	-3.0140 (5.3593)	0.0496 (1.0053)	0.0177 (0.0308)
Regulatory Quality(t-1)	-0.0310 (0.0552)	0.0661 (0.1160)	0.0014 (0.0025)

Notes: *** and ** depict significance at 1% and 5% level, respectively.

Table 57: Findings for the GMM-PVAR Model 47

Variables	Thefts	Unemployment	Rule of Law
Thefts(t-1)	1.0270 *** (0.0276)	0.0006 (0.0053)	0.0032 (0.0339)
Unemployment(t-1)	0.1456 (0.1618)	0.9971 (1.1225)	0.0509 (0.0573)
Rule of Law(t-1)	0.0068 (0.0077)	-0.0257 (0.0291)	0.0049 (0.0055)

Notes: *** and ** depict significance at 1% and 5% level, respectively.

Table 58: Findings for the GMM-PVAR Model 48

Variables	Thefts	Unemployment	Control of Corruption
Thefts(t-1)	1.0287 *** (0.0253)	0.0002 (0.0020)	0.0057 (0.0140)
Unemployment(t-1)	0.1034 (0.0652)	1.0730 (0.6905)	-0.0557 (0.0358)
Control of Corruption(t-1)	-0.0016 (0.0011)	0.0309 (0.0199)	-0.0013 (0.0009)

Notes: *** and ** depict significance at 1% and 5% level, respectively.

As a first broad observation, the results are inconsistent with the empirical association between criminality and governance. In all estimated models, the six variables – governance indicators – that are used interchangeably as measures of countries' governance quality do not display any statistically significant association with any other type of criminality in the case of European countries, with the exception of "political stability and no violence" index with the type of serious assaults. These findings suggest that while governance quality may create favorable conditions of living, it does not guarantee the reduction of criminality. Especially, the findings reported herein are inconsistent with the work of scholars such as Asongu and Andres (2013); Asongu and Kodila-Tedika (2013); Habibullah et al. (2016); Neumayer (2003). Their findings suggest a dampening effect on criminality (Table 59). Overall, it appears that the results, unexpectedly, do not offer any support in favor of the quality governance-criminality nexus. Nor do the results support the hypothesis that better governance reduces criminality.

Table 59: Summary of papers examining the relationship between governance quality and criminality

Author/Authors	Year	Research range	Type of crime	Basic finding
Asongu and Andres	2013	International	Software piracy	Negative effect for the most indices
Asongu and Kodila-Tedika	2013	International	Total crimes	Negative effect for the most indices
Habibullah et al.	2016	National	Property and violent crimes	Negative effect on property crimes
Neumayer	2003	International	Homicides	Negative effect

However, the results support the hypothesis that unemployment increases criminality. In the case of the unemployment rate, the estimations indicate the presence of a strong, statistically significant connection. As seen in all tables, the unemployment exerts a powerful positive influence on the levels of crimes. In other words, as countries' level of unemployment decreases, the rates of criminality also decreases. The next step in this empirical analysis is the stability tests. The stability of the forty-eight models is confirmed in Figure 1 since the dots (variables) are inside the unit circle.

Figure 1: Stability tests for 48 models

Model 15	Model 16
Roots of the companion matrix	Roots of the companion matrix
Model 17	Model 18
Roots of the companion matrix	Roots of the companion matrix
Model 19	Model 20
Roots of the companion matrix	Roots of the companion matrix

Model 21

Roots of the companion matrix

Model 22

Roots of the companion matrix

Model 23

Roots of the companion matrix

Model 24

Roots of the companion matrix

Model 25

Roots of the companion matrix

Model 26

Roots of the companion matrix

Model 33

Roots of the companion matrix

Model 34

Roots of the companion matrix

Model 35

Roots of the companion matrix

Model 36

Roots of the companion matrix

Model 37

Roots of the companion matrix

Model 38

Roots of the companion matrix

Model 39

Model 40

Model 41

Model 42

Model 43

Model 44

Additionally, Figure 2 illustrates the generalized impulse response functions (GIRF) with 5% error bands. The GIRFs presented show the causal associations between the variables used in the estimation of each model. Furthermore, they depict the reaction of one variable if there is a shock from another variable. This shock has a short run force, eight quarters, whilst the confidence bands are shown by the shaded space. Regarding Figure 2, it can be observed that each variable cannot affect the other two, nor can it be affected by their past values.
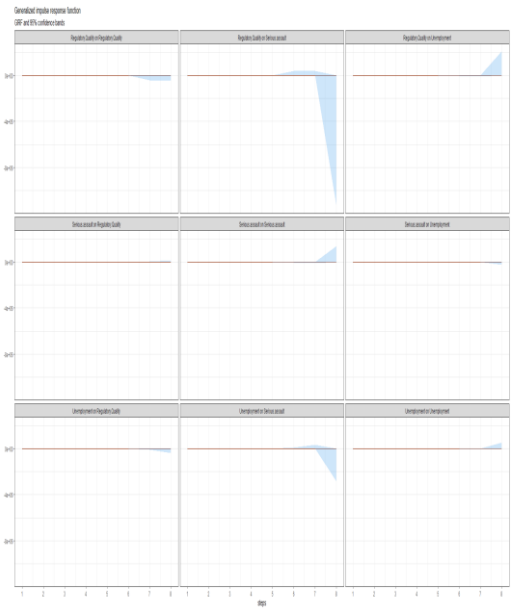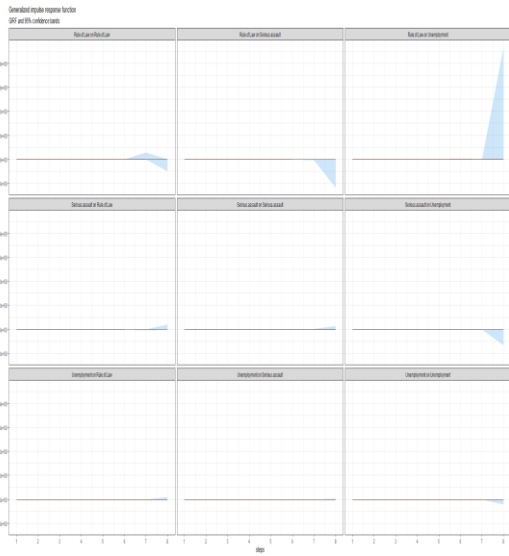
**Figure 2:** GIRF for 48 models
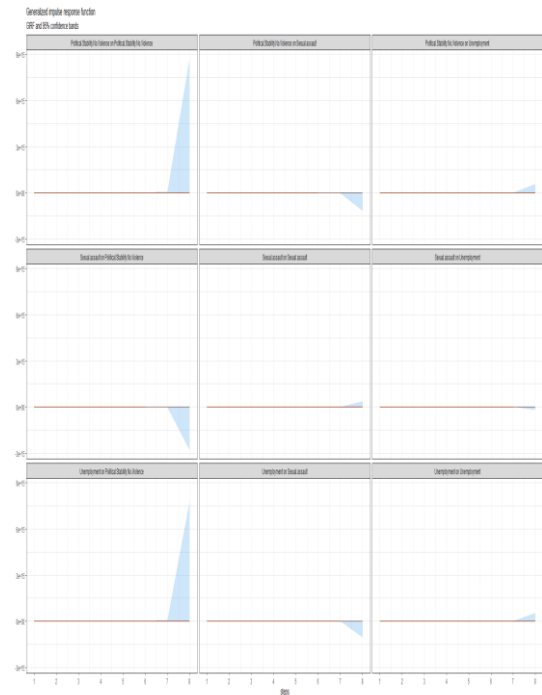
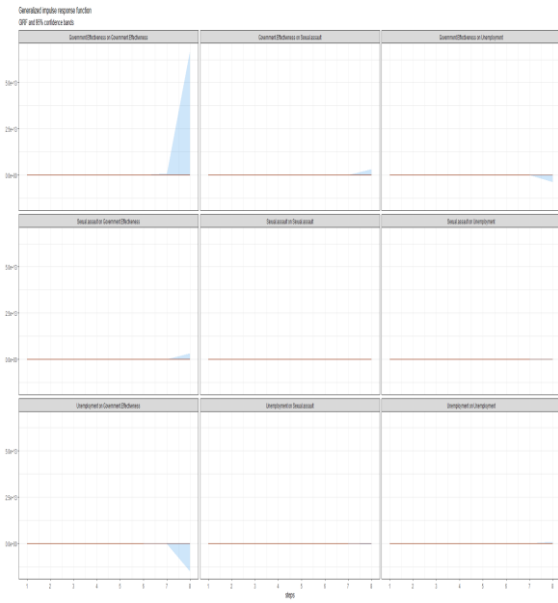GIRF Model 5

