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Going to extremes: Politics after financial crises, 1870–2014

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ABSTRACT

Partisan conflict and policy uncertainty are frequently invoked as factors contributing to slow post-crisis recoveries. Recent events in Europe provide ample evidence that the political aftershocks of financial crises can be severe. In this paper we study the political fall-out from systemic financial crises over the past 140 years. We construct a new long-run dataset covering 20 advanced economies and more than 800 general elections. Our key finding is that policy uncertainty rises strongly after financial crises as government majorities shrink and polarization rises. After a crisis, voters seem to be particularly attracted to the political rhetoric of the extreme right, which often attributes blame to minorities or foreigners. On average, far-right parties increase their vote share by 30% after a financial crisis. Importantly, we do not observe similar political dynamics in normal recessions or after severe macroeconomic shocks that are not financial in nature.

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1. Introduction

With the catastrophe of the 1930s in mind, the fear of political radicalization in the wake of economic and financial disasters looms large in public discourse. Recent events in the Eurozone support such concerns. Since 2008, two-party systems that were stable for decades were swept away in the wake of the economic and financial turmoil. New political forces have since entered parliament and gained ground, while others have disappeared from the political map. In many countries, parties on the extreme right such as Front National in France or Golden Dawn in Greece have scored major electoral successes. Populist or openly Eurosceptic parties such as the Five Star Movement in Italy, Podemos, the party of True Finns, the UK Independence Party, or the Alternative for Germany have been surprise winners in recent elections.

Increasing fractionalization and polarization of parliaments makes crisis resolution more difficult, reduces the chances of serious reform and leads to political conflict at a time when decisive political action may be needed most. A number of authors have linked political gridlock to slow recoveries from financial crises. Frieden (2015) and Mian et al. (2014) as well as Lo and Rogoff (2015) argued that dysfunctional politics contribute to the now well documented phenomenon of slow recoveries from financial crises (Jordà et al., 2013, 2016b).¹ These ideas complement an important body of work in

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E-mail addresses: m.funke@fu-berlin.de (M. Funke), moritz.schularick@uni-bonn.de (M. Schularick), christoph.trebesch@econ.lmu.de (C. Trebesch).¹ Polarization and fractionalization may also have longer-term repercussions on the political economy. For example, Alesina and Tabellini (1990) and Azzimonti (2011) predict that more polarized political systems produce economic inefficiencies, higher debt, and lower growth. Alt and Lassen (2006), Lindqvist and Östling (2010), Azzimonti and Talbert (2014) and Azzimonti (2015) provide empirical evidence supporting this view.

macroeconomics in recent years that has studied policy uncertainty and its economic effects in more depth (Bloom et al., 2007, 2012; Bloom, 2009; Bachmann et al., 2013; Baker et al., 2013). An important insight resulting from this literature is that measured policy uncertainty is particularly high after financial crises. However, with few exceptions, there is limited empirical evidence on the underlying channels.²

What has history to say about the political after-effects of financial crises in modern democracies? Can we, over the long-run of modern history, identify systematic shifts in voting behavior after financial crises? And if so, in which direction? Does the extreme left or the extreme right gain, or both? To answer these questions, we examined the political aftermath of all major financial crises in advanced economies since the late 19th century. We also assembled the most ambitious and comprehensive historical dataset of election results and parliamentary composition to date, covering 20 countries and spanning 140 years with more than 800 elections between 1870 and 2014.

Our first key finding is that financial crises are followed by important changes in voter behavior that in turn, contribute to high levels of policy uncertainty. Political polarization increases after financial crises throughout the 19th and 20th century. Moreover, political parties on the far right appear to be the biggest political beneficiaries of a financial crash. On average, far-right parties have seen an increase in their vote shares of about 30% relative to their pre-crisis level in the five years following a systemic financial crisis. These findings echo a recent study by de Bromhead et al. (2012), who focus on the electoral consequences of crises in the 1920s and 1930s. We show that the gains of far-right parties were not limited to the interwar period: In recent decades, far-right parties, including populist parties of the so-called “New Right”, also saw broad-based electoral gains. After financial crises, voters seem to be systematically lured by the political rhetoric of the far right, with its frequently nationalistic or xenophobic tendencies. Moreover, we identify an important asymmetry in the political response to crises: on average, the far left did not profit equally from episodes of financial instability.³

Our second main insight is that governing becomes more difficult after financial crises, irrespective of which parties are in power. In particular, *after* World War II, crises are associated with shrinking government majorities, a strengthening of opposition and greater political fractionalization. This in turn is associated with a higher probability of government crises and changes in the executive branch. We thus confirm the finding of Mian et al. (2014) that political fractionalization increases in the aftermath of financial crises after 1980. However, using the depth of our historical dataset we can show that these effects have become stronger over time. Third, we document that street protests increase dramatically in the aftermath of financial crises. Riots, strikes and demonstrations can be seen as an additional proxy for political constraints on governing. Passarelli and Tabellini (2013) have recently demonstrated how social unrest may negatively impact policy-making in democracies.

Generally, our study suggests that policy-making and the implementation of reforms become substantially more difficult in the aftermath of a financial crisis. These results are robust to controlling for macroeconomic and financial conditions as well as political factors such as electoral systems, voter turnout, suffrage and different government systems.

On the methodological side, we use the statistical toolkit of local projections (LPs) pioneered in Jordà (2005) and project the path of political variables over a five and ten year horizon following the beginning of a financial crisis recession. As in Jordà et al. (2013, 2016a, 2016b), we compare the political aftermath of crisis recessions to the aftermath of (non-financial) recessions. Benchmarking normal vs. financial recessions allows for cleaner identification of the effects of financial crises than comparing financial crises spells to a counterfactual of all other years. We find that the political effects of financial crises are particularly more pronounced than those of normal recessions that tend to have little or no effects on political variables.

A potential concern with these findings is that financial recessions could be deeper than normal recessions and as a result the observed effects are due to the severity of the recession and not to the financial crisis. In the spirit of Barro and Ursúa (2008), we then compare financial crisis recessions to other severe macroeconomic “disasters” that do not involve a financial crash. We find that the effects are much more pronounced in financial crises and conclude that financial crashes stand out since their political after-effects are particularly disruptive.

What explains the more severe political fall-out after financial crises? One possibility is that non-financial downturns are seen as “excusable” events, triggered by exogenous shocks, while financial crises may be perceived as endogenous and “inexcusable” – the result of policy failures, moral hazard and favoritism. The electorate may blame politics for financial crashes because the perception is that they could have been avoided. Moreover, financial crises may provoke unprecedented policy reactions and uncertainty about their consequences, which in turn reduces confidence in the political leadership. Financial crises may also have social repercussions that are not observable after non-financial recessions. For example, it is possible that the disputes between creditors and debtors are more severe or that inequality rises more strongly (e.g., Bordo and Meissner, 2011). Lastly, financial crises involve unpopular bailouts for the financial sector (e.g., Broz, 2005), which increases political discontent.

On the data side, a core contribution of this paper is the compilation of a rich new dataset that will benefit future research in the field. Our newly compiled data covers the near universe of systemic financial crises and general elections in 20 advanced economies since 1870. Since financial crises are rare events, many researchers in this field have opted to go

² An exception here are Baker et al. (2014) who show that political polarization was an important driver for the increase in US policy uncertainty since the 1960s.

³ This finding somewhat contradicts Giuliano and Spilimbergo (2014) who link recession experiences to distrust in institutions, leading to more right voting, as well as to more support of government intervention/redistribution, resulting in more left voting.

back in time and use longer time spans of data to study crises and their consequences (e.g., Reinhart and Rogoff 2009a, 2009b, 2014; Schularick and Taylor, 2012; Perri and Steinberg, 2012; Kose et al., 2013; Jordà et al., 2013, 2016a, 2016b). We focus on advanced economies and intentionally avoid blending the experience of developing and advanced economies. We study systemic banking crises only and avoid less precise definitions of financial crises that, to varying degrees, encapsulate inflation spurts, stock market crashes, currency crashes and sovereign defaults. For the coding of systemic banking crises, we rely on the papers by Jordà et al. (2013) and Jordà et al. (2016a).

This paper is part of a growing literature on the political consequences of financial crises. The majority of existing studies focus on individual countries or shorter time windows.⁴ An exception is Chwieroth and Walter (2013) who study leadership turnover during and after banking crises in 20 developed and developing countries since 1830.⁵ Our analysis differs from these previous studies in that we focus on political responses to economic crises in a broad sense, and not only on government survival or leadership turnover.⁶ We are aware of only one paper with a similar focus, namely that of Mian et al. (2014). Moreover, we are the first to study the link between crises and social unrest for a broad cross-country dataset, which corroborates the analysis of the political effects of austerity policy by Ponticelli and Voth (2011).

The structure of the paper is as follows. In the next section we introduce our dataset; in the third section we discuss the statistical design. The fourth section contains the empirical core of our study: we demonstrate the electoral successes of far-right parties, the increase in political polarization and fragmentation, and its link to instability and uncertainty. In the fifth section we compare financial crises to severe and normal non-financial recessions as well as to other macro disasters. The last section of this paper concludes and summarizes our findings.

2. Data

In this study, we draw on a broad set of historical data. This section describes the main variables used in our analysis, all measured at annual frequency and for the following 20 developed economies: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom and the United States. Appendix Table A1 lists the definitions and sources for our main variables, and Appendix Table A2 shows the summary statistics.

2.1. Election results and parliamentary composition, 1870–2014

We compiled an archive of 827 parliamentary elections from throughout history. This new dataset, encompassing the years from 1870–2014, includes detailed information on general elections to the national parliaments of the 20 countries in our sample. Presidential elections, non-nationwide (regional or local) elections and referendums are excluded. In case of two or more elections in one year (e.g., Greece in 2012), we count the last election in that year. In the case of bicameral legislatures (e.g., in the United States), only elections to the *lower* chamber are considered (e.g., the US House of Representatives). Altogether, we identified 859 elections, but could not find sufficient data for 32 of these. Therefore, the final sample includes 827 election events.⁷ Appendix Table B1 gives an overview of which parliamentary elections we coded and shows the names of the respective parliaments/chambers as well as cases with missing data. The information on vote shares and on the distribution of seats in parliament come from three main sources, namely Döring and Manow (2012), Mackie and Rose (1974) and Nohlen and Stöver (2010). In addition, we drew on a series of country-specific sources, which are also listed in Appendix B.

Based on the raw data, we group the vote shares along several dimensions. First, we add together votes of anti-system parties, i.e., *vote shares of parties on the far left or the far right*, which seek to change the system of government per se (see Sartori, 1976). To categorize parties as far-right or far-left we follow de Bromhead et al. (2012) for the interwar period (1919–1938). Extremist parties in the pre-1919 period are ignored, simply because there are no sufficient sources for a clean classification. For the period after 1939, we track the parties coded as extremist by de Bromhead et al. (2012), and their follow-up or splinter formations. Furthermore, we identify newly formed parties on the extreme left and right by assessing

⁴ See Haggard (2000), MacIntyre (2002), Bernhard and Leblang (2008), Crespo-Tenorio et al. (2012), and de Bromhead et al. (2012).

⁵ They use the Reinhart and Rogoff (2009b) crises dating and follow the approach by Crespo-Tenorio et al. (2012) to measure political turnover risks. Their main result is that governments are more likely to lose power following a financial crisis today, compared with during the 19th or early 20th century. Their interpretation is that citizens' awareness of the ability of the government to manage the economy increased dramatically in the wake of the Great Depression and World War II. Another recent long-run analysis is by Ahlquist et al. (2014), who find that the political cost of exiting a fixed exchange rate regime is high, both before and after World War II.

⁶ Specifically, we consider the vote share of government coalitions regardless of whether they were the government that led the country into the crisis or were the one that replaced it. We are not mainly interested in the (somewhat unsurprising) punishment of poor economic policy-making and crisis management by incumbent governments, but in the general ability of a country to establish political stability and leadership in the aftermath of a financial crisis.

⁷ Another reason for missing data were institutional factors. In the 19th century, some parliaments consisted merely of unlinked, nonpartisan candidates from various constituencies. It was therefore not possible to assign members to parties and to compute vote and seat shares. This was the case in the Dutch general elections from 1871–1887 (Mackie and Rose, 1974, p. 267), the Norwegian parliamentary elections 1870–1879 (Rokkan, 1967, p. 376) and the Swedish general elections from 1872–1884 (Stjernquist and Dahl, 1966, p. 120).

the political platform of each party gaining more than 0.1% of the vote in our post-World War II sample of elections. For this purpose we draw on [Betz \(1994\)](#), [Ignazi \(2003\)](#), [Minkenberg \(2001, 2008\)](#), [Minkenberg and Perrineau \(2007\)](#), and [Mudde \(2000, 2005, 2007\)](#), country reports by [Bertelsmann Stiftung \(2009\)](#), as well as large number of country-specific sources (see [Appendix B](#)).

In the spectrum of far-right parties, we include parties of the “New Right”, i.e., those parties in the grey area between far-right extremism and right-wing populism. This follows the widespread view in political science literature that the profile of the political far right has undergone fundamental changes since World War II (e.g., [Betz, 1994](#); [Ignazi, 2003](#)). Many parties discarded openly fascist and anti-democratic attitudes and adopted a more moderate tone in reference to ethnocentrism, nationalism and secessionism, most recently often combined with a Eurosceptic platform. On the far left, we include all parties that take up traditional communist and/or Marxist–Leninist positions. Similar to the right wing views, we also include parties that would not be identified as communists in the traditional sense, but included those who refuse contemporary international economic order and base their national economic policies on an anti-capitalist ideology (e.g., “The Left” in Germany). Some of these parties can also be classified in the populist, Eurosceptic spectrum. For example, we code the “United Left” in Spain and the Italian anti-establishment party “Five Star Movement” as far-left parties. [Appendix Table B2](#) provides further details and shows all parties classified as far-right and far-left in our sample.

Second, we add up the *government vote share* by combining the votes of the governing party or of parties in the governing coalition, as well as the *opposition vote share*, which is done by combining the vote share of all parties in the opposition. This was possible to do for most countries since 1870, although we exclude elections in monarchies in the early years of the sample, i.e., of the German Reich, Denmark, Finland (under Russian occupation), Japan, Norway, Portugal, Spain and Sweden. We also exclude elections in the fascist and military dictatorships of Germany (1933–1945), Italy (1924–1945), and Portugal (1926–1974).⁸ The distinction between government and opposition does not make much sense for these countries during those time periods. We again refer to [Appendix Table B1](#), which gives a condensed overview of the elections in our sample and their characteristics.

To identify government and opposition we draw on a wide range of sources, in particular [Döring and Manow \(2012\)](#), as well as a series of country-specific sources listed in [Appendix B](#). In parliamentary systems, we code those parties that were represented in the cabinet as government parties. In presidential systems, we code only the president's party as the government party, while all remaining parties are coded as opposition parties. We exclude independent candidates without party affiliation, since they may switch sides depending on the law that is under consideration (this follows [Mian et al., 2014](#)). If there is a change in power in a given year, we code the vote shares of the newly elected government, not of the outgoing one.⁹

Lastly, we code two measures on the degree of parliamentary fragmentation based on the raw data on seats in parliament.¹⁰ First, we simply count the *number of parties in parliament*. Second, we consider the distribution of parliamentary seats among parties following the more sophisticated approach implemented by [Beck et al. \(2001\)](#). Specifically, we code a long-run measure of *fractionalization*, which is defined as the probability that two representatives picked at random from among the parties in the legislature will be of different parties. More formally this can be written as:

$$\text{legislative fractionalization} = 1 - \sum_{i=1}^n \left[\frac{(n_i - 1) \frac{n_i}{N}}{N - 1} \right], \quad (1)$$

where n = number of parties, n_i = seats held by the n -th party, and N = total seats in the parliament. Of course, in this context of course the definition of “party” is crucial. See [Appendix B](#) for details on the coding of this variable. The fractionalization measure is bound between 0 and 1. The lowest value of 0 indicates no fractionalization, while the value of 1 indicates maximal fractionalization.

2.2. Street protests, 1919–2012

In addition to the parliamentary variables, street protests are good indicators of political radicalization and serve as a proxy for political instability in the post-crisis period (see, for example, [Ponticelli and Voth, 2011](#); [Passarelli and Tabellini, 2013](#)). To approximate street protest we rely on the dataset of [Banks and Wilson \(2014\)](#), which provides information on the annual frequency of domestic conflict events from 1919 to 2012 (excluding the World War II period from 1940 to 1945). In particular, we consider the number of *general strikes*, defined as “any strike of 1,000 or more industrial or service workers that involves more than one employer and that is aimed at national government policies”, the number of *violent riots*, defined as “any violent demonstration or clash of more than 100 citizens involving the use of physical force”, and the number of *anti-government demonstrations*, defined as “any peaceful public gathering of at least 100 people for the primary

⁸ There were no elections in Spain from 1936–1974 and in Greece from 1937–1941 and from 1967–1973.

⁹ Whenever government formation after an election exceeds the turn of a calendar year (e.g., in the United States) we record the year in which the election took place. In cases of interim governments we denote the next partisan government that took office.

¹⁰ To go as far back as possible, these measures are computed for all elections, except for the elections held during the dictatorships in Germany from 1933–1945, in Italy from 1924–1945, and in Portugal from 1926–1974. In other words, we explicitly include monarchies with a legislature. However, the results are also robust to when monarchies are excluded.

purpose of displaying or voicing their opposition to government policies". We use the sum of these three variables as our baseline variable – termed *street protests* – to measure the overall degree of open protest in the street.

In comparison to our other dependent variables, street protests show strong time trends, which is evident when looking at Fig. C1 in the appendix. The degree of social unrest is very volatile and can double from one decade to another; our data shows peaks during the 1960s and 2010s. At the same time, there is on average long periods with little street protest, e.g. the 1980s and 1990s. To deal with time trends in the data, we decomposed the variable into a trend and cycle component. Specifically, we apply the widely used Hodrick Prescott filter (see Hodrick and Prescott, 1997) with a smoothing parameter of 6.25. Using it as dependent variable, we then compute the percent deviation from trend for the street protest variable. This reduces the risk of spurious inference, but also makes the results somewhat harder to interpret.

