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CUTS AND SOCIAL UNREST IN
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ABSTRACT

Austerity and Anarchy: Budget Cuts and Social Unrest in Europe, 1919-2009*

Does fiscal consolidation lead to social unrest? From the end of the Weimar Republic in Germany in the 1930s to anti-government demonstrations in Greece in 2010-11, austerity has tended to go hand in hand with politically motivated violence and social instability. In this paper, we assemble cross-country evidence for the period 1919 to the present, and examine the extent to which societies become unstable after budget cuts. The results show a clear positive correlation between fiscal retrenchment and instability. We test if the relationship simply reflects economic downturns, and conclude that this is not the key factor. We also analyse interactions with various economic and political variables. While autocracies and democracies show a broadly similar responses to budget cuts, countries with more constraints on the executive are less likely to see unrest as a result of austerity measures. Growing media penetration does not lead to a stronger effect of cut-backs on the level of unrest.

JEL Classification: H40, H50, H60 and N14

Keywords: demonstrations, Europe, government deficits, instability, public expenditure, riots and unrest

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1. Introduction

Social unrest has led to key turning points in modern history since, at least, the French Revolution. Marx saw it as the driving force of the transition of societies from feudalism to capitalism and, eventually, communism. Unrest's power as a catalyst for change manifests itself explicitly regime changes, such as during the "Arab Spring" of 2010-2011, or it operates through expectations: The extension of the franchise in Western societies has been interpreted as an attempt to heed off the threat of revolution (Acemoglu and Robinson 2000).¹ What leads to social unrest is less clear. Economic shocks are one important contributing factor: The demise of the Weimar Republic during the Great Depression is a prominent example of how economic hardship can translate into unrest (Bracher 1978).²

In this paper, we examine what leads to social instability and violent protests. In particular, we ask whether fiscal policy affect the level of social unrest. The extent to which societies fracture and become unstable in response to drastic changes in the government budget is a primary concern for policymakers attempting to reduce budget deficits: From Argentina in 2001 to Greece in 2010-11, austerity measures have often created a wave of violent protests and massive civil unrest. Economic conditions can deteriorate further and faster if political and social chaos follows attempts to reign in spending. Consequently, sustainable debt levels for countries that are prone to unrest may be lower than they otherwise would be.

We use a long panel dataset covering almost a century, focusing on Europe, 1919 to 2009. 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, political assassinations, government crises, 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 compile a new index that summarizes these variables, and then ask -- for every percentage cut in government spending, how much more instability should we expect?

The data shows a clear link between the magnitude of expenditure cut-backs and increases in social unrest. With every additional percentage point of

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).

GDP in spending cuts, the risk of unrest increases. As a first pass at the data, Figure 1 examines the relationship between fiscal adjustment episodes and the number of incidents indicating instability (CHAOS). CHAOS is the sum of demonstrations, riots, strikes, 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 1.5 events. When expenditure cuts reach 1% or more of GDP, this grows to nearly 2 events, a relative increase by almost a third compared to the periods of budget expansion. As cuts intensify, the frequency of disturbances rises. Once austerity measures involve expenditure reductions by 5% or more, there are more than 3 events per year and country -- twice as many as in times of expenditure increases.

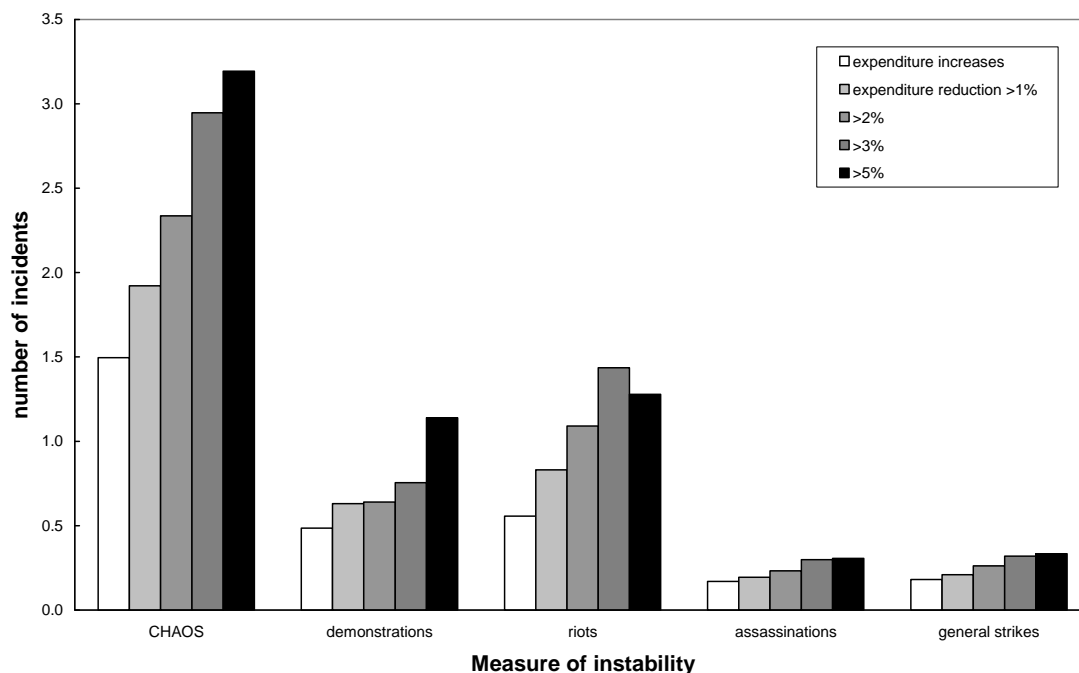


Figure 1: Frequency of incidents and the scale of expenditure cuts

Exactly the same relationship can be observed in each of the four main subcategories of CHAOS. The frequency of demonstrations, assassinations, and general strikes rises monotonically with the scale of cuts. Only in the case of riots is there a small decline for the biggest cut-backs. In the case of demonstrations, the frequency of incidents appears to rise particularly fast as expenditure cuts pass the 3% threshold.

The strength of the link between austerity measures and unrest is our first important finding. Is the link causal? Other factors, such as generally

depressed economic conditions, could drive up unrest and the need for cut-backs simultaneously. Controlling for economic growth does not change our results. This suggests that we capture more than the general association between economic downturns and unrest. To demonstrate that causality runs from cut-backs to unrest, we refine the data in two ways: First, we analyse a more detailed dataset that gives information about the causes of each incident. Second, we use recently-compiled data on changes in the government budget that follow directly from policy changes (Devries et al. 2011). For both types of additional evidence, we find clear indications that the link runs from budget cuts to unrest. We also conduct placebo tests with other types of unrest – inspired by ecological issues and world peace, for example – and find no effect of budget measures.