GIRF Model 6

GIRF Model 7
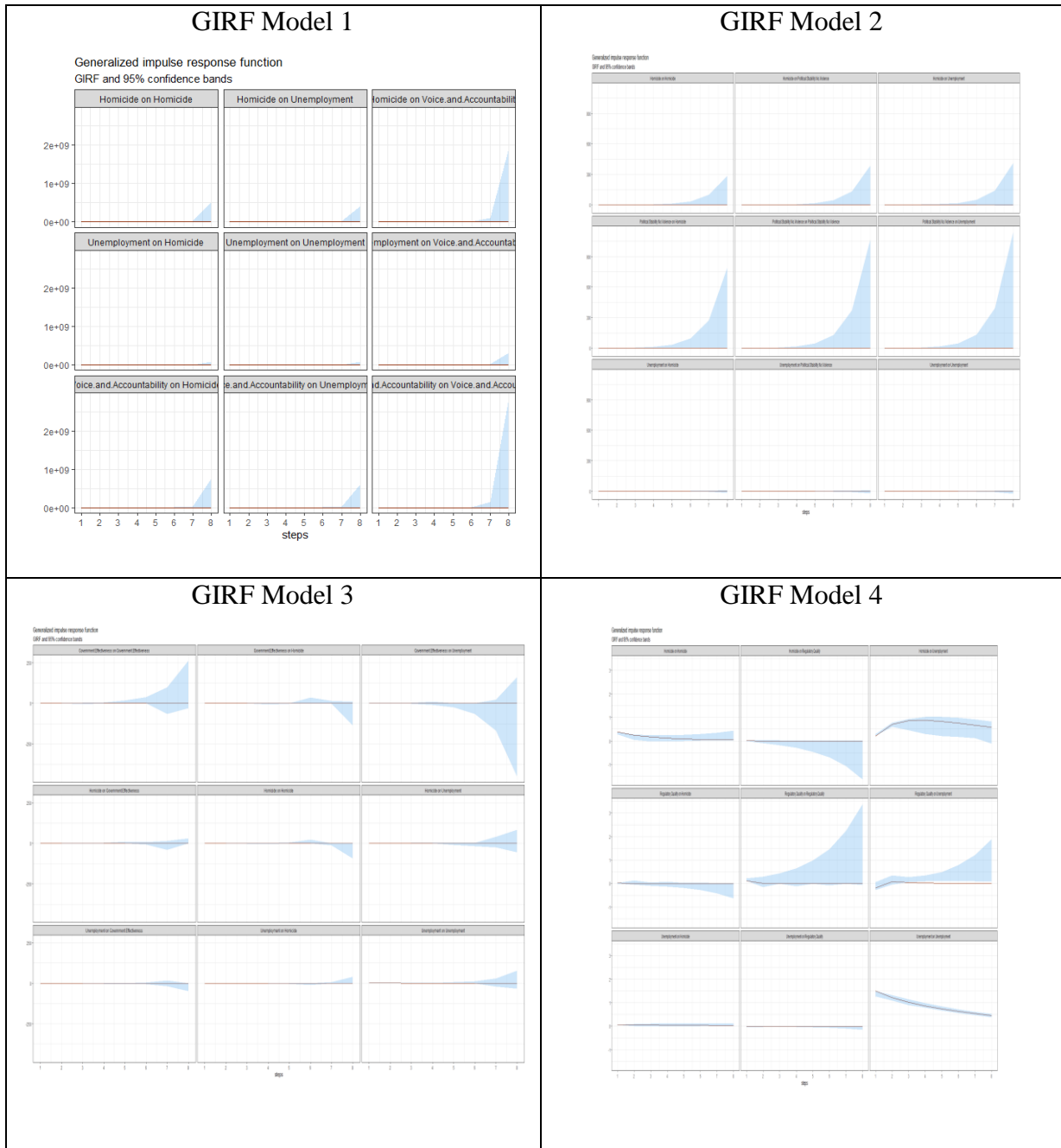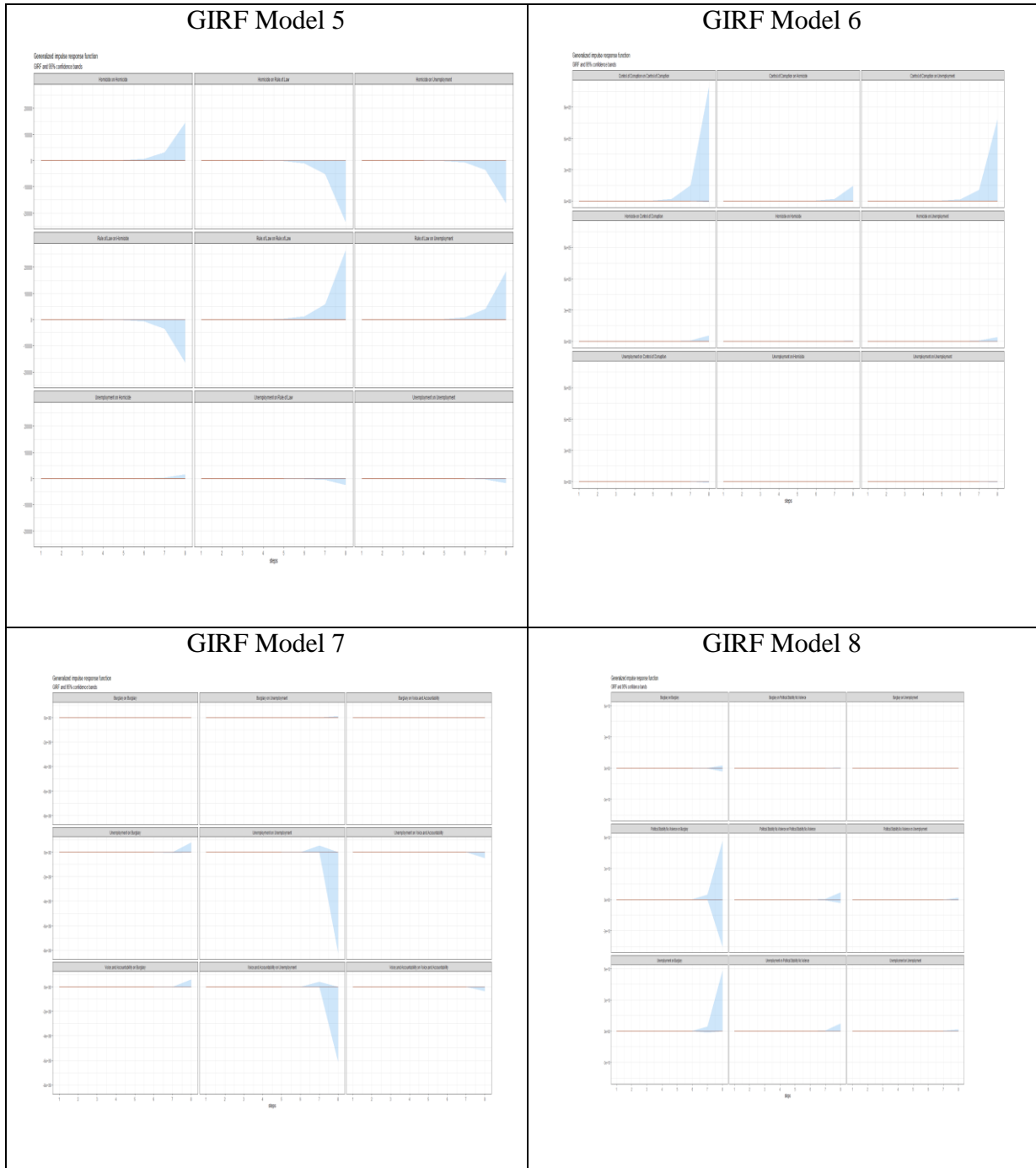
GIRF Model 8
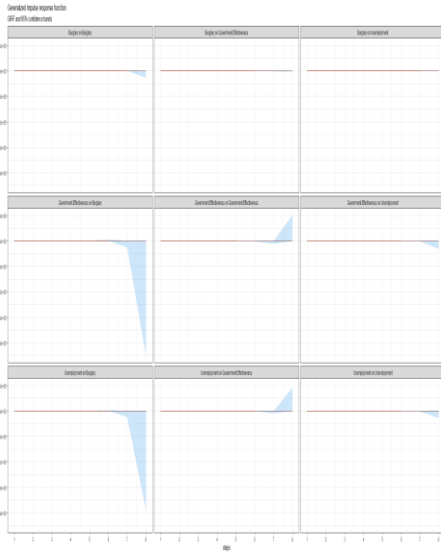
GIRF Model 9	GIRF Model 10
GIRF Model 11	GIRF Model 12
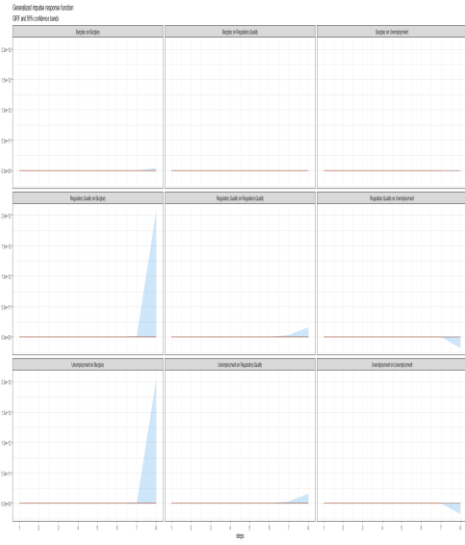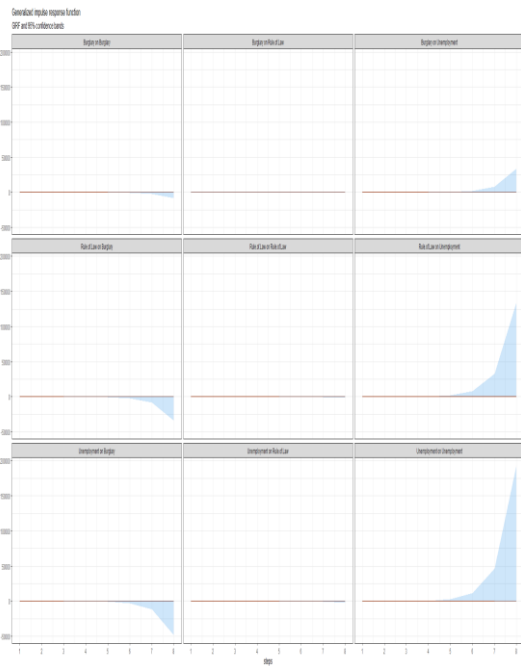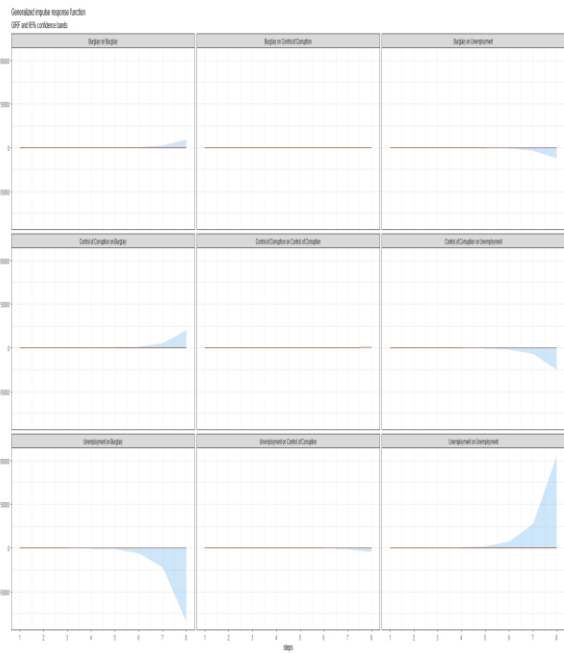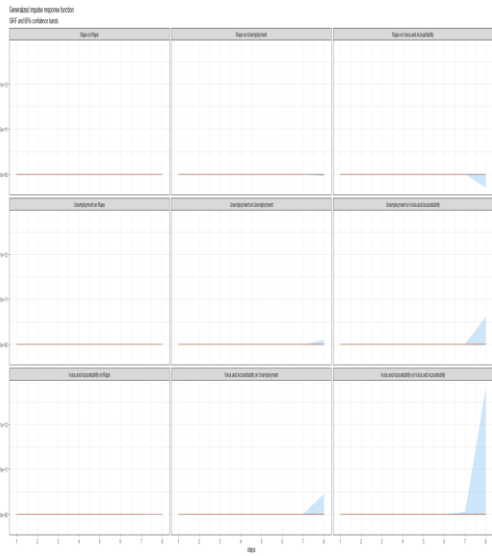
