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Austerity and anarchy: Budget cuts and social unrest in Europe, 1919–2008[☆]

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ABSTRACT

Does fiscal consolidation lead to social unrest? Using cross-country evidence for the period 1919 to 2008, we examine the extent to which societies become unstable after budget cuts. We find a positive correlation between fiscal retrenchment and instability. Expenditure cuts are particularly potent in fueling protests; tax rises have only small effects. To isolate the effect of policy decisions on social unrest we exploit variation in neighboring countries' past fiscal policies.

1. Introduction

Social unrest has led to key turning points in history since, at least, the French Revolution. The power of unrest as a catalyst for change can manifest itself explicitly in regime changes, such as during the “Arab Spring” of 2010–2011, or it can operate through expectations. For example, the extension of the franchise in Western societies can be seen as a bid to reduce the threat of revolution (Acemoglu and Robinson, 2000, Aidt and Franck, 2015).¹ What leads to social unrest is less clear. Economic shocks are one possible contributing factor. Adverse weather and commodity price shocks, for example, have been associated with civil conflicts (Miguel et al., 2004; Chassang and Padro-i Miquel, 2009). The link is not limited to developing countries. The demise of the Weimar Republic at the height of the Great Depression is a prominent example of economic hardship translating into political instability and social unrest (Bracher, 1978).²

In this paper, we examine from an historical perspective one of the possible determinants of unrest and protests: fiscal policy. How do budget measures affect the level of social instability? The extent to which societies fracture and become unstable in response to drastic retrenchment in the government budget is a major concern for policymakers tackling large budget deficits. From Argentina in 2001, to Greece and the London Riots in 2011, austerity measures have often coincided with waves of protest and civil unrest. Economic conditions can deteriorate further and faster if political and social chaos follows attempts to rein in spending.³ Consequently, sustainable debt levels for countries that are prone to unrest may be lower than they otherwise would be.

Our empirical analysis relies on historical data on government revenues and expenditure for 24 European countries over the

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¹ In a related exercise, Boix (2003) models the incentives of the populace to resort to violence as a function of the wealth distribution and economic development.

² The French Revolution has also been interpreted in these terms (Soboul, 1974; Doyle, 2001). The view is controversial (Hunt, 2004; Cobban, 1964).

³ Bloom (2009) documents how uncertainty shocks can drive output down.

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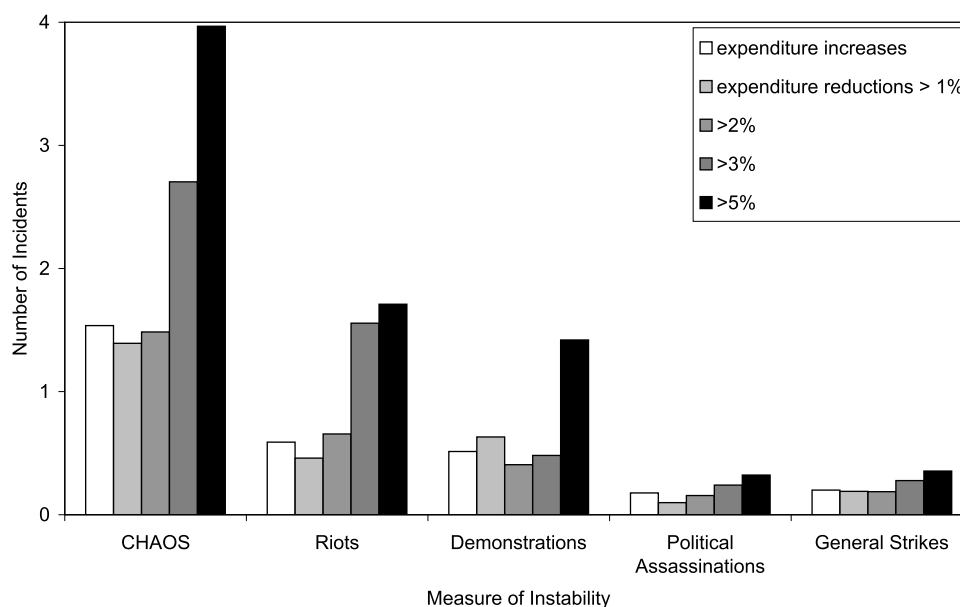


Fig. 1. Frequency of incidents and the scale of expenditure cuts.

period 1919 to 2008. Europe over the last century is an ideal testing ground to study the effect of fiscal consolidation on social unrest. The continent went from high levels of instability in the first half of the 20th century to relatively low ones in the second, and from frequently troubled economic conditions to prosperity. It thus provides a rich laboratory of changing economic, social and political conditions. In terms of outcome variables, we focus on riots, demonstrations, general strikes, political assassinations, and attempted revolutions. These span the full range of forms of unrest, from relatively minor disturbances to armed attempts to overthrow the established political order.

We start by documenting a set of correlations in the data between fiscal adjustments and the level of social unrest. As a first pass at the data, Fig. 1 shows the relationship between fiscal adjustment episodes and the number of incidents indicating instability. Our measure of instability is the sum of demonstrations, riots, strikes, political assassinations, and attempted revolutions in a single year in each country. The first set of five bars show the frequencies conditional on the size of budget cuts. When expenditure is increasing, the average country-year unit of observation in our data registers less than 1.4 events. For moderate budget cuts, there is no increase in the frequency of unrest. However, as austerity intensifies, the average frequency of disturbances in our sample rises. For expenditure cuts above 3% of GDP, the average frequency of events rises to 2.7 per country-year. Once austerity measures involve expenditure reductions of 5% of GDP or more, we observe around 4 events per year and country - more than twice as many as in times of expenditure increases or mild cuts. The same relationship can be observed in each of the four main subcategories of instability. The frequency of demonstrations, political assassinations, and general strikes increases with the size of the reduction in government expenditure as a share of GDP. Increases in government revenues, often obtained through an increase in taxes, have instead only small and insignificant effects. We show that these results are robust to a large set of observable country characteristics such as economic growth and unemployment, as well as possible tools available to governments to finance public deficit such as inflation. This suggests that we capture more than a general association between economic downturns and unrest.

Documenting the correlation between austerity measures and unrest and showing that this correlation is driven by expenditure cuts and not by tax increases is our first important finding. In this setting, the main identification challenge we face is to isolate changes in social unrest that are driven by austerity measures and not by other changes in government policies or overall economic conditions. Other factors, such as economic downturns, could drive up unrest and the need for cut-backs simultaneously.

In order to isolate the effect of policy decisions on social unrest, we propose an identification strategy that exploits past policy decision in neighboring countries. Our strategy builds on Buera et al. (2011), which propose a model where other countries' past policy decisions affect policy choices through their impact on policymakers' beliefs. In their model, past policy decisions in countries that are geographically closer receive a higher weight in influencing policymakers' beliefs. Buera et al. (2011) use this model to study empirically the diffusion of market-oriented policies across countries in the post-war period. We apply their strategy to another set of policymakers' beliefs: those regarding austerity measures.

First, we show that policy decisions in a given country are strongly predicted by past fiscal adjustment decisions in neighboring countries. This allows us to generate variation in fiscal variables that is plausibly driven by policymakers' discretionary decisions rather than by the current economic conditions in a given country. The results obtained with this identification strategy are consistent with the basic correlations described above. In particular, we find that countries whose policymakers implement larger cuts in government expenditure – as explained by their neighbors' past policies – experience larger increases in social unrest.

In the last part of the paper we study to what extent the effect of austerity on unrest has changed over the 20th century, and

whether it varies depending on a country's level of adoption of democratic institutions or penetration of peer-to-peer communication. We find that the link between austerity and unrest is present both in the interwar period and in the post World War II years with similar magnitude. We also find that this link is weak in more autocratic regimes and only appears in democratic countries. Finally, we examine if the diffusion of peer-to-peer communication technologies changes the probability of unrest. We find that our effects are stronger in countries with higher diffusion of phones per capita – which facilitates peer-to-peer communication.

Related literature

Our results are informative for both the literature on the determinants of social unrest and the political economy literature on expenditure cuts.

There is a large theoretical and empirical literature on the causes and consequences of social unrest. Early theoretical contributions include [Kuran \(1989\)](#), [Tullock \(1971\)](#), and [Grossman \(1991\)](#). In more recent work, [Passarelli and Tabellini \(2017\)](#) model social unrest as a form of political participation that can shape public policies – for example when protests triggered by policy proposals feed back into policymakers' decisions. [Battaglini \(2017\)](#) explores the limits of social protests as a mechanism to aggregate individual information and influence policy making.⁴ A vast empirical literature has shown that social unrest is positively associated with ethnic heterogeneity ([DiPasquale and Glaeser, 1998](#)), income inequality ([Alesina and Perotti, 1996](#)), and negatively associated with good economic conditions ([Bohlken and Sergenti, 2010](#); [Burke and Leigh, 2010](#); [Aidt and Leon, 2016](#)). More recently, the literature has focused on the role of new communication technologies and social media in the amplification and diffusion of social protests ([Enikolopov et al., 2016](#); [Enikolopov et al., 2017](#); [Manacorda and Tesei, 2016](#)).⁵

Earlier papers on austerity as a potential catalyst for protests have focused on case studies or a subset of the developing world. For example, [Paldam \(1993\)](#) finds that the run-up to new austerity measures in South American countries in the 1980s is associated with higher levels of unrest, but that actual implementation is followed by fewer disturbances. Similarly, [Haggard et al. \(1995\)](#) find that IMF interventions and monetary contractions in developing countries led to greater instability.⁶ Relative to these papers, our work offers a first systematic analysis of how budget cuts affect the level of social instability and unrest in a broad cross-section of developed countries, over a long period of time.