Our findings are robust to a wide range of alternative specifications and further tests. Different measures of unrest do not affect our conclusions. We examine if the link between austerity and unrest changes as countries institutions improve. For most value of the Polity2 score of institutional quality, results are broadly unchanged. However, countries with very high levels of constraints on the executive show a weaker degree of association. Further, we examine if the spread of mass media changes the probability of unrest. This is not the case. If anything, higher levels of media availability and a more developed telecommunications infrastructure reduce the strength of the mapping from budget cuts to instability. We also test which part of the distribution of unrest is responsible for our results, using quantile regressions: The higher the level of unrest, the bigger the relative impact of additional budget cuts. Finally, we test for asymmetries in the relationship between unrest and austerity. Reductions increase instability, but spending increases do not cut the number of incidents to the same extent.

Earlier papers on the same topic have typically focussed on case studies, or on subsets of the developing world. Work on 23 African countries during the 1980s found that budget cuts had typically no effect on political and social stability. IMF interventions, on the other hand, often led to more frequent disturbances (Morrison, Lafay, and Dessus 1994). Paldam (1993) examines current account crises in seven South American countries during the period 1981-90, using high-frequency (weekly) data. He finds that the run-up to new austerity measures is associated with higher levels of unrest, but that actual implementation is followed by fewer disturbances. Similarly, Haggard, Lafay and Morrison (1995) find that IMF interventions and monetary contractions in developing countries led to greater instability. Analysing the

period 1937-1995, Voth (2011) explores related issues for the case of Latin America. He finds that austerity and unrest are tightly linked in a majority of cases. Remarkably, to the best of our knowledge, there exists no 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.

Other related literature includes work on the political economy of fiscal consolidation, and on its economic effects. The composition of fiscal adjustment has been examined; cutting entitlement programs tends to produce persistent improvements in the budget balance, while revenue measures and capital expenditure cuts have only temporary effects (Alesina and Perotti 1995). The timing of stabilization measures has been explored in war-of-attrition models, which view relative bargaining strength of different groups as crucial (Alesina and Drazen 1991). A rich literature has examined the macroeconomic effects of budget cuts. Giavazzi and Pagano (1990) and Alesina et al. (2002) find that cuts can be expansionary. Amongst the reasons suggested for this finding are a reduction in uncertainty about the course future spending (Blanchard 1990a), and a positive wealth shock as a result of lower taxes in the future (Bertola and Drazen 1993).³ Recently, work by the IMF has suggested that austerity measures may be less expansionary than previously thought; they may well have the standard negative Keynesian effects as a result of lower demand (IMF 2010; Pescatori, Leigh, and Guajardo 2011).

We proceed as follows: Section 2 presents our data, and section 3 summarizes our main results. Robustness checks and extensions are discussed in section 4; section 5 concludes.

2. Data

In this section, we briefly describe our data and summarize its main features. We use two datasets – a long-term one which allows tracing out the broad patterns of unrest and austerity since 1919, as well as a short-term one that contains richer information on the causes of unrest. For both, we use information on unrest as well as on economic performance and budget measures.

Five main indicators of domestic conflict in the long-term data will form the main focus of this study – general strikes, riots, anti-government demonstrations, political assassinations, and attempted revolutions. These

³ Once the response of labor supply and capital formation is fully taken into account, these effects may not go through (Baxter and King 1993).

data are part of the Cross National Time Series Dataset, compiled by Arthur Banks (2010) and his collaborators. The main source of data on unrest episodes are the reports of the *The New York Times*, while the variables' definition is adopted from Rummel (1974). In addition, we use data on GDP, government revenue, expenditure, and the budget balance from a variety of sources.⁴ The long-term data has information on 26 European countries and covers the years from 1919 to 2008.⁵

Table 1 gives an overview of the main variables and their descriptive statistic for the long-term data. The average number of assassinations and general strikes was quite low in our sample, with less than 2 events in each decade. There were more riots and more demonstrations – 5-6 per decade. Attempted revolutions are quite rare, but some countries registered high levels of instability. The record in our sample is Germany in 1923, with 5 recorded attempts at overthrow (with communist insurgencies in Saxony and Thuringia, the Hitler Beer Hall Putsch, and a separatist movement in the Rhineland). Assassinations and riots similarly show a broad range of observed values.

Using almost a century of data allows us to include some extreme observations. For example, Austria and Germany saw major output declines in 1945 and 1946, respectively. The biggest reduction in governments spending in our data occurred in Poland, in 1982; the second-largest, in Finland, in 1947. The start of war is often associated with big increases in expenditure. The record-holder in our dataset is Hungary in 1940, with an increase of over 30 percent.

⁴ Data on fiscal variables (Total Central Government Expenditure and Revenue) and GDP are from OECD Stat (2010) for years from 1970 onwards, and from Mitchell (2005) for the period 1919-1970. Data on GDP growth in real terms for the all sample are from Maddison (2010).

⁵ The 26 European countries included in the long-term data are: Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Netherlands, Norway, Poland, Portugal, Romania, Russian Federation, Serbia, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, United Kingdom, Yugoslavia.

Table 1: Descriptive statistics, main variables

Variable	Mean	Std. Dev.	Min.	Max.	N
assassinations	0.161	0.723	0	15	2044
gen_strikes	0.186	0.634	0	7	2044
riots	0.595	1.904	0	25	2044
revolutions	0.085	0.345	0	5	2044
demonstrations	0.521	1.514	0	17	2044
wci	864.576	1917.308	0	27625	2044
dy	0.024	0.062	-0.879	0.506	1888
CHAOS	1.548	3.634	0	38	2044
dexp	0.003	0.028	-0.167	0.303	1492
dtax	0.002	0.02	-0.123	0.205	1435
dbudget	0	0.022	-0.1	0.099	1428

To obtain a single measure of instability, we calculate CHAOS by taking the sum of the number of assassinations, demonstrations, riots, general strikes, and attempted revolutions. While a crude way of aggregating indicators, it turns out to be powerful.⁶ In the robustness section, we show that alternative methods of reducing data complexity such as principal components analysis do not change our results.