2.3. Financial crises and recessions

Financial crises are defined as events during which a country's banking sector experiences bank runs, sharp increases in default rates accompanied by large losses of capital that result in public intervention, bankruptcy, or forced merger of financial institutions.¹¹ Dates of systemic financial crises are based on the study by Jordà et al. (2013), which build on the timing of historical crisis events pioneered by Bordo et al. (2001) and Reinhart and Rogoff (2009b). The Laeven and Valencia (2008, 2012) dataset of systemic banking crises is the main source for post-1970 crisis events. Appendix Table D1 shows a full list of the 103 financial crises in our dataset.

Besides financial crisis dates, we also determine the dates of recessions following the data and methodology in Jordà et al. (2013). Specifically, we generate two auxiliary dummy variables using the intuition in the Bry and Boschan (1971) algorithm to capture business cycle features in the data. This algorithm separately generates dates of peaks and troughs in economic activity for each country in our sample. Using real GDP per capita, a peak corresponds to a local maximum and a trough corresponds to a local minimum. A recession is defined as the period between a peak and the following trough, whereas an expansion is defined as the period between the trough and the subsequent peak.

For the empirical analysis, we then make the distinction between recessions that coincide with a major financial crisis – termed *financial crisis recessions* – and those without major financial disruptions – termed *normal recessions*. More precisely, we call a recession *financial* if a major financial crisis erupts within a two year window around the peak of the cycle. Appendix Table D2 shows the full list of financial and normal recessions in our dataset. Benchmarking normal vs. financial recessions allows for cleaner identification of the effects of financial crises rather than comparing financial crises spells to a counterfactual of all other years. However, normal recessions are typically less severe than financial recessions. Therefore, as a second benchmarking exercise, we also compare financial recessions to a subset of normal recessions that are particularly deep. In the spirit of Barro (2006) and Barro and Ursúa (2008, 2011), we term these severe normal recessions as *non-financial macro disasters*. Specifically, we keep only those non-financial recessions with an average GDP p.c. decline that is higher than the average GDP decline during financial recessions. We apply this cut-off separately for the pre-World II sample (with a threshold of 3.35%) and for the post-World War II sample (with a threshold of –2.55%). The end result is a list of non-financial macro disasters provided in Appendix Table D3. On average, these events see a GDP contraction of 5.82% per year. The results are similar if we use a full-sample average, or if we use the median GDP contraction as a cut-off. Similarly, the results are roughly the same if we apply an even stricter threshold and only consider the worst 25% normal recessions (those with the highest GDP contractions).

3. Statistical design

For each dependent variable, we start with a preliminary view of the data, including summary statistics, visual plots of the data and OLS panel regressions. We then take the time dimension more seriously and estimate local projections (LPs) following the method pioneered by Jordà (2005) and applied in a range of closely related studies (Jordà et al., 2011, 2013, 2016a). Moreover, we provide a range of robustness checks of our estimates.

In a first step, we compare pre-crisis spells with post-crisis spells following Mian et al. (2014). Specifically, we restrict the sample to a full five years before and a full five years after a financial crisis, excluding the crisis year itself. In cases of follow-up crises, where the five year pre-crisis horizon and the five year post-crisis horizon overlap, we exclude subsequent crises as we interpret them as after-effects of the initial crisis. Note that crises where either the crisis event itself or one of the five year windows coincides with years of global wartime (1914–1918 and 1939–1949) are omitted from the sample. We again refer to Appendix Table D1, which also indicates the 67 (of 103) crises that are considered in the descriptive analysis.

In step two, we then expand the analysis to more broadly compare crisis times to non-crisis times, by running fixed effects panel OLS regressions in our full sample. This allows us to tease out post-crisis deviations from the long-run historical average, using more than 100 years of data. Specifically, we start with a 'bare bones' model in which our dependent variables, i.e., election results and parliamentary composition (denoted as Y_{it}), are regressed on a post-crisis indicator

¹¹ Jordà et al. (2016a) emphasize the distinction between isolated banking failures (such as the demise of Baring Brothers in the U.K. in 1995) and systemic distress (such as the Global Financial Crisis 2008). However, their systemic financial crisis classification has proven valuable in previous studies.

variable $post_{it}$ that takes the value of 1 in the five years after a crisis event τ . We only add country fixed effects μ_i to account for unobservable country-specific heterogeneity. This simple model can be written as follows:

$$Y_{it} = \alpha + \beta * post_{it} + \mu_i + \varepsilon_{it}, \text{ where } post_{it} = \{\tau_i + 1, \dots, \tau_i + 5\}. \quad (2)$$

Different from the descriptive analysis, however, we do not restrict the post-crisis spell to a full five years. Post-crisis years now include all years within (i.e., up to) five years after a financial crisis event. Again, Table D1 indicates the 94 (of 103) crises included in the baseline OLS regression. We again remove follow-up crises and crises that began during global wartime.¹²

Third, we follow Jordà (2005) and calculate dynamic multipliers. There are several advantages to this approach, which explains its growing popularity. Local projections handle asymmetries, non-linearities, and richer data structures with great ease. We follow Jordà et al. (2013) and distinguish between *financial recessions* and those without major financial disruptions, i.e. *normal recessions*. The reasoning behind it is that financial crises often go hand in hand with economic recessions. One could therefore argue that the changes in the political environment that a country experiences after a financial crisis are mainly a function of the recession and independent of the financial crisis *per se*. Therefore, a stricter test for the effects of financial instability on politics is not based on a comparison of financial crisis periods with tranquil times when the economy expands, but it compares financial crises to recession periods, including severe recessions (or macrodisasters).

The first type of recession is associated with a financial crisis. The second type is a standard business cycle contraction without a systemic financial event. This results in a chronology of business cycle peaks, where “N” denotes a non-financial business cycle peak, and “F” denotes a peak associated with a systemic financial crisis. Table D2 in the appendix shows the dates of financial crisis recessions and “normal”, non-financial recessions in each country. The list of recessions in that table includes the subsample of particularly severe non-financial recessions (macro disasters), which are shown again separately in Table D3 and are defined above. Note that we again exclude any years of global wartime (1914–1918 and 1939–1949) in the analysis.

The fixed-effect regressions discussed above resemble unconditional averaging in the sense of a basic event-study approach à la Romer et al. (1989) in which every occurrence is treated identically. Yet such an approach may not provide sufficient economic structure as economies are complex and dynamic systems. In the local projection set-up we control for observable macroeconomic factors that might impact the post-crisis trajectory of a country. As a proxy for overall economic conditions, we include the growth rate of real GDP per capita as well CPI inflation. However, we also tested the robustness of our results with additional variables such as loan growth and public debt.¹³ The long-run data comes from the macroeconomic database compiled by Jordà et al. (2013).¹⁴ By controlling for economic factors with more variables and more complex dynamics, we make it far less likely that financial crises *per se* are an independent driver of political reactions and not a function of economic conditions.

Our *treatment* variables will simply be the occurrence of a financial or normal recession (including non-financial macro disasters). Clearly, the term *treatment* does not necessarily have to be interpreted in a causal sense. The notation works as follows. N and T denote the cross-sectional and time dimension of the panel. Y_{it} is a vector of political and macroeconomic variables. For any variable we want to estimate the change in that variable from the beginning of the recession (previous peak) at time t to time $t+h$.

We will calculate this response by estimating a fixed-effects panel model with a discrete treatment depending on whether the recession is financial or not (N, F):

$$\Delta_h Y_{it+h}^k = \alpha_i^k + \theta_N^k N + \theta_F^k F + \sum_{j=0}^p \Gamma_j^k Y_{it-j} + u_{it}^k; \quad k = 1, \dots, K; \quad h = 1, \dots, H, \quad (3)$$

where θ_N^k is the *normal* recession treatment ($N = 1$)¹⁵ and θ_F^k is the *financial* recession treatment ($F = 1$). In addition, lags of the control variables Y at time t are included, as are α_i^k country fixed effects; also u is the error term.

4. Going to extremes: politics after financial crises

In this section we present and discuss the historical evidence that the political climate changes substantially after financial crises leading to greater political instability and uncertainty. More specifically, we will present three main stylized facts from 140 years of modern political economy. First, politics take a “hard right turn” after financial crises. Both before and after World War II, we observe a significant increase of votes for far-right parties. In contrast, parties on the far left of the political spectrum did not have comparable electoral successes after crises. Second, we also find that political polarization increases substantially after financial crises as measured by weaker government majorities, a stronger opposition and a greater fractionalization of parliaments. These effects are considerably more pronounced after World War II than before. Finally, we show that street protests typically increase after financial crises, then and now.

¹² Note that Spain and Switzerland experienced a financial crises in 1913. These crises are technically not excluded, but their entire aftermath coincides with World War I.

¹³ This, however, did not significantly affect our main results and our sample often shrank considerably.

¹⁴ For a more detailed documentation of their sources, refer to their study directly.

¹⁵ In the more restrictive benchmarking exercise with non-financial macro disasters, we only consider those non-financial business cycle peaks “N” that are followed by particularly deep recessions (see above) and set milder recessions to zero.

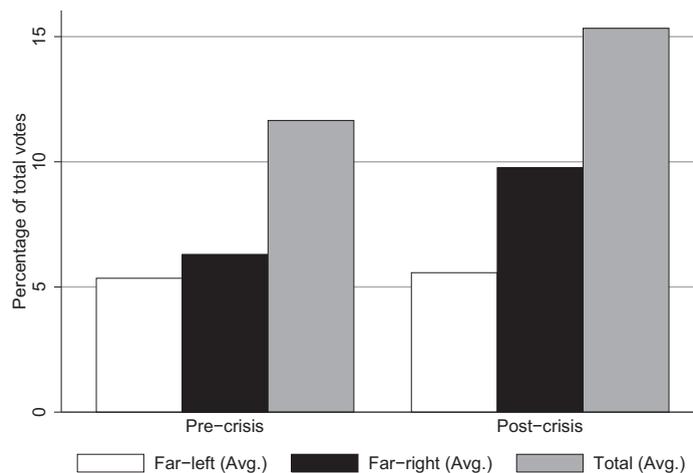


Fig. 1. Vote shares of the far right and left. **Notes:** The figure shows average vote shares of far-left (white columns) and far-right (black columns) political parties. The grey columns represent the sum of the two. The left panel refers to average vote shares in the five years before the start of a financial crisis and the right panel shows average shares in the five years after. The differences are statistically significant at the 5% level, except for the far-left vote share, which does not significantly increase in the post-crisis period. [Table D1](#) shows the crises included.

4.1. Increasing polarization: hard right turns

A striking result of our election coding effort is the strong evidence for the rise of extremist parties in the aftermath of financial crisis, in particular for far-right parties. This is true for both before and after World War II. Starting with some simple descriptive statistics, [Fig. 1](#) shows average vote shares of far-left and far-right political parties five years before and five years after financial crisis events between 1919 and 2014.¹⁶ Far-right voting increases from about 6% to about 10% of the vote following a financial crisis. In contrast, we do not observe a strong post-crisis increase in far-left voting.

4.1.1. Some historical narrative

The electoral gains of far-right parties have been particularly pronounced after the global economic crises of the 1920s/1930s and after 2008. In the interwar period, the most prominent cases are Italy and Germany. Mussolini's fascist alliance benefited from the early 1920s banking crisis in Italy and the global recession after the end of World War I, earning 19.1% of the vote in 1921 and about 65% in 1925. In Germany, the Nazis won 18.3% of the vote in the 1930 elections, more than 30% in the two 1932 elections, and over 40% in the March 1933 elections, when the Great Depression had its strongest impact on Central Europe. However, during the 1930s far-right parties also had increased electoral success in Belgium (the Rexists and the Flemish National Union), Denmark (the National Socialist Workers' Party), in Finland (Patriotic People's Movement), in Spain (Falange) and in Switzerland (National Front).

In the aftermath of the 2007–2008 global crisis, far-right and right-wing populist parties more than doubled their vote share in many advanced economies, including France, the UK, Sweden, Finland, the Netherlands, Portugal and Japan. For example, the Sweden Democrats improved their vote share from 2.9% in 2006 to 5.7% in 2010. In the Netherlands, the right-wing populist Party for Freedom gained almost 10 percentage points following the 2007 crisis (5.9% in 2006 vs. 15.5% in 2010). In France, the Front National party earned 13.6% in 2011, in the first election following the crisis, compared to just 4.3% in 2007. Similarly, we find that the vote share of the True Finns party skyrocketed from 4.1% in 2007 to 19.1% in 2011.

These patterns can also be seen when using supplementary data from elections to the European Parliament in 2004, 2009, and 2014. Due to the short history of the European parliament, this data is not used in the remainder of the paper, but they are illustrative of the trends observed above, also because the electoral rules and voting dates are the same for all EU countries. As we show in [Fig. 2](#), the vote share of far-right parties increased in the majority of countries over time, with an especially strong spike between the 2009 and 2014 elections in the wake of the European financial crisis. Among the countries in our sample, the largest electoral gains were made by the Front National party in France. UKIP in the United Kingdom and the Danish People's Party also showed massive gains in the 2014 elections. On average, the far-right vote share approximately tripled between 2004 and 2014.

Importantly, however, the observed shift to the right is not only a phenomenon of the “Great Depression” of the 1930s and the “Great Recession” of the late 2000s. As we will illustrate below, our results hold even when these two significant episodes are excluded. Indeed, hard right turns are also observed following more regional financial crisis events, for instance the late 1980s/early 1990s Scandinavian banking crisis. In Norway, the right-wing populist Norwegian Progress Party won just 3.7% of the vote in 1985. In 1989, in the first election after the financial crisis of 1987, the same party won 13% of the vote and became the third political force. Also its Danish counterpart, the Danish Progress Party, more than doubled vote shares from 3.6% in 1984 to 9% in

¹⁶ We exclude crises that erupt within less than five years after a preceding crises as well as crises where either the pre-crisis or post-crisis window overlaps with a period of global wartime (see data section above).

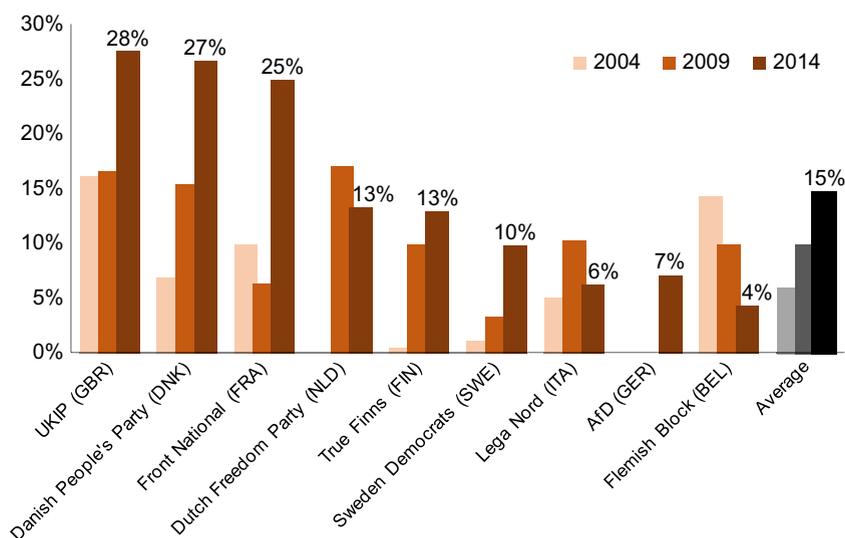


Fig. 2. Far-right and right-wing populist votes in European elections. **Notes:** The figure shows the vote shares of far-right and right-wing populist parties in the elections to the European Parliament 2004, 2009, and 2014. These 9 EU countries are also included in the main analysis. The figure is for illustration only, since electoral data from the European Parliament are not used in the remainder of the paper. The grey columns show averages.

1989, becoming the fifth political force in the first election after the crisis. Prior to the Swedish financial crisis of 1990, right-wing parties earned below 1% of the vote in the 1988 election. However, after the crisis, in 1991, they won 6.8% of the vote. The newly founded right-wing populist party “New Democracy” gained an impromptu 25 parliamentary seats.¹⁷

4.1.2. Empirical results

These anecdotal observations are strengthened by the results of fixed-effects panel regressions of vote shares on a post-crisis dummy variable (which has the value of 1 for the five years following a financial crisis). To tease out the vote share deviation from the long run historical average, we include all non-crisis years. Table 1 shows the regression results for the full sample (left panel), the interwar period (middle panel) and the post-World War II period (right panel).

Far-right votes increase by more than 4 percentage points after financial crises in the full sample. This difference is significant at the 10% level. In the post-World War II sample we find a significant (at the 1% level) increase of 3.8 percentage points in right-wing voting. The coefficient for the period between 1919 and 1938 is comparably large but not statistically significant. The interwar increase in extremist voting is partly driven by two of the 20 advanced countries in our sample, Germany and Italy, while the post-crisis shift to the far right after World War II is a more widespread phenomenon. Accordingly, once we remove the country fixed effects, we find a significant coefficient of 5.3 for far-right votes after crises in the pre-World War II sample.

Fig. 3 shows local projections of the cumulative change in far-right vote shares for years 1–5 of the financial recession (red line), controlling for real GDP growth and inflation (and their lags). The shaded region is a 90% confidence interval. Analogous to the OLS regressions, we show results in the full sample with all recessions (left panel), pre-World War II recessions (middle panel) and post-World War II recessions (right panel). The figure points to a constant upward trend in far-right voting after financial recessions in the full sample, and both before and after World War II. The same can be seen in the corresponding results in Table 5 in the text below. On average, far-right votes increase by more than 30% (not percentage points) in the five years after financial recessions.