Our paper is also related to the political economy literature on fiscal consolidation and its economic effects. For example, [Alesina et al. \(1998\)](#) and [Alesina et al. \(2010\)](#) show that governments typically do not lose votes in elections after they implement austerity programs. Relatedly, higher deficits (more spending) does not seem to lead to reelection of incumbent parties ([Brender and Drazen, 2008](#)). Our finding that austerity can lead to social unrest - even without penalties at the ballot box - may help to explain why governments are typically reluctant to cut spending, even if this might be economically beneficial.⁷

The rest of the paper is organized as follows. [Section 2](#) describes the data used in the empirical analysis, [Section 3](#) presents the main correlations in the data, and [Section 4](#) describes our identification strategy and the main empirical results. [Section 5](#) concludes.

2. Data

In this section, we describe the main datasets used in our empirical analysis. We start with the data on social unrest episodes, which is from [Banks \(2010\)](#). The data has been manually collected from articles published in the *New York Times* and reports the number of episodes occurring in a given country and year. This dataset distinguishes between five main types of social unrest and domestic conflict: general strikes, riots, anti-government demonstrations, political assassinations (including attempted ones), and coups d'état (including attempted ones). Episodes extracted from *New York Times* articles are categorized into these five indicators based on the definitions proposed by [Rummel and Tanter \(1971\)](#). For example, an anti-government demonstration is defined as any peaceful public gathering of one hundred people or more with the objective of voicing opposition to government policies, while a general strike is defined as any strike of 1000 or more industrial or service workers that involves more than one employer and that is aimed at national government policies. A detailed definition of each indicator of conflict is reported in [Table A1](#).

Summary statistics for the social unrest variables are reported in [Table 1](#). The most frequent episodes are anti-government demonstrations and riots, while politically-motivated assassinations (or attempted assassinations) and attempted coups are relatively rare. The frequency of unrest episodes varies considerably from country to country. Some register high levels of instability, including of the most extreme types. For example, Germany in 1923 recorded no less than five attempts at government overthrow with communist insurgencies in Saxony and Thuringia, the Hitler Beer Hall Putsch, and a separatist uprising in the Rhineland.

While each variable captures a particular aspect of political instability, we are interested in the overall pattern. Assassinations, general strikes, riots, revolutions and demonstrations are all positively and significantly correlated with each other. This supports our assumption that they reflect a broader underlying pattern of social instability and unrest. To obtain a single indicator of instability, we define CHAOS as the sum of the number of assassinations, demonstrations, riots, general strikes, and attempted revolutions. As

⁴ See also the related theoretical work by [Edmond \(2013\)](#) and empirical evidence in [Cantoni et al. \(2017\)](#).

⁵ On the determinants of social unrest see also [Baudains et al. \(2013\)](#), [Paldam and Pedersen \(1984\)](#), [Morrison et al. \(1994\)](#) and [Field et al. \(2008\)](#).

⁶ See also [Voth \(2011\)](#), that explores the relationship between austerity and unrest in Latin America in the period 1937–1995.

⁷ A rich literature has examined the macroeconomic effects of fiscal adjustments. [Giavazzi and Pagano \(1990\)](#) and [Alesina et al. \(2002\)](#) find that cuts can be expansionary. Among the reasons suggested for this finding are a reduction in uncertainty about the course future spending ([Blanchard, 1990](#)), and a positive wealth shock as a result of lower taxes in the future ([Bertola and Drazen, 1993](#)). However, once the response of labor supply and capital formation is fully taken into account, these effects may not go through ([Baxter and King, 1993](#)). Others have suggested that austerity measures may be less expansionary than previously thought ([IMF, 2010](#); [Guajardo et al., 2011](#)).

Table 1
Descriptive statistics.

Variable	Mean	Std. Dev.	N
Δ (budget balance/GDP) $_t$	0.014	2.023	1253
Δ (exp/GDP) $_t$	0.143	2.483	1253
Δ (rev/GDP) $_t$	0.157	1.7	1253
Δ (primary budget/GDP)	0.04	1.796	522
Δ (primary exp/GDP)	0.269	1.283	522
Δ (tot rev/GDP)	0.245	1.157	522
Δ (GDP) $_t$	3.532	3.633	1253
CHAOS	1.548	3.67	1253
chaos	0.722	1.619	1253
riots	0.633	2.067	1253
demonstrations	0.484	1.287	1253
general strikes	0.207	0.677	1253
assassinations	0.169	0.828	1253
revolutions	0.055	0.264	1253
Δ (exp/GDP) $_{t-1}$, Other Countries	0.054	1.1	1200

Notes: The variable *chaos* is equal to the total number of social unrest episodes per 10 million inhabitants in a given country and year.

shown in Table 1, the average country-year in our sample registers 1.5 incidents per year while the maximum number of episodes is registered in Italy in 1947 with a total of 38 incidents, including 7 general strikes, 19 riots, and 9 anti-government demonstrations.

Fig. 2 shows the evolution of CHAOS over time, and reports the average and the maximum number of incidents by year. The period between World War I and World War II saw relatively high levels of unrest, with an average of 1.8 episodes per year, compared to the 1.3 episodes per year in the period after World War II. In a long-run perspective, recent decades registered relatively low levels of social unrest, with an average of 0.7 episodes per year in the period 1994 to 2008.

Data on government revenues and expenditure as a share of country GDP are from the *International Historical Statistics* (Mitchell 2007) for the period between 1919 and 1969, and from the OECD from 1970 to 2008. Panel B of Table A1 reports definitions and data source for each of the main fiscal variables used in the empirical analysis. As shown in Table 1, the average change in government budget balance over GDP in our data is close to zero percent, and the average change in central government expenditure relative to GDP is 0.3 percent, with large variation across countries. Fig. 3 shows the distribution of yearly changes in

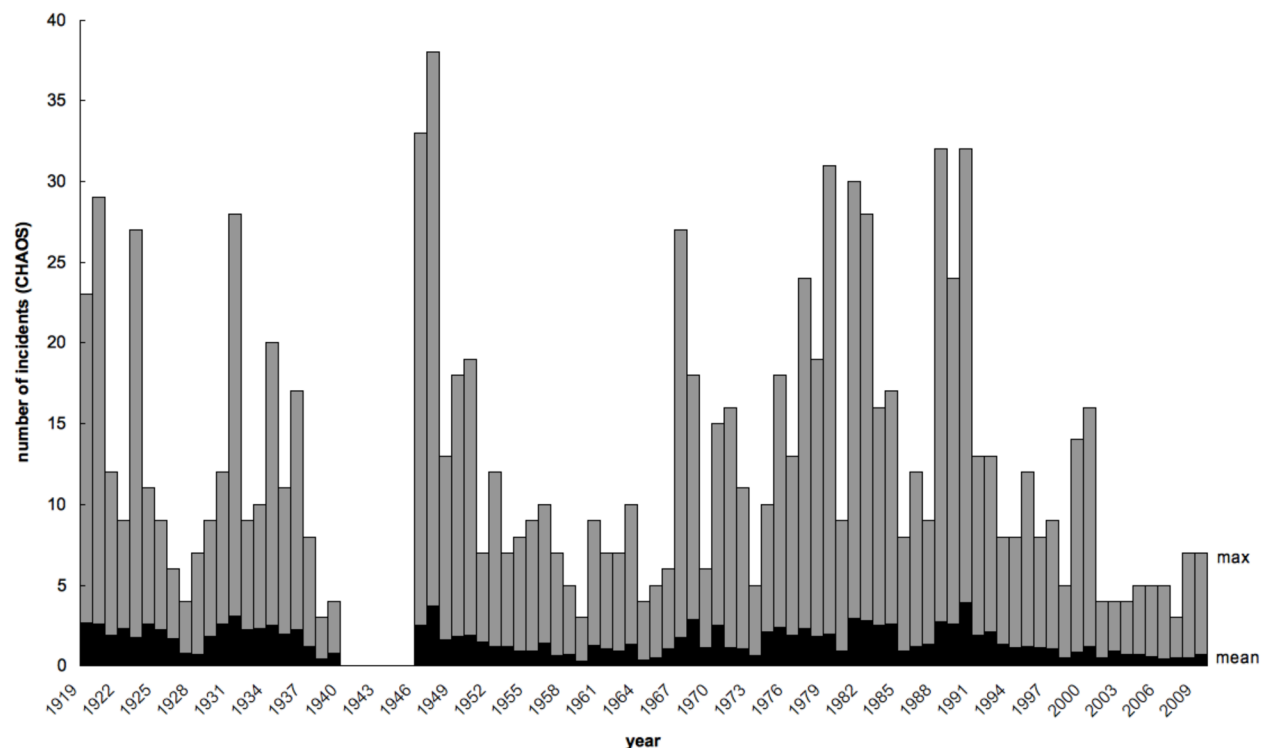


Fig. 2. Number of incidents over time.