For CHAOS, the average country in our sample registers 1.5 incidents per year. Instability was not constant over time. The maximum is higher – Italy in 1947 saw a total of 38 incidents, including 7 general strikes, 19 riots, and 9 anti-government demonstrations. Figure 1 gives an overview of the evolution over time, plotting the average of CHAOS as well as the maximum number of incidents observed. While there is no clear-cut pattern over time, some features emerge. The interwar period showed relatively high levels of unrest, with an average of 2 incidents per year, compared to 1.4 in the post-war period. The immediate post-World War II period, and the period from 1968 to 1994 also show unusually high levels of unrest. Comparatively speaking, the years since 1994 have been unusually tranquil (average CHAOS = 0.78)

⁶ One alternative is the weighted conflict indicator (wci), as compiled by Banks (2010). It gives fixed weights determined to different forms of unrest: Demonstrations have a weight of 200, while political assassinations have a weight of 24.

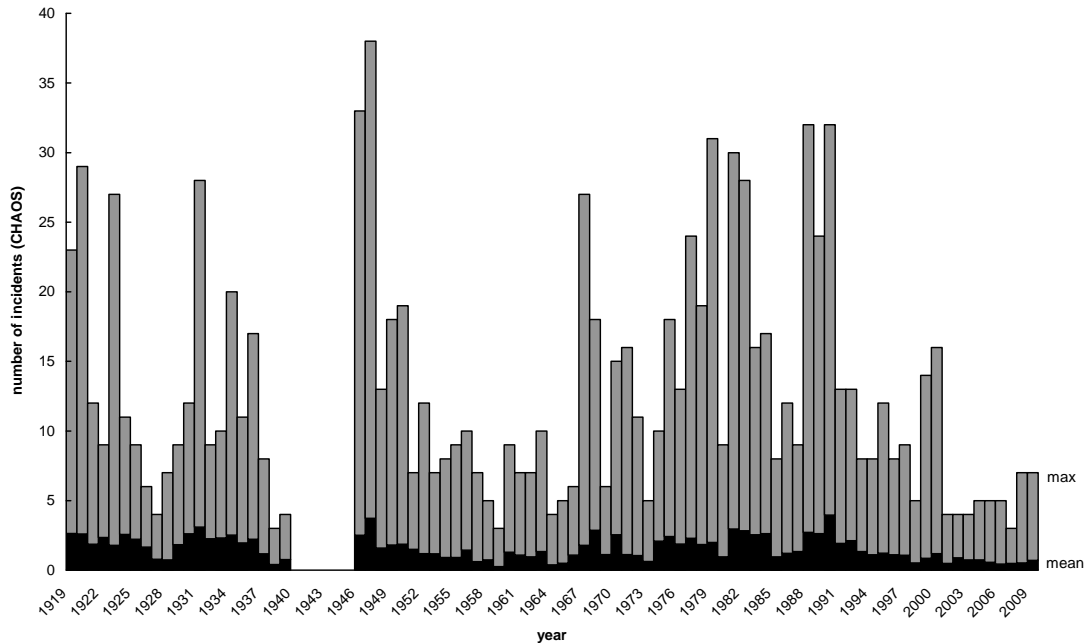


Figure 1: CHAOS over time

The short-term data on unrest is from the European Protest and Coercion Database (EPCD) developed by Francisco (2000). The EPCD codes daily data on all reported protest events occurred in 28 European countries between 1980 and 1995. The data is constructed using the full-text reports from more than 400 newspapers in the Lexis-Nexis database. We restrict our attention to the same types of protest events covered in the long-term data: riots, demonstrations, political assassinations, general strikes, and attempted revolutions.⁷ The main advantage of the EPCD over the Arthur Banks' database is that the former records the issue behind each protest, allowing us to test the relationship between austerity and unrest in a very precise way, even if only for a small subset of the overall dataset.

There are relatively few protests that are caused by austerity measures. At the same time, when they happen, they involve a large number of participants – by far the largest number of protesters of any category, as Table 2 illustrates. These protests tend to be relatively peaceful, with few protesters arrested, injured or killed, and relatively few members of the security forces involved.

⁷ We only consider protest events whose number of participants is above 100 for riots and demonstrations and above 1000 for general strikes (no threshold is used for assassinations and attempted revolutions). These are the same threshold used in the Arthur Banks database.

Table 2: Unrest in the EPCD sample, 1980-95.

Main issue:	Austerity	Labour	Ecology	Pacifism	Education	Other Issues
number of events:	213	1,577	218	1,025	301	6,242
Average number of protesters per event:						
total	712,693	106,153	3,056	14,547	33,865	53,625
arrested	.68	1.9	2	4.2	3.2	4.4
injured	.41	.76	2.3	1.9	1.3	2
killed	.0047	.00063	.0046	0	.013	.016
Average number of members of security forces per event:						
total	130	162	73	181	253	149
injured	.37	.46	.22	.11	2.1	.59
killed	0	0	.023	.00098	.0033	.059

In compiling information on expenditure and the budget balance data, we need to trade off the accuracy of information against availability over a long time span. For the 1919-2009 dataset, we rely on standard data sources on the central government revenue and expenditure relative to GDP (Mitchell 2007) for the years 1919 to 1970, augmented by data from the OECD (2010) for the period thereafter.

Expenditure changes will serve as the main explanatory variable. Figure 2 graphs changes in expenditure/GDP from one year to the next. The distribution is almost symmetric around the mean, with similar numbers of country-years witnessing expenditure increases and declines (807 vs 685). In an average year and country over the period, central government expenditure relative to GDP rose by 0.3%. The vast majority of observations falls between increases and decreases of 5%, with a few outliers in the tails of the distribution (typically driven by the beginning and end of wars).

