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Political instability and economic growth: Causation and transmission

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ABSTRACT

This paper examines the link between political instability and economic growth in 34 advanced economies from 1996 to 2020. First, we use a panel VAR estimated via the System GMM to explore the endogenous relationship between economic growth and political instability and identify transmission channels. Second, we employ an instrumental variable approach, exploiting temperature variation and spillover effects of political instability to establish causality. The results of both approaches indicate that a one-standard deviation shock of political instability significantly and substantially reduces economic output. We find no evidence, however, that economic growth affects political instability.

1. Introduction

An erosion of democratic norms - such as electoral fairness, political pluralism, and freedom of speech - is a concern in many countries. This phenomenon, which political scientist Larry (Diamond, 2015) calls a "democratic recession", is not confined to developing countries. Even in established Western democracies, political movements continue to emerge that challenge or even damage democratic institutions (Diamond, 2015; Fukuyama, 2020). Recent examples show that the challenges to democratic systems are diverse in nature. A defining feature of a democracy is the peaceful transfer of power, even by those who lose an election. However, the 2021 presidential election in the US has shown that this transfer of power can be contested, even in well-established democratic nations. Additionally, separatist movements, such as the one present in Catalonia, can pose a significant threat to a country's political stability. Another example is the "yellow vest" movement in France, characterized by widespread civil unrest, including acts of vandalism, looting, and violent confrontations with law enforcement. The movement initially began as a protest against tax increases, but later broadened to include demands for a higher minimum wage and general tax cuts.

These events do not necessarily threaten the democratic order in general, but they certainly raise political instability by challenging trust in democratic institutions. This could have a negative impact on economic development, as many business and household decisions are influenced by the stability of the institutional environment. A number of empirical studies find, in particular,

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effects of political instability on domestic investment (Asteriou and Price, 2001) and consumption (Bahmani-Oskooee and Maki Nayeri, 2020) due to precautionary motives. Aisen and Veiga (2013) and Alexandre et al. (2022) show that an increase in political instability reduces productivity growth. Additionally, Acemoglu et al. (2005) argue that political instability can lead to weak institutions, which in turn negatively affect the economy in the long-run.

Although a vast body of the literature has examined the relationship between political instability and economic growth, the quantification of the relationship between the two variables is still pending for two reasons. First, previous studies have mainly focused on the relationship between political instability and economic growth in developing countries, while advanced economies with established democracies have been investigated much less frequently. Second, there is an ongoing academic debate regarding the direction of causation. While the first strand of the literature emphasizes the important role of political stability for the prospects of economic growth (Alesina et al., 1996; Aisen and Veiga, 2013; Alesina and Rodrik, 1994; Cukierman et al., 1992; Uddin et al., 2017), the second strand argues that political stability depends on economic performance (Paldam, 1998; Campos and Nugent, 2002; Collier, 2004; Goldstone et al., 2010; Gassebner et al., 2016; Al-Shammari and Willoughby, 2019). However, few studies have examined both directions of causality in a common empirical framework.

We therefore analyze the relationship between measures of political instability and economic growth in a panel of 34 advanced economies that are considered as liberal democracies from 1996 to 2020. The possibility of a bidirectional relationship between economic growth and political instability poses a particular challenge for the identification strategy. Therefore, we propose two different identification strategies with unique advantages.

In the first step of the analysis, we estimate a panel vector autoregression (panel VAR) model that, by design, treats economic growth and political instability as endogenous and does not impose a direction of Granger causality a priori. We use Choleski decomposition to compute the impulse-response functions (IRFs) and examine the empirical relationship between the two variables. The panel VAR approach allows us to examine potential transmission channels between political instability and economic activity in detail. To this end, we decompose gross domestic product (GDP) into its main expenditure side components: private consumption, investment, and government consumption.

In the second step of the analysis, we use a dynamic panel fixed effects instrumental variable (Dynamic Panel FE-IV) approach to identify the causal effect of economic growth on political instability and vice versa. We use the political instability of culturally close countries as an exogenous source of domestic political instability following Grechyna (2018) and Vu (2022) and exploit variation in temperature to instrument economic growth following Miguel et al. (2004). To account for the dynamic relationship between the two variables and compare IV results with panel VAR results, we estimate (Jordà, 2005) local projections. While panel VAR standard errors tend to be much smaller, local projections yield results much more robust to model misspecification (Plagborg-Møller and Wolf, 2021).

Our results contribute to the existing literature by identifying the causal effect and the relevant transmission channels. First, in line with most of the empirical literature, we provide empirical evidence that political instability negatively affects economic growth. Both, the panel VAR and the Dynamic Panel FE-IV show that a one-standard deviation shock in political instability causally reduces economic growth significantly in the first years after the shock, mainly through lower consumption and investment. Second, we do not find evidence that economic growth affects political instability significantly. Third, the empirical findings show that political instability is not only economically relevant for developing countries, but that is also has implications for the prosperity of advanced economies.

The structure of the paper is as follows: First, the measure of political instability used in the paper is discussed in Section 2.1, while Section 2.2 provides a brief overview of the transmission channels between political instability and the economy discussed in the relevant literature. In Section 3, we present the applied data, and we explain the empirical approach of the panel VAR estimation in Section 4. Results and robustness tests of the Panel VAR estimation are reported and discussed in Sections 5 and 6, respectively. Section 7 presents the instrumental variable strategies and the corresponding findings. Section 8 summarizes our most relevant results.

2. Political instability in advanced economies

2.1. Measures of political instability

Political instability can be defined as the extent to which the distribution of power within a political system is challenged by internal or external political actors.[1] According to Jong-A-Pin (2009) four different dimensions of political instability can be distinguished: *(1) politically motivated aggression, (2) mass civil protests, (3) instability within the political regime,* and *(4) instability of the political regime*. While most empirical studies focus on the relationship between political stability and economic growth in developing countries, *mass civil protests* and *instability within the political regime* are also relevant for advanced economies.

Relying on one-dimensional proxies (e.g., the number of purges or riots, regular and irregular regime changes, successful and unsuccessful coups, or government collapses) as frequently done in the empirical literature (Parvin, 1973; Asteriou and Price, 2001;

[1] Therefore, it is conceptually different from the related concept of political uncertainty, which is uncertainty caused by a possible change in the political situation, where it is unclear how this change will be shaped and what consequences it may have. On the one hand, policy uncertainty may be a direct consequence of political instability. On the other hand, a high degree of policy uncertainty does not have to lead to political instability. For example, policy uncertainty surged in most advanced economies during 2020 as a result of the COVID-19 pandemic, while political instability remained relatively unchanged.

Table 1
Components of the WGI of Political Stability and Absence of Violence/Terrorism. Source: Kaufmann and Kraay (2020).

	Subindex	Events of political instability
1	Economist Intelligence Unit Riskwire and Democracy Index	Orderly transfers, Armed conflict, Violent demonstrations, Social unrest, and International tensions/terrorist threat
2	Cingranelli Richards Human Rights Database and Political Terror Scale	Political Terror Scale
3	iJET Country Security Risk Ratings	Security risk rating
4	Institutional Profiles Database	Intensity of internal conflicts: ethnic, religious or regional, Intensity of violent activities, and Intensity of social conflicts (excluding conflicts relating to land)
5	Political Risk Services International Country Risk Guide	Government stability, Internal conflict, External conflict, and Ethnic tensions
6	Global Insight Business Conditions and Risk	Protests and Riots, Terrorism, Interstate war and Civil war

Aisen and Veiga, 2006, 2013), leads to an omitted variable bias if the full extent of political instability remains unobserved (Jong-A-Pin, 2009). To limit this bias, multidimensional indices are frequently applied in the empirical literature (e.g., Cukierman et al., 1992; Barro, 1991; Alesina and Perotti, 1996; Gyimah-Brempong, 1999; Obinger, 2000; Campos and Nugent, 2002; Busse and Hefeker, 2007; Blanco and Grier, 2009; Goldstone et al., 2010; Kim, 2010; Bernal-Verdugo et al., 2013; Aisen and Veiga, 2013; Alcántar-Toledo and Venieris, 2014; Akçoraoğlu and Kaplan, 2017; Uddin et al., 2017; Al-Shammari and Willoughby, 2019; Andrijevic et al., 2020).

Therefore, we employ the World Governance Indicator (WGI) of Political Stability and Absence of Violence/Terrorism. This frequently used multidimensional index (e.g., Uddin et al., 2017; Grechyna, 2018; Ezcurra, 2021; Vu, 2022; Alexandre et al., 2022) is constructed to measure the "perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including political violence and terrorism" (Kaufmann and Kraay, 2020).

The advantage of the indicator is that it combines information from many different subindicators that measure more specific aspects of political instability. The index is constructed by using an unobserved component model that comprises data from different sources (see Table 1). The rationale of aggregating data from different sources is that each subindicator is assumed to be a noisy signal of the underlying notion of political stability. The Method of Unobserved Components provides a way to extract the signal of interest while excluding noisy variation in the data (Kaufmann et al., 2011). Jong-A-Pin (2009) confirms that composite indices of political stability have a smaller measurement error.

A disadvantage of the indicator is that the combination of the data prevents a direct identification of the driving forces. However, the underlying data used to create the WGI of Political Stability and Absence of Violence/Terrorism is easily available. For example, when large shifts in the indicator occur, it is often possible to trace these developments back to their source, which improves the overall understanding of the data.

Therefore, we also examine the subindices of the WGI of Political Stability and Absence of Violence/Terrorism. Fig. 1 shows the WGI of Political Stability and Absence of Violence/Terrorism, the Economist Intelligence Unit Riskwire and Democracy Index, Political Risk Services International Country Risk Guide, and the Global Insight Business Conditions and Risk Index for six selected countries. The data indicate an overall trend of increasing instability in most observed countries across all subindices and the aggregated index of political instability. The three subindices capture events of political instability corresponding to the dimension of *mass civil protest* and *instability within the political regime*. As they account for 96% of the variance in the WGI of Political Stability and Absence of Violence/Terrorism, they indicate that these two dimensions are the predominant sources of political instability in advanced economies.

The main cause of increasing *instability within the political system* is a decrease in government unity, legislative strength and popular support (Howell, 2011). In line, Hadjar and Köthemann (2014) find that trust in political institutions in many advanced economies has been decreasing since the 1980s. Since all examined advanced economies are considered to be liberal democracies, the increasing political instability is directly related to the growing pressure on the related institutions. We note that the underlying causes of this trend are multivariate. Diamond (2015) argues that the increased pressure on Western democracies is driven by bad governance (i.e., governments were unable to address the crucial problems of the society). Looking to the US, he mentions the shutdown of the federal government in 2013, the increasing inability of the legislation to fulfill its obligations and the inability of Congress to pass a budget.

The second reason for increasing *instability within the political system* is a recent increase in the dimension of *mass civil protest*, which causes are multivariate, too. Important drivers of social unrest are economic stagnation (Alesina and Perotti, 1996), cuts in government spending or tax rises (Ponticelli and Voth, 2020), rising inequality (Rodrik, 2018), economic crises and climate change (Brannen et al., 2022). In Europe, many movements are also associated with anti-migration sentiments and both left- and right-wing populist movements, as evidenced by data from the Cross-National Time-Series Data Archive. This connection underscores the complex relationship between populism and political instability.