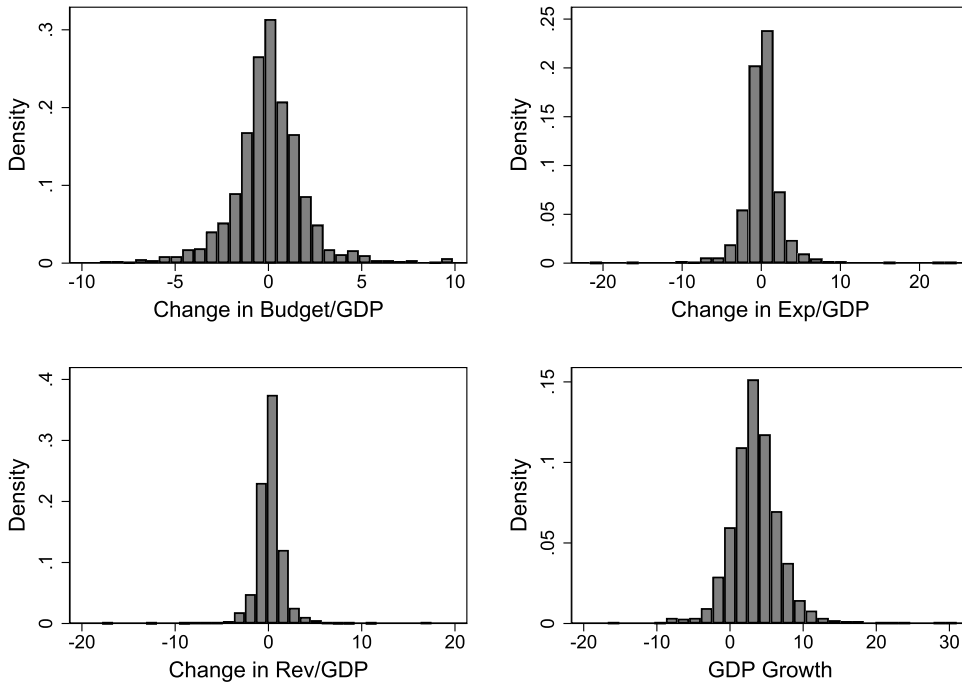


Fig. 3. Changes in fiscal variables and GDP per capita (percentage points).

fiscal variables for the countries and years used in the empirical analysis.

For the period after 1970, we also use cyclically adjusted fiscal data on primary government budget, expenditure, and total revenues constructed by Alesina and Ardagna (2010). This data allows us to correct for both changes in interest payments and the immediate effect of the economic cycle, which can drive changes in government expenditure and revenues in the absence of any policy decision.

In addition, we use data on observable characteristics from a variety of sources, reported in Table A1. Our final dataset covers 24 European countries over the period 1919 to 2008.⁸

3. Basic correlations in the data

The graphical evidence presented in Fig. 1 suggests that there is a positive correlation between budget cut-backs and social unrest across European countries in the period 1919 to 2008. In this section we test this relationship more formally by estimating the following specification:

$$chaos_{it} = \alpha_i + \alpha_t + \beta \Delta A_{it} + \gamma X_{i,t-1} + chaos_{it-1} + \varepsilon_{it} \tag{1}$$

The main outcome variable of interest, $chaos_{it}$, is defined as the number of social unrest episodes in country i at time t , scaled by the country population as follows:

$$chaos_{it} = \left(\frac{CHAOS_{it}}{population_{it}} \right) \times 10,000,000 \tag{2}$$

where $CHAOS_{it}$ is defined as in Section 2, i.e. the sum of the number of demonstrations, riots, general strikes, political assassinations and attempted revolutions in a given country and year. The main independent variable, ΔA_{it} , captures the change in one of our three fiscal variables of interest: government budget balance, government expenditure, and government revenues, all computed as a share of GDP. The vector X_{it} captures a set of observable characteristics at country level – including GDP growth, population and political regime – and α_i and α_t are country and year fixed effects.⁹ We add to Eq. (1) lagged $chaos$, so that the dynamic formulation takes into account potential persistence in social unrest over time. Finally, we cluster standard errors at the country and year level in all specifications.

⁸ The countries included are: Austria, Belgium, Bulgaria, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Netherlands, Norway, Poland, Portugal, Russian Federation, Slovak Republic, Spain, Sweden, Switzerland, United Kingdom, former-Yugoslavia.

⁹ Note that we decompose GDP growth into a trend and cycle component using the Hodrick-Prescott filter and add both components as controls in our main specification.

Table 2 reports the results of estimating Eq. (1). For each fiscal variable of interest, we show three specifications: the first includes only country and year fixed effects, the second includes GDP growth as a control, the third augments the model with controls for population, political regime and lagged level of unrest.¹⁰ The first three columns show a positive and significant relationship between improvements in the budget balance and social instability. This relationship is not driven by a country’s economic performance, size or institutional quality. As shown in columns (4) to (6), this effect is entirely accounted for by expenditure cuts, while changes in government revenues are uncorrelated with unrest. The magnitude of the estimated coefficient reported in column (6) suggests that countries with a one standard deviation larger government expenditure cut (2.5 percentage points) experience an increase of 0.16 in the number of unrest episodes per 10 million inhabitants.

To illustrate the magnitude of effects, we estimate the predicted number of unrest episodes per country and year conditional on different values of government budget balance adjustments (Panel A), government expenditure cuts (Panel B) and government revenues increases (Panel C). The predicted number of episodes are reported for different levels of GDP growth and for a hypothetical country with 10 million inhabitants. Table 5 reports the results. As shown in Panel B, for any level of GDP growth, the estimated number of unrest episodes rises rapidly as the magnitude of expenditure cuts increases. At negative growth of 2%, for example, going from expenditure cuts of 1 to 10 percentage points as a share of GDP implies an increase in the predicted number of unrest episodes from 0.1 to 1 per 10 million inhabitants. Relative to these magnitudes, the effect of poor economic performance on future unrest is milder. Going from negative growth of 2% to 10% increases the predicted number of unrest episodes from 0.1 to 0.27 per 10 million inhabitants in a given country and year (holding expenditure cuts constant at 1%).

Which components of social unrest are more correlated with austerity measures? Table A1 in the Appendix reports the correlation between changes in government fiscal variables and different types of social unrest. We focus on two separate components of the variable *chaos*. The first component includes the number of riots, demonstrations and general strikes. We consider these episodes as relatively moderate forms of unrest, despite in some cases they are characterized by violence in the form of clash with the police, setting cars ablaze, or looting shops. The second component includes the most extreme forms of unrest such as political assassinations or attempted ones, as well as coups d’état or attempted ones aimed at changing the government in power or declaring independence from it. As shown, the effects reported in Table 2 are mainly driven by riots, demonstrations and general strikes.

The results reported in Table 2 focus on European countries and use data on social unrest episodes from Banks (2010) which is available up to the end of the 2000s. In Appendix Table A3 we provide an out-of-sample validation of our main results by providing evidence that the association between expenditure cuts and social unrest holds also when focusing on non-European countries and including more recent years in our sample. To this end, we construct a variable capturing the number of protest events recorded in the GDEL1.0 Event Dataset (Leetaru and Schrodt, 2013).¹¹ The GDEL1 data is collected by automated scraping of world’s news media and covers the period from 1979 to 2014. We define an unrest event as any event with Cameo code 14, which identify “Protest” events. Since the GDEL1 dataset records the “target” of a given action, we focus on protest events whose target is the government of a given country. We assign events to countries using geographical coordinates of each event provided in GDEL1.¹² The results reported in Appendix Table A3 are consistent with those reported in Table 2. First, we document that (i) there is a positive correlation between changes in government budget and social unrest – though not statistically significant at standard levels – and (2) that this relationship is driven by variation in government expenditure rather than government revenues. In particular, the coefficient on change in government expenditure is negative and statistically significant.

3.1. Accounting for dynamics

The evidence presented in Table 2 documents a contemporaneous correlation between austerity and unrest. That is, the baseline specification reported in Eq. (1) captures the relationship between government fiscal adjustment and social unrest in the same year. In this section we explore this relationship with a dynamic specification. To this end, we augment Eq. (1) by adding changes in government expenditure at both $t + 1$ and $t - 1$ as follows:

$$\begin{aligned}
 chaos_{it} = & \alpha_i + \alpha_t + \beta_1 \Delta \left(\frac{exp}{GDP} \right)_{it} + \beta_2 \Delta \left(\frac{exp}{GDP} \right)_{it+1} \\
 & + \beta_3 \Delta \left(\frac{exp}{GDP} \right)_{it-1} + \gamma X_{i,t-1} + chaos_{it-1} + \varepsilon_{it}
 \end{aligned} \tag{3}$$

If social unrest occurs in response to the announcement of expenditure cuts, and expenditure cuts are announced in the year before they are implemented, then we should expect social unrest in year t to happen in reaction to expenditure cuts implemented in year $t + 1$. If, instead, social unrest occurs mostly once the effect of expenditure cuts have been experimented for at least one year, then we should expect social unrest in year t to happen in reaction to expenditure cuts in year $t - 1$. The results obtained estimating Eq. (3) are reported in column (1) of Table 4. We find that the negative relationship between changes in government expenditure and social unrest is mostly driven by contemporaneous changes in the two variables.