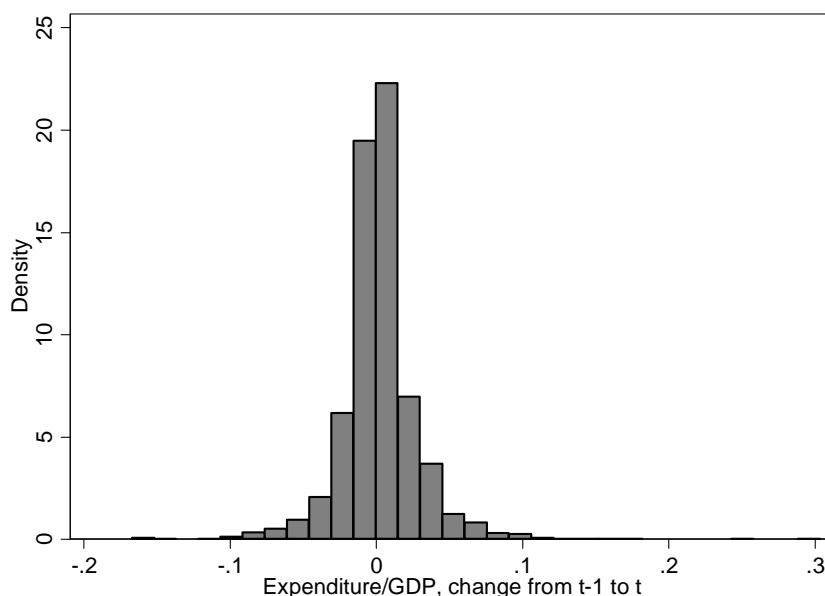


Figure 2: Expenditure changes/GDP, 1919-2009, all countries

In addition, we use the data by Alesina and Ardagna (2010) for the cyclically-adjusted budget balance.⁸ This has the advantage of correcting the budget position for changes in interest payments and for the immediate effect of the economic cycle, which drives both expenditure and revenue without any additional policy decision being taken. For a subsample of the data (1978-2009, 17 countries), we also use data by Devries et al. (2011). These authors examine in detail the policy changes that led to changes in a country’s fiscal stance. Only expenditure cuts or revenue increases motivated by a decision to press ahead with fiscal consolidation are considered.⁹ Overall, Devries et al. (2011) find 173 periods of fiscal policy adjustment,

As a first pass at the data, we repeat the exercise in Figure 1 for output growth (Figure 4). We subdivide the sample into terciles, and examine how much the incidence of various indicators of unrest declines as growth accelerates. For the summary indicator (CHAOS), there are a little more than 2 incidents when growth is in the lowest tercile. This falls to 1.3-1.5 incidents as growth accelerates. There is also a clear pattern of decline for demonstrations and for assassinations. In the case of riots, the differences are smaller overall, whereas in the case of general strikes, there seems to be little pattern at all. Based on a first, visual inspection of the data, it seems that the link between budget cuts and unrest is clearer than the one with growth.

⁸ Alesina and Ardagna use the method of Blanchard (1990b).

⁹ The approach is similar to the “narrative approach” pioneered by Romer and Romer (1989).

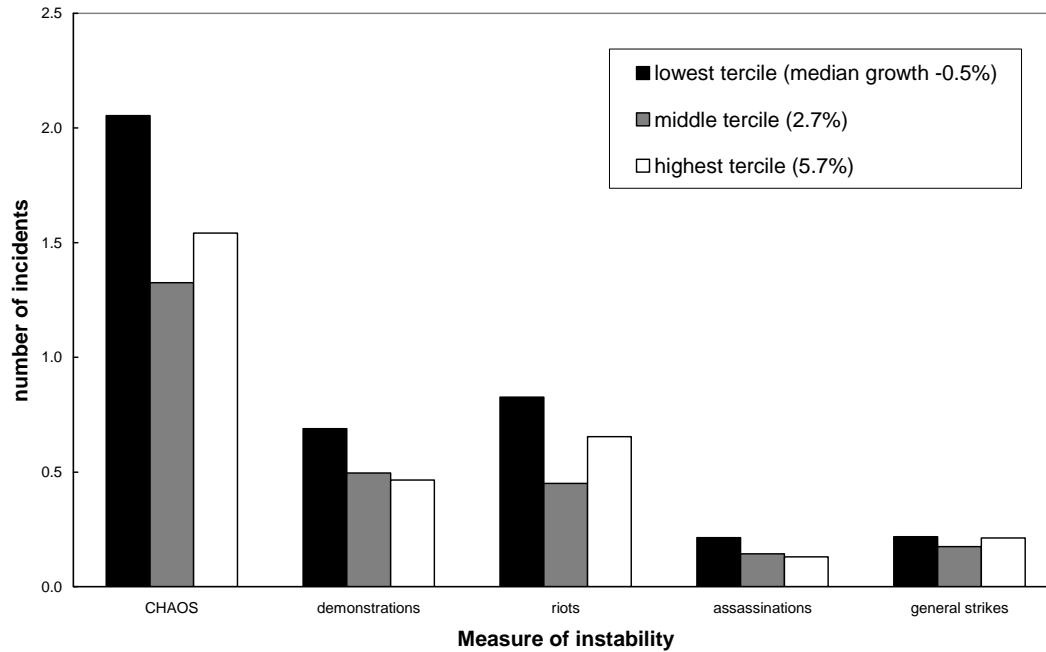


Figure 4: Frequency of incidents and economic growth

Next, we examine the correlation structure of our data in Table 3.

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. CHAOS is also positively correlated with the weighted conflict index (wci). Finally, Table 3 suggests that higher levels of expenditure and faster growth are associated with less unrest. The simple correlation of CHAOS with changes in the budget balance is positive and significant. Higher taxes and lower expenditure are associated with more unrest, but the relationship is not significant.

Table 3: Correlation matrix, main variables

Variables	chaos	assass	gen_strikes	riots	revolt	demo	wci	Δy	Δ budget	Δ tax	Δ exp
chaos	1.000										
assass	0.461 (0.000)	1.000									
gen_strikes	0.589 (0.000)	0.142 (0.000)	1.000								
riots	0.881 (0.000)	0.206 (0.000)	0.419 (0.000)	1.000							
revolt	0.383 (0.000)	0.167 (0.000)	0.223 (0.000)	0.322 (0.000)	1.000						
demo	0.752 (0.000)	0.231 (0.000)	0.343 (0.000)	0.490 (0.000)	0.144 (0.000)	1.000					
wci	0.810 (0.000)	0.379 (0.000)	0.532 (0.000)	0.730 (0.000)	0.581 (0.000)	0.495 (0.000)	1.000				
Δy	-0.017 (0.553)	-0.041 (0.145)	0.035 (0.219)	-0.010 (0.734)	-0.037 (0.185)	-0.016 (0.561)	0.012 (0.667)	1.000			
Δ budget	0.052 (0.067)	0.015 (0.583)	0.048 (0.089)	0.066 (0.020)	0.026 (0.349)	0.002 (0.951)	0.041 (0.143)	0.187 (0.000)	1.000		
Δ tax	0.033 (0.243)	0.020 (0.476)	0.072 (0.010)	0.022 (0.438)	-0.023 (0.416)	0.013 (0.652)	0.029 (0.300)	-0.042 (0.140)	0.175 (0.000)	1.000	
Δ exp	-0.019 (0.507)	0.002 (0.948)	0.013 (0.649)	-0.038 (0.176)	-0.039 (0.173)	0.008 (0.782)	-0.013 (0.647)	-0.185 (0.000)	-0.699 (0.000)	0.582 (0.000)	1.000

(significance levels in parentheses)

In the case of output changes, the coefficient is negative, but insignificant (table 3). The simple correlations suggest that these co-movements do not extend to all indicators of unrest equally – riots, revolutions, and demonstrations decline as expenditure rises, but assassinations and strikes seem – at a first pass – uncorrelated. Similarly, output growth seems to correlate negatively with assassinations, riots, revolutions, and demonstrations, but not with strikes. Next, we examine the connection between budget position, expenditure, and unrest more systematically.