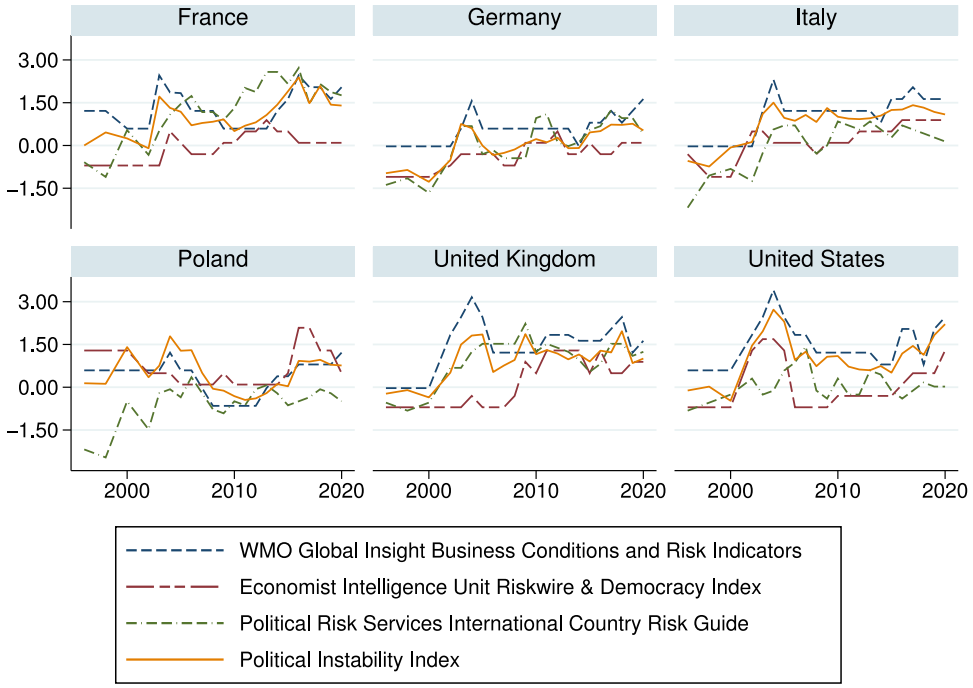

Fig. 1. Different measures of Political Instability (standardized to mean = 0 and standard deviation = 1 over the whole sample) between 1996 and 2020: WMO Global Insight Business Conditions and Risk Indicators (dashed line), Economist Intelligence Unit Riskwire and Democracy Index (dotted line), Political Risk Services International Country Risk Guide (dashed/dotted line), and the WGI of Political Stability and Absence of Violence/Terrorism (solid line). Events of political instability measured by the different measures are reported in Table 1.

2.2. Transmission of political instability in advanced economies

Many different transmission channels between political instability and the economy are discussed in the literature. The following section summarizes the relevant findings regarding the transmission channels between political instability and the components of GDP.

First, Asteriou and Price (2001) argue that political instability creates an environment of uncertainty affecting the investment behavior of risk-averse market agents. In an environment of increasing political instability, the resultant uncertainty about future developments would cause investors to have a more cautious attitude. Postponing investment gives investors more time to reconsider their business decisions, but compared to a counterfactual without political instability, it leads to an immediate drop in investment. Furthermore, this uncertainty may lead to capital outflows (Alesina and Tabellini, 1989). Further empirical evidence is provided by Barro (1991), Alesina and Perotti (1996) and Blanco and Grier (2009).

Second, political instability leads to a restraint of consumption expenditures since risk-averse market agents increase their savings for precautionary motives. Regarding the literature on risk and uncertainty, this effect is well documented (Miles, 1997; Hahm and Steigerwald, 1999; Banks et al., 2001; Guariglia, 2002; Menegatti, 2007, 2010; Bahmani-Oskooee and Maki Nayeri, 2020). Additionally, the behavior of private households regarding purchases of durable goods is quite similar to the behavior of firms (Coibion et al., 2018). It is therefore likely that political instability also has an effect on private consumption. Likewise, the reverse relationship may hold. If budget restrictions become tighter due to, for example decreased purchasing power, the dissatisfaction with the political regime in charge may increase leading to political instability.

Third, the effect of political instability on government consumption is unclear. On the one hand, Darby et al. (2004) argue that government consumption is positively affected by political instability since governments in unstable political environments seek to address short-term issues rather than long-term problems. On the other hand, governments under pressure may be urged to consolidate and therefore must reduce government consumption. Vice versa, changes in government consumption may be a source of political instability. Ponticelli and Voth (2020) provide the causal inference that fiscal retrenchment fuels political instability. Especially expenditure cuts, rather than tax rises, have significant effects on the occurrence of civil unrest and protest.

Table 2
Summary statistics .* The data sourced from the Economist Country Viewswire Service, the IHS Markit World Economic Service, and the International Country Risk Guide is obtained from Kaufmann and Kraay (2020) as publicly accessible subindicators extracted from commercially available comprehensive datasets.

	Variable	Abbreviation	Mean	Std. Dev.	Min.	Max.	N	Source
1	Political Instability Index	pi	−0.889	0.412	−1.76	0.474	850	Kaufmann and Kraay (2020)
2	Economist Intelligence Unit Riskwire & Democracy Index	eiu	−0.812	0.126	−1	−0.35	830	The Economist Country Viewswire Service*
3	WMO Global Insight Business Conditions and Risk Indicators	wmo	−0.872	0.1	−1	−0.5	850	IHS Markit World Economic Service*
4	Political Risk Services	prs	−0.778	0.081	−0.977	−0.559	840	International Country Risk Guide*
5	Real GDP (in billion constant 2015 US$) in growth rates	gy	0.023	0.034	−0.148	0.252	848	World Bank (2023)
6	Investment (in billion constant 2015 US$) in growth rates	gi	0.033	0.111	−0.543	1.019	850	World Bank (2023)
7	Consumption (in billion constant 2015 US$) in growth rates	gc	0.022	0.035	−0.174	0.184	850	World Bank (2023)
8	Government consumption (in billion constant 2015 US$) in growth rates	gg	0.02	0.026	−0.1	0.15	850	World Bank (2023)

3. Data

In this paper, we use data from a panel of 34 selected advanced economies, including the G7 countries, Switzerland, Norway, and South Korea, and all member states of the European Union but Bulgaria, Romania and Malta.[2] We focus on advanced economies for two reasons. First, most of the empirical literature focuses on developing countries. Although political instability is increasing in advanced countries, the dynamic relationship with economic growth remains largely unresolved. The selection of countries allows us to fill this gap. Second, restricting the sample to advanced economies that are similar in terms of economic progress and political institutions is advantageous with respect to the empirical estimation since we can exploit the cross-country dimension in a homogeneous estimation framework and increase the precision of inference.

We use the *WGI of Political Stability and Absence of Violence/Terrorism* as our main indicator for political instability. This indicator ranges from approximately −2.5 to 2.5. For ease of exposition, we invert the index by multiplying by −1 and interpret it as an index of political *instability*. Hence, higher values are associated with a higher degree of political instability. The index is available for all countries in the sample for the years 1996, 1998, 2000 and from 2002 to 2020. Missing data points are approximated using linear interpolation, to ensure a balanced panel.[3]

In our sample of advanced economies, the mean of political instability is −0.89 (Table 2). Compared to other regions in the world, such as Subsaharan Africa, this mean indicates a high level of stability, as can be seen in Fig. 2. However, the range of values indicates a considerable variation. Moreover, Fig. 3 shows a substantial increase in the absolute value of political instability in the world since 2007. The rise in instability in advanced economies is comparable to the rise in other regions of the world. This finding motivates our analysis of whether this development also has an impact on economic growth in advanced economies.

Data for GDP in constant 2015 US$ is taken from the World Bank and is available for the whole period from 1996 to 2020 for all 34 countries in the sample, yielding 850 observations. Table 2 shows that GDP growth rates range between −14.8% and 25.2%, indicating the huge impact of the financial crisis, the European Debt Crisis, and the COVID-19 pandemic on economic development. In all countries in the sample, a significant decline in growth rates can be observed between 2008 and 2009 and in 2020. Additionally, southern European countries experienced another drop between 2010 and 2011. Furthermore, most advanced economies are facing stagnating or even declining growth rates. Various explanations and numerous potential drivers are discussed in the literature. Amongst the most common justifications are: decreasing returns from research and development (Bloom et al., 2020), structural transformation (Nordhaus, 2006), and problems in the transfer of technology (Andrews et al., 2016). Table 3 shows moderate correlations between the index of political instability and GDP growth rates.

We are also interested in the components of GDP: investment, private consumption, and government consumption. We retrieved data on gross capital formation (in constant 2015 US$), general government final consumption expenditure (in constant 2015 US$) and household final consumption expenditure (in constant 2015 US$) from the World Bank. Since all GDP components contain a unit-root in levels, the variables are transformed into growth rates to achieve stationarity. Transformed GDP components have a negative correlation with political instability measured by the WGI of Political Stability and Absence of Violence/Terrorism, as Table 3 reports.

[2] The panel includes data on Australia, Austria, Belgium, Canada, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Korea, Latvia, Lithuania, Luxembourg, the Netherlands, New Zealand, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland, the UK, and the US.

[3] We note that interpolated data points do not affect the overall results.

Table 3
Cross-correlation table.

	Variables	1	2	3	4	5	6	7	8
1	Political Instability Index	1.000							
2	Economist Intelligence Unit Riskwire & Democracy Index: Orderly transfers, Armed	0.723	1.000						
3	WMO Global Insight Business Conditions and Risk Indicators: Protests and riots,	0.840	0.418	1.000					
4	Political Risk Services International Country Risk Guide: Government stability,	0.634	0.393	0.455	1.000				
5	Real GDP (in billion constant 2015 US$) in growth rates	−0.140	−0.022	−0.140	−0.193	1.000			
6	Investment (in billion constant 2015 US$) in growth rates	−0.049	0.028	−0.050	−0.083	0.694	1.000		
7	Consumption (in billion constant 2015 US$) in growth rates	−0.149	−0.060	−0.155	−0.189	0.817	0.591	1.000	
8	Government expenditure (in billion constant 2015 US$) in growth rates	−0.068	−0.020	−0.070	−0.129	0.335	0.182	0.286	1.000

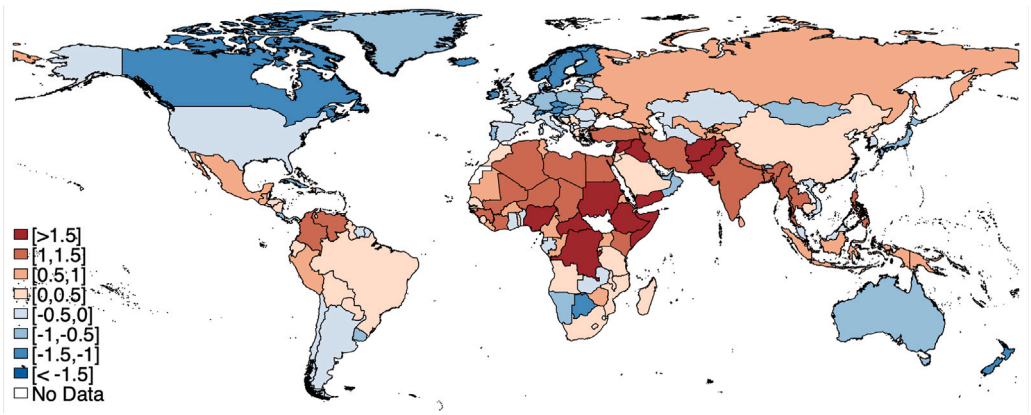

Fig. 2. Average of political instability measured by the WGI of Political Stability and Absence of Violence/Terrorism (Kaufmann and Kraay, 2020) between 2007 and 2020. Higher values (red)/lower values (blue) correspond to higher/lower levels of average political instability. On average, political instability equals 0.05 with a standard deviation of 0.95. (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)