¹⁰ The type of political regime is captured by the Polity2 score sourced from the Polity IV Annual Time-Series dataset, 1800–2018 (Marshall et al., 2019). Higher numbers in this score capture more democratic regimes.

¹¹ Data can be downloaded at <http://data.gdel1project.org/events/index.html>.

¹² Notice that events are recorded in GDEL1 irrespective of their “intensity”, while Banks (2010) data reports a protest event only if it crosses a certain number of participants.

Notice that the contemporaneous correlation between expenditure cuts and unrest does not rule out that protests spur in reaction to the announcement of austerity policies rather than their actual implementation. In fact, our results might reflect expectations of future cuts to the extent that austerity policies are announced and implemented within the same calendar year. To better understand the importance of announcement effects of austerity policies we focused on two event studies that happened within our sample. In particular, we focused on social unrest around two major austerity plans introduced by France and Italy in the mid-1990s after the approval of the Maastricht Treaty. To produce these event-studies we rely on data from the European Protest and Coercion Dataset (EPCD) which record protest events occurred in a set of European countries between 1980 and 1995.¹³ Figs. 4 and 5 show the number of protest events at daily level around the date of announcement of each austerity plan to the national Parliament. Fig. 5 shows protests in France around the announcement of the Juppé Plan in 1995. This plan aimed at bringing the country's budget deficit within the 3% limit established under the Maastricht treaty in 1993. French civil servants and public utilities' workers organized a series of strikes and protests in several parts of the country against the job cuts and the austerity measures included in the Plan. As shown in Fig. 5, most of the protests happened in the months of November and December of 1995, right after the announcement of the Plan to the French Parliament. Fig. 6 shows protests in Italy around the announcement of an austerity plan that the Italian government presented to Parliament at the end of 1994. The plan included spending cuts in pensions and social benefits, and encountered a strong resistance from trade unions and opposition parties. Although the cuts were scheduled for the 1995 budget, protests concentrated in the months of October and November of 1994.

These two examples suggest that announcement effects can be important, especially when it comes to large austerity plans that are widely discussed in the media. In the data we can only back out the announcement date for a limited set of expenditure cuts. Still, the evidence presented in Figs. 5 and 6 suggests that a potential explanation for the timing of the effect documented in Table 4 is that budget cuts are often announced in the same year in which they are implemented.¹⁴

Finally, in column (2) of Table 4, we augment Eq. (3) to study whether social unrest emerges in response to expectations of future bad economic performance. As shown, we find that the estimated coefficient on ΔGDP_{t+1} is small and not statistically significant, while the rest of our estimates are unchanged. This suggests that expectations about a country's economic performance next year do not influence the probability of social unrest this year, or that individuals form wrong expectations about future growth.

3.2. Full set of controls

Table 2 shows that, over the period 1919 to 2008, austerity measures introduced by European countries are associated with increases in the number of social unrest episodes. It also shows that this relationship is driven by changes in government spending, while our estimates suggest that tax increases have no effect on social unrest. However, several country characteristics are not available for the years prior to 1970. For example, consistent and comparable data on unemployment rates is not available for most European countries in the earlier part of the sample. This is an important concern to the extent that an increase in unemployment can affect both social unrest and the need for austerity measures. To address this issue, in this section we focus our analysis on the sub-period after 1970, for which a larger set of country characteristics is available.

Thus, as a robustness, we estimate an augmented version of Eq. (1) which includes a set of additional country characteristics that the previous literature has associated with social unrest: change in unemployment rate, change in inflation rate, and ethnic fractionalization. In addition, for this subset of the data, government fiscal variables are cyclically adjusted as in Alesina and Ardagna (2010), with the objective to isolate variation in government expenses and revenues that is not driven by the business cycle.¹⁵

Table A2 in the Appendix reports the results. The results are in line with those presented in Table 2: there is a positive and strongly significant relationship between austerity measures and social unrest. This relationship is driven by changes in government expenditure, while tax changes have no impact on social unrest. As shown, the point estimates are stable or larger when controlling for additional country characteristics. In addition, the point estimates are similar in magnitude to those reported in Table 2 for the full sample. The estimated coefficient reported in column 4 implies that countries with a one standard deviation higher government expenditure cuts (1.3 percentage points) experienced an increase of 0.14 in the number of unrest episodes per 10 million inhabitants.

4. Identification strategy and results

The challenge in interpreting the estimated coefficients presented in the previous section is that social unrest might not be driven by austerity measures but by other contemporaneous changes in government policies or overall economic conditions. For example, it is possible that the economic cycle is simultaneously driving both unrest and the need for budget cuts. In the previous section we showed that our estimates are unchanged when using cyclically adjusted fiscal variables and additionally controlling for GDP growth

¹³ Data is assembled by Ron Francisco at the University of Kansas and it is publicly available at <http://web.ku.edu/~ronfrand/data/>.

¹⁴ In Table A5 in the Appendix we replicate our main correlation using data from EPCD dataset aggregated at the annual level. As shown, our main results are robust to using this alternative dataset to measure social unrest. In addition, when using this sample, we find negative coefficients of similar magnitude when measuring the correlation between social unrest in year t and changes in government expenditure in year t and year $t + 1$ (see column (2) of Table A5).

¹⁵ For this sub-sample we have data on interest payments on government debt. Thus, we use primary government budget and primary expenditure as independent variables.

Table 2
Unrest and fiscal policy: baseline specification.

outcome:	<i>chaos</i>								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Δ (budget balance/GDP) _t	0.089** [0.034]	0.095** [0.034]	0.087** [0.037]						
Δ (exp/GDP) _t				-0.065** [0.027]	-0.069** [0.028]	-0.065* [0.033]			
Δ (rev/GDP) _t							-0.011 [0.023]	-0.012 [0.023]	-0.013 [0.026]
Δ (GDP cycle) _t		-0.020 [0.022]	-0.038*** [0.011]		-0.020 [0.022]	-0.038*** [0.012]		-0.013 [0.022]	-0.033*** [0.011]
Δ (GDP trend) _t		-0.028 [0.055]	-0.020 [0.054]		-0.022 [0.056]	-0.014 [0.055]		-0.007 [0.057]	-0.001 [0.056]
Log (POP)			0.205 [0.719]			0.237 [0.725]			0.222 [0.741]
Polity2 index			0.008 [0.017]			0.008 [0.016]			0.007 [0.016]
<i>chaos</i> _{t-1}			0.103*** [0.015]			0.105*** [0.016]			0.106*** [0.015]
Observations	1241	1241	1229	1241	1241	1229	1241	1241	1229
R-squared	0.196	0.197	0.235	0.194	0.195	0.233	0.186	0.186	0.226

Notes: Standard errors clustered at country and year level reported in brackets. Significance levels:*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. All regressions include country and year fixed effects. The variable *chaos* is equal to the total number of social unrest episodes per 10 million inhabitants in a given country and year.

Table 3
Predicted Unrest Episodes.

Panel A Magnitude of Government Budget Balance Increase	$\Delta \log(GDP)$			
	3%	-2%	-5%	-10%
Δ (budget balance/GDP) = + 1%	0.030	0.136	0.200	0.306
Δ (budget balance/GDP) = + 5%	0.403	0.510	0.574	0.680
Δ (budget balance/GDP) = + 10%	0.871	0.977	1.041	1.148
Δ (budget balance/GDP) = + 15%	1.338	1.445	1.509	1.615
Panel B Magnitude of Government Expenditure Cut	$\Delta \log(GDP)$			
	3%	-2%	-5%	-10%
Δ (exp/GDP) = -1%	0.008	0.109	0.170	0.271
Δ (exp/GDP) = -5%	0.281	0.382	0.443	0.545
Δ (exp/GDP) = -10%	0.623	0.724	0.785	0.887
Δ (exp/GDP) = -15%	0.965	1.066	1.127	1.229
Panel C Magnitude of Government Revenues Increase	$\Delta \log(GDP)$			
	3%	-2%	-5%	-10%
Δ (rev/GDP) = + 1%	-0.050	0.013	0.050	0.112
Δ (rev/GDP) = + 5%	-0.099	-0.037	0.000	0.063
Δ (rev/GDP) = + 10%	-0.162	-0.099	-0.062	0.000
Δ (rev/GDP) = + 15%	-0.224	-0.161	-0.124	-0.062

Notes: Predicted number of episodes are computed using estimated coefficients reported in columns 3 (Panel A), column 6 (Panel B) and column 9 (Panel C) of Table 2.

and changes in the unemployment rate, which at least mitigates this concern. However, the omitted variable problem would only be solved if we measured the effect of economic output on instability perfectly. Since this is unlikely, we present another type of analysis.