3. Results

The graphical evidence in Figures 1 and 4 suggests a link from “hard times” – low growth and budget cut-backs – to unrest. Next, we examine if there is a systematic relationship between budget measures and social instability. In this section we also address the issue of causality, while in the next section we will test the robustness of our results.

A. Baseline Results

We estimate panel regressions of the type:

$$I_{it} = \alpha_i + \lambda_t + \beta \Delta B_{it} + \gamma X'_{it} + \varepsilon_{it} \quad (1)$$

where I_{it} denotes the level of instability in country i at time t , B is an indicator of the change in the budget position, α is a country-specific intercept, λ is a time-specific dummy, and X' is a vector of control variables.

We use CHAOS as the dependent variable in our baseline specification, and test the robustness of findings to alternative specifications later. Table 4 gives the main results. Under OLS with fixed effects and year-dummies, we find that expenditure increases reduce instability in a powerful way (column 1). A one standard-deviation increase in expenditure cuts the number of incidents (CHAOS) by 0.4 per year and country. Tax increases have a positive sign, but the effect is not significant at standard levels of rejection (column 2). It is also small – a one standard deviation rise in the tax/GDP ratio increases unrest by less than 0.01 events. Overall, we find that improvements in the budget balance raise the level of unrest (column 3). As the results in columns (1) and (2) make clear, this reflects the impact of expenditure cuts, and not of tax increases.

CHAOS is a count variable. Hence, the use of OLS may not be appropriate. Columns (4)-(6) give the results for Poisson Quasi-Maximum Likelihood estimation, with fixed effects. We find the same pattern as before, with strong effects for expenditure cuts and much weaker ones for tax increases.¹⁰

¹⁰ We also experimented with using negative binomial regressions, but results were largely unchanged.

Table 4: Baseline results

Dependent variable: chaos	Panel Fixed-effects			Poisson QML Fixed-effects		
Estimator:	(1)	(2)	(3)	(4)	(5)	(6)
Δ Exp	-14.284** (6.50)			-6.755*** (2.08)		
Δ Tax		0.496 (4.57)			0.341 (2.08)	
Δ Budget			12.472** (6.04)			8.322*** (2.55)
Δ GDP	-2.641 (7.58)	-0.100 (8.83)	-0.800 (8.79)	-1.312 (1.79)	-0.706 (2.25)	-1.009 (1.84)
Year dummies	yes	yes	yes	yes	yes	yes
Constant	4.799 (3.49)	5.058 (3.76)	4.765 (3.49)			
Adj R-squared	0.061	0.045	0.051			
Observations	1318	1263	1256	1296	1241	1234
Number of id	26	26	26	23	23	23

Significance level: *** p<0.01, ** p<0.05, * p<0.1

Standard errors clustered at country level reported in parentheses

Which component of CHAOS is responsible for the significant predictive power of budget cuts? In Table 5, we use the same specification as in Table 4 under Poisson QML, looking at the effect of expenditure cuts on each of the components of the aggregate indicator of instability – general strikes, demonstrations, riots, assassinations, and attempted revolutions. Out of the five outcome variables, four show the expected sign, and all of them are statistically significant. The only variable that does not show a large, significant coefficient is general strikes. On average, years with expenditure increases showed fewer general strikes, but there are numerous general strikes that are not an immediate reaction to economic conditions and budget measures (such as, for example, the 1926 general strike in Britain). For the other variables, the coefficients are large, indicating that austerity measures coincide with significant increases in demonstrations, attempted revolutions, riots, and assassinations.

In all specifications, the effect of GDP growth on unrest is negative. In contrast to the results for expenditure changes, the effect is not tightly estimated, except in the case of demonstrations, when it is also large – every 1% increase in GDP cuts the number of demonstrations by close to 0.4 events.

Table 5: Fiscal Adjustment and CHAOS by component

Estimator:	Poisson QML Fixed-effects				
Component of chaos:	general strikes	demonstrations	riots	assassinations	revolutions
	(1)	(2)	(3)	(4)	(5)
Δ Exp	-1.131 (2.22)	-7.615*** (1.42)	-7.277*** (1.23)	-5.400* (2.86)	-6.515* (3.82)
Δ GDP	-0.633 (1.79)	-3.864*** (1.46)	-0.693 (1.01)	-1.320 (2.37)	-1.555 (2.86)
year dummies	yes	yes	yes	yes	yes
Observations:	1069	1296	1208	1122	687
Number of id:	16	23	21	19	13

Significance level: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Robust standard errors reported in parentheses

Table 6 takes this analysis one step further, by breaking the period 1919-2009 into four sub-periods. We distinguish the interwar period from the period of immediate post-World War II reconstruction, the period of slowing growth into the 1980s, as well as the years after the fall of the Berlin Wall after 1989. On the whole, we find the same pattern as in the sample as a whole, with the exception of the last two decades. The effect of changes in budget expenditure on unrest is strongest in the tumultuous interwar years, when the estimated coefficient is fifty percent larger than in the sample as a whole. The effect of GDP growth is negative, but not tightly estimated. In the years after 1945, the inverse relationship between expenditure and unrest remains. Strikingly, however, more growth now appears to lead to more unrest. While it is difficult to test for the causes of this reversal exactly, it seems that high rates of output growth may have encouraged worker militancy more generally. At a time when many countries reached full employment, this effect seems to have become dominant. The normal pattern of GDP growth reducing unrest reasserts itself after 1965, when there is also still a clear negative effect of higher government expenditure.

The fall of the Berlin wall saw the spread of Western-style democracy eastwards. The overall connection between austerity and social instability now changes sign, and becomes insignificant. This suggests to us that non-economic causes became a dominant feature of the period. Below, we examine the issue in more detail with the help of a dataset that allows us to look at the motive of each demonstration.

Table 6: Results by sub-period and sub-sample

Dependent variable:	chaos			
Estimator:	Poisson QML		Fixed-effects	
Subperiods:	1919-1939	1945-1964	1965-1989	1990-2009
	(1)	(2)	(3)	(4)
Δ Exp	-9.846** (4.548)	-6.488** (2.705)	-5.243* (2.775)	1.451 (2.124)
Δ GDP	-2.614 (1.687)	9.148*** (2.104)	-12.74** (5.599)	-5.076 (3.627)
year dummies	yes	yes	yes	yes
Observations	212	254	352	340
Number of id	16	15	16	21

Significance level: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Standard errors clustered at country level in parentheses

B. Causality

The obvious challenge in interpreting (1) is the potential for omitted variable problems. It is possible that the economic cycle is simultaneously driving both unrest and the need for budget cuts. Above, we already control for GDP growth rates, and our main finding remains unaffected. 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 a different add two type of analysis. We use a related dataset that offers detailed information, for a shorter time period, on the causes behind each unrest event. This allows us to demonstrate the connection between social instability and expenditure cuts more directly.