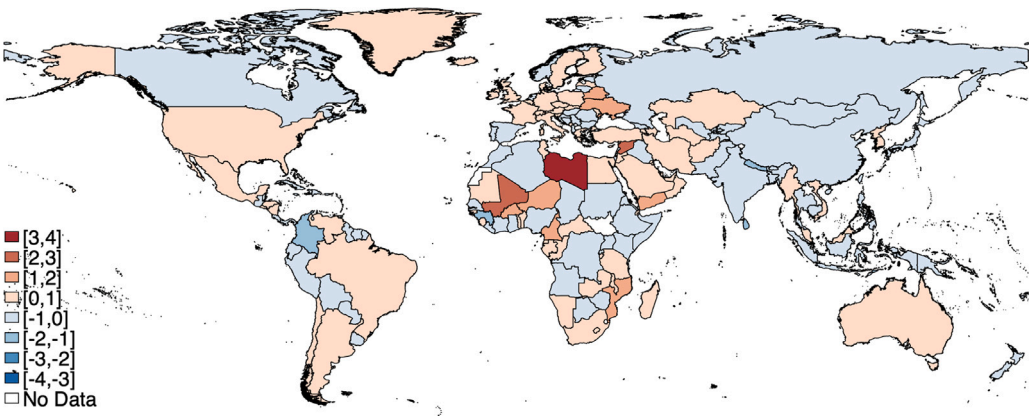

Fig. 3. Absolute change of political instability measured by the WGI of Political Stability and Absence of Violence/Terrorism (Kaufmann and Kraay, 2020) since 2007. Higher values (red)/lower values (blue) correspond to an increase/decrease in average political instability. On average, political instability has increased since 2007 by 0.02 with a standard deviation of 0.62. (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)

4. Empirical approach

We use a homogeneous panel VAR with fixed effects to analyze the relationship between economic growth and political instability. The panel VAR method allows us to take advantage of a panel structure with an increased sample size and statistical power, while controlling for time-invariant unobserved heterogeneity (e.g. monetary policy regimes, different political systems etc.) with the implementation of country fixed effects. We estimate:

$$Y_{i,t} = A_1 Y_{i,t-1} + A_2 Y_{i,t-2} + \cdots + A_p Y_{i,t-p} + \mu_i + e_{i,t} \tag{1}$$

where $Y_{i,t}$ is a vector of the endogenous variables, p is the lag length, μ_i is a vector of panel fixed effects, and $e_{i,t}$ denotes the idiosyncratic error for country i and year t, respectively. The vector $Y_{i,t}$ contains economic growth and political instability (specification I). To identify the relevant economic transmission channels, we decompose economic growth into its three main components: government consumption, private consumption, and investment (specification II-V). Since the degrees of freedom decrease with each variable added to the system, we hesitate to include more variables. The matrices A_1, A_2 to A_p are parameters to be estimated.

Estimating the system described in Eq. (1) with first differences or fixed effects, leads to biased estimators as the lagged dependent variables on the right-hand side are correlated with the error term in dynamic panels (Nickell, 1981). This bias, known as Nickell bias, is particularly problematic for panels with short time dimensions, as Monte Carlo simulations by Judson and Owen (1999) reveal.

Instrumental variable approaches are often used to address this endogeneity issue. However, when suitable instrumental variables are not at hand, the System Generalized Method of Moments (GMM) (Arellano and Bover, 1995; Blundell and Bond, 1998) is an alternative. In this approach, the system of Eq. (1) is estimated in first differences to control for unobserved time-invariant heterogeneity. To address the described endogeneity problem, lagged values of the regressors in levels are used as instruments for the regressors in first differences (Arellano and Bover, 1995; Blundell and Bond, 1998). To improve estimation efficiency, we incorporate multiple lags of endogenous regressors as instruments. This strategy leads to a reduced sample size due to missing observations at the beginning of the sample period. However, a solution proposed by Holtz-Eakin et al. (1988) mitigates this challenge. Following the authors' recommendation, we adopt so-called "GMM-style" instruments and substitute missing observations with zeros.

Arellano and Bover (1995) further suggest to employ forward orthogonal deviation instead of first differences to remove the unobserved time-invariant heterogeneity. Rather than subtracting the previous observation from the contemporaneous one, this method involves subtracting the average of all future available observations of a variable, yielding two advantages. First, it limits the loss of sample size in the case of gaps in the panels (Roodman, 2009). Second, Hayakawa (2009) shows in a Monte Carlo simulation that GMM estimates employing forward orthogonal deviation outperform estimates obtained with first differences.

Abrigo and Love (2016) emphasize that the exogeneity of the implemented instruments is a necessary condition to achieve unbiased estimates. Therefore, we apply the Hansen test, which tests the null hypothesis of the joint validity of instruments. Roodman (2009) argues that too many instruments bias the Hansen statistic. Due to its methodology, the number of instruments rises with T and the number of variables included in the analysis. If too many instruments are included in the system GMM, the endogenous variables are overfitted. However, Roodman (2009) states that *"Unfortunately, there appears to be little guidance from the literature on how many instruments is too many"* (p. 99). As a rule of thumb, Roodman (2009) suggests to treat Hansen p-values higher than 0.25 with caution.

To illustrate how the variables of the model are affected by each other, IRFs are computed based on the panel VAR regression output. To this end, a set of restrictions must be applied. We use Choleski decomposition to identify the orthogonal shocks in the VAR. Choleski decomposition orders the examined variables according to their degree of endogeneity: Variables placed earlier in the ordering are affected contemporaneously and in subsequent periods by variables later in the ordering, while those placed later affect preceding variables only with a lag (Abrigo and Love, 2016). We argue that political instability is by definition subject to recent developments in the political system, such as elections, strikes, demonstrations, coups, etc. and is, therefore, fast moving. Therefore, we assume that it affects economic growth and, thus, government consumption, private consumption, and investment contemporaneously and with delay. The economic variables affect political instability with a lag only. Since no other study has employed a VAR to examine the effects of political instability on the economy, empirical evidence on the ordering is scarce. However, Baker et al. (2016) have fitted a VAR model to explore the effects of political uncertainty, which is a different but related concept, on economic variables, placing the innovation from the political system at the beginning of the Choleksi order. Góes (2016), in contrast, employs a panel VAR to estimate the effect of institutional quality on economic growth, placing the innovation in the political system at the end of the Choleski ordering. In order to stress the identified effect, Colombo (2013) places uncertainty after the block of macroeconomic variables, too. Therefore, the results of an alternative ordering are presented and discussed to test the robustness of the estimated model.

Motivated by Forni and Gambetti (2016) and Blanchard and Perotti (2002), we place government consumption second in order, followed by private consumption, and investment. The rationale is that government consumption is relatively stable and much less dependent on the business cycle than consumption and investment (Caldara and Kamps, 2008). Therefore, we assume that it is not affected by private consumption, and investment contemporaneously. Consumption is also highly persistent. We expect it to be influenced by investment only with a lag. However, investment tends to be highly dependent on the business cycle and on changes in the political system. Therefore, it should be affected contemporaneously by political instability, consumption, and government consumption and placed at the end of the Choleski order.

Consequently, we use the following ordering of the system as our baseline: (1) Political Instability and (2) Economic Growth. In the estimation of decomposed GDP we argue for a Choleski ordering of (1) political instability, (2) government consumption, (3) private consumption, and (4) investment.

Following the expenditure approach, GDP is by definition the sum of government consumption, investment, and private consumption in addition to net exports. To estimate the effect of an orthogonal shock of political instability on economic growth and vice versa, we aggregate the estimated IRF of consumption, investment, and government consumption. More precisely, IRFs of economic growth are the weighted sums of consumption growth, investment growth, and government consumption growth with respect to their share of GDP. For the sake of simplicity, we assume net exports to be stable in order to compute the IRF with respect to economic growth.

5. Results

5.1. The relationship between political instability and economic growth

We start by analyzing the relationship between political instability and economic growth. We estimate the bivariate panel VAR with System GMM. The first two lags are included in the panel VAR according to the Modified Akaike Information Criterion (MAIC). As explained in Section 4, we use the first four lags of each endogenous regressor as "GMM-Style" instruments to increase the efficiency of our estimation. We note that the overall results are robust to a different number of lags of instruments. Furthermore, the panel VAR is invertible, has an infinite order vector moving-average representation, and is, thus, stable (Abrigo and Love, 2016).

We calculate IRFs for the consecutive 20 years after a shock (Fig. 4). On this horizon, all IRFs become insignificantly different from zero. The IRFs are based on a one-standard deviation shock. To estimate the confidence bands, 100 Monte Carlo simulations were employed using the Gaussian approximation as proposed by Abrigo and Love (2016).

We find that political instability has a negative and statistically significant effect on economic growth, as depicted in Fig. 4. After a shock of political instability by one-standard deviation, corresponding to an increase of the WGI of Political Stability and Absence of Violence/Terrorism by 0.13 index points, the GDP growth rate is dampened over a prolonged period of time: Economic growth is decreased by 0.7 percentage points initially. The maximum effect on the GDP growth rate of 1.3 percentage points is reached after three years. These results cannot be easily compared to those of other studies, as the GDP effects are often calculated from estimated elasticities. In a number of studies, the negative effect of an increase of political instability by 1 percentage point on GDP ranges between 2 and 3 percentage points (Barro, 1991; Chen and Feng, 1996; Aisen and Veiga, 2013). Notably, the impulse simulated in our study is considerably larger. The standard deviation of the innovations is 0.13, while the standard deviation of the time series of political instability is 0.41. This comparison suggests that the effect found in this study is smaller than in earlier research. As our analysis is restricted to advanced economies, which generally have more stable political institutions, this observation is substantiated. Looking at the reverse relationship, we find that the estimated effect of economic growth on political instability is negative but insignificant.

5.2. The relationship between political instability, investment, consumption and government consumption

In the next step of the analysis, we limit the analysis to the effects of political instability on main demand aggregates – investment, private consumption, and government consumption – to identify the relevant transmission channels. Again, we use the MAIC criterion to determine the number of lags included in the VAR. The test statistic suggests to include the first two lags in the VAR model. As in the previous specification, we include the first four lags as "GMM-Style" instruments. The Hansen J-statistic indicates that the selection of instruments is valid. The panel VAR is also stable.

The corresponding orthogonalized IRFs are presented in Fig. 5 for the consecutive 20 years. First, we examine the effects of political instability on consumption, investment, and government consumption. In line with the empirical literature (Alesina and Perotti, 1996; Perotti, 1996; Aisen and Veiga, 2013), we find that an increase in political instability by 1 standard deviation has a negative and statistically significant impact on investment. Fig. 5 shows that each period after the shock investment is decreased by approximately 1 to 2.2 percentage points compared to a counterfactual without a shock of political instability. The effect is significant for more than ten periods ahead. This result suggests that a shock to political instability has an pronounced effect on private investment. Likewise, we observe a negative impact on both private and government consumption. Nonetheless, the decline is less pronounced compared to investment. Our findings indicate that following a shock in political instability, private consumption decreases by 0.8 to 1.7 percentage points, while government consumption decreases by 0.5 to 1 percentage point, depending on the period. The maximum effect is observed after three periods, after which the impulse response functions gradually diminish in significance, eventually becoming statistically insignificant around ten periods after the initial shock.

To compute the aggregated effect of political instability on economic growth, the IRFs of political instability on private consumption growth, investment growth, and government consumption growth are summed up according to their share of real GDP. Our estimation reveals a significant decrease in economic growth following a shock of political instability. Notably, the most substantial negative effect on economic growth is observed after three periods, corresponding to a decline of 1.3 percentage points. It takes over a decade for the shock to diffuse, with no observed overshooting in the impulse response functions. Thus, a shock in political instability leads to a sustained shift of the economy to a lower level of output.