In order to isolate the effect of policy decisions on social unrest, we propose an identification strategy that exploits past policy decision in other countries. Our strategy builds on Buera et al. (2011), which propose and estimate a learning model to explain the diffusion of market-oriented policies across countries in the period after World War II. In their model, the authors postulate that policymakers' beliefs about market-oriented policies depends on both their own past experience as well as the experience of other countries that adopted the same policies. Policymakers start with a prior but then use Bayesian updating based on the information coming from other countries. Past policy decisions in countries that are geographically closer receive a higher weight in influencing policymakers' beliefs. The authors show that the predictive power of the model is mostly derived from this learning mechanism rather than by a country's economic and political conditions. In other words, their results support the importance of information spillovers

Table 4
Unrest and fiscal policy: accounting for dynamics.

outcome:	<i>chaos_t</i>	
	(1)	(2)
$\Delta (\text{exp/GDP})_{t-1}$	-0.005 [0.021]	-0.022 [0.027]
$\Delta (\text{exp/GDP})_t$	-0.062* [0.033]	-0.074** [0.033]
$\Delta (\text{exp/GDP})_{t+1}$	0.003 [0.018]	-0.022 [0.024]
$\Delta (\text{GDP cycle})_t$	-0.021 [0.022]	-0.013 [0.017]
$\Delta (\text{GDP trend})_t$	-0.054** [0.020]	0.221 [0.261]
$\Delta (\text{GDP cycle})_{t+1}$		-0.020 [0.025]
$\Delta (\text{GDP trend})_{t+1}$		-0.302 [0.276]
Log (POP)	0.206 [0.755]	0.018 [0.857]
Polity2 index	0.004 [0.018]	-0.004 [0.018]
<i>chaos_{t-1}</i>	0.102*** [0.017]	0.095*** [0.017]
Observations	1197	1158
R-squared	0.233	0.261

Notes: Standard errors clustered at country and year level reported in brackets. Significance levels:*** p < 0.01, ** p < 0.05, * p < 0.1. All regressions include country and year fixed effects. The variable *chaos* is equal to the total number of social unrest episodes per 10 million inhabitants in a given country and year.

Table 5
First stage.

outcome:	$\Delta (\text{expense/GDP})_t$		
	(1)	(2)	(3)
$\Delta (\text{exp/GDP})_{t-1}$, Other Countries	0.452** [0.196]	0.491** [0.196]	0.489** [0.198]
$\Delta (\text{GDP cycle})_t$		-0.078 [0.047]	-0.078 [0.047]
$\Delta (\text{GDP trend})_t$		-0.177*** [0.059]	-0.172*** [0.057]
$\Delta (\text{GDP})_{t-1}$, Other Countries			0.010 [0.077]
Log (POP)			0.499 [0.789]
Polity2 index			0.017 [0.018]
F-stat	12.46	14.82	9.559
Observations	1188	1188	1188
R-squared	0.195	0.209	0.210

Notes: Standard errors clustered at country and year level reported in brackets. Significance levels:*** p < 0.01, ** p < 0.05, * p < 0.1. All regressions include country and year fixed effects. The main explanatory variable is the average value of $\Delta (\text{expense/GDP})$ at time t-1 in all other countries, weighted by 1/distance to this country.

across countries as a determinant of policy choices.

We apply the strategy from Buera et al. (2011) to another set of policymakers' beliefs: those regarding austerity measures. To this end, we build a distance weighted measure of other countries' past fiscal policies as follows:

$$\bar{\theta}_{i,t-1} = \frac{\sum_{j \neq i} \Delta \left(\frac{\text{exp}}{\text{GDP}} \right)_{j,t-1} / d_{i,j}}{\sum_{j \neq i} 1/d_{i,j}} \quad (4)$$

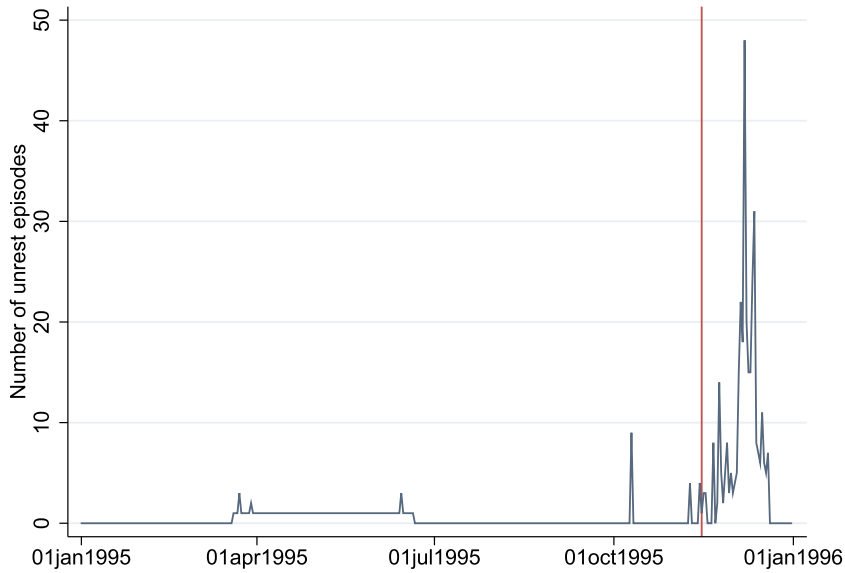


Fig. 4. Frequency of Anti-Austerity Protests - France, 1995 **Notes:** Red vertical line is day in which French Prime Minister Alain Juppé presented the austerity plan to Parliament, on November 15, 1995. Source: EPCD, authors' calculations.

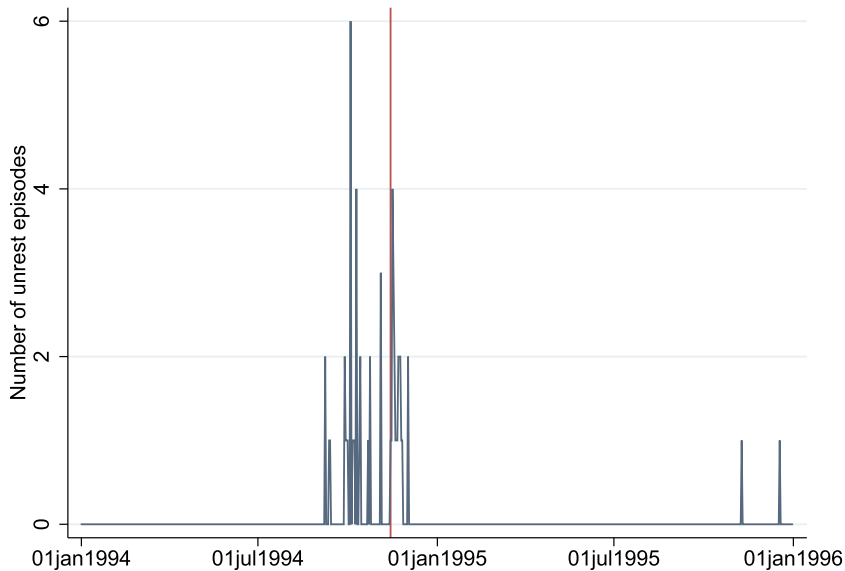


Fig. 5. Frequency of Anti-Austerity Protests - Italy, 1994–1995 **Notes:** Red vertical line is day in which Italian Prime Silvio Berlusconi submitted to Parliament a major austerity budget proposal (November 14, 1994). Source: EPCD, authors' calculations.

Where $d_{i,j}$ is the geographical distance between capitals of country i and country j . As shown, Eq. (4) focuses on past changes in government expenditure over GDP as our main measure of past fiscal policies from other countries. We start by estimating the effect of other countries' past policy decisions on changes in government expenditure in country i as follows:

$$\Delta\left(\frac{exp}{GDP}\right)_{it} = \alpha_i + \alpha_t + \beta\bar{\theta}_{i,t-1} + \gamma X_{it-1} + chaos_{it-1} + \varepsilon_{it} \tag{5}$$

One potential concern with this approach is that social unrest might spread across countries with a similar geographical pattern as policymakers' beliefs. If that is the case, other countries' past austerity policies would affect social unrest not only via policymakers' beliefs but also via the direct transmission of social protests across borders, irrespective of a country policy decisions. To deal with this potential confounding effect, we construct $\bar{\theta}_{i,t-1}$ focusing exclusively on countries that do not experience unrest at time $t - 1$.¹⁶ In

¹⁶Note that results are qualitatively similar if we do not impose this restriction.

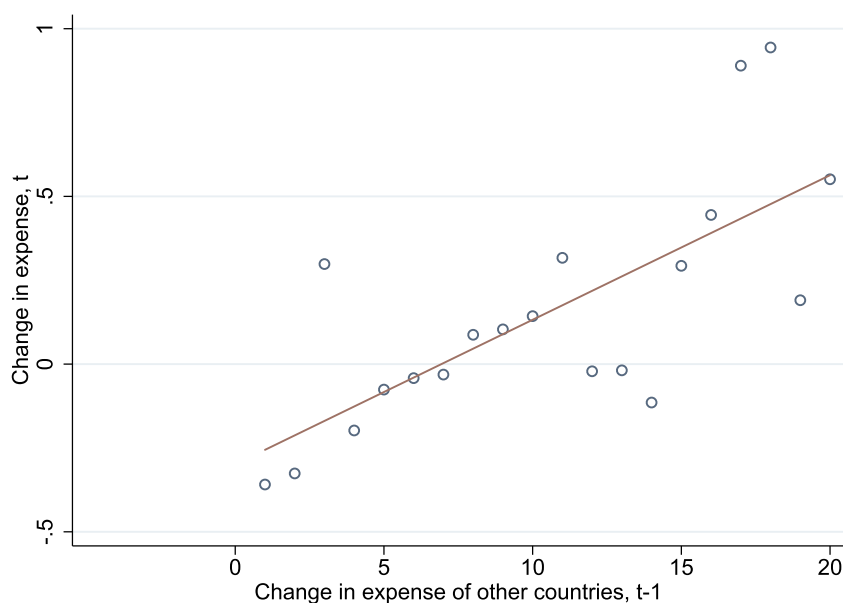


Fig. 6. Relationship between change in expenditure over GDP and distance weighted measure of other countries' past changes in expenditure over GDP **Notes:** Figure shows average change in government expenditure over GDP in country i across 20 bins of $\hat{\theta}_{i,t-1}$.

addition, to deal with potential geographical correlation of the business cycle across neighboring countries, we control for a distance weighted measure of other countries' past GDP growth.