As described in the data section, the EPCD’s dataset allows us to pin down the main motive behind each public demonstration. We examine if the public assemblies that are motivated by anti-austerity sentiment – as determined by the newspaper records in Lexis-Nexis – are significantly affected by actual changes in fiscal policy. Our approach here is similar to what has been called the “narrative approach” (C.D. Romer and D.H. Romer 1989). Table 7 gives the results. If we use the same specification as in Table 1 (where we analysed the dataset spanning the period 1919-1999), we find similar results. Increasing expenditure lowers levels of unrest (column 1). The key variable driving the relationship between budget balance and instability is expenditure, not taxes (columns 2 and 3). The results are robust to including country and year fixed effects. In column 6, we investigate what happens

when we use all forms of demonstrations, not just those associated with austerity. The coefficient is small, positive, and insignificant.

Table 7: EPCD data on unrest and austerity – 1980 to 1995

Dependent variable: unrest from austerity			
Estimator:	Poisson QML Fixed-effects		
	(1)	(2)	(3)
Δ Exp	-22.496** (9.21)		
Δ GDP	-25.613*** (6.90)	-21.733*** (6.53)	-23.930*** (6.70)
Δ Tax		3.901 (7.59)	
Δ Budget			9.794* (5.16)
Year dummies	yes	yes	yes
Constant	-1.850** (0.81)	-2.051** (0.80)	-1.972** (0.80)
Observations	223	223	223
Number of id:	16	16	16

Significance level: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Standard errors reported in parentheses

We can strengthen this result further by conducting a placebo test. In Table 8, we use a set of alternative types of unrest, and test if they can be predicted by the same explanatory variables as in Table 7. Labour disputes and unrest inspired by the state of the economy are more frequent when budgets are being cut, but the link is not strong or statistically significant. Peace rallies, and unrest as a result of education issues, show the opposite sign of the coefficient on austerity – times of rising expenditure also seem to bring these issues to the fore. Overall, the placebo test shows that only in the case of anti-austerity demonstrations is there a strong and significant link with changes in government expenditure.

Table 8: Placebo tests

Dependent variable:	Number of unrest events					
Estimator:	Poisson QML Fixed-effects					
Main issue of unrest event:	labour	economy	ecology	pacifism	education	all
	(1)	(2)	(3)	(4)	(5)	(6)
Δ Exp	-2.980 (3.80)	-5.636 (3.46)	6.722 (12.40)	26.503*** (6.04)	53.361*** (11.36)	2.519 (1.64)
Δ GDP	-5.300* (3.05)	-8.867*** (2.73)	14.958* (7.90)	2.653 (4.04)	16.200** (7.03)	-5.754*** (1.06)
Year dummies	yes	yes	yes	yes	yes	yes
Constant	-1.481*** (0.44)	-1.089*** (0.39)	-19.130 (1784.95)	0.334 (0.29)	-3.524*** (0.80)	1.713*** (0.11)
Observations	223	223	223	223	223	223
Number of id:	16	16	16	16	16	16

Significance level: *** p<0.01, ** p<0.05, * p<0.1

Standard errors reported in parentheses

Another way to strengthen the argument for a causal link is to examine budget measures in more detail. Some of the variation in the budget balance that we have used so far will simply reflect revenue and expenditure changes that are driven by the economic cycle. A simple way to deal with the problem is to use Alesina and Ardagna's (2010) cyclically-adjusted primary budget balance. In table 9, col. (2), we report the results. The coefficient on budget changes is almost identical to the baseline specification. In col. (3), we use the IMF measure of policy-action based changes in the budget balance.¹¹ This also produces a large, significant coefficient. The closer we get to measuring the impact of policy measures, the larger coefficient becomes. This strengthens the case for a causal link between unrest and austerity.

¹¹ Since Devries et al. (2011) only report positive changes in the budget balance, data from IMF International Financial Statistics has been used to proxy for negative changes in the budget position in the IMF (2011) series, sign and size of the coefficient are not affected by this assumption.

Table 9: Unrest and alternative measures of budget balance

Dependent variable: chaos			
Estimator:	Poisson	QML	Fixed-effects
	(1)	(2)	(3)
Δ Budget	8.322*** (2.553)		
Δ Budget [Alesina and Ardagna (2010)]		8.589** (3.758)	
Δ Budget [Devries et al. (2011)]			9.276* (4.743)
Δ GDP	-1.009 (1.835)	-18.23*** (3.817)	-8.583* (5.220)
Year dummies	yes	yes	yes
Observations	1234	535	325
Number of id	23	16	21

*** p<0.01, ** p<0.05, * p<0.1

Clustered standard errors in parentheses

4. Robustness and Extensions

In this section, we examine the sensitivity of our results. We first examine interaction effects with institutional factors. Do countries with more accountable governments weather the storms of austerity better?. We also examine if the effect may be driven by outliers, whether positive or negative changes in expenditure matter more for the effect on unrest, and whether the effect is constant in all parts of the distribution of the dependent variable.

Greater constraints on the executive and more democracy should on the hand - reduce social conflict; on the other, there will be less repression by the authorities as Polity scores improve. Which effect dominates is not clear ex ante. Table 10 demonstrates that in countries with better institutions, the responsiveness of unrest to budget cuts is generally lower. Where constraints on the executive are minimal, the coefficient on expenditure changes is strongly negative – more spending buys a lot of social peace. In countries with Polity-2 scores above zero, the coefficient is about half in size, and less significant. As we limit the sample to ever more democratic countries, the size of the coefficient declines. For full democracies with a complete range of civil rights, the coefficient is still negative, but no longer significant.

The link with growth is less clear-cut. Higher output hardly dents the tendency to riot, demonstrate, assassinate, or strike in countries with low institutional quality. The opposite is true on average in countries with scores

above zero, and throughout the range of scores. The only exception is for full democracies, where the connection is weaker.