These results are robust when we exclude the dictatorship spells from the pre-World War II sample in Austria and Germany from 1933 to 1938 and in Italy from 1924 to 1938 (Spain had no elections during the rule of Franco). Second, the results also hold when we remove the Great Depression and the 2007–2008 global financial crisis from the sample.

We also tested the robustness of our results by controlling for additional characteristics of each election and of the country's voting system, in particular voter turnout (by election, in %), suffrage (population eligible to vote, by election, in %), a dummy for presidential vs. parliamentary system and a dummy for proportional representation vs. first-past-the-post system.¹⁸ The latter measures are important, since presidential democracies and those with first-past-the-post voting systems typically have a less

¹⁷ Other examples include the 1991 financial crisis and subsequent economic stagnation in Switzerland, where the Swiss People's Party achieved about 11% of the vote during the 1980s, and then improved its vote share to 15% in 1995 and then to 22.5% in 1999. During this same period, the 1990 Italian financial crisis was followed by the sudden rise of the federalist and right-wing populist North League party. This party increased its vote share from just 1.3% in the 1987 elections to 8.7% in the post-crisis elections of 1992 and was a relevant political force throughout the 1990s. More generally, we found that one in three far-right political parties was established following a financial crisis (ten-year window).

¹⁸ The data on voter turnout and suffrage comes from the same sources as our electoral data (see appendix). To classify systems of government (parliamentary vs. presidential) we use Banks and Wilson (2014). Information on the history of European and Anglo-Saxon voting systems before 1980 was obtained from McLaren Carstairs (1980) and Lijphart (1994), respectively. All coding after 1980 follows Beck et al. (2001).

Table 1
Far-right and far-left vote shares: post-crisis years vs. normal years.

	(a) Full sample	(b) Pre-WWII	(c) Post-WWII
Far-right vote share			
Post-crisis	4.212* (2.161)	3.288 (3.376)	3.770*** (1.089)
R ²	0.023	0.012	0.056
Obs.	1611	390	1221
Far-left vote share			
Post-crisis	−1.580 (0.978)	−0.001 (0.335)	0.437 (1.025)
R ²	0.015	0.000	0.001
Obs.	1611	390	1221

Notes: This table compares the post-crisis levels of far-right and far-left vote shares to their average level. The time window for post crisis is five years. Robust standard errors (clustered by country) are shown in parentheses. The results are similar when controlling for economic fundamentals, such as the growth rate of GDP per capita and the CPI inflation rate (not reported). The left panel covers the years 1919–2014, excluding World War II, the middle panels 1919–1938, and the right panels 1950–2014. [Table D1](#) shows the crises included. *** Significant at 0.01. * Significant at 0.1.

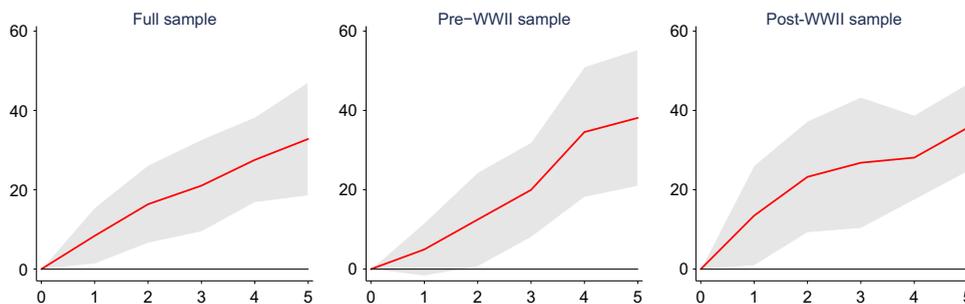


Fig. 3. Far-right vote shares (local projections): financial crisis recessions. **Notes:** Each path shows local projections of the cumulative change relative to peak (in %, y-axis) for years 1–5 of the recession/recovery period (x-axis). The red line refers to the average path in financial crisis recessions and the shaded region is a 90% confidence interval. The controls are contemporaneous and 1-year lagged values of the growth rate of GDP per capita and the CPI inflation rate at peak. The left panel covers the years 1919–2014, excluding World War II, the middle panel 1919–1938, and the right panel 1950–2014. [Table D2](#) shows the recessions included. The dependent variable is the combined vote share of all electorally successful far-right political parties in the most recent general election. For the corresponding regression results see [Table 5](#) in the text below. (For interpretation of the references to color in this figure caption, the reader is referred to the web version of this paper.)

fragmented legislature and tend towards a two-party system (e.g., [Lijphart, 1994](#); [Horowitz, 2003](#)), which could bias our results. However, none of the additional control variables changed our results on far-right voting in a meaningful way.

As an additional test, we divide the group of far-right parties into those of the “Old Right” and those of the “New Right” (see chapter 2.1). We find that the postwar results are mainly driven by the latter, meaning that right-wing populist parties benefited more than traditional fascist and neo-Nazi parties of the extreme right. Nevertheless, traditional far-right parties also see increased vote shares after financial crises in the postwar period; it is just not as pronounced as it is for the populist “New Right” parties such as the UKIP or the Dutch Freedom Party.

Finally, it is clear that in terms of ideology politics has many more dimensions than our classification as “far-left” or “far-right”. Therefore, we applied our statistical analysis to a more narrow and a more wide dimension of politics. More specifically, following [Döring and Manow \(2012\)](#), we classified (post-World War II) political parties into “anti-EU” versus “pro-EU” platforms (as a narrow dimension) as well as into “libertarian” versus “authoritarian” platforms (as a broad dimension). The results however were not straightforward in both cases, suggesting that “far-left” versus “far-right” was a reasonable choice.

4.2. Increasing fragmentation: governing becomes more difficult

In the next part of our analysis, we focus on the measures of political fragmentation and the strength of government outlined above. [Fig. 4](#) shows kernel density estimates of government vote shares, opposition vote shares, our measure on the fractionalization of parliament, and the number of parties in parliament (horizontal panels). Again, we distinguish between the full sample of crises, pre-World War II crises, and post-World War II crises (vertical panels). For each variable, we show kernel densities for the five years prior to a financial crisis (black line) and the five years afterwards (red line).

The figure suggests notable changes in the political response to crises over the past 140 years. In the contemporaneous sample (after World War II), overall fractionalization increases, the number of parties in parliament grows, governments appear weaker, and opposition forces strengthen (in terms of vote shares) after a financial crisis relative to before the crisis. In contrast, the picture is less clear in the pre-World War II period, at times even moving in the opposite direction with regard to government support and opposition forces. Similarly, both parliamentary fractionalization and the number of parties seem to decline post-crisis rather than increasing. Thus, it seems that the weakening of governing coalitions and the fractionalization of parliaments after crises is a relatively recent phenomenon.

4.2.1. Historical evidence

There are many examples for weakening government support and a fragmentation of parliament following financial crises in the post-World War II era. Most notably, the global crisis of 2008 saw a general decline in voter support for the governing coalition and for big tent parties. This was true, for example, in Belgium, Denmark, Germany, Japan, the Netherlands and Portugal, where voter's support for the governing party or coalition decreased by up to 20 percentage points between the last election before the crisis until the first election afterwards. In Spain, for instance, the two main parties that had been alternating power for decades, the People's Party and the Socialist Workers' Party, saw their joint vote share decline from 83.8% in 2008 to just 73.4% in 2011 and similar developments could be observed in France and Germany. In Sweden, the centre-right alliance turned from a majority government in the 2006 election to a minority government in the 2010 election. In the United Kingdom, the Conservatives achieved only 47% of the seats in 2010, which resulted in a hung parliament and a coalition government with the Liberal Democrats, the second such arrangement in British history (the only other coalition government was formed in 1974). Also the Scandinavian banking crisis of the late 1980s and early 1990s was followed by minority governments and weaker governing coalitions, for example the Norwegian cabinet of Jan Syse in the 1989 elections and the Danish government of Poul Schlüter in 1990.

We also find numerous instances of new parties rising and entering parliament in the aftermath of financial crises. In Spain, the number of parties in parliament increased from 10 to 13 in 2011, and two newly founded parties, "Podemos" and "Ciudadanos" are gaining ground, with strong regional and local election results in recent years. In the Italian 2013 elections, a new anti-establishment party named the "Five Star Movement" earned 108 parliamentary seats and 25.5% of the vote off the cuff, posing a threat to effective governing. Further examples include the Swedish "New Democracy", which was founded and entered parliament after the country's banking crisis of 1990, and Italy's "North League" which won 55 seats in the first election after the outbreak of the 1990 crisis.¹⁹

There are a few such anecdotes when we go further back in history. Interesting cases include several English-speaking countries during the 1930s, which saw many more parties entering parliament in response to the economic and financial turmoil brought about by the Great Depression. In Australia, the "Emergency Committee of South Australia" arose, winning six parliamentary seats in its first and only contested election in 1931. In Canada, the "Reconstruction Party" and the "Social Credit Party", both founded in 1935, entered parliament instantly. Similarly, in the United States, the populist "Wisconsin Progressive Party", won seven seats in its first contested election in 1934. Moreover, in the United Kingdom, the "Independent Labour Party" broke away from Labour while the "National Liberal Party" broke away from the Liberals before the 1931 elections, both over disagreements on how to respond to the severe economic problems of the time. Taken together, these examples illustrate that financial crises have often been followed by notable shifts in the political system.

4.2.2. Empirical results

Fixed-effects OLS regressions corroborate the impression given by the kernel density estimates and the anecdotal evidence presented above. The results from Table 2 are particularly pronounced for the post-World War II period. Government vote shares drop by close to 4.4 percentage points, while the opposition vote share increases by 3.5 percentage points. This compares to a mean value of 51% and 46%, respectively.²⁰ In contrast, in the pre-World War II period, the vote shares are statistically insignificant and show much smaller coefficients. The same is true when using the full sample.

The differences before and after the mid-20th century are also apparent for our fractionalization measures. Parliamentary fractionalization increases significantly, by more than 6 percentage points in the contemporaneous sample, but it is not affected after financial crises prior to World War II (coefficient not significant). Similarly, we find that the coefficient for the number of parties in parliament is large and significant after World War II, but not before. The point estimate of 1.11 indicates that, on average, more than one additional party entered the legislature in the five-year spell after financial crises since 1950.

The results are strengthened when estimating local projections and controlling for macroeconomic fundamentals, as shown in Fig. 5. In the full sample and for the pre-World War II sample, the results show no significant dynamics. The indicators for financial recessions are mostly insignificant (see also the Appendix Tables E1–E4). However, in the post World

¹⁹ Similarly, during the mid 1970s crisis in Britain, the separatist parties from Wales (Plaid Cymru) and Scotland (Scottish National Party) entered parliament for the first time. In Japan, the financial crisis of the 1990s was followed by significant changes in the party spectrum, which had been very stable in the preceding decades. In the four elections between 1990 and 2000, six new parties entered parliament, most notably the "New Frontier Party" (156 seats in 1996) and the "Democratic Party of Japan" (52 seats in 1996). The latter won a landslide victory in 2009 and replaced the Liberal Democratic Party, which had been in power almost uninterruptedly since 1955.

²⁰ The discrepancy in coefficient size between government and opposition vote shares indicates that previously unaligned factions join the opposition in post-crisis periods.

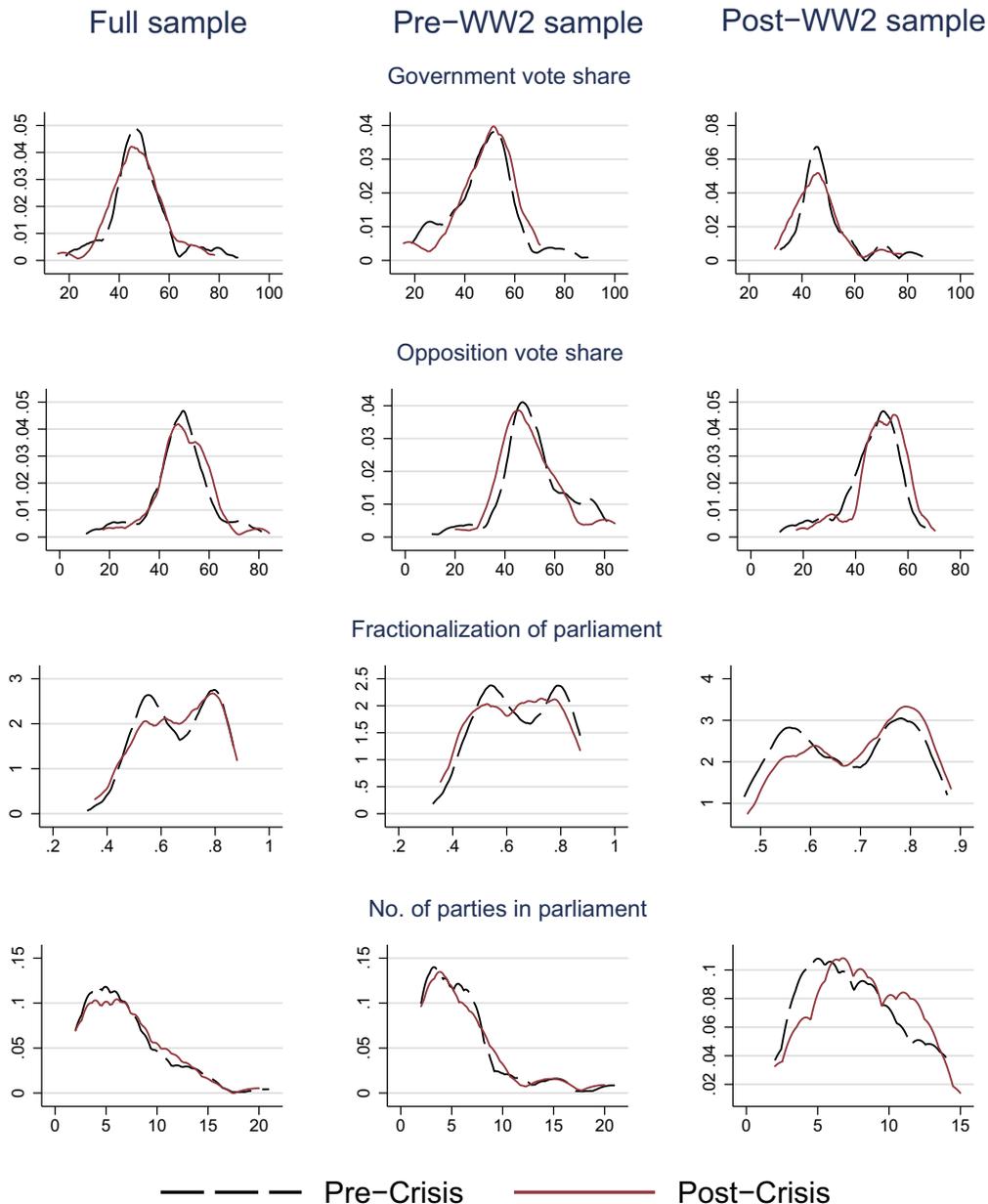


Fig. 4. Kernel densities of parliamentary variables. **Notes:** The figure shows kernel densities (vertical axes) of four different parliamentary variables (horizontal axes), illustrated by each row of panels. The black dashed line refers to the five years before a financial crisis and the red line to the five years after a financial crisis. The left panels cover crises in the years 1870–2014, the middle panels 1870–1938, and the right panels 1950–2014. Periods of global war (1914–1918 and 1939–1949) are excluded. [Table D1](#) details which crises are included. (For interpretation of the references to color in this figure caption, the reader is referred to the web version of this paper.)

War II sample, government vote shares drop significantly after financial recessions and opposition vote shares increase, particularly in years 2 and 3 after the recession start.²¹

With respect to fractionalization, the results are equally pronounced. The two lower panels of [Fig. 5](#) show that both the fractionalization and the number of parties in the legislature increase significantly in the aftermath of financial recessions after World War II. Parliamentary fractionalization rises by 1.6%, cumulatively, over a five year horizon, while the increase in the number of parties amounts to almost 10% in year 5. As discussed above, the results in this section are also robust when

²¹ The coefficients indicate that governments saw their vote shares drop by a cumulative 9% (not percentage points) in the immediate aftermath of financial crises in the post-World War II era. The second panel shows the corresponding result for opposition vote shares, which increase by a total of 11% in year 2 after the start of the recession and the cumulative effect remains significant with a high coefficient until the five year horizon.

Table 2
Parliamentary variables: post-crisis years vs. normal years.

	(a) Full sample	(b) Pre-WWII	(c) Post-WWII
Government vote share			
Post-crisis	-2.275 (1.556)	-0.133 (1.741)	-4.377*** (1.372)
R ²	0.006	0.000	0.022
Obs.	1865	636	1229
Opposition vote share			
Post-crisis	1.623 (1.498)	-0.456 (1.760)	3.523** (1.423)
R ²	0.003	0.000	0.013
Obs.	1865	636	1229
Fractionalization of parliament			
Post-crisis	0.011 (0.020)	0.007 (0.013)	0.063** (0.023)
R ²	0.001	0.000	0.029
Obs.	2241	969	1272
No. of parties in parliament			
Post-crisis	0.325 (0.489)	0.371 (0.271)	1.110*** (0.340)
R ²	0.002	0.004	0.026
Obs.	2241	969	1272

Notes: This table compares the post-crisis levels of the parliamentary variables to their average levels. The time window for post crisis is five years. Robust standard errors (clustered by country) are shown in parentheses. [Table D1](#) details which crises are included. The results are similar when controlling for economic fundamentals, such as the growth rate of GDP per capita and the CPI inflation rate (not reported). The left panels cover the years 1870–2014, the middle panels 1870–1938, and the right panels 1950–2014. Periods of global war (1914–1918 and 1939–1949) are excluded. *** Significant at 0.01. ** Significant at 0.05.

controlling for voter turnout, suffrage, presidential vs. parliamentary systems and for proportional representation vs. first-past-the-post systems (see above for definition and sources).