Moreover, we examine the impact of our main macroeconomic variables on political instability. Illustrated in the first row of Fig. 5, the results depict the IRFs of political instability when shocked by consumption, government expenditure, and investment,

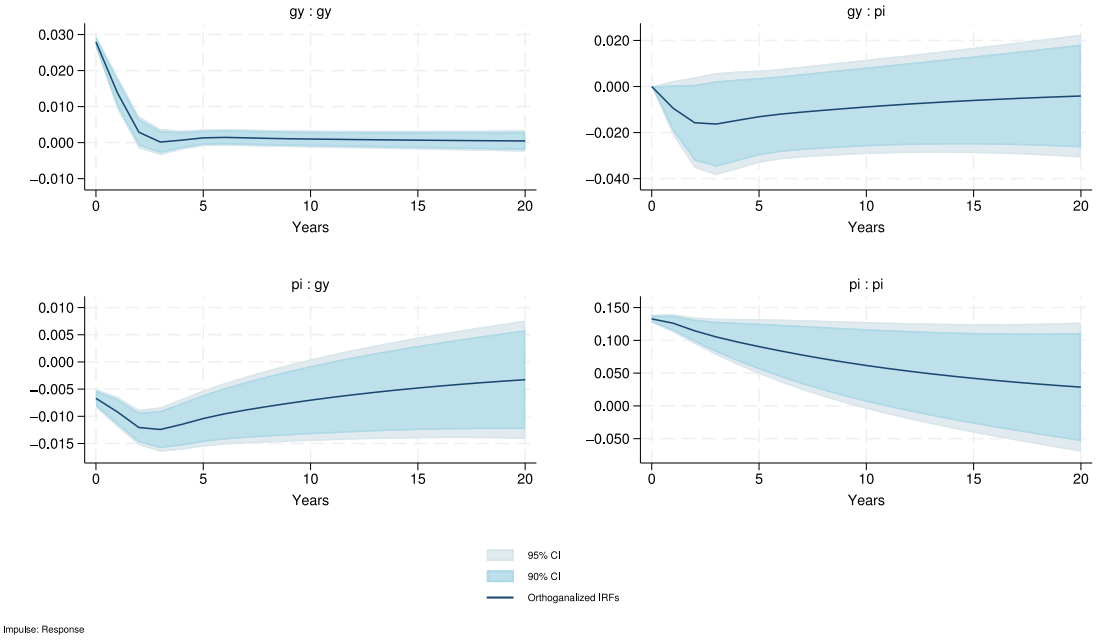

Fig. 4. Impulse response functions of political instability and economic growth (specification I). This figure plots the effect of a shock by one-standard deviation in the impulse variable on the response variable on impact and for the subsequent 20 years. To compute the IRFs, Choleski decomposition is employed. The causal ordering is: (1) political instability (pi) and (2) economic growth (gy). 90% and 95% confidence bands are generated by Monte-Carlo with 100 repetitions and presented by blue and light gray areas, respectively.

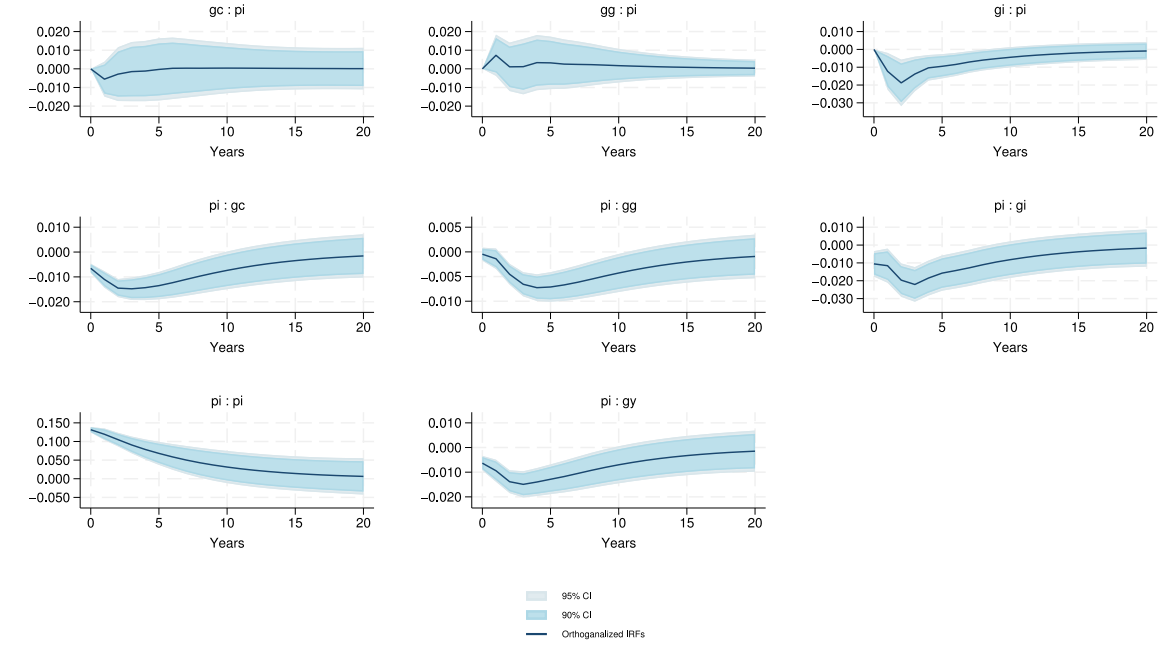

Fig. 5. Impulse response functions of political instability, government consumption, private consumption, and investment (specification II). This figure plots the effect of a shock by 1 standard deviation in the impulse variable on the response variable on impact and for the subsequent 20 years. To compute the IRFs, Choleski decomposition is employed. The causal ordering is: (1) political instability (pi), (2) government consumption (gg), (3) private consumption (gc), and (4) investment (gi). 90% and 95% confidence bands are generated by Monte-Carlo with 100 repetitions and presented by blue and light gray areas, respectively. To compute the aggregated effect of political instability on economic growth, the IRFs of political instability on consumption growth, investment growth, and government consumption growth are summed up according to their share of real GDP.

Table 4
Variance decomposition analysis of specification II. The table shows how much of the forecast error variance for any variable in a system, is explained by innovations to each explanatory variable over time. Steps correspond to years.

Response variable:		Impulse variable:			
	Step	pi	gg	gc	gi
Political Instability (pi)	2	0.990	0.000	0.000	0.000
	4	0.980	0.000	0.000	0.0100
	6	0.980	0.000	0.000	0.0100
	8	0.980	0.000	0.000	0.0100
	10	0.980	0.000	0.000	0.0100
	20	0.980	0.000	0.000	0.0200
Government Consumption (gg)	2	0.000	0.900	0.100	0.000
	4	0.100	0.700	0.190	0.000
	6	0.220	0.610	0.170	0.0100
	8	0.290	0.550	0.150	0.0100
	10	0.330	0.520	0.150	0.0100
	20	0.400	0.460	0.140	0.0100
Private Consumption (gc)	2	0.140	0.0300	0.820	0.0100
	4	0.340	0.0600	0.590	0.0200
	6	0.450	0.0500	0.480	0.0200
	8	0.510	0.0400	0.430	0.0200
	10	0.540	0.0400	0.400	0.0200
	20	0.570	0.0400	0.370	0.0200
Investment (gi)	2	0.0200	0.0300	0.350	0.600
	4	0.0900	0.0300	0.320	0.550
	6	0.130	0.0300	0.310	0.530
	8	0.160	0.0300	0.300	0.510
	10	0.170	0.0300	0.300	0.510
	20	0.170	0.0300	0.280	0.510

respectively. The results suggest that there is a bi-directional relationship between political instability and private investment. Specifically, a shock of 1 standard deviation in investment leads to a reduction in political instability of up to 0.02 units. In contrast, private and public consumption have no effect on political instability indicating that there is a uni-directional relationship running from political instability to consumption.

In addition, we note that the IRFs of private consumption, government consumption, and investment with respect to a shock of one of the other variables have the expected signs and are statistically significant. In most cases, the shocks take less than five periods until they become insignificant from zero.

Table 4 shows the results from a variance decomposition analysis and indicates which percentage of the variance in the response variable is explained by the impulse variable. The analysis emphasizes the long-term effect of political instability on the economy. In fact, the analysis shows that the explanatory power of political instability on all three economic variables under investigation increases over time. The variance of private consumption, for instance, is highly dependent on political instability as it explains up to 54%. This long-term effect cannot be explained by the direct effects of demonstrations and protests (Matta et al., 2022). Therefore, we conclude that indirect effects, such as uncertainty or institutional inefficiency, must be the dominant channels. Since political instability in advanced economies is closely related to increased pressure on liberal democracies, our results are in line with the related research. Indeed, Acemoglu et al. (2005) argue that the shape of institutions has long-lasting effects on the economy since it shapes, *inter alia*, the conditions for investment. Furthermore, democratization is found to have a long-lasting effect on economic growth (Acemoglu et al., 2019), especially if the spread of democratic values surpasses a certain threshold (Ma and Ouyang, 2016). Our findings suggest that instability within these democratic institutions has an inverse and comparable long-lasting effect on the economy.

6. Robustness checks

In this section, we present the results of some alternative model specifications to test the robustness of our results. We control for the effect of economic crises (specification III), reverse the Choleski ordering (specification IV) and implement the Political Risk Services International Country Risk Guide Index as alternative measure for political instability (specification V). The results confirm our findings qualitatively and, to a certain degree, quantitatively.

6.1. Economic crises

Global recessions are periods of significant reductions in economic activity. Often, investment and consumption decline, while the crises' effect on government consumption is less clear. Within the observed period, the Great Recession of 2008/2009 in the advance of the global financial crisis and the economic crisis of 2020 in the wake of the COVID-19 pandemic are of particular importance: Real economic output stagnated in 2008, declined by 3.5% in 2009, and declined by 4.9% in 2020.

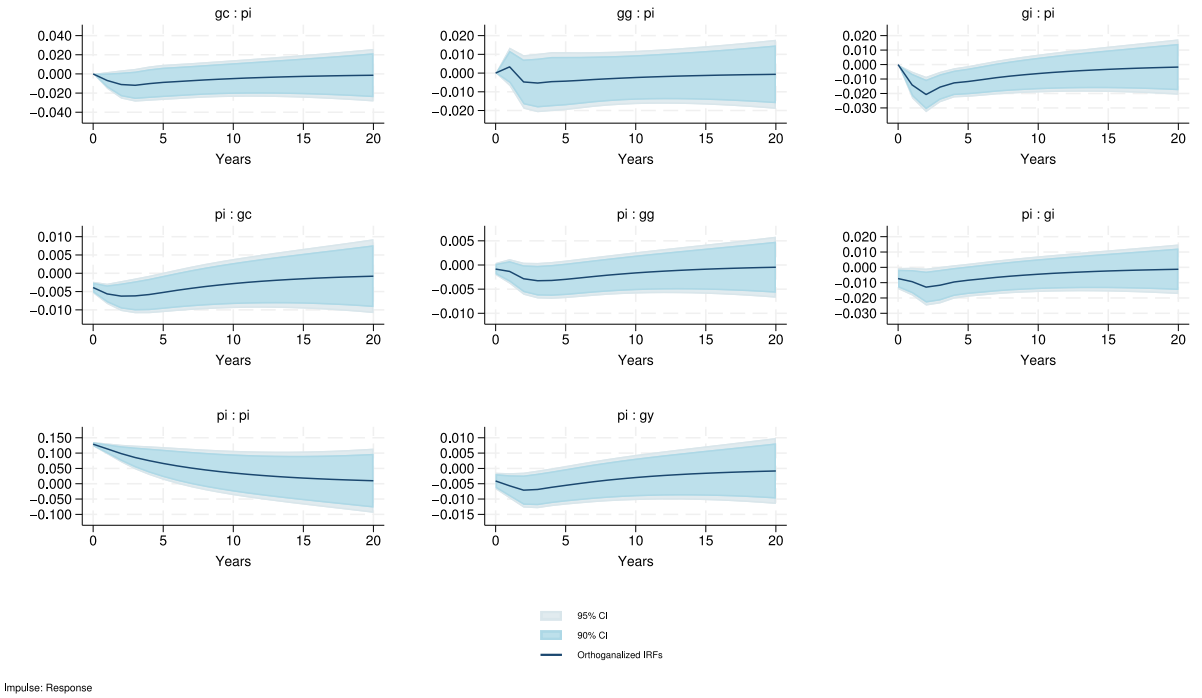

Fig. 6. Impulse response functions of political instability, government consumption, private consumption, and investment with Global Financial Crises, European Debt Crisis and COVID-19 pandemic dummy (specification III). This figure plots the effect of a shock by one-standard deviation in the impulse variable on the response variable on impact and for the subsequent 20 years. To compute the IRFs, Choleski decomposition is employed. The causal ordering is: (1) political instability (pi), (2) government consumption (gg), (3) private consumption (gc), and (4) investment (gi). 90% and 95% confidence bands are generated by Monte-Carlo with 100 repetitions and presented by blue and light gray areas, respectively. To compute the aggregated effect of political instability on economic growth, the IRFs of political instability on private consumption growth, investment growth, and government consumption growth are summed up according to their share of real GDP.