Table 10: Unrest and Institutional Quality (dependent variable: CHAOS)

Dependent variable:	chaos				
Estimator:	Poisson QML Fixed Effects				
Subsamples: Polity2	< 0	> 0	> 5	> 8	= 10
	(1)	(2)	(3)	(4)	(5)
Δ Exp	-8.699*** (3.045)	-3.810* (2.092)	-3.052 (2.076)	-3.347* (1.910)	-2.771 (1.952)
Δ GDP	-0.311 (3.051)	-5.816*** (1.539)	-6.490*** (1.627)	-5.952** (2.759)	-1.479 (3.219)
Year dummies	yes	yes	yes	yes	yes
Observations	166	1128	1086	1007	888
Number of id	9	23	23	22	18

Significance level: *** p<0.01, ** p<0.05, * p<0.1

Robust standard errors in parentheses

When does the link between budget cuts and unrest become particularly strong? We examine which part of the distribution of CHAOS shows a particularly large impact of austerity measures. To do so, we estimate quantile regressions, where we estimate the conditional median, and then the effect from the 5th to the 95th percentile of the distribution of CHAOS. Figure 5 shows the size of effects. The estimated coefficient is zero for much of the range. Only from the 80th percentile upwards – for country-year observations with two or more incidents – is the effect visible. It then grows rapidly as estimated coefficient on expenditure changes (and on output growth) increases at higher and higher percentiles of the distribution of CHAOS. This suggests that unrest reacts particularly strongly to budget cuts and growth when unrest levels are already high.

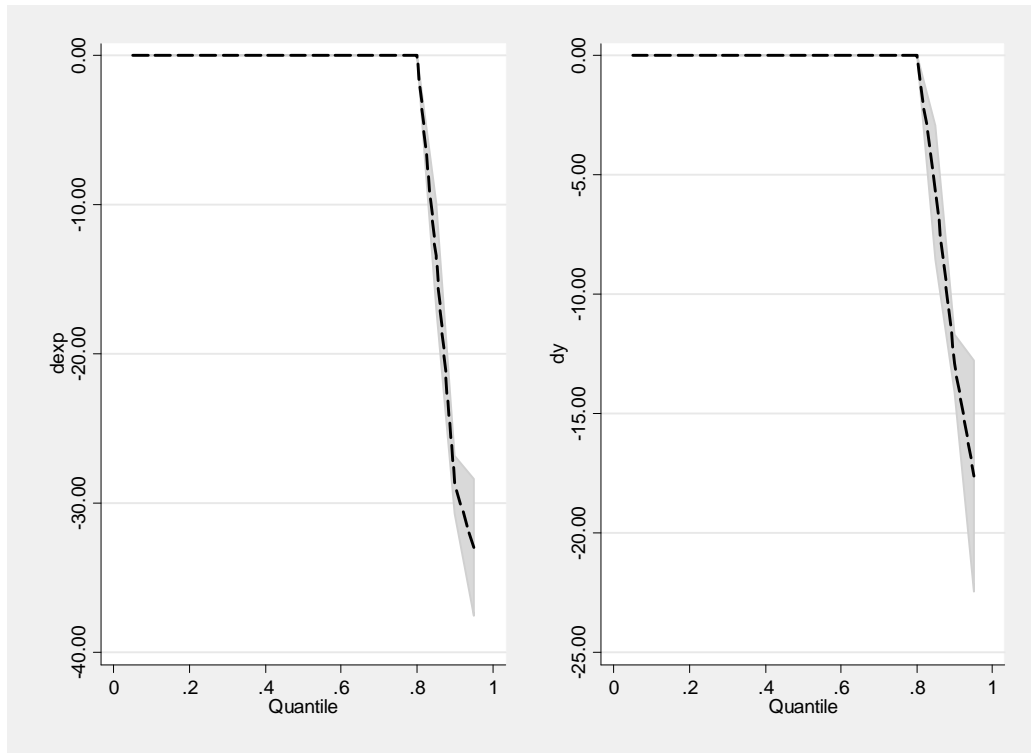


Figure 5: Quantile Regression Plot, Expenditure and Growth (95% confidence intervals)

How much does our main finding depend on the way in which we aggregate unrest? CHAOS is the simple sum of incidents. Instead, we can use the weighted conflict index, as compiled by Banks (1994) and collaborators. It encompasses a larger set of domestic conflicts including, in addition to the components of CHAOS, purges, major government crisis and guerrilla warfare. It also assigns different, fixed weights to each individual component. The correlation coefficient of the variable with CHAOS is 0.75, significant at the 1% level. Another alternative is to use the first principal component of the five indicators that go into CHAOS. They all enter with a positive weighting. The first principal component explains 0.42 of the overall variance. The correlation coefficient with CHAOS is 0.98.

In Table 11, we use both wci and the first principal as dependent variables. Since the dependent variable is no longer a count variable, we use panel OLS, and obtain large and significant coefficients for expenditure changes and the budget position. As before, the same is not true for tax changes. The results are largely identical in terms of magnitude and significance with the baseline results in Table 3. We conclude that the way in which we measure unrest does not matter for our main finding.

Table 11: Unrest and Budget Cuts – Alternative Indicators of Unrest

Estimator: Dependent variable	Panel Fixed-effects					
	Weighted Conflict Index (1)	(2)	(3)	Principal Component of Chaos (4)	(5)	(6)
Δ Exp	-3,946** (1825)			-4.795*** (1.447)		
Δ Tax		95.21 (2635)			0.741 (2.021)	
Δ Budget			4,630* (2390)			4.620** (1.832)
Δ GDP	-382.7 (1638)	-103.5 (1731)	-509.3 (1744)	-1.083 (1.298)	-0.216 (1.328)	-0.525 (1.337)
Year dummies	yes	yes	yes	yes	yes	yes
Constant	2521*** (611.6)	2615*** (615.6)	2508*** (618.1)	1.396*** (0.485)	1.485*** (0.472)	1.376*** (0.474)
Observations	1318	1263	1256	1318	1263	1256
Number of id	26	26	26	26	26	26
R^2	0.131	0.125	0.128	0.124	0.115	0.121

Significance level: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Standard errors in parentheses

An additional factor that can be questioned involves the use of the sum of unrest in the baseline results. The variable CHAOS is designed to capture the intensity of unrest, but it may be that it is influenced by a number of outliers with a high count of incidents. This would then make it easier to find significant effects. To examine this potential issue, we transform CHAOS into a simple dichotomous variable, with unrest coded as equal to unity if there are one or more incidents in a country in a single year. In table 12, we re-estimate the baseline regression with panel logit using country- and year-fixed effects. We find the same results as before – expenditure cuts wreak havoc, tax increases do so only to a small extent and insignificantly. Overall, the budget balance matters for predicting unrest. We conclude that the role of outliers is not decisive in underpinning the relationship we established in baseline results.