A potential explanation for the stronger effects post-World War II is that the share of “economic voters” has grown in the wake of the Great Depression and World War II. This interpretation is in line with [Chwieroth and Walter \(2013\)](#), who argue that citizen’s awareness of the ability of the governments to handle economic problems has increased strongly over the past century. Moreover, it is likely that increasing democratization after World War II brought more and more extra-parliamentary protest and “special issues” into the political system. The growth of protest parties is largely a post-World War II phenomenon too. Clearly, for the pre-World War I period, data availability is also a constraint.

4.2.3. Polarization, instability, and uncertainty

What are the consequences of increased polarization and fractionalization after financial crises? To address this question, we study the links between polarization and policy uncertainty and instability. In particular, we want to understand whether political instability increases in years with weaker governments and more fragmented parliaments.

A useful proxy for political stability in the post-crisis period is the number of major government crises per year, defined as “any rapidly developing situation that threatens to bring the downfall of the present regime” by [Banks and Wilson \(2014\)](#). To approximate political instability and uncertainty, we also use a dummy on executive turnover from the *Archigos* dataset by [Goemans et al. \(2009\)](#). Here a year in which “a new executive leader-spell begins” is coded as 1, and all other years as zero.²² [Table 3](#) displays the results of fixed-effects regressions.

The dependent variables are (a) government crises and (b) executive turnover, and the sample is restricted to a five year window post-crisis as in [Mian et al. \(2014\)](#). The regression for government crises uses a standard fixed-effects OLS model (column 1), since there are up to six government crises in a single year. The regressions with executive turnover as dependent variable use a fixed effects logit model (column 2), since turnover is binary, but the results are similar with OLS. Both models include year and country fixed effects.

These exploratory regressions show that the more strongly polarized politics seen after financial crises tend to be associated with more frequent government instability and a higher probability of executive turnover. For instance,

²² [Goemans et al. \(2009\)](#) regard the prime minister as the chief executive in parliamentary systems, and in presidential systems, the president. We exclude executive turnovers that involve foreign imposition, assassinations, ill health, natural death or suicide.

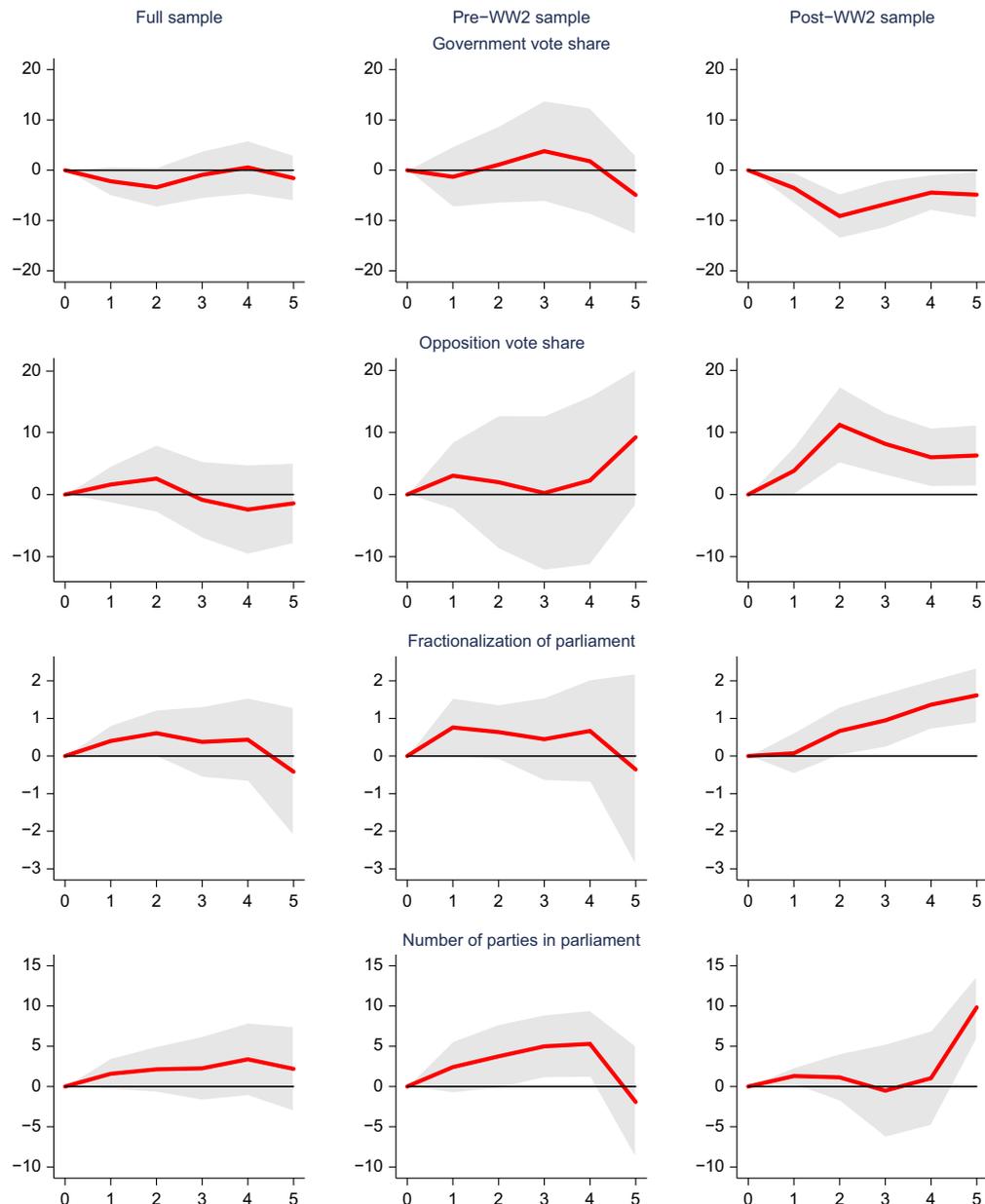


Fig. 5. Parliamentary variables (local projections); financial crisis recessions. **Notes:** Each path shows local projections of the cumulative change relative to peak (in %, y-axis) for years 1–5 of the recession/recovery period (x-axis). The red line refers to the average path in financial crisis recessions and the shaded region is a 90% confidence interval. The controls are contemporaneous and 1-year lagged values of the growth rate of GDP per capita and the CPI inflation rate at peak. The left panels cover the years 1870–2014, the middle panels 1870–1938, and the right panels 1950–2014. The periods of global war (1914–1918 and 1939–1949) are excluded. [Table D2](#) shows the recessions included. For the corresponding regression results refer to Appendix [Table E1](#) (government vote share) up through [Table E4](#) (number of parties). (For interpretation of the references to color in this figure caption, the reader is referred to the web version of this paper.)

a one standard deviation (14.5%) drop in the government vote share is associated with a 0.31, or approximately half a standard deviation, increase in the number of severe government crises in post-crisis years, on average. Similarly, a one standard deviation increase in fractionalization (by 0.18) is associated with an increase in government crises by 0.38. The coefficients for vote shares and fractionalization in column 2 (executive turnover) are also quantitatively and statistically significant. Generally, the evidence uncovered here lends support to the idea that heightened political fractionalization and polarization after financial crises has negative effects, in particular on political stability.

An additional approach to gauge political (in)stability is to focus on “veto players” – a prominent concept in the political science literature advanced by [Tsebelis \(2002\)](#). A veto player is defined as a political actor who can veto reforms, i.e., who

Table 3
Political instability in the post-crisis period.

	Major government crises (fixed effects OLS)	Executive turnover (fixed effects logit)
Government vote	−0.0216* (0.0116)	−0.0701*** (0.0207)
R^2	0.301	–
Observations	235	249
Opposition vote	0.0213* (0.0116)	0.0670*** (0.0195)
R^2	0.302	–
Observations	235	249
Fractionalization	2.1268*** (0.6783)	3.7292** (1.4695)
R^2	0.315	–
Observations	252	380
No. of parties	0.0653** (0.0258)	0.0711 (0.0735)
R^2	0.229	–
Observations	252	380

Notes: This table regresses two measures of political instability (major government crises per year and a dummy for executive turnover) on our main parliamentary variables. The sample is restricted to five year post-crisis windows. Column 1 shows coefficients of an OLS regression with country and year fixed effects. Column 2 shows coefficients from a fixed effects logit regression. Robust standard errors in parentheses. *** Significant at 0.01. ** Significant at 0.05. * Significant at 0.1.

can stop a change from the status quo. The resulting *Veto Player Index* measures the number of such veto players and their ideological distance from each other. More details are discussed in Appendix F, which also shows results using the Veto Player Index as dependent variable. The bottom line is that the power of veto players intensifies substantially (the index increases by nearly 40% within two years after the crisis outbreak). This result is in line with our interpretation above that policy-making and the implementation of reforms becomes substantially more difficult in the aftermath of a financial crisis.

4.3. People take to the streets

The recent turmoil in Europe's troubled southern periphery, particularly Greece and Spain, has shown how a financial crisis can trigger political protest not only at the polls, but also in the streets. In this section, we study the link between crises and social unrest based on our long-run cross-country dataset.

Fig. 6 shows the average yearly number of general strikes (light blue columns), violent riots (white columns) and anti-government demonstrations (black columns). The grey columns sum these three components to an aggregate measure of

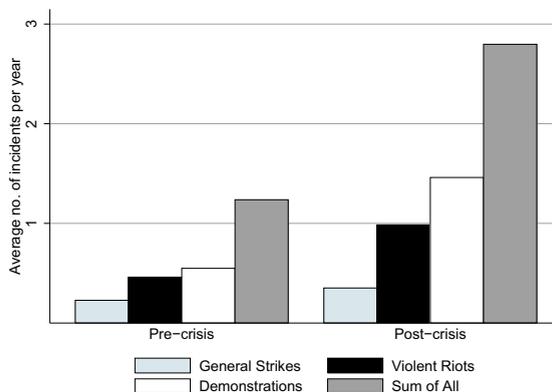


Fig. 6. Street protests. **Notes:** The figure shows the average number of street protest incidents per year, including the number of general strikes (light blue columns), violent riots (black columns), anti-government demonstrations (white columns) and the sum of the three (grey columns). The left panel refers to pre-crisis averages (five years) and the right-hand side bars to post-crisis averages (five years). Appendix Table D1 shows the crises that are included. (For interpretation of the references to color in this figure caption, the reader is referred to the web version of this paper.)

Table 4
Street protest variables: post-crisis years vs. normal years.

	(a) Full sample	(b) Pre-WWII	(c) Post-WWII
General strikes			
Post-crisis	0.058* (0.031)	0.037 (0.023)	0.104*** (0.034)
R ²	0.048	0.048	0.104
Obs.	1623	396	1227
Violent riots			
Post-crisis	0.072** (0.033)	0.140* (0.075)	0.052 (0.048)
R ²	0.014	0.135	0.014
Obs.	1623	396	1227
Anti-government demonstrations			
Post-crisis	0.084*** (0.026)	0.075 (0.048)	0.148** (0.060)
R ²	0.016	0.083	0.026
Obs.	1623	396	1227
Street protests			
Post-crisis	0.115** (0.045)	0.159** (0.070)	0.159** (0.071)
R ²	0.020	0.127	0.025
Obs.	1623	396	1227

Notes: This table compares the post-crisis levels of the number of street protests events per year (% deviation from trend) to their average level. The time window for post crisis is five years. Robust standard errors (clustered by country) are shown in parentheses. Table D1 shows the crises that are included. Regressions controlled for GDP per capita growth rate and CPI inflation rate (not reported). The left panels cover the years 1919–2012, excluding World War II (1939–1949), the middle panels 1919–1938, and the right panels 1950–2012. *** Significant at 0.01. ** Significant at 0.05. * Significant at 0.1.

street protests. We also consider the 1919–2012 period, which is the largest,²³ include our sample of 20 countries and compare five pre-crisis years (left panel) to five post-crisis years (right panel).

The figure indicates a strong increase in street protests in the crisis aftermath: the average number of incidents more than doubles during financial crises episodes, from about 1.2 events to just under 3 per year, and this difference is statistically significant at the 5% level. Looking at the different components, the average number of anti-government

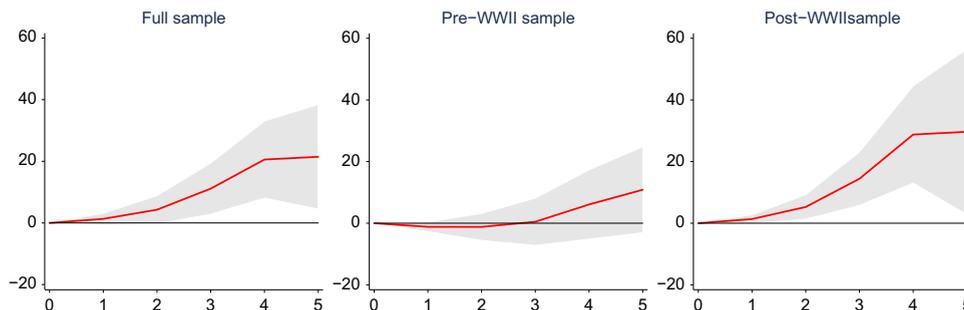


Fig. 7. Streets protests (local projections): financial crisis recessions (% dev. from trend). **Notes:** Each path shows local projections of the cumulative change relative to peak (in %, y-axis) for years 1–5 of the recession/recovery period (x-axis). The red line refers to the average path in financial crisis recessions and the shaded region is a 90% confidence interval. The controls are contemporaneous and 1-year lagged values of the growth rate of GDP per capita and the CPI inflation rate at peak. The left panel covers the years 1919–2014, excluding World War II (1939–1949), the middle panel 1919–1938, and the right panel 1950–2014. Table D2 shows the recessions that are included. The dependent variable is the percentage deviation from trend in the combined number of street protests (general strikes, violent riots and anti-government demonstrations) per year. For the corresponding regression results see Appendix Table E5. (For interpretation of the references to color in this figure caption, the reader is referred to the web version of this paper.)

²³ Domestic conflict event data is available from Banks and Wilson (2014) until 2012.

demonstrations almost triples, the average number of violent riots doubles, and general strikes increase by at least one-third. For demonstrations and violent riots, the mean difference is also statistically significant at the 5% level.

The fixed effects OLS regressions shown in Table 4 use the “detrended” street protest measures as dependent variables and regresses the cyclical components on a five year post-crisis dummy. The results reinforce the impression of the descriptive picture above. Street protests see a significant increase post-crisis, both then and now, although the results vary by type of measure and the time sample used. General strikes and anti-government demonstrations increase most notably in crises after World War II, but see no significant increase in crises during the interwar period. The opposite holds true for violent riots, where the post-crisis dummy is significant at the 10% level before World War II, but not thereafter.

The local projections in Fig. 7 confirm these findings. We present the results for total street protest incidences, i.e., the combined number of general strikes, violent riots and anti-government demonstrations per year as the dependent variable. The picture looks similar if we use these variables individually. Street protests increase strongly in our full sample of financial crisis spells (left panel), with a cumulative deviation from trend of 20%. The results are more pronounced for the post-World War II sample (right panel), especially when compared to the pre-World War II sample (middle panel). This may be due to the fact that the frequency of street protests was generally high during 1920s and 1930s.

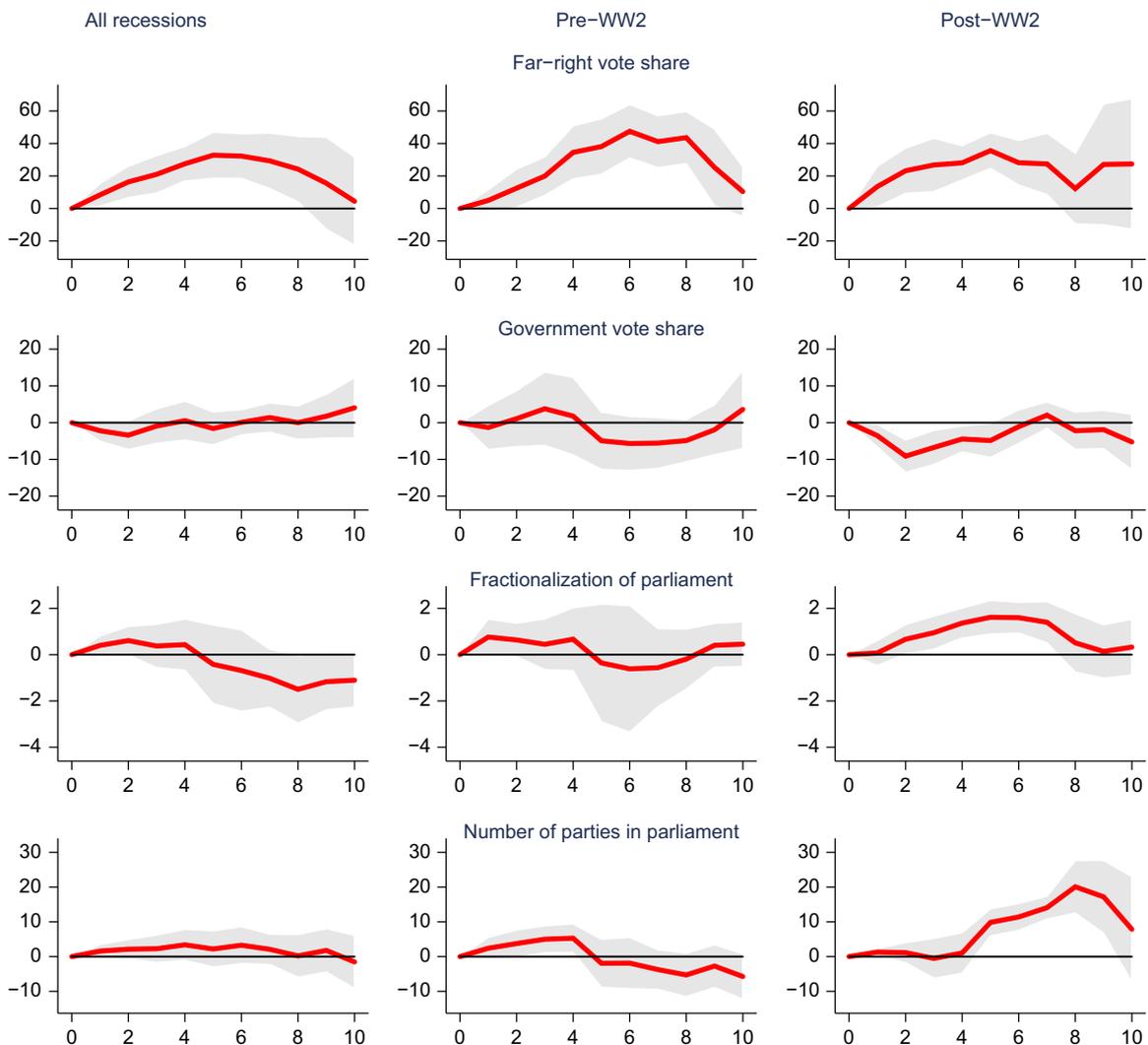


Fig. 8. 10-year local projections: financial crisis recessions. **Notes:** Each path shows local projections of the cumulative change in the political variables relative to peak (in %, y-axis) for years 1–10 of the recession/recovery period (x-axis). The red line refers to the average path in financial crisis recessions and the shaded region is a 90% confidence interval. The controls are contemporaneous and 1-year lagged values of the growth rate of the GDP per capita and the CPI inflation rate at peak. Table D2 shows the financial crisis recessions included. Time periods for each variable are the same as in the above local projections of that variable in Section 4. For the corresponding regression results for years 1–5 we again refer to Table 5 (far-right vote share) in the text and to Table E1 (government vote share) up through Table E4 (number of parties) in the appendix. The regression results for years 6–10 are not reported, but are available upon request. (For interpretation of the references to color in this figure caption, the reader is referred to the web version of this paper.)