GIRF Model 13	GIRF Model 14
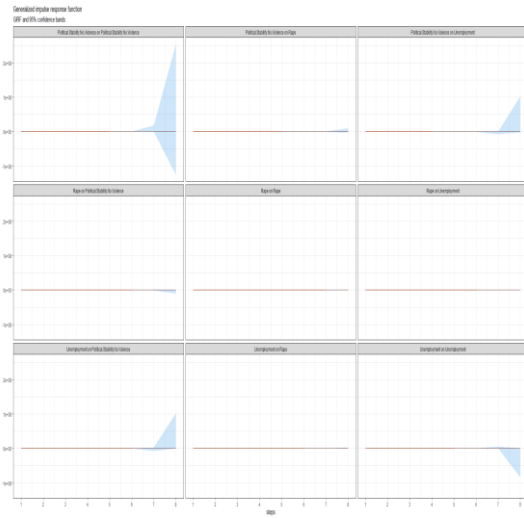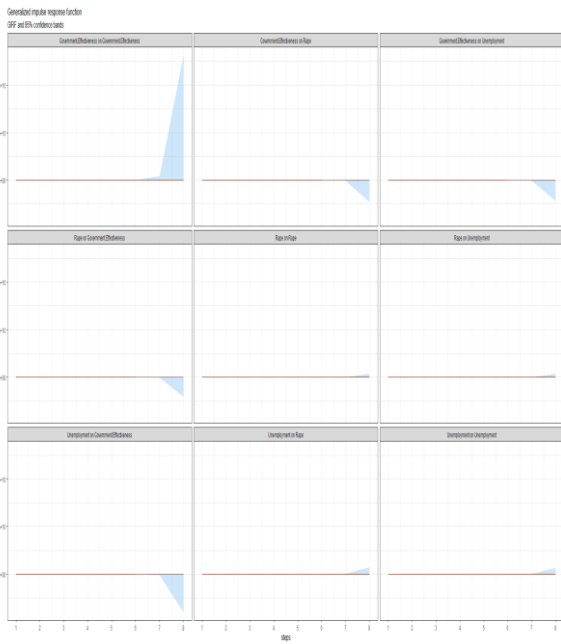
GIRF Model 15	GIRF Model 16
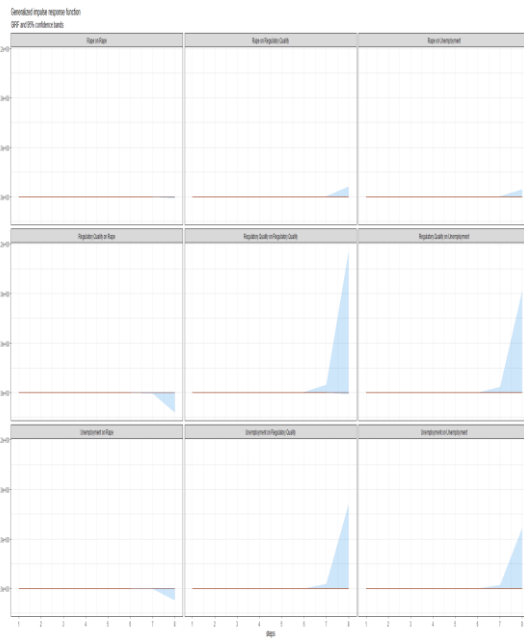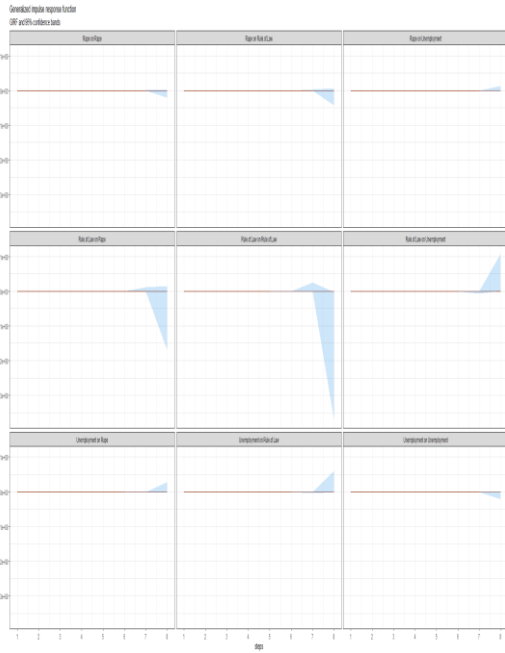
GIRF Model 17	GIRF Model 18
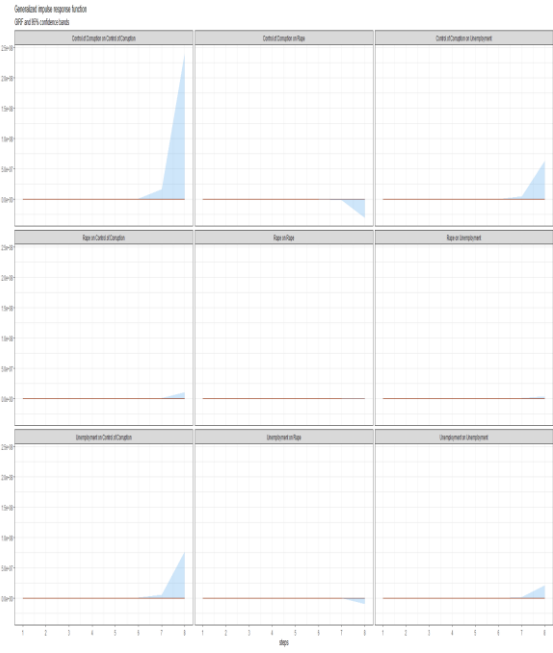
GIRF Model 19	GIRF Model 20
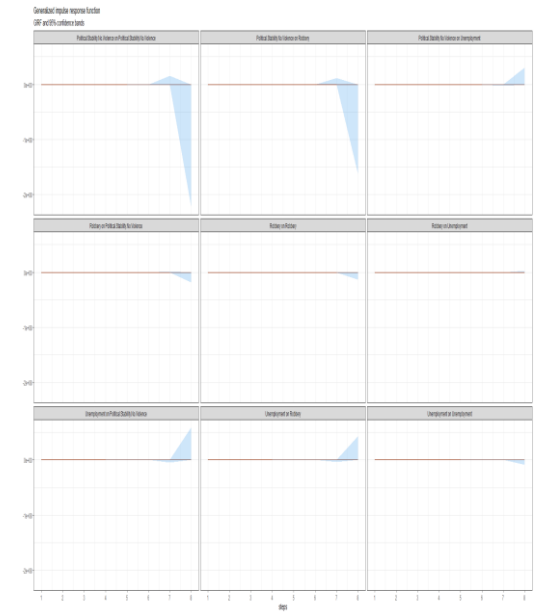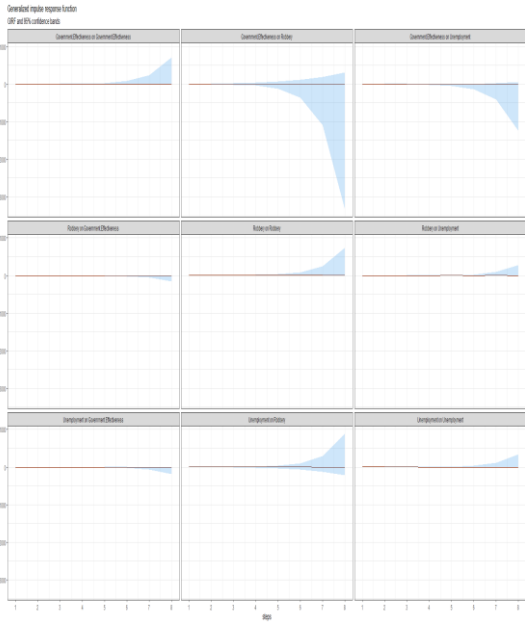