Table 12: CHAOS as a dichotomous variable

Dependent variable Estimator:	Occurrence of chaos (= 1 if chaos > 0) Logit Model with Fixed Effects		
	(1)	(2)	(3)
Δ Exp	-5.081* (2.92)		
Δ Tax		2.534 (4.40)	
Δ Budget			10.985** (4.44)
Δ GDP	-6.057** (2.59)	-5.001* (2.77)	-5.958** (2.84)
Year dummies	yes	yes	yes
Constant	0.606 (0.88)	0.804 (0.90)	0.617 (0.94)
Observations	1301	1244	1237
Number of id	25	25	25

Significance level: *** p<0.01, ** p<0.05, * p<0.1

Robust standard errors in parentheses

Which part of the variation in the explanatory variables is responsible for the link between austerity and unrest? Do increases in expenditure do as much to reduce unrest as cuts increase them? In Table 13, we look at the issue.

Column (1) shows the results for expenditure changes that are positive. The coefficient is negative, but not large, and not significant. In contrast, if expenditure changes are negative, they matter a great deal for unrest, driving up CHAOS by 0.19 incidents for each standard deviation of expenditure cuts. Next, we repeat the exercise for output changes. Increases in output do much to cut unrest (col. 3), with a one standard deviation increase in output (3.77%) reducing CHAOS by 0.2 incidents on average. In contrast, declines do not set off major disruptions to the same degree. Overall, the results in table 12 confirm that the relevant identifying variation for expenditure changes comes from cuts; for output changes, it comes from positive growth, not recessions.

Table 13: Instability, Expenditure Cuts and Growth

Dependent variable:	chaos			
Estimator:	Poisson QML Fixed-effects			
Subsamples:	$\Delta \text{Exp} > 0$	$\Delta \text{Exp} < 0$	$\Delta \text{GDP} > 0$	$\Delta \text{GDP} < 0$
	(1)	(2)	(3)	(4)
ΔExp	-1.437 (1.997)	-9.471*** (2.688)	-5.710*** (1.617)	-0.212 (2.565)
ΔGDP	-4.213* (2.305)	-2.756 (1.682)	1.186 (2.175)	-6.620 (6.369)
Year dummies	yes	yes	yes	yes
Observations	683	605	1102	188
Number of id	22	22	23	19

Significance level: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$
Robust standard errors in parentheses

Does greater media penetration increase or reduce unrest? Events in the Arab world in 2010 and early 2011 have led many to believe that greater media availability tightens the link between discontent and unrest. Data on media penetration is available in the Banks dataset. Four indicators are suitable – phone penetrations per capita, radio and television take-up, and the number of telegrams sent per capita. Radio and television are unidirectional forms of media, allowing typically government-controlled messages to be broadcast to the population. If anything, they should make it easier for authorities to reduce unrest. Phones and telegrams, on the other hand, allow peer-to-peer communication. All else equal, the expected effect is that they facilitate organized protest.

To analyse the data, and to avoid confusing results with the growing availability of broadcasting and telecommunications over time, we rank penetration rate in our sample in each year. We do separately for each category, and then sum the ranks for each country-year. This gives a rank ordering of media penetration in year y . We then divide the sample at the median. Table 14, col. (1) and (2) presents the results. We find that below-average media penetration is associated with a strong effect of expenditure cuts on unrest. Above the median, the effect disappears. There is also some evidence that the opposite pattern obtains with respect to economic conditions – the responsiveness to output changes increases as media penetration grows. In col. (3)-(6), we differentiate between uni-directional information media (infomedia) and peer-to-peer telecommunications (peermedia). While there is some attenuation of the effect of expenditure

changes, it is milder than for all media. For both types, the effect of economic conditions changes from insignificant (in the part of the sample with below-median penetration) to highly significant (above the median). These results do not suggest that countries which, at any one point of time, have greater availability of mass media (relative to their neighbors) experience a higher level of unrest.¹²

Table 14: Media Penetration and Unrest

Dependent variable: chaos						
Estimator: Poisson QML Fixed-effects						
Subsamples:	Media		Info-Media		Peer-Media	
	<median (1)	> median (2)	< median (3)	> median (4)	<median (5)	> median (6)
Δ Exp	-9.667** (3.985)	-0.727 (4.319)	-8.468*** (1.269)	-5.490* (2.952)	-7.984*** (1.752)	-6.503*** (1.926)
Δ GDP	-12.46*** (2.231)	-15.56*** (4.543)	1.712 (1.157)	-8.220** (3.489)	-1.614 (1.254)	-5.261*** (1.382)
Year dummies	yes	yes	yes	yes	yes	yes
Observations	187	247	382	488	390	380
Number of id	13	10	15	12	15	12

Significance level: *** p<0.01, ** p<0.05, * p<0.1
Standard errors in parentheses

5. Conclusions

The political economy literature on austerity suggests a paradox. There is no significant punishment at the polls for governments pursuing cut-backs (Alesina, Perotti, and Tavares 1998; Alesina, Carloni, and Lecce 2010), and no evidence of gains in response to budget expansion (Brender and A. 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.¹³ Why, then, is fiscal consolidation often delayed, or only implemented half-heartedly?

This paper suggests one possible reason why austerity measures are often avoided – fear of instability and unrest.¹⁴ Expenditure cuts carry a significant risk of increasing the frequency of riots, anti-government

¹² The obvious alternative is to condition on the absolute level of, say, phone penetration. Most of the variation in phone penetration, however, simply reflects GDP growth and the declining cost of telephones relative to all other goods; no clear pattern emerges.

¹³ Alesina and Silvio Ardagna 2010; Alesina, Silvio Ardagna, et al. 2002; Pescatori, Leigh, and Guajardo 2011. An early example in the literature is Giavazzi and Pagano (1990).

¹⁴ Alesina, Carloni and Lecce (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).

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 governments. In line with our results on expenditure, Woo (2003) showed that countries with higher levels of unrest are more indebted. High levels of instability show a particularly clear connection with fiscal consolidation.

We demonstrate that the general pattern of association between unrest and budget cuts holds in Europe for the period 1919-2009. It can be found in almost all sub-periods, and for all types of unrest. Strikingly, where we can trace the cause of each incident (during the period 1980-95), we can show that only austerity-inspired demonstrations respond to budget cuts in the time-series. Also, when we use recently-developed data that allows clean identification of policy-driven changes in the budget balance, our results hold. Finally, the results are not affected by using alternative measures of unrest. Contrary to what might be expected, we also find no evidence that the spread of mass media facilitates the rise of mass protests.

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