4.4. How persistent are the effects?

How long-lasting are the political after-shocks of financial crises? Do the effects fade out, and if so, when? To shed light on this, we extend the time frame of the analysis to a ten year window after the crisis event. Fig. 8 displays the post-crisis path of far-right and government vote shares as well as parliamentary fractionalization and the number of parties in parliament over a 10 year horizon.

The graphs demonstrate that the political effects are temporary and diminish over time. 10 years after the crisis, almost all variables are back to their pre-crisis levels.

The top panel shows that the increase in far-right votes is no longer significantly different from zero after year 8. Also the point estimates decrease strongly from a peak of about 30% to 40% in year 5 to about 20% or less by year 10. We find similar responses when looking at government vote shares, as shown in the second panel of Fig. 8. The point estimates decrease in years 6–10 after the crisis and are no longer different from zero in the medium and long run. The degree of political radicalization clearly diminishes over time. Parliamentary fractionalization measures also return to their initial levels over a 10 year horizon. Among all variables, the increase in the number of parties represented in parliament appears to be the most persistent effect of crises. In the post-World War II sample, it takes a decade before the effects are no longer visible in the data.

To sum up, the political consequences of financial crisis start to fade about 5 years after the beginning of the crisis. While some political after-effects of financial crises are measurable for a decade, the good news from our regressions is that the political upheaval in the wake of financial crises is mostly temporary.

5. Normal recessions and non-financial macro disasters

We have shown that financial crises go hand in hand with substantial radicalization and fragmentation of the political landscape. In this section, we compare the political fall-out from financial crises with other episodes of economic distress. It is by now a well-documented fact that financial crises are typically accompanied by economic recessions. Are the political after-effects of financial crises comparable to the political dynamics in other recessions, or are financial crises special? This is the first question we will address. A sceptic observer might point out that financial crisis recessions tend to be deeper than normal recessions so that the correct benchmark for comparison would be equally severe (non-financial) recessions. A second test is to compare the political aftermath of financial crisis with severe non-financial recessions—sometimes dubbed macro-disasters in the literature.

In the following section we track the trajectory of key indicators of political stability in financial crisis recession, in normal recessions and in deep economic crises that are not associated with a financial crash (“non-financial macro disasters”).

We define the latter in Section 2 as (non-financial) recessions that are more severe than the average financial crisis recession, i.e., the annualized percentage fall in GDP per capita exceeds the respective thresholds of 3.35% (pre-World War II sample) and 2.55% (post-World War II sample). Financial crisis recessions are all recessions that coincide with a systemic financial crisis. All other recessions are called “normal recessions”. Consequently, in the local projections we will subject the economy to three different “treatments”: recessions associated with a systemic financial crisis, normal recessions, and other (non-financial) macro disasters.

Table 5 demonstrates that financial crises are different. Financial recessions are followed by a significantly larger increase in far-right votes than either normal recessions or non-financial macro-disasters. The *F*-test rejects the null of equal coefficients at most horizons. The only exception is the interwar period, where substantial increases in far-right votes also occurred in other recessions.

Table 6 shows the coefficients for the three types of downturns for the other political variables. To save space we exclude opposition vote shares and focus on the post-World War II sample where the effects are more precisely estimated. The full set of results can be found in Appendix Tables E1 up through E5. We also refer the reader to these tables for the *R*² and other test statistics.

What are the main insights from Table 6? First, in normal recessions, the political system remains relatively stable. Government vote shares and measures of parliamentary fragmentation do not see notable shifts. Similarly, street protests barely increase in the course of normal recessions. Second, a key difference between financial recessions and severe macro disasters is that support for the government increases during non-financial macro-disasters, but falls significantly in financial crisis recessions. Put differently, in non-financial disasters people rally behind the government. In financial crises, support for the government drops sharply. The bottom panel of Table 6 mirrors this finding: street protests rise strongly after financial crises, but stay flat in non-financial macro disasters. Parliamentary fragmentation increases after non-financial macro disasters, but the effects are estimated imprecisely and remain insignificant at all horizons.

To provide further robustness checks, we applied stricter thresholds to define macro-disasters. For instance, we only coded the most severe non-financial recessions (top 25% and top 10% of the distribution) as macro disasters, or used the harshest non-financial recession in each country. None of this affected our core finding that the political fall-out from financial crises is different and, for the most part, more severe.

How can we account for the fact that financial crises provoke severe political disruptions and other economic crises do not? A first potential explanation could be that non-financial crises are perceived as “excusable” events, triggered by large exogenous shocks such as oil prices, natural catastrophes, or wars. In contrast, financial crises may be perceived as an endogenous and

Table 5

Local projections of far-right vote shares.

(a) Full sample	Year 1	Year 2	Year 3	Year 4	Year 5
Financial recession	8.47* (4.34)	15.90** (5.97)	21.27*** (6.95)	27.85*** (6.38)	33.10*** (8.70)
Normal recession	5.53 (3.27)	8.19** (3.35)	10.14*** (3.37)	7.36** (3.22)	8.72* (4.31)
Non-financial macro disaster	1.20 (2.34)	0.85 (3.29)	4.73 (7.22)	2.10 (8.08)	14.83 (13.51)
H_0 : Financial=normal; p -value	0.66	0.32	0.19	0.01	0.02
H_0 : Financial=disaster; p -value	0.12	0.03	0.11	0.00	0.23
R^2	0.037	0.067	0.091	0.115	0.12
Observations	1539	1515	1491	1467	1443
(b) Pre-WWII sample	Year 1	Year 2	Year 3	Year 4	Year 5
Financial recession	4.72 (4.16)	10.76 (6.59)	19.13*** (6.06)	34.02*** (9.01)	37.89*** (9.86)
Normal recession	9.70 (7.08)	15.79** (5.77)	18.50*** (4.71)	22.04*** (4.78)	23.52*** (5.14)
Non-financial macro disaster	9.06* (4.96)	16.07** (5.84)	24.37*** (7.03)	27.93*** (7.21)	29.81*** (8.47)
H_0 : Financial=normal; p -value	0.54	0.59	0.94	0.24	0.19
H_0 : Financial=disaster; p -value	0.49	0.55	0.56	0.58	0.53
R^2	0.154	0.293	0.420	0.566	0.591
Observations	365	361	357	353	349
(c) Post-WWII sample	Year 1	Year 2	Year 3	Year 4	Year 5
Financial recession	13.77* (7.70)	23.86** (8.56)	27.76** (10.08)	29.03*** (6.78)	36.57*** (6.99)
Normal recession	6.18* (3.23)	9.21** (3.96)	12.48** (4.77)	9.34** (4.33)	11.05* (5.39)
Non-financial macro disaster	0.35 (2.15)	0.15 (4.17)	8.41 (13.30)	7.96 (13.92)	31.95 (24.45)
H_0 : Financial=normal; p -value	0.38	0.12	0.13	0.01	0.00
H_0 : Financial=disaster; p -value	0.10	0.01	0.22	0.16	0.86
R^2	0.056	0.103	0.141	0.167	0.187
Observations	1174	1154	1134	1114	1094

Notes: *** Significant at 0.01. ** Significant at 0.05. * Significant at 0.1. Robust standard errors (clustered by country) in parentheses. Results correspond to local projections of cumulative change in 100 times the logged variable relative to peak for years 1–5 of the financial recession (first row), normal recession (second row), and non-financial macro disaster (third row). The top panel (a) covers the years 1919–2014, with World War II years (1939–1949) being excluded, the middle panel (b) covers the years 1919–1938, and the bottom panel (c) covers the years 1950–2014. Financial=normal (disaster) tests the null that coefficients for each type of recession are the same for the intercept terms in the first and second (third) rows. In each case the p -value of the test is provided. The controls are contemporaneous and 1-year lagged values of the growth rate of GDP per capita and the CPI inflation rate at peak (coefficients not reported). See text.

“inexcusable” types of crisis that are the result of policy failures, moral hazard and favoritism. In other words, the electorate may blame politics for the occurrence of financial crises because the perception is that the crash could have been avoided.

A second important explanation is that financial crises trigger unprecedented policy responses.²⁴ As there tends to be a large degree of uncertainty about the consequences of these policies, confidence in the political leadership may erode and increase the willingness to reject conventional policies. This in turn can give rise to populist or extremist views at the political fringe.

A third explanation is that financial crises typically involve bailouts for the financial sector and these are highly unpopular (e.g., Broz, 2005). Consequently, financial crises may result in more political dissatisfaction than non-financial crises.²⁵

A fourth explanation is that financial crises have social repercussions that are not observable after non-financial recessions. For example, it is possible that the disputes between creditors and debtors are uglier in the wake of financial crises, be it internally or internationally (e.g., Halac et al., 2004; Mian et al., 2014). Similarly, it is possible that inequality rises more strongly in the aftermath of financial crises, but less so in other crisis types (e.g., Atkinson and Morelli, 2011; Bordo and Meissner, 2011). Exploring these questions in more detail is beyond the scope of this paper, but will be addressed in future research.

²⁴ We are grateful to Eric Leeper for pointing this out.

²⁵ These explanations relate to Giuliano and Spilimbergo (2014) who find a higher propensity to distrust political institutions among individuals growing up during recessions than among individuals without such experiences.

Table 6
Local projections of political variables, post-World War II sample.

	Year 1	Year 2	Year 3	Year 4	Year 5
Government vote share					
Financial recession	−3.54* (1.89)	−9.13*** (2.68)	−6.86** (2.85)	−4.50* (2.21)	−4.84 (2.84)
Normal recession	−0.91 (1.62)	−0.17 (1.62)	−0.54 (1.41)	−0.02 (1.24)	0.24 (1.31)
Non-financial macro disaster	−1.30 (1.53)	−0.00 (2.74)	8.98* (4.98)	2.82 (1.63)	3.73 (3.87)
H_0 : Financial = normal; p -value	0.37	0.02	0.02	0.11	0.16
H_0 : Financial = disaster; p -value	0.43	0.06	0.01	0.01	0.07
Fractionalization of parliament					
Financial recession	0.02 (0.33)	0.70* (0.37)	0.95** (0.41)	1.36*** (0.39)	1.60*** (0.44)
Normal recession	−0.33 (0.31)	−0.13 (0.39)	0.33 (0.45)	0.10 (0.42)	−0.29 (0.55)
Non-financial macro disaster	−0.53 (0.47)	2.15 (3.15)	2.00 (3.29)	2.47 (3.19)	1.65 (3.81)
H_0 : Financial = normal; p -value	0.37	0.06	0.36	0.05	0.02
H_0 : Financial = disaster; p -value	0.25	0.64	0.75	0.73	0.99
Number of parties in parliament					
Financial recession	1.33* (0.67)	1.17 (1.68)	−0.44 (3.56)	1.14 (3.67)	9.83*** (2.40)
Normal recession	1.69 (1.22)	1.98 (1.46)	3.11* (1.57)	2.17* (1.18)	2.56* (1.37)
Non-financial macro disaster	−0.03 (1.29)	5.31 (7.74)	8.62 (9.34)	12.16 (7.80)	12.68 (7.71)
H_0 : Financial = normal; p -value	0.68	0.71	0.39	0.78	0.01
H_0 : Financial = disaster; p -value	0.29	0.62	0.38	0.19	0.72
Street protests (% deviation from trend)					
Financial recession	1.37 (0.86)	5.30** (2.45)	14.72** (5.47)	28.96*** (9.77)	30.04* (16.39)
Normal recession	2.20*** (0.69)	2.71** (1.28)	0.96 (2.03)	−0.03 (2.40)	−1.52 (2.60)
Non-financial macro disaster	3.95* (2.19)	7.78 (5.19)	6.99 (5.73)	4.53 (6.74)	4.20 (9.71)
H_0 : Financial = normal; p -value	0.50	0.42	0.04	0.01	0.08
H_0 : Financial = disaster; p -value	0.34	0.71	0.40	0.08	0.19

Notes: *** Significant at 0.01. ** Significant at 0.05. * Significant at 0.1. Robust standard errors (clustered by country) in parentheses. Results correspond to local projections of cumulative change in 100 times the logged variable relative to peak for years 1–5 of the financial recession (first row), normal recession (second row), and non-financial macro disaster (third row). The data cover the years 1950–2014. Financial = normal (disaster) tests the null that coefficients for each type of recession are the same for the intercept terms in the first and second (third) rows. In each case the p -value of the test is provided. The controls are contemporaneous and 1-year lagged values of the growth rate of GDP per capita and the CPI inflation rate at peak (coefficients not reported). See text.

6. Conclusion

This paper studies the political aftermath of financial crises with a historical perspective. The evidence we uncover shows that financial crises put a strain on modern democracies. The typical political reaction is as follows: votes for far-right parties increase strongly, government majorities shrink, the fractionalization of parliaments rises and the overall number of parties represented in parliament jumps. These developments likely hinder crisis resolution and contribute to political gridlock. The resulting policy uncertainty may contribute to the much debated slow economic recoveries from financial crises.

Financial crises are politically disruptive, even when compared to other economic crises. Indeed, we find no (or only slight) political effects of normal recessions and different responses in severe crises not involving a financial crash. In the latter, right wing votes do not increase as strongly and people rally behind the government. In the light of modern history, political radicalization, declining government majorities and increasing street protests appear to be the hallmark of financial crises. As a consequence, regulators and central bankers carry a big responsibility for political stability when overseeing financial markets. Preventing financial crises also means reducing the probability of a political disaster.

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Appendix A. Variables and summary statistics

See [Tables A1](#) and [A2](#).

Table A1

Main variables: description and sources.

Variable	Description	Sources
Government vote share	Vote share of governing party or coalition in the most recent general elections to the national parliament (lower chamber)	Mackie and Rose (1974), Nohlen and Stöver (2010), Döring and Manow (2012) and country-specific sources listed in Appendix B
Opposition vote share	Combined vote share of all opposition parties, excluding independents, in the most recent general elections to the national parliament (lower chamber)	Mackie and Rose (1974), Nohlen and Stöver (2010), Döring and Manow (2012) and country-specific sources listed in Appendix B
Far-right/far-left vote share	Combined vote share of all far-right (far-left) political parties with more than 0.1% of total votes in the most recent general elections to the national parliament (lower chamber)	Bertelsmann Stiftung (2009), Betz (1994), Capoccia (2001), de Bromhead et al. (2012), Minkenberg (2001), Minkenberg (2008), Mudde (2000), Mudde (2005), Mudde (2007) and country-specific sources (see Appendix B).
Fractionalization	The probability that two representatives picked at random from among the parties in the legislature will be of different parties; range: [0;1]	Mackie and Rose (1974), Nohlen and Stöver (2010), Döring and Manow (2012) and country-specific sources listed in Appendix B
No. of parties	The number of parties elected into the legislative branch in the most recent general election to the national parliament (lower chamber)	Mackie and Rose (1974), Nohlen and Stöver (2010), Döring and Manow (2012) and country-specific sources listed in Appendix B
Violent riots	Any violent demonstration or clash of more than 100 citizens involving the use of physical force.	Banks and Wilson (2014)
General strikes	Any strike of 1000 or more industrial or service workers that involves more than one employer and is aimed at national government policies or authority	Banks and Wilson (2014)
Demonstrations	Any peaceful public gathering of at least 100 people for the purpose of voicing opposition to government policies or authority, excluding demonstrations of a distinctly anti-foreign nature	Banks and Wilson (2014)
Street protests	The sum of violent riots, general strikes, and demonstrations per year	Banks and Wilson (2014)
Executive turnover	1 indicates year with a new leadership; 0 indicates year with no changes in effective executive	Beck et al. (2001), Goemans et al. (2009)
Government crises	Any rapidly developing situation that threatens to bring the downfall of the present regime – excluding situations of revolt aimed at such an overthrow	Banks and Wilson (2014)
Financial crises	Events during which a country's banking sector experiences bank runs, sharp increases in default rates accompanied by large losses of capital that result in public intervention, bankruptcy, or forced merger of financial institutions	Bordo et al. (2001), Reinhart and Rogoff (2009b), Laeven and Valencia (2008), Laeven and Valencia (2012), Jordà et al. (2013)
Recessions	Financial recessions: financial crisis within ± 2 years around peak. Normal recessions: all non-financial peaks. Non-financial macro disasters: normal recessions with yearly real p.c. GDP percentage loss > average loss in financial recessions	Algorithm from Bry and Boschan (1971), crisis dating based on Jordà et al. (2013) and their sources
GDP	Growth rate of real GDP per capita	Jordà et al. (2013) and their sources
Inflation	CPI inflation rate	Jordà et al. (2013) and their sources

Table A2
Summary statistics.