Table 5 reports the results of estimating Eq. (5). The estimated coefficients on our measure of other countries' past fiscal policy decisions are positive and strongly significant. The magnitude indicates that a country whose neighbors adopted – on average – a 1 percentage point increase in government expenditure over GDP experience around 0.5 percentage points higher increase in expenditure in the following year. This point estimate is stable to controlling for a country's economic conditions, size and level of democratic institutions. The F-stat of the first stage in its most conservative specification is 9.6.

Fig. 4 reports a scatter plot of the relationship between changes in government expenditure over GDP for a given country and the distance weighted average of neighboring countries' past changes in government expenditure over GDP. As shown in the figure, this relationship is not driven by extreme observations. In sum, the results in Table 5 and Fig. 4 show that policy decisions in a given country are strongly predicted by past fiscal adjustment decisions in neighboring countries.

Next, we use variation in government expenditure over GDP that is plausibly driven by policymakers' discretionary decisions as influenced by other countries to estimate the effect of these decisions on social unrest. The results obtained with this identification strategy are reported in Table 6. The outcome variable in Table 6 is *chaos* as defined in Eq. (2). Columns (1) to (3) report IV coefficients of the effect of changes in government expenditure over GDP on social unrest. The estimated coefficient is negative and significant, indicating that larger government expenditure cuts fuel more social protests. The magnitude of the effect indicates that countries with a one standard deviation larger government expenditure cut (2.5 percentage points) experience an increase of 1.7 in the number of social unrest episodes per 10 million inhabitants.

Note that the magnitude of the IV coefficient is larger – in absolute value – than the OLS coefficient reported in Table 2. A potential source of bias in the OLS estimates is that politicians might take into account the risk of social unrest in their own country when considering cuts in government expenditure. This implies that politicians might be less likely to decide in favor of expenditure cuts when the risk of unrest is particularly high, generating a downward bias in the OLS specification. On the other hand, our IV strategy allows to isolate variation in policymakers' decisions that is solely driven by other countries' policymakers' decisions, net of their own country perceived risk of social unrest.

Columns (4) to (6) of Table 6 report the reduced form estimates of the effect of our distance weighted measure of other countries' past austerity measures on social unrest. As shown, the estimated coefficients are negative and significant, and point estimates are stable to adding country controls.

To what extent do our main findings depend on the way in which we aggregate unrest? The variable *chaos* is the sum of incidents divided by population in a given country and year, as described in Eq. 2. In Table A6 we use, as outcome variable, the first principal component of the five types of unrest episodes that are part of the *chaos* measure. The Table reports OLS, IV and Reduced Form estimates, which are consistent in terms of sign and significance with those presented in Table 6.

To sum up, the results presented in this section are consistent with the basic correlations in the data. We find that countries whose policymakers implement larger cuts in government expenditure – as explained by their neighbors' past policies – experience larger increases in social unrest.

Table 6
Unrest and fiscal policy.

outcome:	<i>chaos</i>					
	IV			Reduced Form		
estimator:	(1)	(2)	(3)	(4)	(5)	(6)
$\Delta(\text{exp/GDP})_t$	-0.636** [0.268]	-0.594** [0.238]	-0.685** [0.306]			
$\Delta(\text{exp/GDP})_{t-1}$, Other Countries				-0.288*** [0.070]	-0.292*** [0.070]	-0.271*** [0.077]
$\Delta(\text{GDP cycle})_t$		-0.071* [0.037]	-0.080* [0.040]		-0.024 [0.028]	-0.037 [0.022]
$\Delta(\text{GDP trend})_t$		-0.081 [0.061]	-0.098 [0.080]		0.024 [0.043]	0.002 [0.031]
$\Delta(\text{GDP})_{t-1}$, Other Countries			0.065 [0.084]			0.075* [0.041]
Log (POP)			0.584 [0.671]			0.221 [0.656]
Polity2 index			0.017 [0.020]			0.004 [0.015]
<i>chaos</i> _{t-1}			0.094** [0.036]			0.099*** [0.013]
Observations	1188	1188	1182	1188	1188	1182
R-squared				0.205	0.206	0.243

Notes: Standard errors clustered at country and year level reported in brackets. Significance levels:*** p < 0.01, ** p < 0.05, * p < 0.1. All regressions include country and year fixed effects. The variable *chaos* is equal to the total number of social unrest episodes per 10 million inhabitants in a given country and year. The outcome variable *chaos* is equal to the total number of social unrest episodes per 10 million inhabitants in a given country and year. The instrument in columns (1) to (3) is the average value of $\Delta(\text{expense/GDP})$ at time t-1 in all other countries, weighted by 1/distance to this country.

4.1. Heterogeneous effects: Sub-period, level of democracy and phone penetration

In this final section of the paper we study whether the effect of austerity measures on social unrest differs across sub-periods of our sample, or whether it depends on the quality of democratic institutions or the penetration of peer-to-peer communication devices in a given country.

We start by breaking the period 1919–2008 into two sub-periods. In particular, we distinguish the interwar years 1919–1939 from the post-World War II period. This distinction is potentially important since the nature of government expenditure changed substantially during the 20th century and the notion of welfare state expanded across Europe with the electoral victories of Communist and Socialist parties (Alesina and Glaeser 2006). In each sub-period, we estimate both the baseline OLS correlation and the reduced form version of our identification strategy. The results are reported in Table A7. Columns (1) and (2) report the OLS estimates for the interwar period and the post-WWII period, respectively. We find negative and statistically significant effects of expenditure cuts on unrest in the post WWII period, while the effects are negative but not statistically significant at standard levels in the interwar period. Still, the two estimated coefficients are similar in magnitude. Next, in columns (3) and (4), we use the identification strategy described in Section 4. As shown, we find negative and strongly significant coefficients in both periods. To sum up, the results in Table A7 indicate that the link between austerity and social unrest had similar patterns in each sub-period of our long-run data.

Next, we ask if countries with more accountable governments weather the storms of austerity better. On the one hand, greater constraints on the executive and more democracy should mitigate social conflict; on the other, there is likely to be less repression of social protests by the authorities in more democratic countries. In order to test these hypotheses we use the identification strategy presented in Section 4 and split our sample between countries with different levels of democracy as measured by the Polity2 score constructed by the Center for Systemic Peace. The Polity2 score captures the degree of constraints on the executive in a given country and ranges from -10 to +10, where countries with higher numbers are more democratic, and a score equal to 10 is considered a full democracy (Marshall and Jaggers, 2010). Given that our sample is mostly composed by relatively democratic regimes, we split the data between “full democracies” (polity score equal to 10) and “non full democracies”. Table A8 reports the results. As shown, the relationship between changes in government spending and social unrest is mostly driven by full democracies. As shown in columns (1) and (2), in more autocratic regimes, changes in expenditure have only small and statistically insignificant effects on social unrest. This could be because public demonstrations against the government are illegal, violently repressed, or not covered by mainstream media. Instead, when we focus on full democracies in columns (3) and (4), the estimated elasticity of social unrest to expenditure changes is similar in magnitude to the coefficient in Table 2.

Finally, we investigate whether greater penetration of peer-to-peer communication devices amplifies or reduces social unrest in response to fiscal adjustments. Events in the Arab world in 2010 and early 2011 have led many observers to argue that greater media availability tightens the link between discontent and unrest. We use data on media penetration from Banks (2010). We focus in particular on number of telephones per capita, a measure that includes mobile phones in the most recent part of the sample. As

phones allow peer-to-peer communication, they can potentially facilitate organized protest.

To explore this dimension of heterogeneity we first create a variable capturing the ranking of phone penetration across countries within each year. We then divide the sample at the median of the ranking variable. Finally, we apply the identification strategy described in Section 4 separately for the sub-samples with high and low phone penetration. Table A9 reports the results. As shown, the effect of expenditure cuts on social unrest is concentrated in the sub-sample with above the median phone penetration. Notice that this is only suggestive evidence that peer-to-peer communication can facilitate organized forms of social unrest. However, these results are in line with recent research providing micro-based evidence on the potential of phone communication in solving collective action problems (Manacorda and Tesei, 2016).

5. Conclusion

The political economy literature on austerity suggests that there is no significant punishment at the polls for governments pursuing cut-backs (Alesina et al., 1998; Alesina et al., 2010), and little evidence of gains in response to budget expansion (Brender and Drazen, 2008). Also, the empirical evidence on the economic effects of budget cuts is mixed, with some studies finding an expansionary effect, and others, a contractionary one.¹⁷ Why, then, is fiscal consolidation often delayed, or only implemented halfheartedly?