To control for whether economic crises drive the overall results, we extend specification II by including five dummy variables as exogenous variables. The first and second dummy variable account for the effects of the Great Recession: the first is equal to one in 2008 and the second is equal to one in 2009 while both are zero otherwise. The third dummy variable accounts for the effects of the COVID-19 pandemic and is equal to one in 2020 and zero otherwise. The fourth dummy variable is equal to one for all members of the EU for the years 2010–2013, while the last dummy variable is equal to one for the countries Cyprus, Greece, Ireland, Portugal, Italy, and Spain (Kok et al., 2022). IRFs for specification III are displayed in Fig. 6.

Compared to specification II, deviations regarding the estimated effect sizes of some of the variables under investigation can be observed. The maximum effect of political instability on investment observed three periods after the shock decreases from −2.2 % in specification II to −1.3 % if controlled for global economic recessions. Likewise, the effect of political instability on private consumption, and government consumption is smaller than in specification II. Consequently, the aggregated effects on economic growth are also dwarfed. However, the overall results in terms of signs and significance remain robust.

6.2. Alternative order

To assess whether our results depend on the causal ordering, we follow a common approach in the literature and estimate specification II with the reverse causal ordering: (1) investment, (2) private consumption, (3) government consumption, and (4) political instability.

Impulse response functions for specification IV, displayed in Fig. 7, indicate that the negative effect of political instability on the economic components of GDP is robust to a different causal ordering in terms of sign, size, and significance. Furthermore, we note that the responses of private consumption, investment, and government consumption to a shock of one of the economic variables are consistent with our previous results. Regarding the effect of a shock in one of the economic variables, we again find that an investment shock reduces political instability. However, the results estimated with a reversed Choleski order also show a negative effect of private consumption on political instability.

6.3. Alternative measure

There is an ongoing debate in sociology and political science about whether protests and demonstrations truly indicate a growing disconnection from the political system and a loss of faith in the political institutions (Daphi et al., 2021). Empirical evidence shows

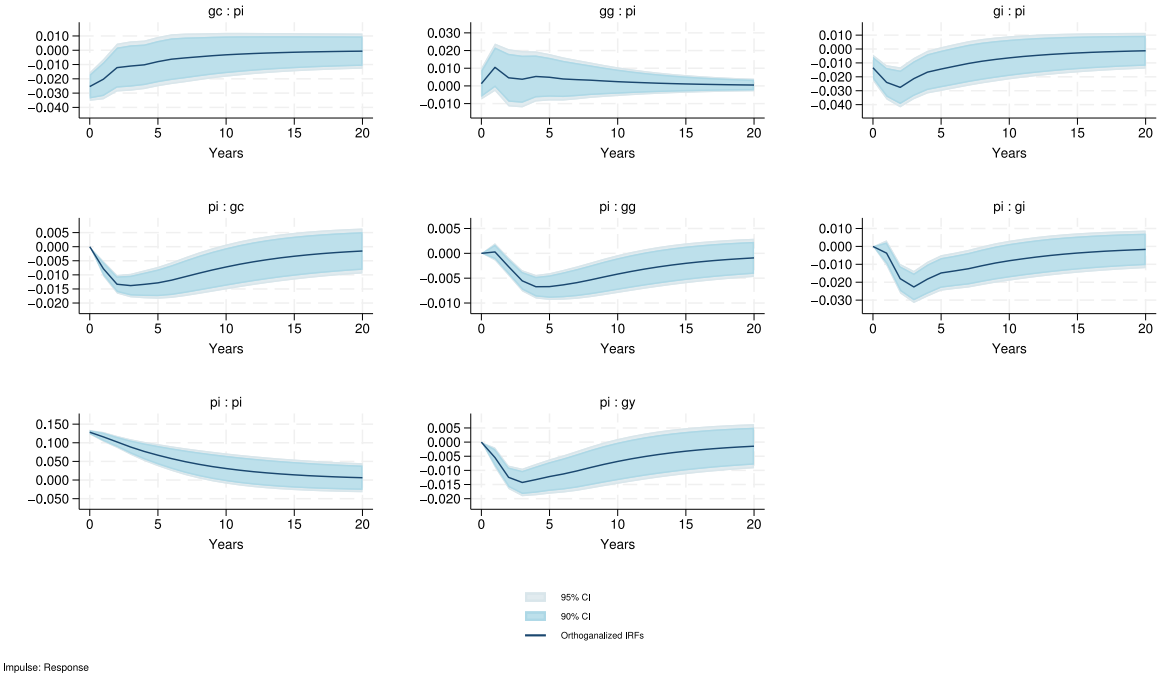

Fig. 7. Impulse response functions of political instability, government consumption, private consumption, and investment with alternative Choleski order (specification IV). This figure plots the effect of a shock by 1 standard deviation in the impulse variable on the response variable on impact and for the subsequent 20 years. To compute the IRFs, Choleski decomposition is employed. The causal ordering is: (1) political instability (pi), (2) government consumption (gg), (3) private consumption (gc), and (4) investment (gi). 90% and 95% confidence bands are generated by Monte-Carlo with 100 repetitions and presented by blue and light gray areas, respectively. To compute the aggregated effect of political instability on economic growth, the IRFs of political instability on private consumption growth, investment growth, and government consumption growth are summed up according to their share of real GDP.

that demonstrators are associated with a lower level of political trust than the public (Hooghe and Marien, 2013). However, Della Porta (2009) and Flesher Fominaya (2020) argue that demonstrations, in particular in Western democracies, may be a part of regular democratic participation, which as such can also strengthen political stability.

If protests and demonstrations are a not a suitable proxy for political instability, this may bias the results. To address this issue, we reestimate specification II using the Political Risk Services International Country Risk Guide Index as an alternative measure of political instability that does not proxy for events related to the mass civil protest dimension of political instability.

Panel VAR impulse response functions for specification V reported in Fig. 8 provide results similar to those fore specification II. Again, we find that instability has a decreasing effect on economic growth via a reduction in investment, private consumption, and government consumption. The empirical findings suggest that the information on protests included in the WGI of Political Stability and Absence of Violence/Terrorism – which might not increase political instability – does not bias the overall results.

7. Dynamic panel FE-IV approach

While VAR models are the preferred tool to examine dynamic relationships between variables, they are less well-suited to identify causal relationships. Therefore, we implement an instrumental variable approach that allows us to examine the causal effect of political instability on economic growth and vice versa. Our Panel VAR results emphasize that the relationship between political instability and economic growth is dynamic. To compare IV results with the panel VAR results, we estimate a local projection with fixed effects following Jordà (2005). The method allows us to compute IRFs based on the panel IV estimation. Plagborg-Møller and Wolf (2021) show that IRFs estimated by VARs and local projections do not differ substantially. However, IRFs estimated by local projections are more robust against misspecification. Therefore, they provide a useful check on the robustness of the panel VAR results.

7.1. The causal effect of political instability on economic growth

Following Grechyna (2018) and Vu (2022), we utilize the political instability of culturally close countries as an external source of domestic political instability. The rationale behind this approach is that political movements often occur in waves across several countries. For example Acemoglu et al. (2019) argued that the process of democratization takes place in such waves of countries. Political protest movements are also often not limited to individual countries, but occur simultaneously in neighboring countries (Grechyna, 2018). The reason for this is that the social and political structures and processes are similar. Moreover,

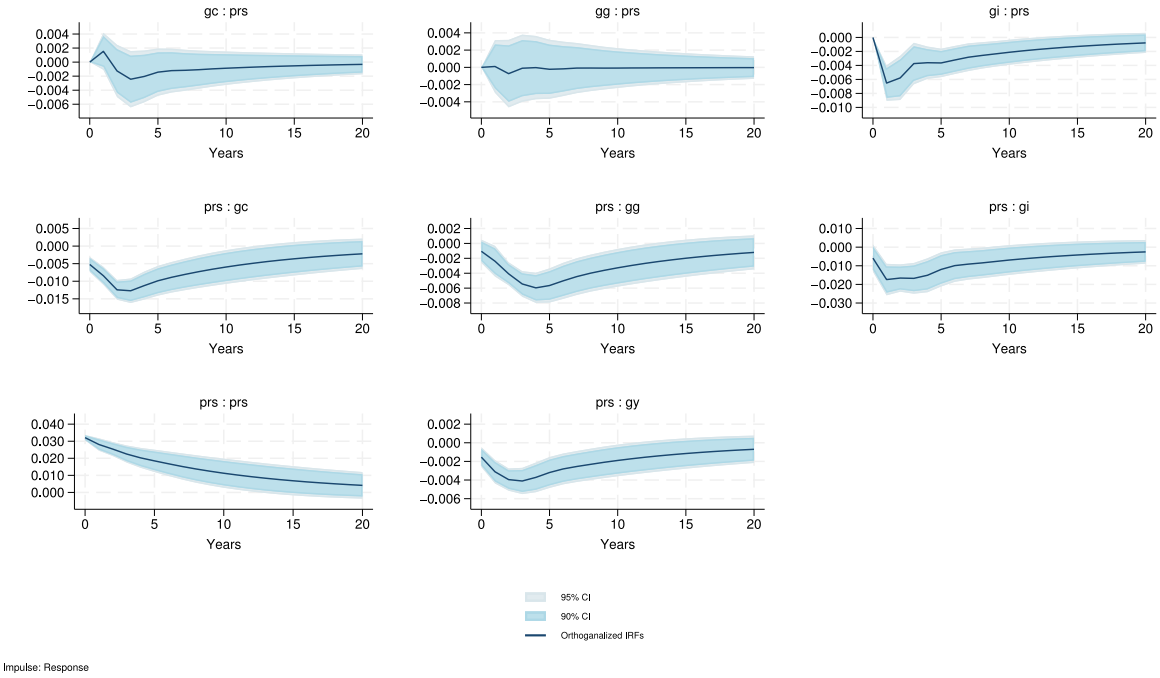

Fig. 8. Impulse response functions of political instability, government consumption, private consumption, and investment with the International Country Risk Guide Index as a measure of political instability (specification V). This figure plots the effect of a shock by 1 standard deviation in the impulse variable on the response variable on impact and for the subsequent 20 years. To compute the IRFs, Choleski decomposition is employed. The causal ordering is: (1) political instability (pi), (2) government consumption (gg), (3) private consumption (gc), and (4) investment (gi). 90% and 95% confidence bands are generated by Monte-Carlo with 100 repetitions and presented by blue and light gray areas, respectively. To compute the aggregated effect of political instability on economic growth, the IRFs of political instability on private consumption growth, investment growth, and government consumption growth are summed up according to their share of real GDP.

countries are closely tied to each other via an eased and regular exchange of information (Kuran, 1989; Lohmann, 1994; Ellis and Fender, 2011; Buera et al., 2011). Lastly, neighboring countries often face the same political challenges. Examples are the recent conflicts with the influx of migrants in Europe and the US, and the COVID-19 pandemic. These arguments support the relevance condition.