Variable	Obs.	Mean	Std. dev.	Min.	Max.
Far-right vote share	1794	5.45	14.5	0.00	99.8
Far-left vote share	1794	5.46	7.01	0.00	34.4
Government vote share	2078	50.7	14.5	12.3	100
Opposition vote share	2078	46.1	14.6	0.00	84.1
Fractionalization of parliament	2510	0.63	0.18	0.00	0.89
No. of parties in parliament	2495	6.26	3.51	1.00	21.0
No. of general strikes	1727	0.22	0.72	0.00	8.00
No. of violent riots	1727	0.81	2.80	0.00	55.0
No. of anti-government demonstrations	1727	0.82	2.99	0.00	60.0
No. of street protest incidents	1727	1.85	5.42	0.00	85.0
No. of major government crises	1727	0.37	0.82	0.00	6.00
Executive turnover dummy	2572	0.29	0.45	0.00	1.00
Financial crises dummy	2900	0.04	0.19	0.00	1.00
Financial recession dummy	2900	0.03	0.17	0.00	1.00
Normal recession dummy	2900	0.12	0.33	0.00	1.00
Non-financial macro disaster dummy	2900	0.02	0.15	0.00	1.00

Notes: Summary statistics refer to the raw data collected for all 20 countries and all years from 1870 to 2014, including non-democratic spells and periods of global war (1914–1918 and 1939–1949). Generally not considered in the empirical analysis of political variables are Austria and Ireland prior to World War I, and Australia prior to 1901 (no independent states). Finland prior to 1917, as an autonomous part of the Russian Empire, is considered.

Appendix B. Coding of elections and parliamentary variables

This section lists the sources used to code our archive of election results (vote shares) and parliamentary composition from 1870 to 2014. The bibliographical details of main sources are shown in the reference list above, while country-specific references are shown in full below.

B.1. Sources of election dates, results and parliamentary composition

The election data come from the following three main sources:

- D/M: Döring and Manow (2012)
- M/R: Mackie and Rose (1974)
- N/S: Nohlen and Stöver (2010)

Detailed election data sources per country : **Australia:** Elections from 1901–2013: D/M. – **Austria:** 1919–1930: M/R. 1945–2013: D/M. – **Belgium:** 1870.1–1939: M/R. 1946–2014: D/M. – **Canada:** 1872–1940: M/R. 1945–2011: D/M. – **Denmark:** 1872–1873: Skov, Kaare. 1999. *Demokratiets Danmarkshistorie – Gennem 150 år.* Copenhagen: Aschenhoug. 1876–1882: N/S. 1884–1943: M/R. 1945–2011: D/M. – **Finland:** 1907–1924: M/R. 1927–2011: D/M. – **France:** 1871–1898: N/S. 1902–1936: M/R. 1945–2012: D/M. – **Germany:** 1871–1933.1: M/R. 1933.2–1938: Jung, Otmar. 1998. *Wahlen und Abstimmungen im Dritten Reich 1933–1938.* In: Eckhard Jesse and Konrad Löw (ed.): *Wahlen in Deutschland* (Berlin: Duncker & Humblot 1998): 69–98. 1949–2013: D/M. – **Greece:** 1873–1964: N/S. 1974–2012.2: D/M. – **Ireland:** 1918–1943: M/R. 1944–2011: D/M. – **Italy:** 1870–1892: N/S. 1895–1921: M/R. 1924–1934: Salvatorelli, Luigi, and Giovanni Mira. 1945. *Storia del Fascismo – Italia dal 1919 al 1945.* Roma: Edizioni di Novissima. 1946–2013: D/M. – **Japan:** 1890–1937: Scalapino, Robert. 1968. *Elections and Political Modernization in Prewar Japan.* In: Robert Ward (ed.): *Political Development in Modern Japan* (Princeton: Princeton University Press 1968): 249–292. 1942: Drea, Edward. 1979. *The 1942 Japanese General Election: Political Mobilization in Wartime Japan.* Chicago: Paragon. 1946–2014: D/M. – **Netherlands:** 1888–1937: M/R. 1946–2012: D/M. – **Norway:** 1870.2–1879: N/S. 1882–1936: M/R. 1945–2013: D/M. – **Portugal:** 1871–1973: N/S. 1975–2011: D/M. – **Spain:** 1871–1936: N/S. 1977–2011: D/M. – **Sweden:** 1887.1–1940: M/R. 1944–2014: D/M. – **Switzerland:** 1872–1893: Gruner, Erich. 1978. *Die Wahlen in den Schweizerischen Nationalrat 1848–1919: Vol 1.* Bern: Francke. 1896–1917: M/R; 1919–2011: D/M. – **United Kingdom:** 1874–1880: Craig, Frederick Walter Scott. 1989. *British Electoral Facts: 1832–1987.* Dartmouth: Parliamentary Research Services. 1885–1935: M/R. 1945–2010: D/M. – **United States:** 1870–1918: Dubin, Michael J. 1998. *United States Congressional Elections, 1788–1997: The Official Results of the Elections of the 1st through 105th Congresses.* Jefferson: McFarland. 1920–2014: Office of the Clerk of the U.S. House of Representatives. 2014. *Election Statistics.* Available at www.history.house.gov/institution/election-statistics/election-statistics/.

An overview of all elections in our 20-country sample spanning the years from 1870–2014 is provided in the table below. Altogether, we identified 751 elections, but we could not find sufficient data for 32 of these (in round brackets), so the final sample of coded elections includes 719 events.

Table B1
Parliamentary elections 1870–2014.

AUS	AUT	BEL	CAN	CHE	DEU	DNK	ESP	FIN	FRA	GBR	GRC	IRL	ITA	JPN	NLD	NOR	PRT	SWE	USA
1901	1919	1870*	1872	1872	[1871]	[1872]	(1871)	(1872)	1871	1874	1873	1918	(1870)	[1890]	(1871)	(1870*)	[1871]	(1872)	1870
1903	1920	1872	1874	1875	[1874]	[1873]	(1872)	(1877)	1876	1880	1875	1921	1874	[1892]	(1873)	(1873)	[1874]	(1875)	1872
1906	1923	1874	1878	1878	[1877]	[1876]	1873	(1882)	1877	1885	1879	1922	1876	[1894*]	(1875)	(1876)	[1878]	(1878)	1874
1910	1927	1876	1882	1881	[1878]	[1879]	[1876]	(1885)	1881	1886	1881	1923	1880	[1898*]	(1877)	(1879)	[1879]	(1881)	1876
1913	1930	1878	1887	1884	[1881]	[1881*]	[1879]	(1888)	1885	1892	1885	1927*	1882	[1902]	(1879)	[1882]	[1881]	(1884)	1878
1914	1945	1880	1891	1887	[1884]	[1882]	[1881]	(1891)	1889	1895	1890	1932	1886	[1903]	(1881)	1885	[1884]	[1887*]	1880
1917	1949	1882	1896	1890	[1887]	[1884]	[1884]	(1894)	1893	1900	1892	1933	1890	[1904]	(1883)	1888	[1887]	[1890]	1882
1919	1953	1884	1900	1893	[1890]	[1887]	[1886]	(1900)	1898	1906	1895	1937	1892	[1908]	(1884)	1891	[1889]	[1893]	1884
1922	1956	1886	1904	1896	[1893]	[1890]	[1891]	(1901)	1902	1910*	1899	1938	1895	[1912]	(1886)	1894	[1890]	[1896]	1886
1925	1959	1888	1908	1899	[1898]	[1892]	[1893]	(1905)	1906	1918	1902	1943	1897	[1915]	(1887)	1897	[1892]	[1899]	1888
1928	1962	1890	1911	1902	[1903]	[1895]	[1896]	[1907]	1910	1922	1905	1944	1900	[1917]	1888	1900	[1894]	[1902]	1890
1929	1966	1892	1917	1905	[1907]	[1898]	[1898]	[1908]	1914	1923	1906	1948	1904	[1920]	1891	1903	[1895]	[1905]	1892
1931	1970	1894	1921	1908	[1912]	1901	[1901]	[1909]	1919	1924	1910*	1951	1909	[1924]	1894	1906	[1897]	[1908]	1894
1934	1971	1896	1925	1911	1919	1903	[1903]	[1910]	1924	1929	1912	1954	1913	[1928]	1897	1909	[1899]	[1911]	1896
1937	1975	1898	1926	1914	1920	1906	[1905]	[1911]	1928	1931	1915*	1957	1919	[1930]	1901	1912	[1900]	[1914]	1898
1943	1979	1900	1930	1917	1924*	1909	[1907]	[1913]	1932	1935	1920	1961	1921	[1932]	1905	1915	[1901]	1917	1900
1946	1983	1902	1935	1919	1928	1910	[1910]	[1916]	1936	1945	1923	1965	[1924]	[1936]	1909	1918	[1905]	1920	1902
1949	1986	1904	1940	1922	1930	1913	[1914]	[1917]	1945	1950	1926	1969	[1929]	[1937]	1913	1921	[1906*]	1921	1904
1951	1990	1906	1945	1925	[1932*]	1915	[1916]	1919	1946*	1951	1928	1973	[1934]	[1942]	1917	1924	[1908]	1924	1906
1954	1994	1908	1949	1928	[1933*]	1918	[1918]	1922	1951	1955	1932	1977	1946	1946	1918	1927	[1910]	1928	1908
1955	1995	1910	1953	1931	[1936]	1920*	[1919]	1924	1956	1959	1933	1981	1948	1947	1922	1930	1911	1932	1910
1958	1999	1912	1957	1935	[1938]	1924	[1920]	1927	1958	1964	1935	1982*	1953	1949	1925	1933	1915	1936	1912
1961	2002	1914	1958	1939	1949	1926	[1922]	1929	1962	1966	1936	1987	1958	1952	1929	1936	1918	1940	1914
1963	2006	1919	1962	1943	1953	1929	1931	1930	1967	1970	1946	1989	1963	1953	1933	1945	1919	1944	1916
1966	2008	1921	1963	1947	1957	1932	1933	1933	1968	1974*	1950	1992	1968	1955	1937	1949	1921	1948	1918
1969	2013	1925	1965	1951	1961	1935	1936	1936	1973	1979	1951	1997	1972	1958	1946	1953	1922	1952	1920
1972		1929	1968	1955	1965	1939	1977	1939	1978	1983	1952	2002	1976	1960	1948	1957	1925	1956	1922
1975		1932	1972	1959	1969	1943	1979	1945	1981	1987	1956	2007	1979	1963	1952	1961	[1934]	1958	1924
1977		1936	1974	1963	1972	1945	1982	1948	1986	1992	1958	2011	1983	1967	1956	1965	[1938]	1960	1926
1980		1939	1979	1967	1976	1947	1986	1951	1988	1997	1961		1987	1969	1959	1969	[1942]	1964	1928
1983		1946	1980	1971	1980	1950	1989	1954	1993	2001	1963		1992	1971	1963	1973	[1945]	1968	1930
1984		1949	1984	1975	1983	1953*	1992	1958	1997	2005	1964		1994	1972	1967	1977	[1949]	1970	1932
1987		1950	1988	1979	1987	1957	1996	1962	2002	2010	1974		1996	1976	1971	1981	[1953]	1973	1934
1990		1954	1993	1983	1990	1960	2000	1966	2007		1977		2001	1979	1972	1985	[1957]	1976	1936
1993		1958	1997	1987	1994	1964	2003	1970	2012		1981		2006	1980	1977	1989	[1961]	1979	1938
1996		1961	2000	1991	1998	1966	2008	1972			1985		2008	1983	1982	1993	[1965]	1982	1940
1998		1965	2004	1995	2002	1968	2011	1975			1989*		2013	1986	1986	1997	[1969]	1985	1942
2001		1966	2006	1999	2005	1971		1979			1990			1990	1989	2001	[1973]	1988	1944
2004		1968	2008	2003	2009	1973		1983			1993			1993	1994	2005	1975	1991	1946

2007	1971	2011	2007	2013	1975	1987	1996	1996	1998	2009	1976	1994	1948
2010	1974		2011		1977	1991	2000	2000	2002	2013	1979	1998	1950
2013	1977				1979	1995	2004	2003	2003		1980	2002	1952
	1978				1981	1999	2007	2005	2006		1983	2006	1954
	1981				1984	2003	2009	2009	2010		1985	2010	1956
	1985				1987	2007	2012*	2012	2012		1987	2014	1958
	1987				1988	2011		2014			1991		1960
	1991				1990						1995		1962
	1995				1994						1999		1964
	1999				1998						2002		1966
	2003				2001						2005		1968
	2007				2005						2009		1970
	2010				2007						2011		1972
	2014				2011								1974
													1976
													1978
													1980
													1982
													1984
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													2002
													2004
													2006
													2008
													2010
													2012
													2014

Notes: ()=no data available []=monarchy/dictatorship *=two elections in that year. The table provides a chronology of elections from 1870-2014 by country. We include all general elections to the national parliament, but not sub-national or presidential elections. In the case of a bicameral legislative, we only consider results from the lower legislative chamber. This means that we focus on the following results: AUS: House of Representatives (lower house); AUT: National Council (lower house); BEL: Chamber of Representatives (lower house); CAN: House of Commons (lower house); CHE: National Council (lower house); DEU: Bundestag (until 1945 Reichstag) (unicameral); DNK: Folketing (until 1953 lower house, since then unicameral); ESP: Congress of Deputies (lower house); FIN: Eduskunta (unicameral); FRA: National Assembly (until 1946 Chamber of Deputies) (lower house); GBR: House of Commons (lower house); GRC: Hellenic Parliament (unicameral, bicameral from 1927–1935); IRL: Dáil Éireann (lower house); ITA: Chamber of Deputies (lower house); JPN: House of Representatives (lower house). NLD: Tweede Kamer (lower house); NOR: Storting (unicameral); PRT: Assembly of the Republic (unicameral, bicameral from 1915–1925); SWE: Riksdag (unicameral); USA: House of Representatives (lower house).

B.2. Coding of far-right and far-left parties

Table B2 shows our full list of far-left and far-right parties in the period from 1919 to 2014. For the interwar period (1919–1938) we follow the classification in de Bromhead et al. (2012) and their main source Capoccia (2001). For the post-World War II period, we draw on Betz (1994), Ignazi (2003), Minkenberg (2001; 2008), Minkenberg and Perrineau (2007), Mudde (2000; 2005; 2007) as well as country reports by Bertelsmann Stiftung (2009) and a large number of country-specific sources listed in Appendix B.2 of the Working Paper (pages 45–48; URL: https://www.cesifo-group.de/de/ifoHome/publications/working-papers/CESifoWP/CESifoWPdetails?wp_id=19172486).

B.3. Coding of government and opposition parties

This section lists the sources used to classify parties into government and opposition. The classification for the post-World War II period mainly follows Döring and Manow (2012) (D/M). The remaining historical and country-specific sources are listed below:

Australia: 1901–2013: D/M. – *Austria*: 1919–1930: Website of the Austrian government. Available at www.parlament.gv.at/WWER/BREG/REG. 1945–2013: N/S. *Belgium*: 1870.2–1939: Website of the Belgian government. Available at www.premier.fgov.be; 1946–2014: D/M. – *Canada*: 1872–1940: Privy Council Office. 2013. A Guide to Canadian Ministries since Confederation. Ottawa. Available at www.pco-bcp.gc.ca/mgm; 1945–2011: D/M. – *Denmark*: 1901–1943: Website of the Danish government. Available at www.stm.dk. 1945–2011: D/M. – *Finland*: 1919–1924: The Finnish Government. 2014. Government and Ministers since 1917. Helsinki. Available at www.valtioneuvo.fi/tietoa/historiaa/hallitukset-jaministerit; 1927–2011: D/M. – *France* 1871–1936: Website of the French government. Available at www.gouvernement.fr. 1945–2012: D/M. – *Germany*: 1919–1932.2: Lothar Gall, and Michael Hollman. 2009. Reich Chancellery Files: Weimar Republic Edition (Online Version). Available at www.bundesarchiv.de/aktenreichskanzlei/1919-1933/0000/index.html; 1949–2013: D/M. – *Greece*: 1889–1964: Henisz, Witold. 2000. The Institutional Environment for Economic Growth. Economics and Politics. 12(1): 1–31; 1974–2012.2: D/M. – *Ireland*: 1918–1943: Website of the Irish government. Available at www.taoiseach.gov.ie/eng/historical_information/history_of_government; 1944–2011: D/M. – *Italy*: 1874–1921: Henisz, Witold. 2000. The Institutional Environment for Economic Growth. Economics and Politics. 12(1): 1–31; 1946–2013: D/M. – *Japan*: 1946–2014: D/M. – *Netherlands*: 1888–1937: Website of the Dutch government. Available at

Table B2

List of far-right (R) and far-left (L) parties since 1919 (incl. new Eurosceptic parties).