This paper suggests one possible reason why austerity measures are often avoided – fear of instability and unrest.¹⁸ To isolate the effect of policy decisions on social unrest, we propose an identification strategy inspired from Buera et al. (2011) that exploits past policy decision in neighboring countries. This allows us to generate variation in fiscal variables that is plausibly driven by policy-makers' discretionary decisions rather than by the current economic conditions. Expenditure cuts carry a significant risk of increasing the frequency of riots, anti-government demonstrations, general strikes, political assassinations, and attempts at revolutionary overthrow of the established order. While these are low-probability events in normal years, they become much more common as austerity measures are implemented. This may act as a potent brake on government policy, helping us to understand why fiscal consolidation is often avoided or delayed.

Appendix

Table A1

Data sources of main variables.

Variable name	Definition	Source	Time period
<i>Panel A. Social unrest variables</i>			
Riots	Any violent demonstration or clash of more than 100 citizens involving the use of physical force	Banks (2010)	1919–2008
Demonstrations	Any peaceful public gathering of at least 100 people for the primary purpose of displaying or voicing their opposition to government policies or authority (excluding anti-foreign nature demonstrations)	Banks (2010)	1919–2008
General strikes	Any strike of 1000 or more industrial or service workers that involves more than one employer and that is aimed at national government policies or authority	Banks (2010)	1919–2008
Assassinations	Any politically motivated murder or attempted murder of a high government official or politician	Banks (2010)	1919–2008
Revolutions	Any illegal or forced change in the top governmental elite, any attempt at such a change, or any successful or unsuccessful armed rebellion whose aim is independence from the central government	Banks (2010)	1919–2008
<i>Panel B. Fiscal variables</i>			
<i>Main fiscal variables:</i>			
$\Delta(\text{exp}/\text{GDP})$	Annual change in total central government spending as a share of GDP (percentage points)	(Mitchell, 2007) from 1919 to 1969; OECD from 1970 to 2008 (GTE).	1919–2008
$\Delta(\text{exp}/\text{GDP})_{t-1}$, Other Countries	Average value of Δ (expense/GDP) at time t-1 in all other countries, weighted by 1/distance to this country.	(Mitchell, 2007) from 1919 to 1969; OECD from 1970 to 2008 (GTE).	1920–2008
$\Delta(\text{rev}/\text{GDP})$	Annual change in total central government revenue as a share of GDP (percentage points)	(Mitchell, 2007) from 1919 to 1969; OECD from 1970 to 2008 (GTR)	1919–2008

(continued on next page)

¹⁷ Alesina and Ardagna (2010); Alesina et al. (2002); Guajardo et al. (2011). An early example in the literature is Giavazzi and Pagano (1990)

¹⁸ Alesina et al. (2010) also suggest that implementation of budget measures may be harder if the burden falls disproportionately on some groups. War-of-attrition models of consolidation are one alternative (Alesina and Drazen, 1991).

Table A1 (continued)

Variable name	Definition	Source	Time period
$\Delta(\text{budget balance}/\text{GDP})$	Annual change in total central government budget as a share of GDP (percentage points)	(Mitchell, 2007) from 1919 to 1969 ($\frac{\text{rev} - \text{exp}}{\text{GDP}}$); OECD from 1970 to 2008 ($(\text{GTE} - \text{GTR})/\text{B1_GA}$)	1919–2008
<i>Cyclically adjusted fiscal variables:</i>			
$\Delta(\text{primary exp}/\text{GDP})$	Annual change in cyclically adjusted current expenditure as a share of GDP (percentage points)	Alesina and Ardagna (2010) (blepgcurr)	1970–2007
$\Delta(\text{tot rev}/\text{GDP})$	Annual change in cyclically adjusted total revenue as a share of GDP (percentage points)	Alesina and Ardagna (2010) (blept)	1970–2007
$\Delta(\text{primary budget balance}/\text{GDP})$	Annual change in cyclically adjusted primary budget as a share of GDP (percentage points)	Alesina and Ardagna (2010) (-blepprdef)	1970–2007
<i>Panel C. Controls:</i>			
$\Delta(\text{GDP})$	Annual growth in GDP, PPP adjusted	Maddison (2010)	1919–2008
$\Delta(\text{Unemployment rate})$		OECD Outlook n. 84	1970–2007
$\Delta(\text{Inflation rate})$		OECD Outlook n. 84	1970–2007
Ethnic Fragmentation	Probability that two randomly selected individuals in a country belong to different ethnic groups. Data is available for 1985 and 2000. We assign the 1985 values to years from 1970 to 1990, and the 2000 value for years from 1991 to 2007	Patsiurko et al. (2011)	1985, 2000
Polity2	Revised Combined Polity Score	Marshall and Jagers (2010)	
TV per capita	Televisions per capita	Banks (2010) (media4)	1919–2008
Phones per capita	All telephones, including mobiles, per capita	Banks (2010) (phone6)	1919–2008

Table A2

Unrest and fiscal policy: by type of social unrest.

outcome:	Riots, Demonstrations and General Strikes						Attempted political assassinations and coups					
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
$\Delta(\text{budget balance}/\text{GDP})_t$	0.090** [0.035]	0.087** [0.037]					0.005 [0.006]	0.005 [0.007]				
$\Delta(\text{exp}/\text{GDP})_t$			-0.053* [0.027]	-0.050 [0.030]						-0.016* [0.008]	-0.017* [0.008]	
$\Delta(\text{rev}/\text{GDP})_t$					0.013 [0.021]	0.013 [0.021]						-0.025** [0.011]
$\Delta(\text{GDP cycle})_t$	-0.015 [0.023]	-0.030* [0.015]	-0.013 [0.023]	-0.029* [0.016]	-0.008 [0.023]	-0.025 [0.015]	-0.005 [0.007]	-0.007 [0.010]	-0.006 [0.008]	-0.007 [0.010]	-0.005 [0.007]	-0.007 [0.010]
$\Delta(\text{GDP trend})_t$	-0.045 [0.054]	-0.038 [0.053]	-0.037 [0.055]	-0.030 [0.054]	-0.025 [0.056]	-0.020 [0.055]	0.017 [0.015]	0.006 [0.020]	0.015 [0.014]	0.004 [0.020]	0.019 [0.015]	0.007 [0.020]
Log (POP)		0.780 [0.504]		0.813 [0.501]		0.794 [0.515]				-0.113 [0.290]	-0.108 [0.290]	-0.099 [0.295]
Polity2 index		0.011 [0.014]		0.011 [0.014]		0.010 [0.014]		0.005 [0.006]		0.005 [0.006]		0.005 [0.006]
rds_{t-1}		0.144** [0.064]		0.148** [0.064]		0.147** [0.064]						
$apac_{t-1}$								0.173* [0.085]		0.172* [0.085]		0.173* [0.085]
Observations	1241	1229	1241	1229	1241	1229	1241	1229	1241	1229	1241	1229
R-squared	0.171	0.187	0.165	0.182	0.159	0.177	0.215	0.240	0.219	0.245	0.220	0.246

Notes: Standard errors clustered at country and year level reported in brackets. Significance levels:*** p < 0.01, ** p < 0.05, * p < 0.1. All regressions include country and year fixed effects.

Table A3
Unrest and fiscal policy: out-of-sample test using GDELT data.

outcome:	GDELT Protests per 10M inhabitants		
	(1)	(2)	(3)
Δ (budget balance/GDP) _t	0.176 [0.142]		
Δ (exp/GDP) _t		-0.284** [0.140]	
Δ (rev/GDP) _t			-0.046 [0.164]
Δ (GDP) _t	-0.310*** [0.090]	-0.317*** [0.084]	-0.286*** [0.086]
Log(POP)	8.936 [6.358]	8.498 [6.508]	8.298 [6.514]
Polity2 Index	-0.460** [0.181]	-0.453** [0.180]	-0.445** [0.181]
Observations	579	582	577
R-squared	0.505	0.503	0.497

Notes: Standard errors clustered at country and year level reported in brackets. Significance levels:*** p < 0.01, ** p < 0.05, * p < 0.1. All regressions include country and year fixed effects. The outcome variable is constructed as number of protest events recorded in the GDELT 1.0 Event Dataset per 10 million inhabitants. We define an unrest event as any event with Cameo code 14, which identify “Protest” events. Since the GDELT dataset records the “target” of a given action, we focus on protest events whose target is the government of a given country.