Empirical evidence for spillover effects of neighborhood political instability from culturally close countries on domestic political instability is provided by Grechyna (2018). To deal with the problem of mutual reinforcement of domestic and neighborhood instability, Grechyna (2018) uses *"fundamental (exogenous) characteristics of neighbors' neighbors to instrument for the neighbors' political instability"* (p. 583). The findings are robust regardless of the level of development and, thus, should hold also for our sample.

Economically, the exclusion assumption implies that neighborhood instability conditional on lags of GDP growth and country fixed effects has no direct effect on domestic GDP growth in period t. This assumption cannot be tested empirically. One concern may be that common economic developments drive the regional degree of political instability. However, we argue that cross-national shocks of political instability are not driven by common economic trends. This reasoning follows Acemoglu et al. (2019), who argue that regional spillovers of political instability are caused by "similar histories, political cultures, practical problems, and close informational ties" (p. 80).

A second concern is that an increase in political instability in the neighborhood has a direct impact on domestic economic growth, as, for example, domestic production declines because domestic firms expect a drop in foreign sales due to spending restraint. If this is the case, a negative effect of political instability on exports is expected. However, regressing foreign political instability on domestic exports or imports in a dynamic fixed effects model does not yield a significant relationship. We, therefore assume, that the exclusion restriction is fulfilled.

The construction of the variable neighborhood political instability follows an approach similar to that of Grechyna (2018) and Vu (2022). To compute the level of neighborhood political instability, we calculate a neighborhood-specific average of political instability. Consequently, country i's neighborhood instability is represented by the neighborhood-specific average of political instability, excluding country i's level of political instability.

However, we diverge from the methods of Grechyna (2018) and Vu (2022) in defining the group of neighborhood countries. While in their studies neighboring countries are defined as those sharing a common border, we, instead, group culturally close countries using the United Nations Geoscheme based on the M49 coding classification.

The decision not to base country groupings on borders with other countries but rather on the M49 coding classification is motivated by two primary reasons. First, our sample is restricted to a smaller selection of countries compared to the samples used

Table 5
Local projection estimation results for a Dynamic Panel FE-IV: The effect of political instability on economic growth. The dependent variable used in each regression is indicated in the respective column heading. Variation in neighborhood political instability conditional on country and time fixed effects, is exploited as an exogenous source of variation in domestic political instability. First stage estimates are reported in column 1, while local projection results of the Dynamic Panel FE-IV estimation are presented in Columns 2–7. Columns 2–7 show the responses of economic growth to a shock of political instability by 0.13 index points (corresponding to 1 standard deviation of political instability in specification I) on impact and for the subsequent 20 years. Sample period: 1996–2020; standard errors are in parentheses; significance levels at which the null hypothesis is rejected are as follows: $^{*}p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	First Stage:	Second Stage: Real GDP growth					
	Political Instability	h = 0	h = 1	h = 2	h = 3	h = 4	h = 5
Political Instability Index		−0.0084***	−0.0108***	−0.0064**	−0.0071**	−0.0014	0.0021
		(0.0030)	(0.0034)	(0.0031)	(0.0034)	(0.0031)	(0.0030)
Neighborhood Political Instability Index	2.833***						
	(0.4991)						
L. GDP in growth rates	−7.8410***	0.3275***	−0.0465	−0.0462	−0.2023***	−0.0001	−0.0569
	(2.5128)	(0.0487)	(0.0552)	(0.0503)	(0.0548)	(0.0502)	(0.0546)
L2. GDP in growth rates	−8.1037***	−0.2067***	−0.1576***	−0.1987***	−0.0548	−0.1519***	−0.1238**
	(2.4377)	(0.0488)	(0.0555)	(0.0511)	(0.0552)	(0.0566)	(0.0551)
Constant	−3.3356***	−0.0370*	−0.0402*	0.0050	−0.0149	0.0225	0.0521**
	(0.4443)	(0.0216)	(0.0242)	(0.0220)	(0.0242)	(0.0224)	(0.0209)
Time effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	782	782	748	714	680	646	612
Number of groups	34	34	34	34	34	34	34
R-squared within	0.3050	0.5271	0.4023	0.5082	0.4455	0.5476	0.5891
F-statistics	12.53	36.8887	26.7815	33.1320	28.8612	34.9471	39.1607
P-value of F-statistics	0.000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
F-Statistics of the excluded instrument	32.2194						

by Grechyna (2018) and Vu (2022). Some countries in our sample, such as Australia and New Zealand, do not share a border with any other country, while others, such as the UK, Canada, or the US, have only one or two neighboring countries. Therefore, constructing groups based on country borders is either not feasible or would result in relatively small neighborhood groups. Second, cultural proximity may be more important than geographical proximity with respect to political spillovers, as noted by Grechyna (2018). This is especially true for countries that do not share a border but share a common language, history, political principles, and culture, such as Australia, Canada, the UK, Ireland, and the US. Thus, constructing groups based on country borders rather than culture would overlook the potential for political ideas to spread through means other than country borders. Therefore, our approach is much closer to Acemoglu et al. (2019), who create jack-knifed regional averages of democratization as an instrument for democracy in growth regressions. Their approach involves dividing the sample into seven distinct regions, based on a World Bank classification, and defining a country's neighbors as all other countries in the same region.

We note that we deviate from the United Nations Geoscheme grouping in two cases: First, we combined the North America group and the Australia and New Zealand group because otherwise each group would contain only two countries. Second, we added the UK and Ireland to this group of countries, leaving us with a single group of all English-speaking countries in the sample that further share historical ties. We note that the qualitative results of our estimate are robust to these adjustments.

The following dynamic panel model is estimated via 2SLS estimation:

$$Y_{i,t+h} = \sum_{l=1}^{2} \beta_{h,l} Y_{i,t-l} + \gamma_h pi_{i,t} + \mu_{i,h} + \tau_{t,h} + \epsilon_{i,t,h} \tag{2}$$

where $Y_{i,t}$ corresponds to economic growth and $pi_{i,t}$ corresponds to the WGI of Political Stability and Absence of Violence/Terrorism instrumented by neighborhood political instability. The parameter h denotes the projection horizon, γ_h and $\beta_{1,h}$ are the projection coefficients, and $\epsilon_{i,t,h}$ is the projection error term. Country fixed effects are denoted by $\mu_{t,h}$ while time fixed effects are denoted by $\tau_{t,h}$.

Results are reported in Table 5. Column (1) shows the first stage of the Dynamic Panel FE-IV estimation. The results reveal that neighborhood political instability has a significant effect on domestic political instability conditional on economic growth and country and time fixed effects. We emphasize that general macroeconomic shocks (e.g., the Financial Crisis or the COVID-19 pandemic) do not drive this relationship since we have controlled for time fixed effects. Furthermore, the F-statistics of the excluded instrument is considerably larger than 10. We conclude that the relevance condition is fulfilled and neighborhood political instability is not a weak instrument (Staiger and Stock, 1997; Stock and Yogo, 2002). The model accounts for approximately 30% of the total variance in political instability. Table 5 also shows that past economic growth has a significant negative effect on political instability, emphasizing the simultaneous relationship between both variables.

The subsequent columns report the estimated effect of a shock of political instability, initially and for the 5 subsequent years. We note that the estimates reported in Table 5 show the response of economic growth to a shock of political instability of the same magnitude as used in specification I of the panel VAR estimation. Specifically, this shock equals an increase in political instability by 0.13 index points, corresponding to 1 standard deviation of political instability in specification I. This alignment allows for a direct comparison between the Dynamic Panel FE-IV estimation and the panel VAR findings. We report a negative and significant

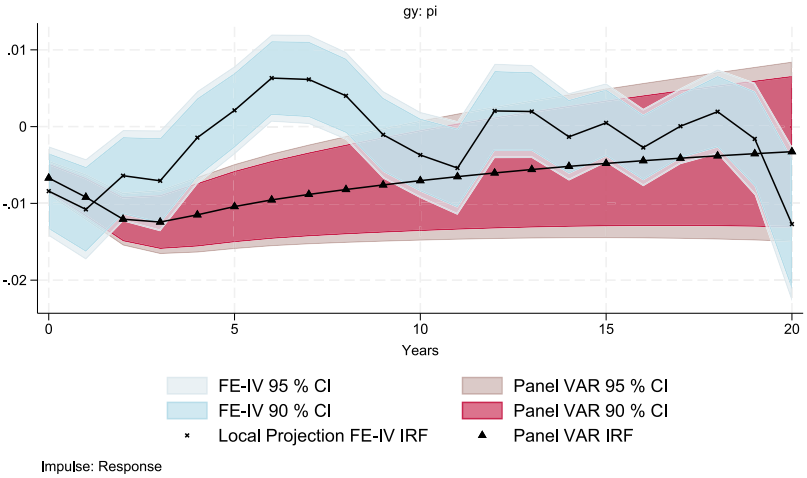

Fig. 9. Panel VAR and Dynamic Panel FE-IV estimates of the effect of political instability on economic growth. This figure plots the responses of economic growth to a shock of political instability of 0.13 index units (corresponding to 1 standard deviation of political instability in specification I) on impact and for the subsequent 20 years. To compute the IRFs, Choleski decomposition is employed. The causal ordering is: (1) political instability (pi) and (2) economic growth (gy). Panel IV effects (crosses) are estimated using Jordà (2005) local projections. 90% and 95% confidence bands are presented by red and light red areas, respectively. Panel VAR estimates (triangles) are based on specification 1. 90% and 95% confidence bands are generated by Monte-Carlo with 100 repetitions and presented by blue and light gray areas, respectively.

effect of political instability on economic growth initially and for the first three periods after the shock (Columns 2–5). The size of the estimated shock reaches its highest value in the first period after the shock, which is equal to a decrease in economic growth by 1.1 percentage points (column 3). In the fourth year after the shock, the coefficient remains negative but becomes insignificant (Columns 6–7).

Fig. 9 shows the IRF of the estimated model in comparison with the panel VAR results of specification I for the 20 consecutive periods after the shock. In line with the panel VAR results, the IRF computed with the Dynamic Panel FE-IV estimation indicates that GDP growth is affected significantly by political instability for the subsequent 4 years after a shock at the 95% level. We note that the Dynamic Panel FE-IV IRF indicates a much faster fade out of the observed effect. This is likely due to the estimation method of the local projection since the sample size decreases with each additional projection estimated ahead. Thus, with increasing projection horizons, observations at the end of the sample gain weight relative to observations at the start of the sample. This may lead to estimates diverging from the panel VAR results close to the end of the estimation horizon. However, after the negative effect observed in the first four periods has faded out, the estimated coefficients become insignificant from zero quickly. We conclude that the Dynamic Panel FE-IV regression results confirm the hypothesis that economic growth is affected negatively by political instability.

7.2. The causal effect of economic growth on political instability

To estimate the causal effect of economic growth on political instability, we need an instrument for economic growth. Weather data has frequently been used as an instrument for economic growth. This correlation appears to be much stronger for developing countries than for advanced economies (Dell et al., 2012; Kalkuhl and Wenz, 2020; Miguel et al., 2004). The negative effect on agricultural production through cold or dry weather seems to be the obvious channel (Lesk et al., 2016). However, Burke et al. (2015) show that the relationship between climatic conditions and economic growth is non-linear. In their empirical study, the authors argue that the correlation is positive up to an annual average temperature of 13 °C and becomes negative thereafter. This non-linearity can therefore explain why a non-significant linear relationship is found in a joint analysis of developing countries and advanced economies. In our empirical analysis, we focus on advanced economies. In most of these countries, the average annual temperature is below 13 °C. Only countries such as Spain and Italy have higher average temperatures.

Building on the empirical finding that there is a relationship between weather conditions and economic growth even in advanced economies, we argue that significant positive deviations from these mean values have negative effects on economic growth. This is supported by empirical studies that suggest that industrial production is also negatively affected by above-average temperatures (Jones and Olken, 2010; Dell et al., 2012). For example, labor productivity is negatively affected by high temperatures. Furthermore, transportation costs increase and power plants must be curtailed because water levels in rivers are low during hot summers. We, therefore, argue that the relevance condition holds and employ the number of months with above-median temperatures within a year conditional on country and year fixed effects as an instrument for economic growth.