GIRF Model 21	GIRF Model 22
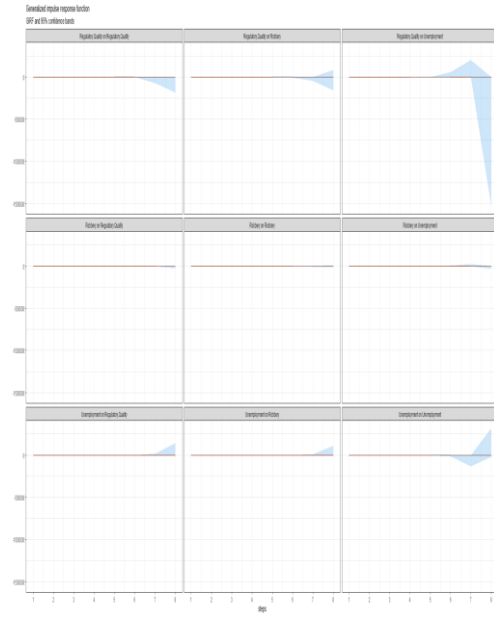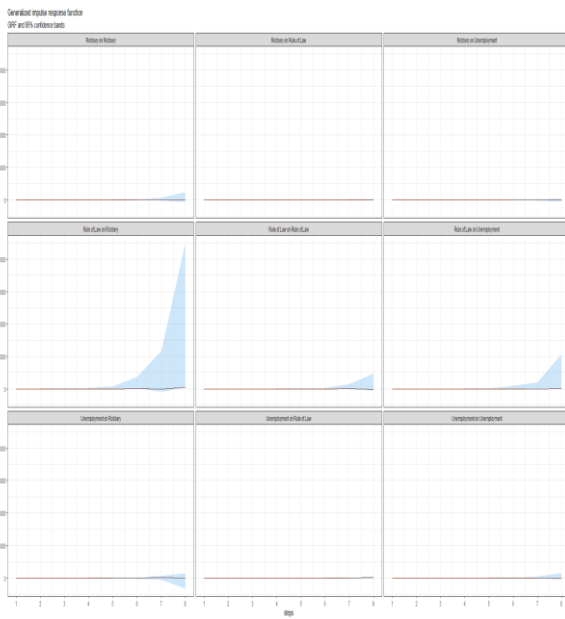
GIRF Model 23	GIRF Model 24
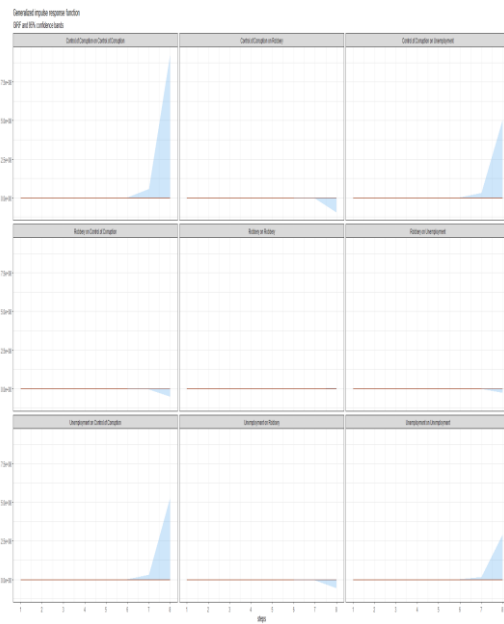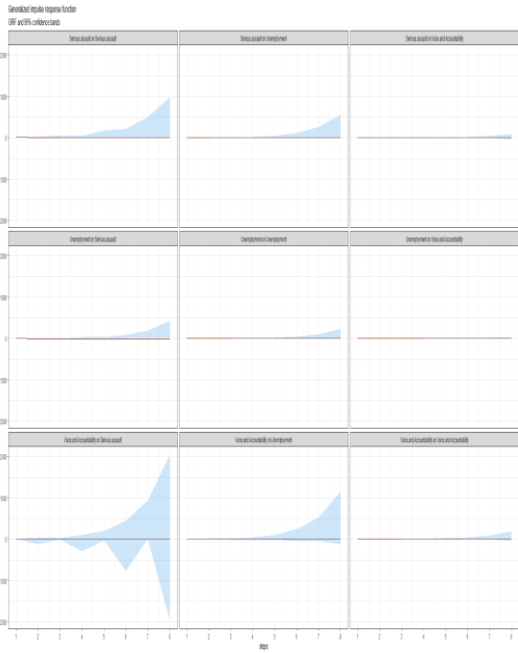
GIRF Model 25	GIRF Model 26
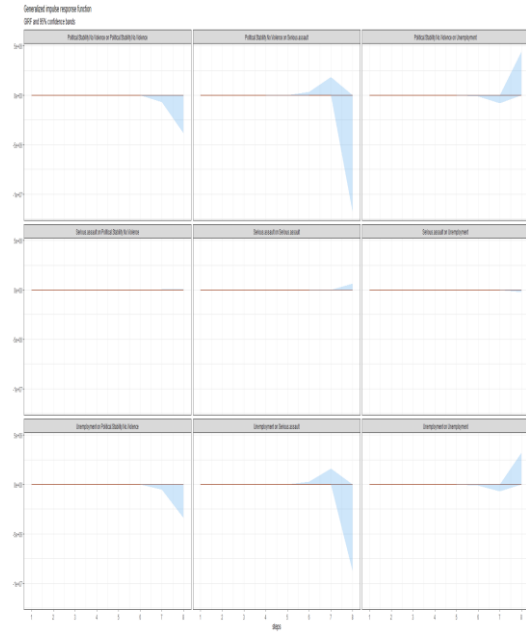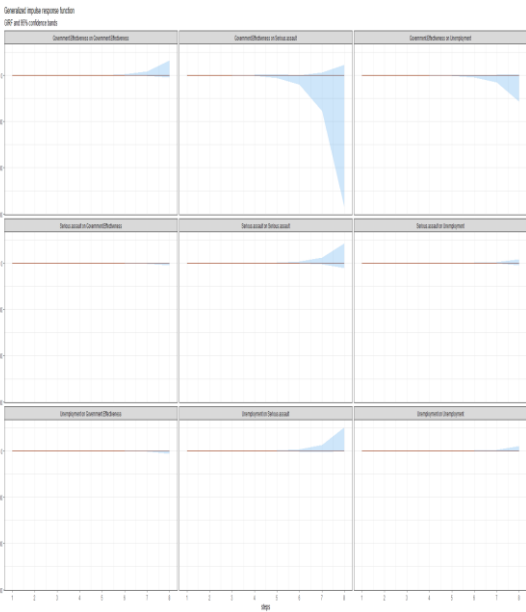
GIRF Model 27	GIRF Model 28