AUS	R	Australia First, Citizens Electoral Council, One Nation, Rise Up Australia
	L	Communist Party of Australia*, Democratic Socialist Electoral League, Democratic Socialist Perspective, Socialist Alliance
AUT	R	Alliance for the Future of Austria, Fatherland Block*, Federation of Independents, Freedom Party of Austria, German Nationalists*, Greater German's People's Party*, Movement for Political Renewal, National Socialist German Workers' Party*
	L	Communists and Left Socialists, Communist Party of Austria*
BEL	R	Flemish Block, Flemish Interest, Flemish Nationalists*, Libertarian-Direct-Democratic, National Front, People's Party, People's Union, Rexists*
	L	Communist Party of Belgium*, Left Socialist Party, Wallon Labour Party, Worker's Party of Belgium
CAN	R	No electorally successful parties identified
	L	Communist Party of Canada*, Communist Party of Canada – Marxist-Leninist
CHE	R	Freedom Party of Switzerland, Geneva Citizens' Movement, National Front*, Swiss Democrats, Swiss People's Party, Ticino League
	L	Alternative Left, Autonomous Socialist Party, Communist Party of Switzerland*, Progressive Organizations of Switzerland, Solidarity, Swiss Party of Labour
DEU	R	Action Alliance of Independent Germans, Alternative for Germany, Civil Rights Movement Solidarity, Economic Reconstruction Union, Empowered Citizens, German Community, German National People's Party*, German Party, German People's Union, German Right Party, Law and Order Offensive, National Democratic Party of Germany, National Socialist German Workers' Party*, Organization of the National Collection, Patriots for Germany, Popular Vote, Pro Germany, Pro German Middle, Statt Party, The Offensive
	L	Action Democratic Progress, Alliance of Germans, Collection to Action, Communist Party of Germany*, German Communist Party, German Union for Peace, Marxist-Leninist Party of Germany, The Left
DNK	R	Danish People's Party, National Socialist Worker's Party of Denmark*, Progress Party
	L	Communist Party of Denmark*, Common Course, Left Socialists, Socialist People's Party, Unity List – The Red-Greens
ESP	R	Falange Española*, Basque Nationalists*
	L	Catalan Nationalists*, Communist Party of Spain*, Workers' Party of Marxist Unification*, United Left
FIN	R	Finns Party, Finish Rural Party, Patriotic People's Movement*
	L	Communist Worker's Party, Communist Party of Finland*, Finnish People's Democratic League, Left Alliance
FRA	R	Movement for France, National Front, National Republican Movement
	L	French Communist Party*, Left Front, Revolutionary Communist League, Worker's Struggle
GBR	R	British National Party, Democratic Unionist Party, English Democrats, National Democratic Party, National Front, United Kingdom Independence Party
	L	Communist Party of Great Britain*, Green Party of England and Wales, Plaid Cymru, Respect Party, Scottish Socialist Party, Sinn Féin, Socialist Alternative, Socialist Labor Party
GRC	R	Freethinkers' Party*, Golden Dawn, Independent Greeks, National Democratic Union, National Political Union, Popular Independent Alignment, Popular Orthodox Rally

Table B2 (continued)

	L	Coalition of the Radical Left, Communist Party of Greece*, Communist Party of Greece (Interior), Democratic Left, Synaspismos, United Democratic Left
IRL	R	No electorally successful parties identified
	L	Communist Party of Ireland*, Democratic Left, National Progressive Democrats, People Before Profit Alliance, Sinn Féin, Socialist Labour Party, Socialist Party, Workers Party
ITA	R	Brothers of Italy, Casa Pound, Ex-Servicemen Party*, Italian Social Movement, National Alliance, National Fascist Party*, New Force, No Euro, Northern League, Social Alternative, The Freedmites, The Right, Tricolour Flame
	L	Civil Revolution, Communist Refoundation Party, Communist Worker's Party, Critical Left, Democratic Party of the Left, Five Star Movement, Italian Communist Party*, Party of Italian Communists
JPN	R	Japan Restoration Party
	L	Japanese Communist Party
NLD	R	Centre Democrats, Centre Party, Democratic Political Turning Point, Liveable Netherland, National Socialist Movement in the Netherlands*, One NL, Party for Freedom, Patriotic Democratic Appeal, Pim Fortyn List, Proud of the Netherlands
	L	Communist Party of the Netherlands*, New Communist Party of the Netherlands, Pacifist Socialist Party, Socialist Party
NOR	R	Democrats in Norway, Fatherland Party, National Socialist Party of Norway*, Norwegian People's Party, Progress Party, The Democrats
	L	Communist Party of Norway, Socialist Left Party, The Red Party
PRT	R	Democratic and Social Centre – People's Party, National Renovator Party
	L	Democratic Unitarian Coalition, Left Bloc, Left Revolutionary Front, People's Democratic Union, People's Socialist Front, Portuguese Communist Party*, Portuguese Labour Party, Portuguese Workers' Communist Party, Revolutionary Socialist Party, United People Alliance, Workers Party of Socialist Unity
SWE	R	National Socialist Party*, National League of Sweden*, New Democracy, Sweden Democrats
	L	Communist Party of Sweden*, The Left Party
USA	R	No electorally successful parties identified
	L	No electorally successful parties identified

Notes: *Parties with an asterisk are those participating in elections between 1919 and 1938. Some of these (e.g., French Communist Party) still exist today, some have dissolved, some were banned (e.g., Communist Party of Germany), some were merged into new parties, or changed their name over time (e.g., Flemish Nationalists to Flemish Block to Flemish Interest). In our analysis we always calculate the vote share of all *then-current* far-right and far-left parties.

www.government.nl; 1946–2012: D/M. – *Norway*: 1885–1936: Government Administration Services. Information from the Government and the Ministries. Norway's Governments since 1814. Available at www.regjeringen.no/en/the-government/previous-governments; 1945–2013: D/M. – *Portugal*: 1911–1925: Henisz, Witold. 2000. The Institutional Environment for Economic Growth. Economics and Politics. 12(1): 1–31; 1975–2011: D/M. – *Spain*: 1873, 1931–1936: Henisz, Witold. 2000. The Institutional Environment for Economic Growth. Economics and Politics. 12(1): 1–31; 1977–2011: D/M. – *Sweden*: 1917–1940: Website of the Swedish government. Available at www.government.se/sb/d/576; 1944–2014: D/M. – *Switzerland*: 1872–1917: The Federal Authorities of the Swiss Confederation. All Federal Councillors since 1848. Bern. Available at www.admin.ch/gov/en/start/federal-council.html; 1919–2011: D/M. – *United Kingdom*: 1874–1935: Cook, Chris, and Brendan Keith. 1984. British Historical Facts, 1830–1900. Palgrave Macmillan, Butler, David. 2000. Twentieth Century British Political Facts, 1900–2000. Palgrave Macmillan, Henisz, Witold. 2000. The Institutional Environment for Economic Growth. Economics and Politics. 12(1): 1–31; 1945–2010: D/M. – *United States*: 1870–2014: United States government. Website of the White House. Available at www.whitehouse.gov/about/presidents.

B.4. Coding the fractionalization measure

To measure parliamentary fractionalization it is essential to define what a party is. This is not always straightforward. To define parties we follow the approach used by Beck et al. (2001) and apply it to all parliaments since 1870. Specifically, we use the following coding rules:

- We split up party umbrellas and electoral fronts and count the parties individually if one or more of the following conditions are met: (1) the parties in the front compete for seats, (2) two or more parties within the front put forward their own presidential/premier candidates, and/or (3) the sources indicate that cabinet positions have been distributed among members of the different parties forming the front. If none of these are true, the front is recorded as a single party. If the sources only provide seats for the front, we regard the front as one party. In case of ambiguities, the front is considered to be one party.
- If parties have several wings based on language or ethnic divisions (e.g. Belgium), the wings are treated as separate or united depending on how the voting results and seats are reported in statistical sources. If the seats are broken down by wing they are classified as separate parties; if seats are only reported for the overall party, we regard it as one party.
- Independent deputies are treated as if they were individual parties with one seat each. This applies for the fractionalization measure, but not for our variable that represents the number of parties in the legislature.
- Unless otherwise stated parties and independent deputies from autonomous or semi-autonomous territories are included when sources indicate their presence in the parliament (e.g., France or Denmark).

Appendix C. Coding of street protest variables

See Fig. C1.

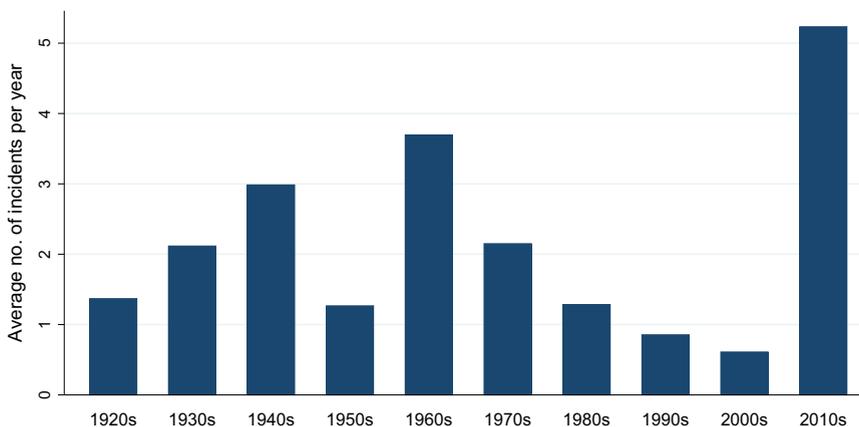


Fig. C1. Street protests: variation over time. **Notes:** The figure shows the number of street protest incidents per year, averaged over the decades from the 1920s to the 2010s. Note that the 2010s column refers only to the years 2010–2012.

Appendix D. Financial crises and recession dates

See Tables D1–D3.

Table D1
Financial crisis events, 1870–2014.

Australia	1893	1989							
Austria	1873	1924	1929	2008					
Belgium	1870	1885	1925	1931	1939*	2008			
Canada	1873	1907	1923						
Denmark	1877	1885	1908	1921	1931	1987	2008		
Finland	1878	1900	1921	1931	1991				
France	1882	1889	1907	1930	2008				
Germany	1873	1891	1901	1907	1931	2008			
Greece	1931	1991	2008						
Ireland	2008								
Italy	1873	1887	1893	1907	1921	1930	1935*	1990	2008
Japan	1882	1900	1904*	1907	1913	1927	1992		
Netherlands	1893	1907	1921	1939*	2008				
Norway	1899	1922	1931	1988					
Portugal	1890	1920	1923*	1931	2008				
Spain	1883	1890	1913	1920	1924*	1931	1978	2008	
Sweden	1878	1907	1922	1931	1991	2008			
Switzerland	1870	1910	1931	1991	2008				
United Kingdom	1873	1890	1974	1984	1991	2007			
United States	1873	1884	1893	1907	1929	1984	2007		

Notes: Financial crisis events from Bordo et al. (2001), Reinhart and Rogoff (2009b), Laeven and Valencia (2008), Laeven and Valencia (2012), and Jordà et al. (2013). The table shows all financial crisis events in the 20 countries in our sample since 1870. *=crises removed from the OLS regressions. Italics=crises removed from the descriptive analysis.

Table D2

Financial recessions (F) and normal recessions (N), 1870–2014.

Australia	N	1875 1910 2008	1878 1913	1881 1926	1883 1938	1885 1943	1887 1951	1889 1956	1896 1961	1898 1973	1900 1976	1904 1981
	F	1891	1894	1899								
Austria	N	1878 1943	1884 1974	1887 1977	1892 1980	1899 1983	1907 1992	1912 2012	1915	1922	1939	1941
	F	1872	1874	1922	1929	2008						
Belgium	N	1872 1980	1874 1992	1887 2011	1890	1900	1913	1916	1942	1951	1957	1974
	F	1870	1883	1926	1930	1937	2008					
Canada	N	1871 1947	1877 1953	1882 1956	1888 1981	1891 1989	1894 2007	1903	1913	1917	1928	1944
	F	1874	1907									
Denmark	N	1870 1979	1880 1992	1887 2011	1911	1914	1923	1939	1944	1950	1962	1973
	F	1872	1876	1883	1920	1931	1987	2007				
Finland	N	1870 1957	1883 1975	1890 2008	1898 2011	1907	1913	1916	1938	1941	1943	1952
	F	1876	1900	1929	1989							
France	N	1872 1920	1874 1926	1892 1933	1894 1937	1896 1939	1900 1942	1905 1974	1907 1992	1909 2012	1912	1916
	F	1882	1929	2007								
Germany	N	1879 2012	1898	1905	1913	1922	1943	1966	1974	1980	1992	2001
	F	1875	1890	1908	1928	2008						
Greece	N	1873 1911 1973	1879 1914 1979	1882 1916 1986	1885 1918 1989	1888 1921	1895 1926	1899 1935	1902 1937	1905 1939	1907 1943	1909 1951
	F	1930	1991	2008								
Ireland	N	1925 2011	1931	1936	1938	1941	1944	1955	1957	1975	1982	1985
	F	2007										
Italy	N	1870 2010	1883	1897	1918	1923	1925	1932	1939	1974	2002	2004
	F	1873	1887	1891	1929	1992	2007					
Japan	N	1875 1929	1877 1933	1880 1940	1887 1973	1890 2001	1892 2007	1895 2010	1898	1903	1919	1921
	F	1874	1901	1907	1913	1925	1997					
Netherlands	N	1870 1980	1873 2001	1877 2011	1889	1894	1899	1902	1913	1929	1957	1974
	F	1892	1906	1937	1939	2008						
Norway	N	1876 2007	1881 2012	1885	1893	1902	1916	1923	1939	1941	1957	1981
	F	1897	1920	1930	1987							
Portugal	N	1870 1925 1982	1873 1927 1992	1877 1934 2002	1888 1937 2004	1893 1939 2010	1900 1941	1904 1944	1907 1947	1912 1951	1914 1973	1916
	F	1890	1923	1929	2007							
Spain	N	1873 1940	1877 1944	1892 1947	1894 1952	1901 1958	1909 1974	1911 1980	1916 1992	1927 2011	1932	1935
	F	1883	1889	1913	1925	1929	1978	2007				
Sweden	N	1873 1916	1876 1924	1881 1939	1883 1976	1885 1980	1888 2011	1890	1899	1901	1904	1913
	F	1878	1907	1920	1930	1990	2007					
Switzerland	N	1875 1933	1880 1939	1886 1947	1890 1951	1893 1957	1899 1974	1902 1981	1906 1994	1912 2001	1916	1920
	F	1871	1929	1990	2008							
U.K.	N	1891 1938	1875 1943	1877 1951	1883 1957	1896 1979	1899 2010	1902	1907	1918	1925	1929
	F	1873	1889	1973	1990	2007						
USA	N	1875 1944	1887 1948	1889 1953	1895 1957	1901 1969	1909 1979	1913 1981	1916 1990	1918 1990	1926 2000	1937
	F	1873	1882	1892	1906	1929	2007					

Table D3

Non-financial macro-economic disasters, 1870–2014.

Australia	1881	1889	1896	1926	1981				
Austria	1912	1915	1943						
Belgium	1913	1916	1942						
Canada	1877	1884	1913	1917	1928	1944	1953	1981	
Denmark	1877	1884	1914	1916	1939	1944	1953	1981	
Finland	1890	1913	1916	1938	2008	2011			
France	1892	1909	1912	1920	1939	1942	2012		
Germany	1879	1913	1922	1943					
Greece	1973	1885	1888	1894	1896	1899	1911	1918	
	1921	1926	1935	1939	1973	1986			
Ireland	None								
Italy	1918	1939	1974	2010					
Japan	1880	1887	1890	1895	1898	1919	1929	1940	
	1973	2007							
Netherlands	1873	1913							
Norway	1873	1916	1939	1941					
Portugal	1916	1927	1934	1939	1973				
Spain	1873	1877	1894	1909	1935				
Sweden	1916	1939							
Switzerland	1875	1890	1893	1916	1920	1939	1957	1974	
United Kingdom	1907	1918	1925	1929	1943				
United States	1895	1913	1918	1937	1944	1957	1981		

Notes: The table shows a sub-sample of non-financial macro-economic disasters from the normal recessions listed in Table D2. Non-financial macro-economic disasters are defined as normal recessions where the yearly real p.c. GDP percentage loss is higher than the average in financial crisis recessions. Thresholds are calculated separately for the pre-World War II sample (−3.35%) and the post-World War II sample (−2.55%).

Appendix E. Local projections

See Tables E1–E5.

Table E1

Local projections of government vote shares.

(a) Full sample	Year 1	Year 2	Year 3	Year 4	Year 5
Financial recession	−2.16 (1.76)	−3.35 (2.41)	−0.88 (2.90)	0.59 (3.28)	−1.48 (2.77)
Normal recession	0.85 (1.17)	2.07** (0.98)	1.70 (1.87)	3.32* (1.84)	3.27* (1.75)
Non-financial macro disaster	2.23 (3.88)	4.63 (3.96)	9.57** (3.94)	5.25 (3.29)	4.24 (3.85)
H_0 : Financial=normal; p -value	0.09	0.03	0.41	0.49	0.11
H_0 : Financial=disaster; p -value	0.18	0.12	0.05	0.39	0.28
R^2	0.134	0.233	0.305	0.354	0.370
Observations	1770	1740	1711	1685	1660
(b) Pre-WWII sample	Year 1	Year 2	Year 3	Year 4	Year 5
Financial recession	−1.29 (3.67)	1.13 (4.66)	3.76 (6.10)	1.72 (6.46)	−4.89 (4.77)
Normal recession	2.26 (2.30)	3.66 (2.29)	2.10 (3.32)	4.81 (3.13)	2.72 (3.27)
Non-financial macro disaster	6.08 (9.87)	10.93 (9.52)	10.62 (8.06)	8.41 (8.41)	2.67 (8.41)
H_0 : Financial=normal; p -value	0.20	0.58	0.82	0.65	0.09
H_0 : Financial=disaster; p -value	0.32	0.27	0.42	0.49	0.42
R^2	0.129	0.228	0.301	0.335	0.356
Observations	590	581	573	567	562
(c) Post-WWII sample	Year 1	Year 2	Year 3	Year 4	Year 5
Financial recession	−3.54* (1.89)	−9.13*** (2.68)	−6.86** (2.85)	−4.50* (2.21)	−4.84 (2.84)
Normal recession	−0.91 (1.62)	−0.17 (1.62)	−0.54 (1.41)	−0.02 (1.24)	0.24 (1.31)
Non-financial macro disaster	−1.30 (1.53)	−0.00 (2.74)	8.98* (4.98)	2.82 (1.63)	3.73 (3.87)
H_0 : Financial=normal; p -value	0.37	0.02	0.02	0.11	0.16

Table E1 (continued)

(a) Full sample	Year 1	Year 2	Year 3	Year 4	Year 5
H_0 : Financial = disaster; p -value	0.43	0.06	0.01	0.01	0.07
R^2	0.202	0.338	0.431	0.497	0.524
Observations	1180	1159	1138	1118	1098

Notes: *** Significant at 0.01. ** Significant at 0.05. * Significant at 0.1. Robust standard errors (clustered by country) in parentheses. Results correspond to local projections of cumulative change in 100 times the logged variable relative to peak for years 1–5 of the financial recession (first row), normal recession (second row), and non-financial macro disaster (third row). (a) 1870–2014, (b) 1870–1938, (c) 1950–2014. World War I (1914–1918) and World War II (1939–1949) excluded. Financial = normal (disaster) tests the null that coefficients for each type of recession are the same for the intercept terms in the first and second (third) rows. In each case the p -value of the test is provided. The controls are contemporaneous and 1-year lagged values of the growth rate of GDP per capita and the CPI inflation rate at peak (coefficients not reported). See text.