To construct the instrument, we employ data on temperature (of the air at 2 meter above the surface) obtained from the ERA5 dataset from the European Centre for Medium-Range Weather Forecasts (ECMWF) (Hersbach et al., 2023). A month is classified as

Table 6
Local projection estimation results for a Dynamic Panel FE-IV: The effect of economic growth on political instability. The dependent variable used in each regression is indicated in the respective column heading. Variation in mean temperature conditional on country and time fixed effects is exploited as an exogenous source of variation in economic growth. First stage estimates are reported in column 1, while local projection results of the Dynamic Panel FE-IV estimation are presented in Columns 2-6. Columns 2-6 show the responses of political instability to a shock of economic growth by 2.8 percentage points (corresponding to 1 standard deviation of economic growth in specification I) on impact and for the subsequent 20 years. Sample period: 1996–2020; standard errors in parentheses; significance levels at which the null hypothesis is rejected are as follows: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

	(1)	(2)	(3)	(4)	(5)	(6)
	First Stage:	Second Stage: Political instability				
	Real GDP growth	h=1	h=2	h=3	h=4	h=5
Real GDP (in billion constant 2015 US$) in growth rates		−0.0018	0.0024	0.0038	0.0001	0.0061
		(0.0022)	(0.0026)	(0.0029)	(0.0022)	(0.0047)
Number of hot months	−1.6920***					
	(0.5382)					
L.Political Instability Index	−17.5920***	0.5339***	0.4043***	0.2592***	0.0407	0.0369
	(5.2070)	(0.0451)	(0.0557)	(0.0658)	(0.0509)	(0.0984)
Constant	5.0551	−0.4045***	−0.6527***	−0.8519***	−1.0250***	−1.1976***
	(7.6681)	(0.0452)	(0.0558)	(0.0630)	(0.0495)	(0.0713)
Time effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	748	748	714	680	646	612
Number of groups	34	34	34	34	34	34
R-squared within	0.4782	0.4747	0.1655	.	0.2238	.
F-statistics	27.41	27.1596	12.2023	6.8857	8.6195	3.2513
P-value of F-statistics	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
F-Statistics of the excluded instrument	9.8836					

hot if its mean temperature surpasses the median temperature of the set of corresponding months in previous or following years. Due to data availability, the sample is restricted to data from 1996 to 2019.

The exclusion restriction rests upon the assumption that political instability is not affected by temperatures directly or through a channel other than economic growth. Since the link between aggression and temperatures is well documented in the literature, weather shocks may affect political instability through political violence, such as riots or protests. The rationale is that weather extremes, such as droughts, e.g., increase crop scarcity, which eventually leads to food insecurity and social unrest (Salehyan and Hendrix, 2014). However, Dell et al. (2012) argue that a significant relationship between temperature and political instability is limited to developing countries, while in advanced economies no significant association between both variables can be found. Thus, we argue that the exclusion restriction is not violated.

To estimate the causal effect of economic growth on political instability, we estimate the local projection of the following dynamic panel model via 2SLS estimation:

$$PI_{i,t+h} = \zeta_h Y_{i,t} + \theta_h PI_{i,t-1} + \mu_{i,h} + \tau_{t,h} + \xi_{i,t,h} \tag{3}$$

where $Y_{i,t}$ corresponds to economic growth, instrumented by the number of hot months, ζ and θ are the projection coefficients, and ξ is the error term.

The results of the first stage in column 1 of Table 6 show that the number of hot months within a year is negatively and significantly correlated with economic growth. The F-statistics of the excluded instrument is close to 10 and we conclude that we do not face the problem of a weak instrument (Staiger and Stock, 1997; Stock and Yogo, 2002). As suggested by the previous analysis, a lag of political instability also has a significant effect on economic growth. The first stage model explains 47.9% of the variation in economic growth.

The results for the second stage are reported in columns 2–6 showing the causal effect of a shock of economic growth on political instability for the first and subsequent five periods after the shock. To ease comparison with the panel VAR results, the estimates presented in Table 5 show the response of political instability to a shock of economic growth with the same magnitude as in specification I of the panel VAR estimation. The shock size equals an increase of economic growth by 2.8 percentage points, corresponding to one standard deviation of economic growth in specification I. We assume in line with the Choleski order employed in the panel VAR estimation, that economic growth does not affect political instability contemporaneously. Therefore, the effect of economic growth on political instability is equal to zero in period $h = 0$. The results indicate that political instability is negatively affected by economic growth in the first year after the shock. However, large standard errors typically found in IV settings prevent the identification of an effect significant from zero to any conventional level of significance. The model explains about 47.5% of the total variation in political instability for $h = 1$.

Fig. 10 shows the IRF of the estimated model compared to the effect estimated in the panel VAR of specification I. The estimated effect of economic growth on political instability confirms the baseline results qualitatively since we do not find a significant effect of economic growth on political instability. Furthermore, the estimated results are not statistically significantly different from the panel VAR results.

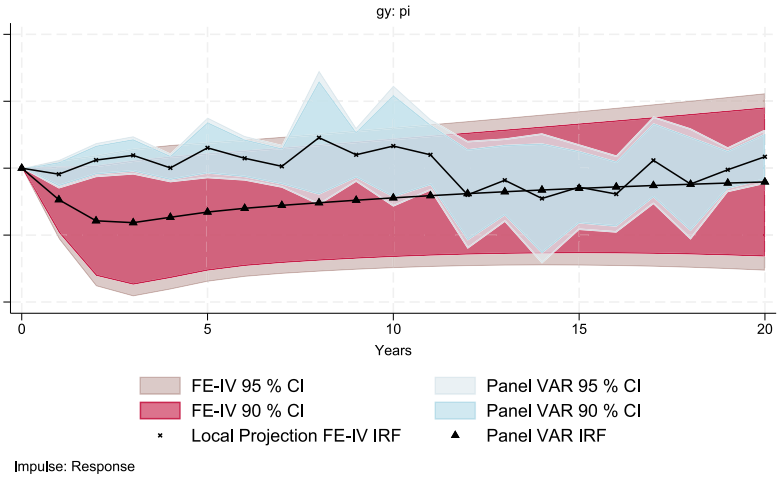

Fig. 10. Panel VAR and Dynamic Panel FE-IV estimates of the effect of economic growth on political instability. This figure plots the responses of political instability to a shock of economic growth by 2.8 percentage points (corresponding to 1 standard deviation of economic growth in specification I) on impact and for the subsequent 20 years. To compute the IRFs, Choleski decomposition is employed. The causal ordering is: (1) political instability (pi) and (2) economic growth (gy). Panel IV effects (crosses) are estimated using Jordà (2005) local projections. 90% and 95% confidence bands are presented by red and light red areas, respectively. Panel VAR estimates (triangles) are based on the model discussed in section 5.1. 90% and 95% confidence bands are generated by Monte-Carlo with 100 repetitions and presented by blue and light gray areas, respectively.

8. Conclusion

Political stability has deteriorated in many advanced economies. The economic implications of this recent trend are still not fully understood. In particular, it is an open question whether and through which channels economic growth affects political stability or vice versa. To close this research gap, we estimate a panel VAR of political instability and economic growth, as well as its components, and calculate IRFs. Additionally, we use a Dynamic Panel FE-IV estimation to establish causality between the two variables. Both approaches yield similar results, particularly with regard to the magnitude of the effects on GDP growth.

The panel VAR results indicate that a one-standard deviation shock of political instability significantly and substantially reduces economic output by 0.7 percentage points initially. The maximum effect on the GDP growth rate of 1.3 percentage points is reached after three years. Decomposing GDP into its main components private consumption, investment, and government consumption shows that private consumption and to a lesser extent investment are important transmission channels through which the economy is affected by a shock to political instability. The reverse effect shows that a one-standard deviation shock to economic growth does not reduce political instability significantly.

The Dynamic Panel FE-IV results confirm the panel VAR results qualitatively and, to some extent, quantitatively. To examine the dynamic effects of a one-standard deviation shock, we rely on Jordà (2005) local projections. Exploiting political instability in neighboring countries as an instrument for domestic political instability, we find that economic growth is reduced by 0.8 percentage points initially and by 0.6 to 1.1 percentage points in consecutive years. The Dynamic Panel FE-IV approach attempts to solve the endogeneity problem between political instability and economic growth in a different way but yields very similar results. This result reinforces the magnitude of the causal effect of political instability on economic growth. An examination of the reverse relationship in a Dynamic Panel FE-IV setting shows results similar to the panel VAR approach. Using weather data as an instrument for economic growth, we do not find a significant effect of economic growth on political instability.

CRediT authorship contribution statement

Maximilian W. Dirks: Writing – review & editing, Writing – original draft, Software, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Torsten Schmidt:** Writing – review & editing, Supervision, Project administration, Methodology, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data and code are saved and available at: https://my.hidrive.com/share/lk95h4yhks#login.