GIRF Model 29	GIRF Model 30
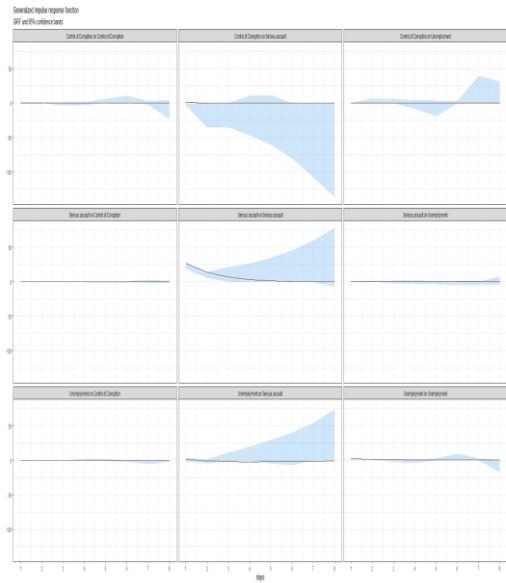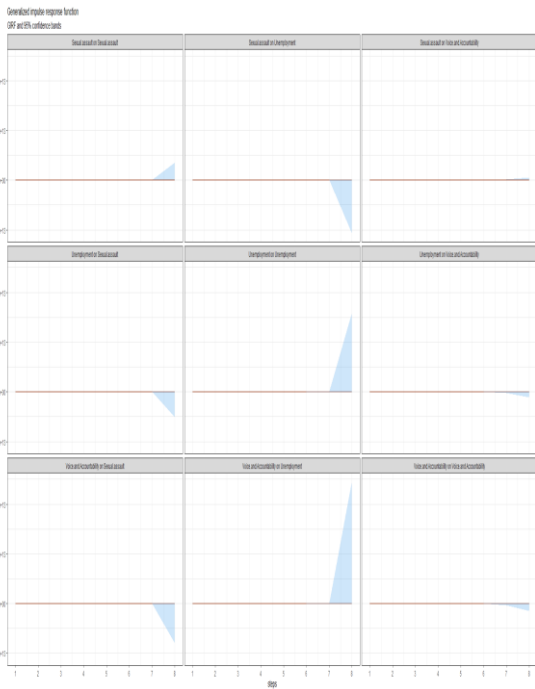
GIRF Model 31	GIRF Model 32