Table A4
Unrest and fiscal policy: results with extended set of controls.

outcome:	<i>chaos</i>					
	(1)	(2)	(3)	(4)	(5)	(6)
Δ (primary budget/GDP)	0.047** [0.021]	0.057** [0.024]				
Δ (primary exp/GDP)			-0.088* [0.042]	-0.110** [0.042]		
Δ (tot rev/GDP)					0.043 [0.042]	0.050 [0.046]
Δ (GDP cycle) _t	-0.088** [0.034]	-0.082* [0.039]	-0.103** [0.036]	-0.108** [0.043]	-0.076** [0.032]	-0.066 [0.038]
Δ (GDP trend) _t	-0.124 [0.076]	-0.111 [0.099]	-0.134* [0.076]	-0.133 [0.099]	-0.116 [0.074]	-0.101 [0.102]
Log (POP)	3.347** [1.382]	3.186** [1.300]	3.330** [1.458]	3.333** [1.451]	3.210** [1.286]	2.987** [1.177]
Polity2 index	-0.172*** [0.039]	-0.183*** [0.044]	-0.167*** [0.038]	-0.180*** [0.044]	-0.171*** [0.039]	-0.179*** [0.044]
<i>chaos</i> _{t-1}	0.065*** [0.019]	0.063*** [0.019]	0.064*** [0.018]	0.062*** [0.019]	0.066*** [0.018]	0.064*** [0.019]
Δ Unemployment Rate		0.041 [0.081]		0.008 [0.078]		0.046 [0.085]
Δ inflation		-0.029 [0.030]		-0.035 [0.028]		-0.022 [0.030]
Ethnic fragmentation		-0.203 [0.835]		-0.183 [0.851]		-0.229 [0.813]
Observations	522	522	522	522	522	522
R-squared	0.283	0.288	0.285	0.291	0.279	0.283

Notes: Standard errors clustered at country and year level reported in brackets. Significance levels:*** p < 0.01, ** p < 0.05, * p < 0.1. All regressions include country and year fixed effects. The variable *chaos* is equal to the total number of social unrest episodes per 10 million inhabitants in a given country and year.

Table A5
Unrest and fiscal policy: EPCD data.

outcome:	$chaos_t^{EPCD}$	
	(1)	(2)
Δ (primary exp/GDP)	-0.319** [0.114]	-0.305** [0.126]
Δ (primary exp/GDP) $_{t+1}$		-0.218 [0.198]
Δ (primary exp/GDP) $_{t+2}$		-0.146 [0.180]
Δ (primary exp/GDP) $_{t+3}$		0.015 [0.172]
Δ (GDP) $_t$	-0.087 [0.159]	-0.097 [0.175]
Log (POP)	47.125* [22.526]	42.783* [22.105]
Polity2 index	-0.002 [0.592]	-0.025 [0.635]
$chaos_{t-1}^{EPCD}$	-0.022 [0.087]	-0.029 [0.090]
Δ Unemployment Rate	-0.046 [0.182]	0.022 [0.170]
Δ inflation	-0.031 [0.071]	-0.040 [0.068]
Ethnic fragmentation	-10.096*** [2.515]	-9.479*** [2.855]
Observations	214	214
R-squared	0.292	0.303

Notes: Standard errors clustered at country and year level reported in brackets. Significance levels:*** p < 0.01, ** p < 0.05, * p < 0.1. All regressions include country and year fixed effects. The variable $chaos_t^{EPCD}$ is equal to the total number of episodes of protest against austerity per 10 million inhabitants in a given country and year according to the EPCD.

Table A6
Unrest and fiscal policy: alternative measure of unrest.

outcome:	PCA of $chaos$								
	OLS			IV			Reduced Form		
estimator:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Δ (exp/GDP) $_t$	-0.048** [0.020]	-0.051** [0.022]	-0.050** [0.024]	-0.436** [0.189]	-0.408** [0.168]	-0.516** [0.245]			
Δ (exp/GDP) $_{t-1}$, Other Countries							-0.197*** [0.057]	-0.200*** [0.058]	-0.205*** [0.061]
Δ (GDP cycle) $_t$		-0.021 [0.017]	-0.031* [0.015]		-0.053* [0.026]	-0.065** [0.030]		-0.021 [0.019]	-0.032* [0.016]
Δ (GDP trend) $_t$		-0.003 [0.032]	-0.014 [0.025]		-0.054 [0.045]	-0.067 [0.057]		0.018 [0.034]	0.010 [0.025]
Δ (GDP) $_{t-1}$, Other Countries						0.042 [0.062]			0.050* [0.027]
Log (POP)			0.455 [0.444]			0.694 [0.506]			0.445 [0.387]
Polity2 index			0.013 [0.012]			0.019 [0.016]			0.010 [0.012]
PCA of $chaos_{t-1}$			0.203*** [0.069]			0.198** [0.087]			0.197*** [0.066]
Observations	1241	1241	1229	1188	1188	1182	1188	1188	1182
R-squared	0.210	0.213	0.244				0.218	0.221	0.252

Notes: Standard errors clustered at country and year level reported in brackets. Significance levels:*** p < 0.01, ** p < 0.05, * p < 0.1. All regressions include country and year fixed effects. The instrument in columns (4) to (6) is the average value of Δ (expense/GDP) at time t-1 in all other countries, weighted by 1/distance to this country.

Table A7
Heterogeneous effects by sub-period.

outcome:	<i>chaos</i>			
	OLS		Reduced Form	
estimator:				
sub-period	1919–1939 (1)	1945–2008 (2)	1919–1939 (3)	1945–2008 (4)
$\Delta(\text{exp/GDP})_t$	-0.063 [0.049]	-0.075* [0.041]		
$\Delta(\text{exp/GDP})_{t-1}$, Other Countries			-0.260*** [0.069]	-0.288** [0.117]
$\Delta(\text{GDP cycle})_t$	-0.014 [0.023]	-0.060 [0.037]	-0.020 [0.027]	-0.059 [0.042]
$\Delta(\text{GDP trend})_t$	-0.069 [0.102]	-0.020 [0.034]	-0.060 [0.108]	0.026 [0.020]
$\Delta(\text{GDP})_{t-1}$, Other Countries			0.031 [0.099]	0.104*** [0.014]
Log (POP)	1.732 [5.252]	1.296 [1.794]	-2.215 [5.254]	1.032 [1.803]
Polity2 index	0.099** [0.034]	-0.015 [0.015]	0.084** [0.037]	-0.013 [0.016]
chaos_{t-1}	0.075** [0.033]	0.103*** [0.016]	0.088** [0.040]	0.094*** [0.015]
Observations	240	988	227	954
R-squared	0.382	0.198	0.397	0.206

Notes: Standard errors clustered at country and year level reported in brackets. Significance levels:*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. All regressions include country and year fixed effects.

Table A8
Level of democracy and social unrest.

outcome:	<i>chaos_t</i>			
	Polity2 < 10		Polity2 = 10	
subsample:				
estimator:	OLS (1)	Reduced Form (2)	OLS (3)	Reduced Form (4)
$\Delta(\text{exp/GDP})_t$	-0.002 [0.084]		-0.072* [0.035]	
$\Delta(\text{exp/GDP})_{t-1}$, Other Countries		-0.104 [0.414]		-0.288*** [0.086]
$\Delta(\text{GDP cycle})_t$	-0.042 [0.034]	-0.042 [0.038]	-0.040** [0.018]	-0.037** [0.017]
$\Delta(\text{GDP trend})_t$	0.058 [0.126]	0.082 [0.125]	-0.034 [0.037]	-0.019 [0.038]
$\Delta(\text{GDP})_{t-1}$, Other Countries		0.185 [0.199]		0.015 [0.058]
Log (POP)	-2.799 [5.827]	-3.345 [6.142]	1.128 [0.892]	1.031 [0.913]
chaos_{t-1}	0.121*** [0.030]	0.121*** [0.029]	0.049*** [0.013]	0.051*** [0.009]
Observations	267	267	904	904
R-squared	0.404	0.408	0.237	0.236

Notes: Standard errors clustered at country and year level reported in brackets. Significance levels:*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. All regressions include country and year fixed effects. The instrument variable is the average value of $\Delta(\text{expense/GDP})$ at time $t-1$ in all other countries, weighted by $1/\text{distance}$ to this country.

Table A9

Phone penetration, expenditure cuts, and social unrest.

outcome:	<i>chaos_t</i>			
subsample:	Phones per capita			
	< Median		> Median	
estimator:	OLS (1)	Reduced Form (2)	OLS (3)	Reduced Form (4)
$\Delta(\text{exp/GDP})_t$	-0.063 [0.052]		-0.069** [0.029]	
$\Delta(\text{exp/GDP})_{t-1}$, Other Countries		0.018 [0.205]		-0.356*** [0.100]
$\Delta(\text{GDP cycle HP})_t$	-0.080** [0.036]	-0.090** [0.038]	-0.037* [0.018]	-0.028* [0.016]
$\Delta(\text{GDP trend HP})_t$	0.024 [0.122]	0.043 [0.158]	-0.084 [0.049]	-0.067 [0.049]
(mean) <i>ldgdp1</i>		0.111 [0.106]		0.038 [0.074]
Log (POP)	-2.078 [2.090]	-2.244 [2.308]	1.585** [0.742]	1.385* [0.725]
Polity2 index	0.051** [0.018]	0.044** [0.018]	0.002 [0.030]	0.006 [0.026]
<i>CHAOS</i> _{t-1}	0.126*** [0.017]	0.120*** [0.017]	0.047*** [0.015]	0.062*** [0.015]
Observations	440	393	786	786
R-squared	0.351	0.377	0.257	0.270

Notes: Standard errors clustered at country level reported in brackets. Significance levels:*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The instrument variable is the average value of $\Delta(\text{expense/GDP})$ at time $t-1$ in all other countries, weighted by $1/\text{distance}$ to this country.

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