Table E2

Local projections of opposition vote shares.

(a) Full sample	Year 1	Year 2	Year 3	Year 4	Year 5
Financial recession	1.41 (1.81)	2.34 (3.32)	–1.13 (3.78)	–2.74 (4.41)	–1.81 (3.97)
Normal recession	–2.35 (2.42)	–3.57 (2.53)	–1.42 (3.26)	–5.11 (4.10)	–4.23 (3.99)
Non-financial macro disaster	–5.44 (7.18)	–11.00 (7.30)	–17.28* (9.79)	–9.22 (9.21)	–12.20 (8.84)
H_0 : Financial = normal; p -value	0.14	0.10	0.95	0.70	0.56
H_0 : Financial = disaster; p -value	0.30	0.12	0.14	0.55	0.31
R^2	0.058	0.101	0.136	0.168	0.189
Observations	1770	1740	1711	1685	1660
(b) Pre-WWII sample	Year 1	Year 2	Year 3	Year 4	Year 5
Financial recession	3.03 (3.31)	1.96 (6.54)	0.29 (7.60)	2.31 (8.26)	9.17 (6.67)
Normal recession	–2.71 (4.69)	–4.50 (4.21)	–0.35 (4.34)	–8.87 (6.92)	–4.17 (8.17)
Non-financial macro disaster	–12.86 (18.77)	–20.29 (19.29)	–17.50 (19.45)	–14.74 (19.58)	–12.07 (17.91)
H_0 : Financial = normal; p -value	0.12	0.35	0.95	0.32	0.13
H_0 : Financial = disaster; p -value	0.34	0.24	0.38	0.42	0.30
R^2	0.070	0.125	0.162	0.210	0.255
Observations	590	581	573	567	562
(c) Post-WWII sample	Year 1	Year 2	Year 3	Year 4	Year 5
Financial recession	3.66 (2.34)	11.23*** (3.71)	8.15** (3.07)	5.91* (2.89)	6.19* (3.03)
Normal recession	–0.61 (2.54)	–0.53 (3.10)	1.98 (2.80)	2.25 (2.58)	2.52 (2.55)
Non-financial macro disaster	1.32 (1.60)	–3.84 (6.65)	–17.93 (12.08)	–4.13 (6.07)	–7.57 (6.82)
H_0 : Financial = normal; p -value	0.28	0.03	0.10	0.43	0.40
H_0 : Financial = disaster; p -value	0.48	0.10	0.04	0.07	0.03
R^2	0.138	0.258	0.363	0.455	0.528
Observations	1180	1159	1138	1118	1098

Notes: *** Significant at 0.01. ** Significant at 0.05. * Significant at 0.1. Robust standard errors (clustered by country) in parentheses. Results correspond to local projections of cumulative change in 100 times the logged variable relative to peak for years 1–5 of the financial recession (first row), normal recession (second row), and non-financial macro disaster (third row). The top panel (a) covers the years 1870–2014, the middle panel (b) covers the years 1870–1938, and the bottom panel (c) covers the years 1950–2014. World War I years (1914–1918) and World War II years (1939–1949) are excluded. Financial = normal tests the null that coefficients for each type of recession are the same for the intercept terms in the first and second rows. Financial = disaster tests the null that coefficients for each type of recession are the same for the intercept terms in the first and third rows. In each case the p -value of the test is provided. The controls are contemporaneous and 1-year lagged values of the growth rate of GDP per capita and the CPI inflation rate at peak (coefficients not reported). See text.

Table E3

Local projections of parliamentary fractionalization.

(a) Full sample	Year 1	Year 2	Year 3	Year 4	Year 5
Financial recession	0.36 (0.23)	0.63* (0.36)	0.44 (0.55)	0.50 (0.65)	–0.32 (1.15)
Normal recession	–0.09 (0.14)	–0.30 (0.23)	0.25 (0.46)	–0.11 (0.44)	–0.06 (0.49)
Non-financial macro disaster	0.17	0.80	0.68	0.90	0.99

Table E3 (continued)

(a) Full sample	Year 1	Year 2	Year 3	Year 4	Year 5
H_0 : Financial=normal; p -value	0.07	0.00	0.69	0.16	0.84
H_0 : Financial=disaster; p -value	0.63	0.90	0.85	0.72	0.54
R^2	0.048	0.086	0.115	0.144	0.159
Observations	2149	2126	2103	2080	2057
(b) Pre-WWII sample	Year 1	Year 2	Year 3	Year 4	Year 5
Financial recession	0.76 (0.50)	0.76 (0.49)	0.57 (0.73)	0.61 (0.85)	-0.55 (1.63)
Normal recession	0.16 (0.41)	-0.51 (0.46)	0.22 (0.54)	-0.17 (0.60)	0.35 (0.71)
Non-financial macro disaster	0.60 (0.78)	-0.17 (0.92)	-0.30 (0.76)	-0.16 (0.66)	0.66 (0.89)
H_0 : Financial=normal; p -value	0.28	0.05	0.54	0.25	0.61
H_0 : Financial=disaster; p -value	0.84	0.31	0.41	0.46	0.45
R^2	0.065	0.119	0.158	0.191	0.204
Observations	923	920	917	914	911
(c) Post-WWII sample	Year 1	Year 2	Year 3	Year 4	Year 5
Financial recession	0.02 (0.33)	0.70* (0.37)	0.95** (0.41)	1.36*** (0.39)	1.60*** (0.44)
Normal recession	-0.33 (0.31)	-0.13 (0.39)	0.33 (0.45)	0.10 (0.42)	-0.29 (0.55)
Non-financial macro disaster	-0.53 (0.47)	2.15 (3.15)	2.00 (3.29)	2.47 (3.19)	1.65 (3.81)
H_0 : Financial=normal; p -value	0.37	0.06	0.36	0.05	0.02
H_0 : Financial=disaster; p -value	0.25	0.64	0.75	0.73	0.99
R^2	0.071	0.106	0.142	0.177	0.215
Observations	1226	1206	1186	1166	1146

Notes: *** Significant at 0.01. ** Significant at 0.05. * Significant at 0.1. Robust standard errors (clustered by country) in parentheses. Results correspond to local projections of cumulative change in 100 times the logged variable relative to peak for years 1–5 of the financial recession (first row), normal recession (second row), and non-financial macro disaster (third row). The top panel (a) covers the years 1870–2014, the middle panel (b) covers the years 1870–1938, and the bottom panel (c) covers the years 1950–2014. World War I years (1914–1918) and World War II years (1939–1949) are excluded. Financial=normal tests the null that coefficients for each type of recession are the same for the intercept terms in the first and second rows. Financial=disaster tests the null that coefficients for each type of recession are the same for the intercept terms in the first and third rows. In each case the p -value of the test is provided. The controls are contemporaneous and 1-year lagged values of the growth rate of GDP per capita and the CPI inflation rate at peak (coefficients not reported). See text.

Table E4

Local projections of the number of parties in parliament.

(a) Full sample	Year 1	Year 2	Year 3	Year 4	Year 5
Financial recession	1.57 (1.20)	2.10 (1.73)	2.17 (2.42)	3.21 (2.75)	1.88 (3.24)
Normal recession	0.26 (0.80)	0.50 (0.97)	2.55** (1.11)	1.47 (1.12)	1.96 (1.21)
Non-financial macro disaster	-0.90 (1.17)	1.94 (3.74)	4.73 (4.04)	6.75** (3.21)	6.91* (3.55)
H_0 : Financial=normal; p -value	0.31	0.39	0.88	0.40	0.98
H_0 : Financial=disaster; p -value	0.10	0.97	0.60	0.45	0.34
R^2	0.045	0.083	0.114	0.142	0.172
Observations	2146	2121	2095	2069	2043
(b) Pre-WWII sample	Year 1	Year 2	Year 3	Year 4	Year 5
Financial recession	2.43 (1.95)	3.82 (2.42)	5.08** (2.40)	5.35** (2.54)	-1.92 (4.25)
Normal recession	-0.72 (1.60)	-0.19 (1.91)	2.97 (2.29)	1.03 (2.04)	1.27 (1.90)
Non-financial macro disaster	-1.48 (2.09)	-0.10 (3.78)	1.95 (3.75)	2.42 (3.93)	2.63 (4.74)
H_0 : Financial=normal; p -value	0.10	0.10	0.42	0.10	0.53
H_0 : Financial=disaster; p -value	0.09	0.33	0.56	0.59	0.49
R^2	0.061	0.106	0.144	0.173	0.204
Observations	920	915	909	903	897

Table E4 (continued)

(a) Full sample	Year 1	Year 2	Year 3	Year 4	Year 5
(c) Post-WWII sample	Year 1	Year 2	Year 3	Year 4	Year 5
Financial recession	1.33* (0.67)	1.17 (1.68)	−0.44 (3.56)	1.14 (3.67)	9.83*** (2.40)
Normal recession	1.69 (1.22)	1.98 (1.46)	3.11* (1.57)	2.17* (1.18)	2.56* (1.37)
Non-financial macro disaster	−0.03 (1.29)	5.31 (7.74)	8.62 (9.34)	12.16 (7.80)	12.68 (7.71)
H_0 : Financial = normal; p -value	0.68	0.71	0.39	0.78	0.01
H_0 : Financial = disaster; p -value	0.29	0.62	0.38	0.19	0.72
R^2	0.063	0.119	0.163	0.207	0.251
Observations	1226	1206	1186	1166	1146

Notes: *** Significant at 0.01. ** Significant at 0.05. * Significant at 0.1. Robust standard errors (clustered by country) in parentheses. Results correspond to local projections of cumulative change in 100 times the logged variable relative to peak for years 1–5 of the financial recession (first row), normal recession (second row), and non-financial macro disaster (third row). The top panel (a) covers the years 1870–2014, the middle panel (b) covers the years 1870–1938, and the bottom panel (c) covers the years 1950–2014. World War I years (1914–1918) and World War II years (1939–1949) are excluded. Financial = normal tests the null that coefficients for each type of recession are the same for the intercept terms in the first and second rows. Financial = disaster tests the null that coefficients for each type of recession are the same for the intercept terms in the first and third rows. In each case the p -value of the test is provided. The controls are contemporaneous and 1-year lagged values of the growth rate of GDP per capita and the CPI inflation rate at peak (coefficients not reported). See text.

Table E5

Local projections of the no. of street protest incidents (% deviation from trend).

(a) Full sample	Year 1	Year 2	Year 3	Year 4	Year 5
Financial recession	1.34 (1.13)	4.37 (2.80)	11.22** (5.07)	20.65** (7.62)	21.51* (10.35)
Normal recession	0.65 (0.57)	0.34 (1.41)	−1.10 (2.11)	−2.69 (2.78)	−3.60 (2.53)
Non-financial macro disaster	1.33 (1.51)	1.57 (4.20)	−1.64 (6.56)	−7.78 (8.71)	−3.65 (7.04)
H_0 : Financial = normal; p -value	0.61	0.27	0.05	0.01	0.03
H_0 : Financial = disaster; p -value	1.00	0.63	0.18	0.05	0.06
R^2	0.612	0.522	0.441	0.407	0.408
Observations	1561	1521	1481	1441	1401
(b) Pre-WWII sample	Year 1	Year 2	Year 3	Year 4	Year 5
Financial recession	−1.09 (0.95)	−1.00 (2.62)	0.89 (4.61)	6.78 (6.90)	11.68 (8.62)
Normal recession	−1.87** (0.82)	−1.37 (2.13)	2.14 (3.66)	3.82 (4.77)	6.70 (5.28)
Non-financial macro disaster	−1.15 (1.08)	−2.93 (3.27)	−3.15 (6.24)	−8.55 (9.66)	−2.25 (8.25)
H_0 : Financial = normal; p -value	0.62	0.93	0.86	0.76	0.66
H_0 : Financial = disaster; p -value	0.97	0.64	0.61	0.23	0.26
R^2	0.873	0.790	0.736	0.725	0.754
Observations	357	337	317	297	277
(c) Post-WWII sample	Year 1	Year 2	Year 3	Year 4	Year 5
Financial recession	1.37 (0.86)	5.30** (2.45)	14.72** (5.47)	28.96*** (9.77)	30.04* (16.39)
Normal recession	2.20*** (0.69)	2.71** (1.28)	0.96 (2.03)	−0.03 (2.40)	−1.52 (2.60)
Non-financial macro disaster	3.95* (2.19)	7.78 (5.19)	6.99 (5.73)	4.53 (6.74)	4.20 (9.71)
H_0 : Financial = normal; p -value	0.50	0.42	0.04	0.01	0.08
H_0 : Financial = disaster; p -value	0.34	0.71	0.40	0.08	0.19
R^2	0.545	0.469	0.399	0.380	0.383
Observations	1204	1184	1164	1144	1124

Notes: *** Significant at 0.01. ** Significant at 0.05. * Significant at 0.1. Robust standard errors (clustered by country) in parentheses. Results correspond to local projections of cumulative change in 100 times the logged variable relative to peak for years 1–5 of the financial recession (first row), normal recession (second row), and non-financial macro disaster (third row). The top panel (a) covers the years 1919–2012, with World War II years (1939–1949) being excluded, the middle panel (b) covers the years 1919–1938 and the bottom panel (c) covers the years 1950–2012. Financial = normal tests the null that coefficients for each type of recession are the same for the intercept terms in the first and second rows. Financial = disaster tests the null that coefficients for each type of recession are the same for the intercept terms in the first and third rows. In each case the p -value of the test is provided. The controls are contemporaneous and 1-year lagged values of the growth rate of GDP per capita and the CPI inflation rate at peak (coefficients not reported). See text.

Appendix F. The reform process after crises: veto players

This section describes the Veto Player Index by Tsebelis (2002), as well as the application of the index in our analysis. Tsebelis (2002) defines a veto player as any individual (e.g., a president or a strong party) or collective (e.g., a parliament or a weak party) political actor that can veto reforms. More specifically, the Veto Player Index, for a given country and year, captures (a) the number of such veto players, (b) their maximum ideological distance from each other (right/left dimension), and (c) the internal coherence of individual players.

The index ranges from 0 to 12 and increases in the number of veto players, in the degree of diverging preferences among them, and/or if there is less internal coherence among the set of veto players. According to Tsebelis (2002), higher index values imply more difficulties in policy-making and a reduced chance for implementing reforms.

Fig. F1 plots local projections on the evolution of the veto player index post-crisis, using data from Tesebelis (2002) for 18 countries in the post-World War II period (the data cover only the years from 1945 to 2000 and exclude Greece and the United States).

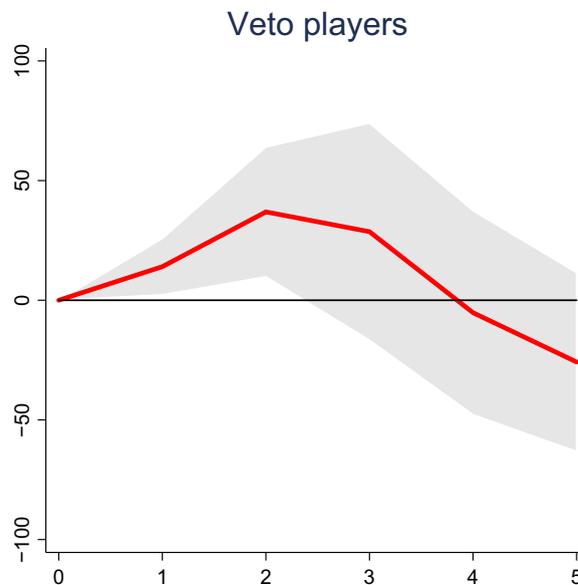


Fig. F1. Veto Player Index (local projections): financial crisis recessions. **Notes:** Each path shows local projections of the cumulative change relative to peak for years 1–5 of the recession/recovery period. The red line refers to the average path in financial crisis recessions and the shaded region is a 90% confidence interval. The controls are contemporaneous and 1-year lagged values of the growth rate of GDP per capita and the CPI inflation rate at peak. The panel covers the years from 1950 to 2000. Table D2 shows the recessions included. The dependent variable is the Veto Player Index by Tsebelis (2002). (For interpretation of the references to color in this figure caption, the reader is referred to the web version of this paper.)

The estimates show that the index increases by a cumulative 37% in year 2 after the crisis and is back to the pre-crisis level by year 4. This suggests that political constraints become significantly more intense, making it harder to govern and to get reforms underway.

For robustness, we also use the Political Constraint Index III by Henisz (2000), which resembles the index by Tsebelis, but measures the preferences of – and the alignment across – three government branches (executive, lower house, upper house). Henisz' measure is bound between 0 and 1, with higher values indicating more political constraints. Similar to Fig. F1, we find a significant post-crisis increase in this index, although the magnitude is smaller compared to the Tsebelis data. The results are available upon request.

Appendix G. Supplementary data

Supplementary data associated with this paper can be found in the online version at <http://dx.doi.org/10.1016/j.eurocorev.2016.03.006>.

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