GIRF Model 33	GIRF Model 34
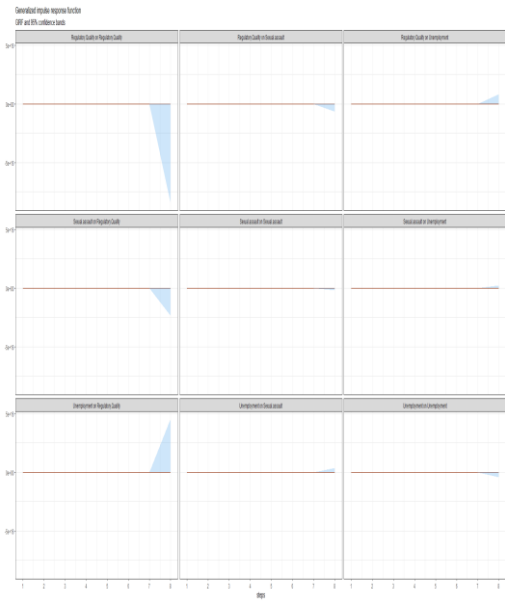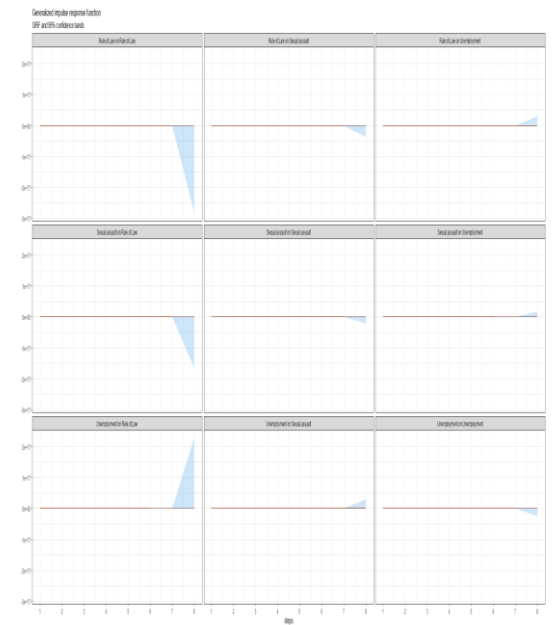
GIRF Model 35	GIRF Model 36
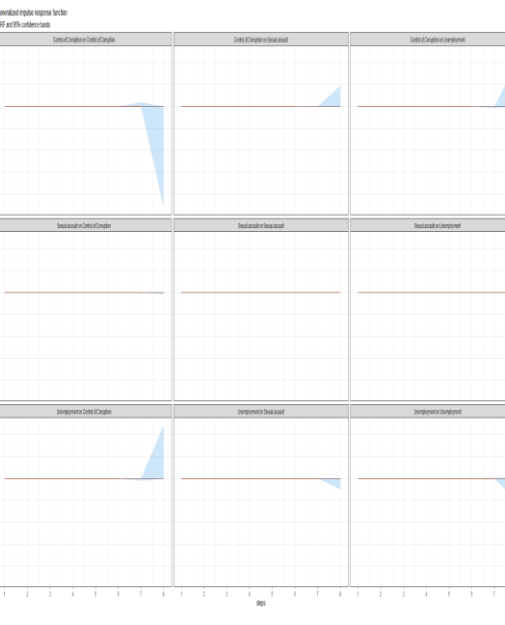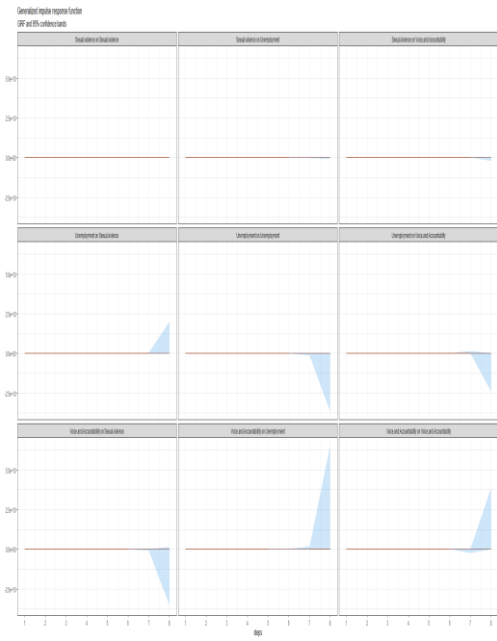
GIRF Model 37	GIRF Model 38
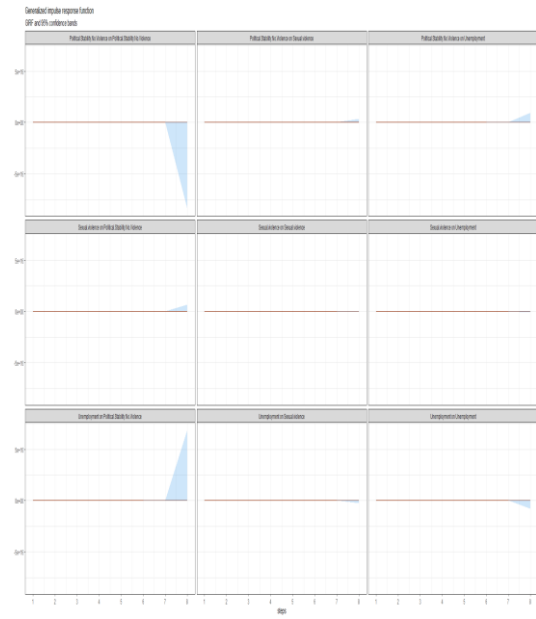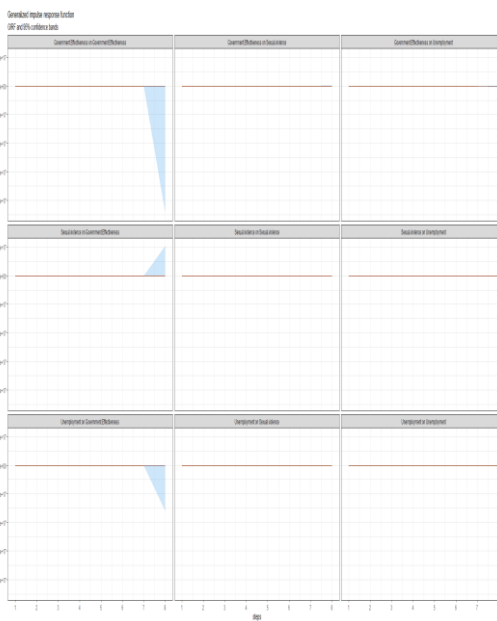
GIRF Model 39	GIRF Model 40
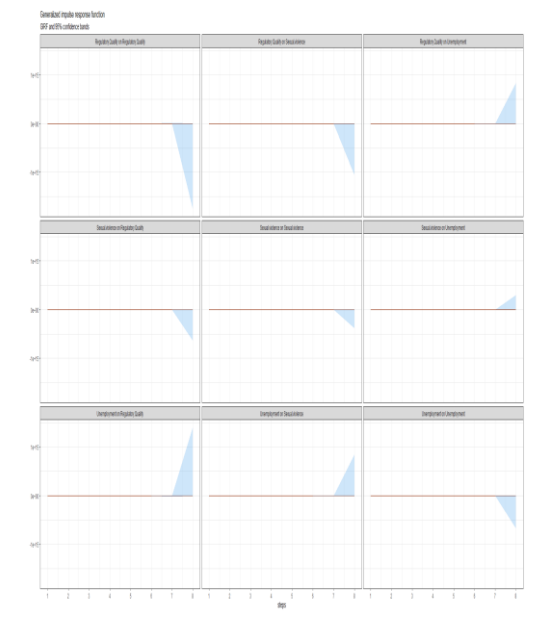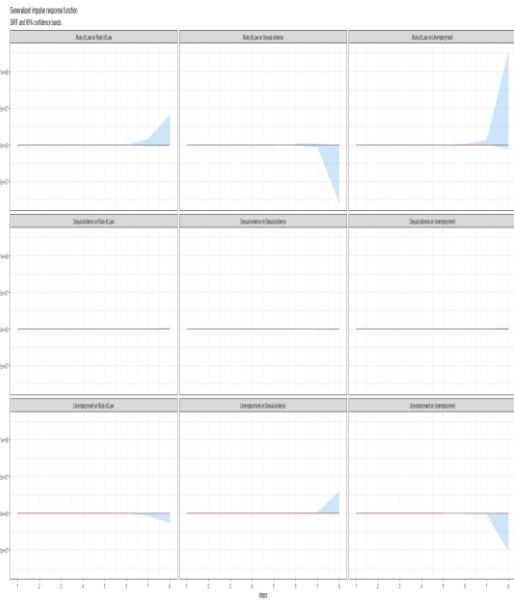
GIRF Model 41	GIRF Model 42
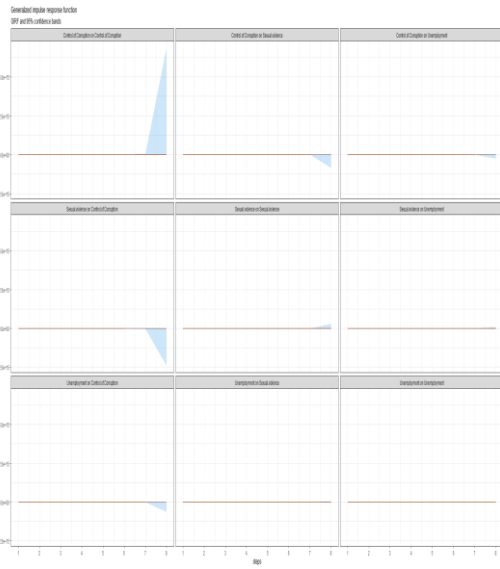
GIRF Model 43	GIRF Model 44
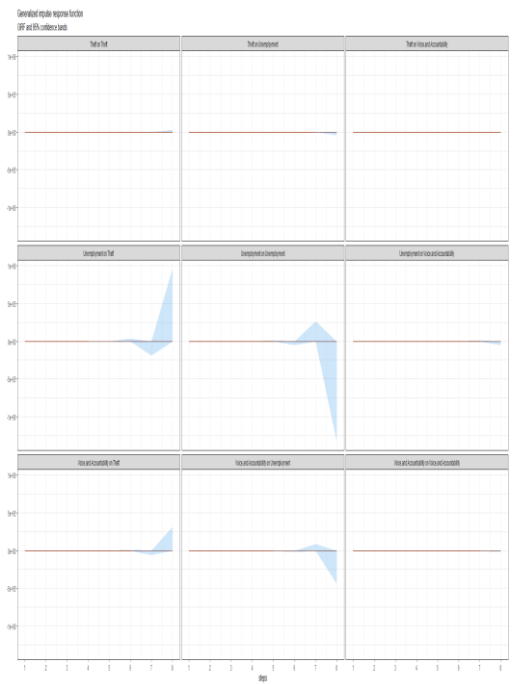
GIRF Model 45	GIRF Model 46
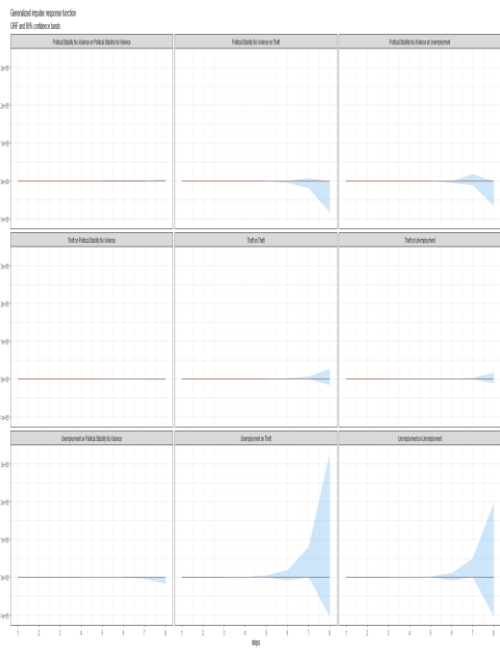
4. Concluding remarks