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References

Abrigo, M.R.M., Love, I., 2016. Estimation of panel vector autoregression in stata. Stata J. Promot. Commun. Stat. Stata 16 (3), 778–804.
Acemoglu, D., Johnson, S., Robinson, J.A., 2005. Chapter 6 institutions as a fundamental cause of long-run growth. In: Handbook of Economic Growth, vol. 1, Elsevier, pp. 385–472.
Acemoglu, D., Naidu, S., Restrepo, P., Robinson, J.A., 2019. Democracy does cause growth. J. Polit. Econ. 127 (1), 47–100.
Aisen, A., Veiga, F.J., 2006. Does political instability lead to higher inflation? A panel data analysis. J. Money Credit Bank. 38 (5), 1379–1389.
Aisen, A., Veiga, F.J., 2013. How does political instability affect economic growth? Eur. J. Political Econ. 29, 151–167.
Akçoraoğlu, A., Kaplan, E.A., 2017. Political instability, corruption, and economic growth: Evidence from a panel of OECD countries. Bus. Econ. Res. J. 8 (3), 363–377.
Al-Shammari, N., Willoughby, J., 2019. Determinants of political instability across arab spring countries. Mediterranean Politics 24 (2), 196–217.
Alcántar-Toledo, J., Venieris, Y.P., 2014. Fiscal policy, growth, income distribution and sociopolitical instability. Eur. J. Political Econ. 34, 315–331.
Alesina, A., Ozler, S., Roubini, N., Swagel, P., 1996. Political instability and economic growth. J. Econ. Growth 1 (2), 189–211.
Alesina, A., Perotti, R., 1996. Income distribution, political instability, and investment. Eur. Econ. Rev. 40 (6), 1203–1228.
Alesina, A., Rodrik, D., 1994. Distributive politics and economic growth. Q. J. Econ. 109 (2), 465–490.
Alesina, A., Tabellini, G., 1989. External debt, capital flight and political risk. J. Int. Econ. 27 (3–4), 199–220.
Alexandre, F., Bação, P., Veiga, F.J., 2022. The political economy of productivity growth. Eur. J. Political Econ. 75, 102185.
Andrews, D., Criscuolo, C., Gal, P., 2016. The best versus the rest: The global productivity slowdown, divergence across firms and the role of public policy. 5, (5), pp. 1–77, OECD Productivity Working Papers 5.
Andrijevic, M., Crespo Cuaresma, J., Muttarak, R., Schleussner, C.-F., 2020. Governance in socioeconomic pathways and its role for future adaptive capacity. Nature Sustainability 3 (1), 35–41.
Arellano, M., Bover, O., 1995. Another look at the instrumental variable estimation of error-components models. J. Econometrics 68 (1), 29–51.
Asteriou, D., Price, S., 2001. Political instability and economic growth: UK time series evidence. Scott. J. Political Econ. 48 (4), 383–399.
Bahmani-Oskooee, M., Maki Nayeri, M., 2020. Policy uncertainty and consumption in G7 countries: an asymmetry analysis. Int. Econ. 163, 101–113.
Baker, S.R., Bloom, N., Davis, S.J., 2016. Measuring economic policy uncertainty*. Q. J. Econ. 131 (4), 1593–1636.
Banks, J., Blundell, R., Brugiavini, A., 2001. Risk pooling, precautionary saving and consumption growth. Rev. Econ. Stud. 68 (4), 757–779.
Barro, R.J., 1991. Economic growth in a cross section of countries. Q. J. Econ. 106 (2), 407–443.
Bernal-Verdugo, L.E., Furceri, D., Guillaume, D.M., 2013. The dynamic effect of social and political instability on output: the role of reforms. pp. 1–41, IMF Working Paper WP/13/91, International Monetary Fund.
Blanchard, O., Perotti, R., 2002. An empirical characterization of the dynamic effects of changes in government spending and taxes on output. Q. J. Econ. 117 (4), 1329–1368.
Blanco, L., Grier, R., 2009. Long live democracy: The determinants of political instability in Latin America. J. Dev. Stud. 45 (1), 76–95.
Bloom, N., Jones, C.I., Van Reenen, J., Webb, M., 2020. Are ideas getting harder to find? Amer. Econ. Rev. 110 (4), 1104–1144.
Blundell, R., Bond, S., 1998. Initial conditions and moment restrictions in dynamic panel data models. J. Econometrics 29.
Brannen, S.J., Haig, C.S., Schmidt, K., 2022. Root Causes of Unrest and the Continued Increase in Global Uprisings. Center for Strategic and International Studies, p. 8, The Age of Mass Protests.
Buera, F.J., Monge-Naranjo, A., Primiceri, G.E., 2011. Learning the wealth of nations. Econometrica 79 (1), 1–45.
Burke, M., Hsiang, S.M., Miguel, E., 2015. Global non-linear effect of temperature on economic production. Nature 527 (7577), 235–239.
Busse, M., Hefeker, C., 2007. Political risk, institutions and foreign direct investment. Eur. J. Political Econ. 23 (2), 397–415.
Caldara, D., Kamps, C., 2008. What are the effects of fiscal policy shocks? A VAR-based comparative analysis. ECB - Working Paper Series, (877), p. 47.
Campos, N.F., Nugent, J.B., 2002. Who is afraid of political instability? J. Dev. Econ. 67 (1), 157–172.
Chen, B., Feng, Y., 1996. Some political determinants of economic growth: Theory and empirical implications. Eur. J. Political Econ. 12 (4), 609–627.
Coibion, O., Gorodnichenko, Y., Kamdar, R., 2018. The formation of expectations, inflation, and the phillips curve. J. Econ. Lit. 56 (4), 1447–1491.
Collier, P., 2004. Greed and grievance in civil war. Oxf. Econ. Pap. 56 (4), 563–595.
Colombo, V., 2013. Economic policy uncertainty in the US: Does it matter for the Euro area? Econom. Lett. 121 (1), 39–42.
Cukierman, A., Edwards, S., Tabellini, G., 1992. Seigniorage and political instability. Am. Econ. Rev. 82 (3), 537–555.
Daphi, P., Haunss, S., Sommer, M., Teune, S., 2021. Taking to the streets in Germany – disenchanted and confident critics in mass demonstrations. German Politics 1–29.
Darby, J., Li, C.-W., Muscatelli, V., 2004. Political uncertainty, public expenditure and growth. Eur. J. Political Econ. 20 (1), 153–179.
Dell, M., Jones, B.F., Olken, B.A., 2012. Temperature shocks and economic growth: Evidence from the last half century. Am. Econ. J.: Macroecon. 4 (3), 66–95.
Della Porta, D., 2009. Democracy in Social Movements. Palgrave Macmillan UK, London.
Diamond, L., 2015. Facing up to the democratic recession. J. Democr. 26 (1), 141–155.
Ellis, C.J., Fender, J., 2011. Information cascades and revolutionary regime transitions. Econ. J. 121 (553), 763–792.
Ezcurra, R., 2021. Individualism and political instability. Eur. J. Political Econ. 66, 101959.
Flesher Fominaya, C., 2020. Democracy reloaded: Inside Spain's political laboratory from 15-m to podemos. Oxford Studies in Culture and Politics, Oxford University Press, New York, NY.
Forni, M., Gambetti, L., 2016. Government spending shocks in open economy VARs. J. Int. Econ. 99, 68–84.
Fukuyama, F., 2020. 30 Years of world politics: What has changed? J. Democr. 31 (1), 11–21.
Gassebner, M., Gutmann, J., Voigt, S., 2016. When to expect a coup d'état? an extreme bounds analysis of coup determinants. Public Choice 169 (3–4), 293–313.
Góes, C., 2016. Institutions and growth: A GMM/IV Panel VAR approach. Econom. Lett. 138, 85–91.

Goldstone, J.A., Bates, R.H., Epstein, D.L., Gurr, T.R., Lustik, M.B., Marshall, M.G., Ulfelder, J., Woodward, M., 2010. A global model for forecasting political instability. Am. J. Political Sci. 54 (1), 190–208.
Grechyna, D., 2018. Shall we riot too? The geographical neighbor impact on political instability: Shall we riot too? Kyklos 71 (4), 581–612.
Guariglia, A., 2002. Consumption, habit formation, and precautionary saving: evidence from the British household panel survey. Oxf. Econ. Pap. 54 (1), 1–19.
Gyimah-Brempong, K., 1999. Political instability, investment and economic growth in Sub-Saharan Africa. J. Afr. Econ. 8 (1), 52–86.
Hadjar, A., Köthemann, D., 2014. Klassenspezifische Wahlabstinenz – Spielt das Vertrauen in politische Institutionen eine Rolle? KZfSS Kölner Z. Soziologie Sozialpsychologie 66 (1), 51–76.
Hahm, J.-H., Steigerwald, D.G., 1999. Consumption adjustment under time-varying income uncertainty. Rev. Econ. Stat. 81 (1), 32–40.
Hayakawa, K., 2009. First difference or forward orthogonal deviation- which transformation should be used in dynamic panel data models?: A simulation study. Econ. Bull. 29 (3), 2008–2017.
Hersbach, H., Bell, B., Berrisford, P., Biavati, G., Horányi, A., Muñoz Sabater, J., Nicolas, J., Peubey, C., Radu, R., Rozum, I., Schepers, D., Simmons, A., Soci, C., Dee, D., Thépaut, J.-N., 2023. ERA5 hourly data on single levels from 1940 to present. copernicus climate change service (C3S) climate data store (CDS).
Holtz-Eakin, D., Newey, W., Rosen, H.S., 1988. Estimating vector autoregressions with panel data. Econometrica 56 (6), 1371.
Hooghe, M., Marien, S., 2013. A comparative analysis of the relation between political trust and forms of political participation in Europe. Eur. Societies 15 (1), 131–152.
Howell, L.D., 2011. International Country Risk Guide Methodology. PRS Group, East Syracuse, NY, p. 17.
Jones, B.F., Olken, B.A., 2010. Climate shocks and exports. Amer. Econ. Rev. 100 (2), 454–459.
Jong-A-Pin, R., 2009. On the measurement of political instability and its impact on economic growth. Eur. J. Political Econ. 25 (1), 15–29.
Jordà, Ò., 2005. Estimation and inference of impulse responses by local projections. Amer. Econ. Rev. 95 (1), 161–182.
Judson, R.A., Owen, A.L., 1999. Estimating dynamic panel data models: A guide for macroeconomists. Econom. Lett. 7.
Kalkuhl, M., Wenz, L., 2020. The impact of climate conditions on economic production. Evidence from a global panel of regions. J. Environ. Econ. Manage. 103, 102360.
Kaufmann, D., Kraay, A., 2020. World governance indicators. https://info.worldbank.org/governance/wgi/.
Kaufmann, D., Kraay, A., Mastruzzi, M., 2011. The worldwide governance indicators: Methodology and analytical issues. Hague J. Rule Law 3 (02), 220–246.
Kim, H., 2010. Political stability and foreign direct investment. Int. J. Econ. Finance 2 (3), 59–71.
Kok, C., Mongelli, F.P., Hobelsberger, K., 2022. A tale of three crises: Synergies between ECB tasks. SSRN Electron. J..
Kuran, T., 1989. Sparks and prairie fires: A theory of unanticipated political revolution. Public Choice 61 (1), 41–74.
Lesk, C., Rowhani, P., Ramankutty, N., 2016. Influence of extreme weather disasters on global crop production. Nature 529 (7584), 84–87.
Lohmann, S., 1994. The dynamics of informational cascades: The monday demonstrations in Leipzig, East Germany, 1989–91. World Politics 47 (1), 42–101.
Ma, T.-C., Ouyang, L., 2016. Democracy and growth: A perspective from democratic experience: Democracy and growth. Econ. Inq. 54 (4), 1790–1804.
Matta, S., Bleaney, M., Appleton, S., 2022. The economic impact of political instability and mass civil protest. Econ. Politics 34 (1), 253–270.
Menegatti, M., 2007. Consumption and uncertainty: A panel analysis in Italian regions. Appl. Econ. Lett. 14 (1), 39–42.
Menegatti, M., 2010. Uncertainty and consumption: New evidence in OECD Countries. Bull. Econ. Res. 62 (3), 227–242.
Miguel, E., Satyanath, S., Sergenti, E., 2004. Economic shocks and civil conflict: An instrumental variables approach. J. Polit. Econ. 112 (4), 725–753.
Miles, D., 1997. A household level study of the determinants of incomes and consumption. Econ. J. 107 (440), 1–25.
Nickell, S., 1981. Biases in dynamic models with fixed effects. Econometrica 49 (6), 1417–1426.
Nordhaus, W.D., 2006. Baumol's diseases: A macroeconomic perspective. (Working Paper 12218, National Bureau of Economic Research).
Obinger, H., 2000. Politische regime, politische stabilität und wirtschaftswachstum. Swiss Political Sci. Rev. 6 (2), 1–26.
Paldam, M., 1998. Does economic growth lead to political stability? In: Borner, S., Paldam, M. (Eds.), The Political Dimension of Economic Growth. Palgrave Macmillan UK, London, pp. 171–190.
Parvin, M., 1973. Economic determinants of political unrest: An econometric approach. J. Confl. Resolut. 17 (2), 271–296.
Perotti, R., 1996. Growth, income distribution and democracy: What the data say. J. Econ. Growth 1 (2), 149–187.
Plagborg-Møller, M., Wolf, C.K., 2021. Local projections and VARs estimate the same impulse responses. Econometrica 89 (2), 955–980.
Ponticelli, J., Voth, H.-J., 2020. Austerity and Anarchy: Budget cuts and social unrest in Europe, 1919–2008. J. Comp. Econ. 48 (1), 1–19.
Rodrik, D., 2018. Populism and the economics of globalization. J. Int. Bus. Policy 1 (1–2), 12–33.
Roodman, D., 2009. How to do Xtabond2: An introduction to difference and system GMM in stata. Stata J. 9 (1), 86–136.
Salehyan, I., Hendrix, C.S., 2014. Climate shocks and political violence. Global Environ. Change 28, 239–250.
Staiger, D., Stock, J.H., 1997. Instrumental variables regression with weak instruments. Econometrica 65 (3), 557.
Stock, J., Yogo, M., 2002. Testing for weak instruments in linear IV regression. NBER Technical Working Papers, (284).
Uddin, M.A., Ali, M.H., Masih, M., 2017. Political stability and growth: An application of dynamic GMM and quantile regression. Econ. Model. 64, 610–625.
Vu, T.V., 2022. Unbundling the effect of political instability on income redistribution. Eur. J. Political Econ. 75, 102189.
World Bank, 2023. World development indicators. https://databank.worldbank.org.