Using the Word Bank's composite WGIs, the paper examined empirically the presence of a nexus among quality of governance, unemployment and criminality. The common belief that bad governance as well as corruption are among the principal barriers for economic and social development formed the theoretical underpinnings of the empirical investigation. The governance-crime nexus has been addressed by previous studies (Asongu and Kodila-Tedika, 2016; Neumayer, 2003; Habibullah *et al.* 2016; Asongu and Andres, 2013). For our purposes here, a sample of 32 European countries and data series covering the period 2008-20121 were used. The results reported herein did not reveal any statistically traceable nexus between the quality of governance and criminality. The absence of any statistically traceable nexus between governance and the levels of criminality does not accord with the findings of studies such as Asongu and Andres (2013), Asongu and Kodila-Tedika (2016), Habibullah *et al.* (2016). We tentatively argue that this divergence in the findings may be due to the fact that these previous empirical studies addressed the theme at hand in the case of developing countries. In such countries low quality governance invariably is the norm. Hence, poor performance in areas such as Government Effectiveness, Rule of Law, Control of Corruption is, as one would intuitively expect, conducive for criminal activity and thus negatively associated with crime rates. The sample of countries used herein is made up by developed countries with comparatively much better institutional functioning and better levels of governance vis-à-vis developing countries. This difference could be cited as a tentative explanation for the contrasting findings reported above compared to the studies by Asongu and Kodila-Tedika (2016), Habibullah *et al.* (2016), Asongu and Andres (2013). The findings indicate only a negative and statistically significant association between the "political stability and no violence" governance index and the crime type of serious assaults.

On the other hand, our findings indicated a positive and statistically significant association between the unemployment and criminality. This finding is in line with the accumulated empirical literature that suggests a strong association between prevailing socioeconomic conditions and crime rates (*inter alia*: Buonanno and Leonida, 2009; Cebula, 2012; Kollias and Paleologou, 2012; Engelen *et al.* 2016; Altindag, 2012). Finally, as noted in a previous section, given the data availability limitations that dictated the length of the period covered by the empirical tests, the results and the concomitant inferences should be treated cautiously. Moreover, a part of this period coincides with the global financial crisis and the depression that ensued as a result. It is possible that this bears an effect of the findings reported herein. Hence, if data spanning a longer time period becomes available, this theme could by revisited by future research that could also utilize different empirical methodologies such as panel quantile regression analysis that can potentially offer better insights into the relationship examined here. Nonetheless, tentative policy implications can be derived from the findings reported above. The results stress the importance of economic conditions, specifically of unemployment levels that cause economic hardship for the afflicted households, as an important determinant of crime rates in European countries. The concomitant short and medium-term implications for policy makers is that policies aimed at reducing unemployment levels and income inequalities, improving labor market conditions especially for younger persons (Leontopoulou and Chletsos, 2023), can also prove an effective additional means of reducing criminality and delinquent activities in European societies.

Acknowledgements

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Appendix

Table A1: Variables and countries included in each model.

Model	Variables included	Countries included
1	Homicide, unemployment, voice and accountability	Belgium, Bulgaria, Czechia, Denmark, Germany, Estonia, Ireland, Greece, Spain, France, Croatia, Italy, Cyprus, Latvia, Lithuania, Luxembourg, Hungary, Malta, Austria, Poland, Portugal, Romania, Slovenia, Slovakia, Finland, Sweden, Iceland, Norway, Switzerland, Montenegro, Serbia
2	Homicide, unemployment, political stability and no violence	
3	Homicide, unemployment, government effectiveness	
4	Homicide, unemployment, regulatory quality	
5	Homicide, unemployment, rule of law	
6	Homicide, unemployment, control of corruption	
7	Burglary, unemployment, voice and accountability	Belgium, Bulgaria, Czechia, Denmark, Germany, Ireland, Greece, Spain, France, Croatia, Cyprus, Luxembourg, Malta, Netherlands, Austria, Poland, Portugal, Romania, Slovenia, Slovakia, Finland, Sweden, Iceland, Montenegro, Serbia
8	Burglary, unemployment, political stability and no violence	
9	Burglary, unemployment, government effectiveness	
10	Burglary, unemployment, regulatory quality	
11	Burglary, unemployment, rule of law	
12	Burglary, unemployment, control of corruption	
13	Rape, unemployment, voice and accountability	Belgium, Bulgaria, Czechia, Denmark, Germany, Estonia, Ireland, Greece, Spain, France, Croatia, Cyprus, Latvia, Lithuania, Luxembourg, Hungary, Malta, Netherlands, Austria, Poland, Portugal, Romania, Slovenia, Slovakia, Finland, Sweden, Iceland, Norway, Switzerland, Montenegro, Serbia
14	Rape, unemployment, political stability and no violence	
15	Rape, unemployment, government effectiveness	
16	Rape, unemployment, regulatory quality	
17	Rape, unemployment, rule of law	
18	Rape, unemployment, control of corruption	
19	Robbery, unemployment, voice and accountability	Belgium, Bulgaria, Czechia, Denmark, Germany, Estonia, Ireland, Greece, Spain, France, Croatia, Italy, Cyprus, Latvia, Lithuania, Luxembourg, Hungary, Malta, Netherlands, Austria, Poland, Portugal, Romania, Slovenia, Slovakia, Finland, Sweden, Iceland, Norway, Switzerland, Montenegro, Serbia
20	Robbery, unemployment, political stability and no violence	
21	Robbery, unemployment, government effectiveness	
22	Robbery, unemployment, regulatory quality	
23	Robbery, unemployment, rule of law	
24	Robbery, unemployment, control of corruption	
25	Serious assault, unemployment, voice and accountability	Belgium, Bulgaria, Czechia, Denmark, Germany, Estonia,

26	Serious assault, unemployment, political stability and no violence	Ireland, Greece, Spain, France, Croatia, Italy, Cyprus, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Austria, Portugal, Romania, Slovenia, Slovakia, Finland, Sweden, Iceland, Norway, Switzerland, Montenegro, Serbia
27	Serious assault, unemployment, government effectiveness	
28	Serious assault, unemployment, regulatory quality	
29	Serious assault, unemployment, rule of law	
30	Serious assault, unemployment, control of corruption	
31	Sexual assault, unemployment, voice and accountability	Belgium, Czechia, Denmark, Germany, Estonia, Ireland, Greece, Spain, France, Croatia, Cyprus, Lithuania, Malta, Netherlands, Austria, Portugal, Romania, Slovenia, Finland, Sweden, Norway, Montenegro, Serbia
32	Sexual assault, unemployment, political stability and no violence	
33	Sexual assault, unemployment, government effectiveness	
34	Sexual assault, unemployment, regulatory quality	
35	Sexual assault, unemployment, rule of law	
36	Sexual assault, unemployment, control of corruption	
37	Sexual violence, unemployment, voice and accountability	Belgium, Bulgaria, Czechia, Denmark, Germany, Estonia, Ireland, Greece, Spain, France, Croatia, Cyprus, Lithuania, Hungary, Malta, Netherlands, Austria, Portugal, Romania, Slovenia, Finland, Sweden, Norway, Serbia
38	Sexual violence, unemployment, political stability and no violence	
39	Sexual violence, unemployment, government effectiveness	
40	Sexual violence, unemployment, regulatory quality	
41	Sexual violence, unemployment, rule of law	
42	Sexual violence, unemployment, control of corruption	
43	Theft, unemployment, voice and accountability	Belgium, Bulgaria, Czechia, Denmark, Germany, Estonia, Ireland, Greece, Spain, France, Croatia, Italy, Cyprus, Lithuania, Luxembourg, Hungary, Malta, Austria, Poland, Portugal, Romania, Slovenia, Slovakia, Finland, Sweden, Iceland, Norway, Switzerland, Montenegro, Serbia
44	Theft, unemployment, political stability and no violence	
45	Theft, unemployment, government effectiveness	
46	Theft, unemployment, regulatory quality	
47	Theft, unemployment, rule of law	
48	Theft, unemployment, control of corruption	